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Sir Andrew Ag Agnew
of LOCHNAW, Bart.

JOHN A. SEAVERNS

THE

ENCYCLOPÆDIA OF SPORT

Drawn by J. Thurburn

Pheasant

THE

ENCYCLOPÆDIA

OF

SPORT

EDITED BY

THE EARL OF SUFFOLK AND BERKSHIRE

HEDLEY PEEK

AND

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LICENCES—**Dog Licences**—An annual licence, formerly costing 5*s.* (30 & 31 Vict. c. 5), but now costing 7*s.* 6*d.*, is required to be taken out for every dog more than six months old (except *sheep dogs*, used exclusively for sheep, *blind men's dogs*, and *hounds*, otherwise paid for), under a penalty of £5 and costs for each dog so kept.

The penalty for using a dog without a licence to kill or take game is £20, under 23 & 24 Vic. c. 90 sec. 4, entitled "An Act to repeal the duties on Game Certificates and Certificates to kill game, and to impose in lieu thereof Duties on Excise Licences and Certificates for the like purpose."

Game Licences—After repeated discussions in Parliament, the necessity of any qualification for killing game was by 1 & 2 Will. IV. c. 32 abolished, and the right was made to depend merely on the payment of an annual tax called a "game certificate,"[1] still so called in Ireland, but now termed in England a "licence to kill game."

This licence is required to be taken out by every person using a dog, gun, net, or "other engine," for taking or killing "game" (elsewhere defined), or any woodcocks, snipes, quail, landrail, rabbits, or deer.

No licence, however, is required for netting or snaring woodcocks and snipes; for killing rabbits in a warren; for coursing or hunting hares, or for hunting deer; and the following persons are also exempted from taking out a game licence, viz., members of the Royal Family; Her Majesty's game-keepers; persons assisting *without guns* in the killing of game by licensed persons; and owners or occupiers of enclosed land killing hares on their own enclosed land. Under the Ground Game Act (43 & 44 Vic. c. 47) the occupier and persons authorised by him to kill ground game are not for that purpose required to take out a licence to kill game, but it is expressly enacted (sec. 4) that they must hold a 10*s.* gun licence, under the provisions of the Gun Licence Act, 1870 (33 & 34 Vict. c. 57).

The duties to be paid for game licences vary according to the period for which the licence is required. For the whole season the duty is £3; until October 31st £2; and after November 1st to end of season (February 2nd) £2; while a licence for fourteen consecutive days at any time during the season may be obtained on payment of £1. The cost of a game-keeper's licence is only £2 for the whole season. Subject to the exemptions above mentioned, the penalty for searching for, or killing "game" without a licence, is a fine not exceeding £5 (under 1 & 2 Will. IV. c. 32), and for killing "game," woodcock, snipe, quail, landrail, rabbit, or deer without a licence £20 (under the Licensing Act 23 & 24 Vict. c. 90), while any person discovered in pursuit of "game," &c., and refusing to give his name and address, or to produce his licence to persons authorised to require its production, or producing a fictitious or expired licence, or giving a fictitious name, is also liable to a penalty of £20.

Gun Licences—Until August 1870 no duty was payable by any person using a gun for any other purpose than killing game.

In that month, however, the "Gun Licence Act" 1870 (33 & 34 Vic. c. 57) came into operation, and by its provisions no one (except those exempted from duty as above mentioned) may use or carry a gun without a licence costing 10*s.*, under a penalty of £10. This licence, however, is not required to be applied for by persons who have already taken out a game licence, so long as that game licence remains in force; nor does the "Gun Licence Act" apply to persons in the army, navy, volunteers, or constabulary using their firearms in the performance of their duty, or to persons carrying a gun to scare birds from the crops, or to kill vermin, or carrying a gun for the holder of a game licence or gun licence.

The term "gun" includes a firearm of any description, and an air gun, or any other kind of gun, from which any shot, bullet, or other missile can be discharged (sect. 2). Under this section it has been held that a toy pistol is a gun within the meaning of the Act (*Campbell* v. *Haaley*, 40 J. P. 756), but not a catapult.

Proceedings under this Act cannot be instituted by private individuals, but only by the Commissioners of Inland Revenue, inasmuch as the Act was passed for the purpose of raising revenues.

J. E. Harting.

LIFE-SAVING—[*See* Swimming].

LION—SOUTH AND SOUTH-EAST AFRICA (*Felis leo*)—Although I believe that it is now the opinion of most modern naturalists that there is no specific difference between the African lion and his Asiatic relative, and that therefore there is but one species of this animal in the world, whether it be found in North-Western India or in Persia, or in any district of the vast African continent; and although I myself consider the opposite view, that several species of lions exist, to be quite untenable; yet I think it possible that these animals may vary to some extent in character even in different districts of the same continent. I will therefore preface what I am about to write concerning them by saying that my observations have been made solely in

[1] Certificates were first required to be taken out by persons qualified to kill game by statute 25 Geo. III. c. 50.

Southern and South-Eastern Africa, and my notes therefore will be descriptive of the lion as I have found him in those districts.

When the Dutch first landed at the Cape of Good Hope, lions must have been very numerous in the Cape Peninsula, as the following entry occurs in the diary of the first Governor of the country: "This night the lions roared as if they would take the fort by storm," the said fort standing on the site of what is now Cape Town. Long after this date, in the early years of the present century, lions were still plentiful in many parts of the Cape Colony. But as the abounding game on which they lived was killed off, and the country settled up by the ever advancing European colonists, there was no food left for the great carnivora but the flocks and herds of the human intruders. On these the lions feasted freely, and sometimes they were able to kill and eat one of the disturbers of their peace; but teeth and claws, though good weapons in their way, are no match for firearms, and so the lions were gradually destroyed, and now one must travel many a hundred miles inland from Cape Town in order to meet with one of these grand brutes in his wild state.

Where the carcase is, there will be the vultures, and at the present day in Africa where there is game, there too will lions be found; few and far between where the beasts on which they prey are scarce and scattered, but numerous in districts where wild animals still abound. How numerous both game and lions once were in South Africa may be judged when I mention that the Rev. Robert Moffat has left it on record that he once saw in one day, when travelling on the eastern border of what is now British Bechuanaland, nine different troops or families of the latter animals.

It is undoubtedly more usual to come across several lions together than one by itself; and I think I may say that in undisturbed parts of the country, where game is abundant, it is quite the exception to find a lion or a lioness alone. Two or three male lions often hunt together, though family parties are, I think, more frequently met with. The grown-up members of such parties may consist of one old male and from one to four females; but should two or more of these females have cubs of different ages at the same time, the family party may become a veritable troop of lions, amongst which at a little distance the more mature of the rising generation will be scarcely distinguishable from their mothers, whom they do not leave until they are old enough to hunt for themselves. From my own experience I should say that it is very unusual to find more than one mature male amongst a family party of lions, though such a master of the harem may tolerate the company of one or two of his sons until they become old enough to aspire to the affections of one of his wives. Then there is probably a row, and the young lion quits his father's household and goes out into the world, either alone or accompanied by one or more of the ladies who have caused the trouble. At times, however, undoubtedly two or even three male lions, each with his own females, fraternise and hunt together; but the passions of love and jealousy must always, I fancy, cause such alliances to be of a very temporary character.

Man-eaters—When through old age the powers of a lion begin to fail, he meets with no consideration at the hands of his fellows, by whom he is driven away to lead a solitary life of hardship only to be terminated by death from starvation, or, worse still, by the cruel fangs of the very hyænas to whose carrion-eating tribe he had been as a king in the days of his prime. Does the old lion, I wonder, lying gaunt and mangy, tired and hungry, with shrunken muscles, broken teeth, and worn-out claws, ever remember in his solitude the halcyon times of his earlier career? If so, bitter indeed must be his thoughts. In the days of his strength, not so many years ago, he could seize a buffalo by the nose and break its neck with one swift powerful jerk, or drop a zebra in its tracks with a bite behind the ears. Now he must slink away should a herd of buffaloes approach his lair, and he has neither the agility nor the strength to pull down any of the antelopes that he can see feeding in the plain near him. His only chance is to lie hidden close to some pool of water, in the hope of being able to pounce on a young wild hog. Failing that he must try and kill a porcupine, and fill his mouth and feet with its sharp quills before he can obtain a meal, or else endeavour to find a tortoise and gnaw through its hard shell for the sake of the mouthful of meat within. But day by day he must become weaker, and at last creep into some hiding place and die of starvation, or support the last humiliation of having his poor wasted limbs torn to pieces by wild dogs or hyænas. An old lioness suffers the same hard fate, her sex not protecting her from the neglect or even active hostility of her fellows in her extreme old age. In some parts of Southern Africa, where there is still a fair quantity of game, and where therefore there are lions about, there are also natives living in small communities, whose otherwise monotonous existence is sometimes relieved by the presence of one of these latter animals that has become so old and comparatively weak as to be unable to kill game.

Such an old lion or lioness, having failed for days perhaps to procure food for itself, may at last in its hunger and despair resolve to visit the habitations of the evil-smelling, two-legged creatures of whom it has always hitherto had a strange and unaccountable dread. Let us suppose that an old lioness in the last stage of emaciation has reached a small enclosure in Northern Mashonaland in which there are some

half dozen native huts. It is night, and the famished brute lies watching the light of the fires and listening to the murmur of the human voices and the bleating of the goats. But she is very old and very weak, and lacks the strength and the courage to try to force an entrance into the enclosure, and endeavour to carry off a man or a goat; and so, when day breaks, she is still lying watching.

Presently the poles forming the gate of the enclosure are taken down, and a small troop of goats is driven out, and the hungry, desperate, watching beast notes that the creature who drives them is very small,—a little boy, in fact, of but seven or eight years of age. All that day the goats and their shepherd are followed and watched by a cruel pair of hungry-looking yellow eyes, but not till they are returning home in the dusk of the evening does the watcher at last make up her mind to act. With stealthy step she creeps up behind the little boy as he whistles gaily to his home-returning flock, and is almost upon him before her whereabouts is discovered. The despairing shriek of the child and the low purring growl of the savage beast as she springs upon him are simultaneous.

That evening the goats come up to the kraal alone somewhat later than usual, for when their little shepherd was seized by the lioness they had loitered to browse; and would not have come home at all had not the nannies, whose kids had been kept behind when they went out to feed in the morning, led the way. Search is made for the missing shepherd, but it has grown too dark to note any trace of the brief struggle on the path, and the body has been dragged away into the bush. The next day, however, guessing what has happened, all the men in the village turn out with guns and assegais, and the lioness is soon found lying growling by all that remains of the boy that is not inside her. She is killed there and then without difficulty, and her mangy carcase is burnt on a great fire; and so ends this little tragedy of wild life.

The foregoing is no fancy picture, but the tale of what once happened close to my camp, as well as it could be elucidated by the tracks on the ground, which showed that the lioness had been round the kraal the night before she killed the boy, and had been near the goats as they were feeding during the daytime.

This lioness was not very formidable, as she was extremely old. I once came on one even weaker still from hunger and old age. This animal had been hanging round a Batonga kraal on the Zambesi, the inhabitants of which had no guns, and she had killed a goat or two before my arrival. I came on her early one morning, not far from the native village, as she was lying in wait. On seeing me approach, she left the patch of reeds in which she had been hiding, and walked across the path I was following, on her way to a wooded ridge; but so weak was she that twice in the space of one hundred yards her hind quarters gave way, and she swung over into a sitting position, and when I had shot her I found that she was nothing more than a few fleshless bones with a skin stretched over them. Her teeth were worn down to stumps, and her claws all cracked and broken.

It often happens, however, that an old lion takes to preying on human beings long before he has become actually decrepit, and such an animal may prove a very dangerous neighbour to a native kraal. Having gone hungry for several days through failing to kill game, he comes to a native village ripe for mischief, and perhaps has the luck to kill a nice plump native woman working in her maize field or going to fetch water, the very first day. He is astonished at the ease with which his first human victim was killed, and has also probably found the flesh really tasty; and he very naturally says, "No more running after strong wary brutes with sharp horns for me," and from that time till the day of his death he becomes a man-eater. His career may be cut short very soon, and in a district in which there is a considerable native population it is pretty certain to be so, as African natives usually combine to kill a man-eating lion; but I have known some of these dangerous brutes to become very cunning, and to do a great deal of mischief before they were destroyed. I have, too, seen several small abandoned villages in Northern Mashonaland, which I was assured had been deserted by their inhabitants because of the depredations of man-eating lions.

I have known cases where native men were seized and killed by lions in broad daylight; but such cases are, I think, very rare, man-eaters doing their work as a rule at night or in the dusk of the evening; and I think it may be taken as a general rule that in the daytime, or even on a bright moonlight night, lions will give way before the presence of man. I have on many occasions come upon lions feeding on the carcase of an animal they had only just killed, and at a time when they might reasonably be supposed to have been hungry; yet they invariably relinquished their prey and retreated. Exceptional cases to the contrary have doubtless occurred, but they are so few as to prove the rule.

Lions, however, have different ways of retreating before human beings, and my experience on this point is as follows:—In a country where much shooting has been done, and in which lions have been much disturbed, they will be found to have developed a great fear of man, and will not only retreat before him, but run off directly they become aware of his presence at such a pace that if he is on foot he will never get a shot at them. In districts, however, where they have never been interfered with, and where in fact they have grown to consider themselves

the lords of creation, as the natives from time to time encountered kept out of their way, they behave very differently. Should you come on a family of lions in such a district, they will all stand and look at you with lowered heads, and one or two will perhaps growl and twitch their tails; but the rest will probably walk slowly away, to be followed soon by their more sullen companions, who, however, will keep on halting and looking threateningly back at you; but they will keep on retreating, and finally disappear in the grass or reeds or bushes.

By day, therefore, if he is not interfered with, a lion cannot be called either bold or savage. By night, however, and especially on a dark rainy night, it is a different matter, and a hungry lion will at such a time often show himself to be a most daring and resolute animal. In my own experience I have known a lion enter a strongly-fenced camp three times in one night through the narrow opening left as a doorway, on each occasion carrying off the skin of a sable antelope. The first time he came in, the fire in the middle of the camp had burnt rather low; but it was then made up, and was blazing brightly when he passed within a few yards of it, on his second and third raids. I have also known horses to be seized that were tied to the wheel of a waggon outspanned for the night, and oxen attacked and killed whilst tied up to the yokes. Such incidents indeed are, or perhaps I ought to say, were, of constant occurrence in the history of travel in the interior of South Africa; but the country is fast becoming denuded of game along the main roads, and the lions have moved back with the game, or else have been shot by the owners of the cattle they had killed.

Though man is not the natural food of the lion, and though the latter would doubtless prefer the meat of a buffalo, zebra, horse or donkey, yet I do not think he would ever hesitate to kill and eat a human being, if he happened to meet one on a dark night, and was really hungry. Therefore I consider it more or less risky to walk along a road on a moonless night in any part of South Africa where there are lions about. One might do so twenty times without meeting a lion, and one might meet and pass several lions before coming across a really hungry one. But when at last that hungry animal was encountered, nothing could save one, as the lion would spring upon his unhappy victim from behind, and crush in his skull at one bite with such lightning-like rapidity that all resistance or evasion would be out of the question.

During the construction of the Beira Railway, in South-East Africa, lions were very troublesome, and often carried off men from the native working parties at nights. Indeed, Mr. A. L. Lawley, under whose superintendence the line was constructed, informed me that although he could not give me the exact number of men he had lost in this way, he believed it to be between thirty and thirty-five.

Methods of Killing and Devouring their Prey—Lions have no invariable method of killing their prey, but act in accordance with circumstances and the nature of the animal attacked. However, they appear to know that wounds inflicted on the head, throat, and back of the neck are the most speedily fatal to life, as these are the spots selected for their death-dealing bites.

It is my experience that in South Africa lions do not strike their victims a crushing blow with their paws, but use their claws primarily to hold their prey whilst they kill it with their teeth, although, of course, terrible claw gashes are often inflicted on any soft-skinned animal they may seize. Zebras, horses and donkeys are usually killed by bites behind the ears or under the throat: whilst an ox, buffalo or horned antelope is seized by the nose with one paw, and the claws of the other are driven deep into its withers. At the same time its head is jerked in under it, and its neck either at once dislocated by the enormous strength of the lion, or else the weight of the latter causes it to stumble and fall with its head pulled under it in such a way that it breaks its own neck.

I do not say that this method of killing horned game is invariable with lions, but I have known a large ox to be killed very neatly by a single lion in this manner, and I have found the claw marks on the muzzles of many other oxen, as well as buffaloes and horned antelopes that had been killed by these animals, and therefore imagine that they were killed in the same way. A single lion kills his game neatly and quickly, whilst I have known a party of lions to maul an ox in a disgraceful manner before they killed it. I imagine that this was because the younger members of the party were still learning their trade, and in their eagerness and inexperience bit wherever they could lay hold.

When once a lion or lions have killed an animal, they open the carcase at the point where the skin is thinnest, that is just in front of where the thigh joins the belly, at once eating this thin skin and the thin layer of flesh attached to it. Then they drag out the entrails and paunch through the opening thus made. This operation is performed with extraordinary neatness and cleanliness, the contents of the paunch and entrails never being spilt over the meat, as they always are when a Kaffir has the cutting up of a beast to do. The offal which has thus been removed from the carcase is dragged away to a little distance, and covered with earth and grass, which is scratched up over it, often so profusely that it is quite hidden from sight. Then the feast commences. First the liver, kidneys, heart and lungs are eaten; then the carcase is again torn open at the anus and the

Lion

soft meat of the buttocks eaten. The meat is torn off and eaten in great lumps with the skin attached. The lion is not a bone eater, but likes soft juicy meat, although, if an animal that he has killed is in good condition, he will eat all the fatty bones as well as the meat and fat of the brisket, and also gnaw off the ends of all the ribs, but no attempt is ever made to crunch any of the larger bones.

It used to be a popular fallacy, and possibly is so still, that the lion is a clean feeder, and will not touch carrion, or indeed feed on the flesh of any animal which he has not killed himself. The fact is that he is quite the reverse of choice or delicate as regards food. Should he come across a dead animal of any kind, killed by a human hunter, he will not go a step further to look for game, but will make a meal forthwith on the carcase that chance has thrown in his way. Nor is he at all particular as to the condition of such a carcase; as long as there is any meat left on it he will eat it, and I have known lions to feast night after night on the putrid carcases of elephants in preference to killing fresh meat for themselves, although game of all kinds was abundant in the immediate neighbourhood. Although the lion habitually preys upon every kind of South African game with the exception of the elephant, rhinoceros and hippopotamus, yet in a well-stocked game country, where he can take his choice, his taste seems to incline to the buffalo and Burchell's zebra rather than to any of the antelope tribe. Whether it is that these animals are less wary, and therefore more easily caught than antelopes, I do not know, but certain it is that wherever large herds of buffaloes still exist—I speak of herds of two or three hundred animals together—lions will be found following them about, just as the grey prairie wolves are said to have hung constantly upon the outskirts of the great herds of bison which once roamed over the wide plains of North America. Thus, wherever buffaloes and Burchell's zebras to-day still exist in large numbers, as in the country to the north and south of the lower course of the river Pungwé, there also one may expect to find lions numerous.

Specific Characters and Habits—It has often been asserted that in Southern Africa, and in other portions of that continent as well, I believe, there exist three distinct types of lion, each of which possesses such well defined characteristics as to entitle it to be ranked as a sub-species or constant variety, if not as a true species. This assertion will not, however, stand the test of careful and exhaustive investigation; for, although I grant that there is a wide superficial difference between a lion with a full black mane, and the animal that is so destitute of mane as to look more like a lioness than a lion, whilst the third so-called species, that is, the lion with the full yellow mane, differs considerably in appearance from either, it will yet be found that if a large number of lion skins be examined, they can be arranged in a series showing every stage of variation in the length and abundance and colour of the mane, from the comparatively poor looking beast, with little or no mane at all, to the magnificent animal whose whole neck, chest and shoulders are covered with a luxuriant growth of soft silky black hair. Then again you do not find different types of lions each inhabiting a well-defined area; throughout South Africa, wherever these animals occur, they will be found to differ one from another to an extraordinary degree in the development of their manes, if the extreme forms are taken.

Speaking generally, the wild lion of Southern Africa has a poor mane, covering little more than the neck and chest, with a tag on the top, extending backwards between the shoulder blades, and lions with long full black manes covering the whole shoulder as well as the neck are quite exceptional. In the course of five and twenty years spent in the interior of Southern Africa, I have seen a large number of wild lion skins; but although amongst these were a few with heavy manes which also had tufts of long dark hair in the flanks, yet until the other day I never saw the skin of a wild lion with the whole belly covered with long hair, as is constantly the case with menagerie animals.

The history of the skin in question is that it is that of a lion which was killed in South Africa some fifty years ago, very much further south (and, if on one of the high plateaus of the Cape Colony, the Orange Free State, or the Southern Transvaal, in a country where the cold is much more severe in winter) than in any part of South Africa where lions exist to-day. This bears out the opinion I have always held that the luxuriant growth of mane, which is general amongst the lions which one sees in the menageries of Western Europe, is due to climate—to the influence of cold and damp. The theory that the manes of wild lions get destroyed by thorns will not hold water, as on the high plateaux of Matabeleland and Mashonaland, where there are no thorns or thick bush of any sort, I have seen many lions with very poor manes; but, on the other hand, it is on these same high plateaux where the climate is cold in the winter and never excessively hot, that the finest wild lion skins I have seen—with the exception of the one I have mentioned, whose original owner was shot some fifty years ago, much further south—were obtained, and I do not believe that in the hot coast lands of South-Eastern Africa lions ever develop the long flowing manes that are occasionally met with in the colder plateaux of the interior.

Besides the variation in the growth and colouration of their manes, lions also differ con-

siderably in the colour of their coats, some being light yellow, and others of a much darker shade. I once killed a lioness which was just about to give birth to three cubs, which I took out of her womb fully developed and quite alive. Two of these little creatures were males and the third a female. The last, and one of the males, were very dark, almost blackish in general colour, whilst the other male was yellow; and I believe that had these lion cubs lived to be born and had they reached maturity, they would have become, the one a dark-coated, dark-maned lion, and the other a yellow-maned animal, each representing a so-called variety or species.

In captivity, lionesses frequently give birth to from four to six cubs, but in a wild state the usual number is certainly three, and of these a large number, for some reason or other, never reach maturity. Possibly they die in teething, as it is rare to see a lioness with more than two well-grown cubs, whilst, often, apparently only one out of the original three is reared. Some natural law must of necessity exist to keep within bounds the numbers of such destructive animals; otherwise in course of time they would in parts of Africa have become more numerous than the game on which they preyed, as they were absolutely masters of the situation in uninhabited districts before the advent of European sportsmen, the few scattered natives they happened to meet never interfering with them. They would thus at last have exterminated all the wild animals they were capable of killing, and would then have been forced to prey upon one another, with the final result of the battle between the Kilkenny cats. If we take a district, however, like the country north and south of the Pungwé river, which may be said to have been in the hands of nature from times immemorial, until within the last few years, we find that no such catastrophe has occurred, the balance of nature having been maintained in such a way that, although lions were very numerous, their numbers had been kept down by natural law to a figure strictly proportionate to that of the game on which they lived.

Measurements—As to the size and weight attained to by wild lions, I am sorry that I have not the series of statistics which I might have had, had I carefully measured and weighed all those animals which have fallen to my rifle. What appeared to me to be a very large lion, which was, I think, the largest though perhaps not the heaviest of those I have killed, stood 3 feet 8 inches in perpendicular height at the shoulder, whilst the length in a straight line between two pegs, one of which was driven into the ground at his nose and the other at the end of his tail was 9 feet 11 inches. His weight was 410 pounds, but he might have weighed considerably more once, as he was an old animal, a good deal past his prime, though his coat was in very good order, and he carried a handsome mane. The pegged-out skin of this lion measured 11 feet 9 inches from the nose to the tip of the tail. The greatest length of a pegged-out skin I have ever known was 12 feet 3 inches, and it is the exception for the pegged-out skins of South African lions to measure more than 11 feet. The skull of the large lion I have mentioned as standing 3 feet 8 inches at the shoulder, which is now in the collection of the British Museum of Natural History, measures 15 inches in length and 10½ inches in breadth, and weighs 5½ pounds now that it is thoroughly dried out and cleaned.

The Roar—One of the most notable characteristics of the lion is his roar, which is one of the grandest and most awe-inspiring sounds in nature. But fully to appreciate this magnificent music of the wilderness, one must hear several lions roaring in unison, in the immediate vicinity of one's camp; and it is quite possible to have passed several years in the hunting grounds of Africa without having met with such an experience, although lions would of course frequently have been heard roaring at a distance of a mile away and upwards. The volume of sound produced by four or five lions all roaring together more than a mile away will, even at that distance, be so great as to make one believe that they are within one hundred yards; but, when they are really close, the hiss of their breath can be heard at the end of the grunts with which each lion concludes his actual roaring. To compare the booming call of the male ostrich with the roar of the lion appears to me altogether unjust to the latter, as an ostrich calling three hundred yards away could only be mistaken for a lion roaring in the far distance, and could never be mistaken at all by an experienced ear, as the ostrich has only three notes, the first two short and the third long drawn out; and although the quality of the sound is somewhat similar, the call as a whole is absolutely different to the roaring of the lion, which, beginning with a low humming purr, rises gradually into a magnificent volume of sound, and then dies down and ends in a few short hissing grunts. In my opinion, lions roar freely only when full and satisfied; and when going down to drink in this pleasant frame of mind they often stop at intervals of about ten minutes and, after indulging in a good roar, again proceed on their way. At other times they will roar all night long intermittently round the carcase of an animal on which they are feasting. Usually, therefore, I consider that the loud roaring of lions denotes a sense of satisfaction; but sometimes it must mean defiance, as I remember once hearing lions roaring loudly some three miles from my camp: and on riding out at daylight to look for them, found first of all a single big male, and then another male in the possession of four females, which I feel sure the former was anxious to annex, and the latter

determined to hold for his own, each of them giving vent to his feelings by roaring, in which the females very likely joined.

When a lion comes prowling round an encampment or a waggon outspanned in the wilderness, with intent to seize an ox or horse, or some other domestic animal, he does not make a sound, and his presence is generally first realised when he has actually got hold of his victim. I presume therefore that the same very natural tactics are pursued when he is hunting for game, and that at such times also he does not go about announcing his whereabouts by roaring.

Sometimes I have heard lions emit a kind of low purring growl, which it is very difficult to locate. Such low growls I fancy sound a note of disappointment at not being able to find game, or of chagrin after being baffled, perhaps by the watchfulness of dogs, in an attempt to raid an encampment.

Characteristics when Hunted—When a lion stands at bay, he holds his head low down between his shoulders, and, with his eyes fixed on his adversary, gives vent to a quick succession of deep grunting roars, twitching his tail all the time from side to side with little nervous jerks. Should he suddenly throw his tail in the air straight and stiff as a bar of steel, then look out, for he means coming. I have never known a lion throw his tail up thus two or three times in quick succession without immediately charging, though I have seen many charge without this preliminary warning. When a lion stands at bay, it is worthy of remark that he does not snarl like a leopard, but holds his mouth slightly open, the great canine tooth of the upper jaw being nearly hidden by the heavy jowl. But his eyes scintillate like living fire, and altogether his appearance is most determined and business-like. When he actually charges, he does so to an accompaniment of hoarse, grunting roars. He does not come on with great bounds, but at a heavy gallop, and rather rushes on to than springs upon his prey. I have been chased many times when on horseback by lions, most of which had not been wounded but only irritated by being interfered with. These lions usually turned and stood at bay when the horse was still some distance from them, and, when they charged, the horse always had a start of from sixty to over one hundred yards. At first I think the lions always gained, and sometimes got up pretty close; but not being able to maintain the speed of their first rush, they soon began to lose ground, and as they saw the horse gradually drawing away from them, gave up the pursuit in disgust. The horses I was riding on these occasions were not racers, but good smart animals with a fair turn of speed. A slow, heavily-built horse would doubtless be unable to get away from a lion, though, even should he be overtaken, he would not necessarily be pulled down, as I know of many instances when a horse has got away (sometimes with a rider on his back) after having been seized on either side of the hind quarters by the claws of its pursuer. This is not very wonderful, as it must be remembered that both horse and lion are going at their utmost speed. As the latter draws up close under the tail of the former, he is just able by a great effort to raise his fore quarters from the ground, and clutch the hind quarters of the horse with his armed paws. But the knife-like sharpness of his claws prevents his making good his hold on the body of a heavy animal going at great speed. They tear long deep gashes through skin and flesh as if they were razors, but they seldom hold in such a stern chase; and the horse goes on, possibly a trifle quicker than before, whilst the lion falls heavily back, and loses so much ground that it seldom renews the chase.

Time was when no man dare cast a slur upon the courage of a lion; and even now a brave man is popularly said to be "as brave as a lion." Dr. Livingstone was the first, I think, who deposed the king of beasts from his high estate, making him out to be the veriest cur, and even going so far as to say that in appearance he was only "somewhat larger than the largest dog." Since then some other writers and talkers have followed suit, and nowadays it is not uncommon to hear the lion spoken of as a cowardly brute that can be hunted and killed with far less danger than is likely to be incurred in shooting buffaloes.

With this estimate I cannot agree. Some lions doubtless are cowardly, but I have known others that were just the opposite; and if the average character of his species be taken, I unhesitatingly say that, speaking generally, the lion, at any rate in South and South-Eastern Africa, is a far more dangerous animal to meddle with than a buffalo. True, many men have been killed or badly hurt by wounded buffaloes—or, perhaps, by buffaloes unwounded by them, indeed, but smarting under wounds inflicted by other hunters or by lions—but not nearly so many in the parts of Africa I am acquainted with, as have been killed or mauled by lions: and yet for every lion that has been killed in South Africa during the last twenty-five years, at least fifty buffaloes have been accounted for. This is a point that is usually forgotten or ignored by those who depreciate the courage of the lion, as is the following fact—namely, that inexperienced sportsmen, and sometimes men who ought to know better, will often take liberties with a wounded buffalo that they would not attempt with a lion.

Once he is wounded, the African buffalo becomes a vicious animal that it is highly dangerous to follow into long grass, high reeds, or thick bush. But it is often done, and the

astonishing thing is that more accidents do not happen than actually occur under such circumstances. Few men, however, would be mad enough to follow a wounded lion into really dense cover without dogs. A buffalo will seldom charge unless he sees his pursuer close to him; but a lion, if vicious, will often charge from a distance of over a hundred yards. Then, too, should there be a tree handy, a buffalo can be evaded by swinging one's body a few feet off the ground, but it would be impossible to get high enough up a tree to save oneself from a charging lion. These opinions regarding the relative danger of lion and buffalo hunting I put forward with all deference; but I may remark that I have had a considerable experience with lions and a very large experience with buffaloes, whose character I think I know as well as most people, having killed well over 200 of them, mostly on foot. I do not think that there is much danger in attacking a lion or lions in the first instance, although, should there be several of them together, it is always on the cards that when one is fired at, another of the party will instantly charge, a contingency which, though it has never happened to myself, has befallen men I have known, sometimes with very disagreeable results. The great thing is to be cool and careful, and endeavour to give a lion a deadly wound with the first shot. He usually gives one a good chance, standing broadside on, with head turned sideways, quietly scanning the intruder on his preserves; or, if he has been chased on horseback and brought to bay, facing directly towards his pursuer, with lowered head, growling savagely.

In the second case no time should be lost in dismounting and firing, as it is impossible to tell at what instant he may make up his mind to charge. If he is fairly hit, all the charging is taken out of him for the moment, and if shot through the heart or lungs he will succumb very quickly. If not instantly floored with a broken back or neck, or unless the shot has shattered one of its hind legs (in which latter case the wounded animal will spin round, biting at the injured part), he will turn and run for it, and every effort should then be made to keep him in sight, as he will soon stop and hide behind a small bush or tuft of grass (and it is extraordinary in what thin and scanty cover a lion can conceal himself) and may be expected to charge if followed up.

Some dogs are of the utmost service in lion-hunting, but such animals must be trained to the work, and be both bold and cautious at the same time. A very plucky dog is useless, as he just rushes in and is instantly killed. What is wanted is a dog that will run close up to a lion barking furiously, but not attempting to tackle him. Such an animal will soon bring a lion to bay, and not only divert his attention from the hunter, but also let the latter know where he is, and very likely bring the furious brute charging out of thick cover at the heels of his insignificant assailant. Such dogs are, however, rare, and, to a hunter, worth their weight in gold.

Armament—As for the best rifle for lion shooting, that is a subject upon which almost every one has his own opinion. Large-bore rifles are certainly not necessary, as a lion is not only a thin-skinned animal without heavy bones, but is also much less tenacious of life than any of the African antelopes. I have killed most of my lions with a 450-bore rifle, by Gibbs, of Bristol, using a hollow-pointed 360-grain bullet and 100 grains black powder; but should I ever kill another of these grand brutes, which I am afraid is unlikely, it will be with one of the new small-bore rifles, which, on account of their low trajectory and great killing powers with a good form of bullet, I should now be inclined to use against all but the heaviest classes of game, in preference to any other weapon.

F. C. Selous.

SOMALILAND—There are plenty of lions still to be found in the unexplored parts of the Somali plateau, and in Galla Land, but owing to the attacks of sportsmen they are rare within the explored parts of the coast belt.

To be sure of getting them, it is necessary to march from 150 to 200 miles inland, and then to strike into unexplored territory, the arrangements being, of course, formidable and expensive, including, as they do, a suitable armed escort.

As some of the best lion ground is far from water, several camels must be devoted to its transport. There should be enough water to supply the caravan, which may number from 20 to 50 camels, and nearly as many men, for 7 or 8 days. The camels, of course, can do without water for 10 days or so. Once established in good sporting country, water may be sent for if the nearest wells are not more than 30 miles distant, and the camels may be watered at the same time.

The pursuit of lion-hunting is distinct from other sports in its character. Unlike tiger-hunting, which can be undertaken with the help of elephants and beaters, the hunting of Somali lions is carried out by tracking on foot, or with a steady shooting pony. It is necessary for the sportsman to live a great deal among the kraals of the nomads, for lions follow them, and it is only at the kraals that information can be obtained.

Pitching the camp between two kraals, about half a mile apart, with others dotted about further away, the writer has generally sent out parties before sunrise in every direction, each composed of one or two camelmen, to bring in news from the kraals. If a lion has been heard

to roar during the night, a party has also been sent in that direction from camp to search for tracks on all the soft ground, for it is well known by natives that a lion, being an animal with comparatively tender feet, will not choose rocky ground for his midnight prowl when he can get a stretch of sand. It is probable on this account that in the old days, 1884 to 1887, when in Somaliland lions were plentiful in the broken country of the coast belt, which is intersected by dry sandy river-beds, these were dotted for miles with the footprints of lions which had promenaded all night up and down in small troops, lying in the reed-beds by day. The writer once counted the footprints of eight lions together, only one, however, being a full-grown male.

Considering the number of lions that were about, there was very little of the roaring at night and molesting of hunters' camps that we hear so much of in accounts from South Africa.

When, after the early breakfast, news has been collected from the various kraals—there may be a story of a lion having taken a sheep from one kraal by dragging it through the thorn zeriba, or an ox or a camel, missed the evening before, may be found to have been eaten by lions when searched for in the morning—the sportsman starts out for the scene of the depredation with a guide and two hunters, and a man to carry the waterbottle and a haversack of eatables and spare ammunition. Opinions differ as to weapons, but the writer, who is an advocate of the larger bores, prefers, in ordinary open jungle where shots may be got at from 50 to 150 yards, a double ·577 Express rifle to be carried in his own hand, and a ten-bore "Paradox" gun in the hands of an attendant, who should keep close up. The other native hunter may carry a light snider and do the tracking.

When organising the caravan at the coast, a cartridge-belt should be given to each of the hunters, to carry the ordinary escort cartridges and one or two cartridges of each of the spare sporting rifles. Thus, whatever rapid changes are made among gun-bearers, each man is fully armed.

When about to track a wounded lion through thick cover, the weapons might change hands, for the ten-bore "Paradox" would be the best to stop a charge in bush when the lion might be first seen when from 10 to 30 yards away.

The tracks made during the night and the trail where the victim has been dragged over the sand having been found, the party starts at a fast walk. Rubber tennis shoes are the best for this work, and natives should leave any conspicuously white parts of their clothing behind them, should take off their noisy sandals, and only talk in whispers. The hunters should keep the track until the presence of vultures in a tree, a jackal running across the path, or perhaps a growl, proclaims that the lion is close in front. From the indications, the natives will know whether the lion is still at his meal, or has been disturbed, or is sleeping in a bush close by. If the lion is still at the carcase, he may afford a steady shot before he sees the hunter; or if he bounds away with a growl before being sighted, a dash forward where the bushes are thinnest may give a hurried shot as he makes off. By daylight he will usually, however, be lying up not far away from the carcase in a patch of *durr* grass, a kind which grows about 5 feet high; and if there is a spreading mimosa tree in the centre of the patch, and if, after "ringing" the patch (that is, making a complete circuit), it is found that there are tracks of entrance but none of exit, the lion will be resting under that mimosa.

There are now two courses open to the sportsman—to creep cautiously in with the ten-bore and try to get a shot at the lion while asleep, the result being that he will almost certainly spring away with a loud "whoof" before he can be sighted—or, the better plan, to post oneself on the further edge of the patch, down wind, and, if possible, in the shade, where one is less conspicuous, with one hunter, and send the other men round to shout and give the lion their wind from a distance, and so drive him out. A third way is to burn the patch of grass, if it is dry enough.

In the course of a long track there will be many such patches of *durr* grass in the high stoneless plateau country, which is the best lion ground. There will be strips of sand between the different patches, and tracks are plainly visible outside the grass. If, after having sent men round to "ring" a patch, it is found that there are tracks both of entrance and exit, the lion has evidently gone on, and no time need be wasted, the interior of the patch may be left unexamined, and the tracks may be taken up in the sand beyond. Many patches will be "ringed" in this way, perhaps for miles, and it may be past noon before the absence of exit tracks shows that the lion has halted. It is hot and tiring work for the hunters, but if the lion has had a full meal the night before, he is certain to halt at last, and, if he has not got on to stony ground, he will be found. Then with straight shooting, and well-drilled followers—they should be cautioned not to rush forward, native-like, and get in the way either before or after the first shot—the lion is no very difficult beast to kill.

It is the pent-up excitement after several hours of tracking, the eagerness of the natives, the glare, the intermittent views of the dull-coloured animal through dark thick thorn bushes, that all militate against good shooting. A wounded lion will get to the thickest mimosa jungles he can find, where the hunters have to stoop under low gloomy arches of the spreading

and thorny *khansa*. The party must go in single file, and the pursuit becomes one of considerable danger and excitement.

The place to hit a lion is anywhere in the chest, if in front, or behind the shoulders, if broadside on. The head-shot in front is uncertain, being liable to glance. A lion hit in the lungs will probably survive some minutes, and if followed up will be found lying dead. Lions have sometimes great vitality for a few seconds, having been known to continue a charge for some distance though hit through the heart, and this adds to the danger of following them through dense jungle. Most of the larger animals such as elephants or rhinoceros, can be avoided by dodging, but little escapes the quick eyes of the cat tribe, and the only thing to do in case of a charge is to stand still and shoot straight.

In the vast wilderness of Ogaden, all broken ground covered with bush, which gradually slopes down from the waterless Somali plateau to the Webbe Shabeyli river, 400 miles inland, lions are numerous, but are harder to bag than those of the flat stoneless plateau country. The sport is here varied by constantly losing the tracks on stony ground or in almost impenetrable thorn bush, and the odds are in favour of the lion's escape. This country is infested with man-eaters. In such districts much may be done by constructing a zeriba or thorn shelter, with a loop-hole from which to shoot, and a living bait—donkeys are the best—tied up within 6 feet, in front of the loop-hole. The sportsman is shut into this at sunset with bedding, water-bottle, &c., and one attendant, and is let out by pulling in the thorn branches from outside, in the morning. It is a safe and often successful way of bagging lions, but it is not very interesting, and if it should happen to rain it is a very uncomfortable way of spending the night. Another plan is to spread the bed some 16 feet from the ground, on the flat top of one of the larger mimosa trees.

For night watching, starlight nights are the best, for lions seem to prefer not to attack the bait by moonlight. One night the writer tied up a camel as a bait, the moon being due to set half an hour before dawn. Nothing happened during the night, but in the dark half-hour the lion attacked the camel, biting it through the neck. The watchers were asleep, and, waking up noisily, drove the lion away before a shot could be fired. It is generally accepted that it is best not to fire till the lion has struck down the bait and is busily engaged on the carcase, affording a certain shot. A ten-bore "Paradox" gun would be a good weapon for this sort of work.

At times of drought, say in the *Jilal* season of Somaliland, from January to March, when one pool may be used by all the game for many miles round, watching over water may be successful if the presence of tracks shows that it is frequented by lions.

It is moreover interesting in itself, by reason of the antelopes, small mammalia, and birds which come to drink, and which may be watched at leisure and their habits observed. The writer has not found even the strongest moonlight deter animals from drinking, and once bagged in this manner a rhinoceros and a lioness on the same night, and a hyæna and leopard on another occasion at another pool.

In the Somali waterless plateau, the mimosa forests, sometimes thick and sometimes more open and park-like, are varied by wide open treeless grass plains, called *ban*, and these are roamed over by herds of oryx and Sœmmering's gazelles. Lions lie up on the edge of the bush by day, hunting out in the open plains by night, and horsemen escorting the droves of camels to pasture in the early morning sometimes find a lion returning to the bush to lie up for the day. Lions, like all cats, though capable of great speed for short distances, are easily winded, and they can be ridden to a standstill, vedettes being then posted over them, and messengers sent to the nearest sportman's camp. When attacked in this way, lions are very apt to charge, for the simple reason that they cannot sneak away unobserved as they would do in the bush. A handy pony is useful for this work, steady and able to stand fire.

Somalis hunt the lion by mobbing it on horseback in the open, throwing the spear and shooting poisoned arrows at it; but more commonly the "Midgans," who are the archers, creep up to it in bush and shoot it when busy over a kill. Skins of lions killed by natives are often rendered worthless by the numerous spear-holes inflicted after death.

On account of the comparative openness of the African bush, lions are probably more often seen by daylight than are tigers in an Indian jungle. They appear also to be more careless of concealment, and are therefore easier to find and kill on foot. The writer once found an unwounded lion asleep under a solitary mimosa bush in the open, in broad daylight. It is doubtful whether a tiger would be caught napping in this way. The writer, from some personal experience of both, and from knowledge of many individual experiences of friends, has formed the opinion that the lion is rather more prone to charge than the tiger when followed on foot.

The hunting of lions, involving as it does much camping among native kraals waiting for news, in the dusty proximity of herds of camels and cattle and flocks of sheep, if carried out systematically, can seldom be combined with the pursuit of elephants, rhinoceros, or the more valuable antelopes, such as koodoo, all of which avoid the neighbourhood of the kraals. When lion-hunting, an occasional leopard, oryx, or

gazelle may be bagged; and when after the rarer game, or when merely travelling, a lion can be picked up now and then.

In systematic lion-hunting near the kraals, there are many fruitless hunts, false intelligence being constantly brought in to the sportsman's camp with a view to "baksheesh," and all news should be carefully sifted before it is acted upon. A good lion skin measures about 10 feet 2 inches from nose to tip of tail.

H. G. C. Swayne.

"LORD'S" AND THE "M.C.C."—Thomas Lord, born at Thirsk in 1757, was a cricketer of some note in his time. He suggested to Lord Winchilsea and other influential supporters of cricket the desirability of establishing a club in St. Marylebone, and he must have been well supported, for he was enabled to purchase the site since called Dorset Square. The ground was called "Lord's," and the club The Marylebone Cricket Club. Things went on smoothly there till 1811, when the increased rent demanded by the landlord compelled Lord to find a fresh ground. He then removed his turf to a field in the neighbourhood of North Bank, St. John's Wood, but two years later the Regent's Canal was cut through this ground, and Lord again removed his turf, to the present site of "Lord's" in St. John's Wood Road. What arrangement he made with his patrons will never be known, because all the Club records and documents were destroyed by fire in 1825, but he probably purchased the freehold from the Eyre Estate, took all the subscriptions and gate-money, and paid the expenses of the staff and of what few matches were played.

The first recorded match played by the Marylebone Club took place in 1788. As has been stated, Lord removed from Dorset Square to North Bank in 1811, but only one match is recorded as having been played there in that year, two only in 1812, three in 1813, the match on July 21st of that year being probably the last played at North Bank. The first recorded match played on the present ground is believed to have taken place on June 22nd, 1814, and Hertfordshire had the honour of opposing the Club on that occasion. About this time Lord built himself a house in the south-east corner of the ground, and lived there until about 1830. In or about the year 1825 there was great danger of the ground falling into the hands of the builders, but Mr. William Ward stepped into the gap and purchased the remainder of Lord's interest. To show the peril of the situation, however, it may be stated that plans were actually drawn and approved for the erection of a series of semi-detached villas along the St. John's Wood Road frontage, and also on the east side of the ground.

Allusion has been made to the disastrous fire which destroyed the pavilion and its contents on the early morning of Friday, July 29th, 1825. The following account of the fire, as it was reported in the *John Bull* newspaper of Sunday, July 31st, 1825, will be of interest. "About one o'clock on Friday morning a fire broke out in the pavilion in Lord's Cricket Ground, and, from its being built of wood, it burnt with such fury that the whole was reduced to a heap of ruins before it was possible for the fire-engines to render any assistance. The pavilion was built at a great expense, lately enlarged and decorated for the accommodation of the various clubs who frequent this ground; and with the exception of the foundation nothing now remains. There was in the pavilion a large and valuable stock of wine, the property of the subscribers, which along with all their cricketing apparatus now no longer exists. Mr. Neale, the landlord of the tavern adjoining the ground, cannot account for the accident, for there never was any fire in the pavilion during the season beyond a lighted candle to enable gentlemen to smoke their cigars. Such, however, was the strength and power of the fire at its height, that some of the trees in the adjoining gardens have been damaged." As has been stated, the fire broke out in the early hours of Friday morning: the match between Winchester and Harrow was completed on the Thursday night, and that between Eton and Harrow took place on the Friday and Saturday, but no mention is made in any of the records as to the inconvenience which the Harrow boys must have experienced through the loss of their cricket paraphernalia. The committee seems to have lost no time in erecting a new pavilion, for the anniversary dinner was held there on May 11th in the following year. This building was added to from time to time up to the year 1889, but had long been quite inadequate for the accommodation of the increased and increasing number of members. It was pulled down in August of that year; the foundation stone of the new structure was laid in September, and the present pavilion opened to the Club in 1890. Mr. William Ward continued to be the proprietor of Lord's Ground until 1836, when James Henry Dark purchased his interest, retaining it until 1864, when he sold his lease, including Tavern, Racquet and Tennis Courts, Billiard-room, &c., to the Club for £11,000.

In or about the year 1860, the freehold of the ground was sold by public auction, and although Dark personally expressed his opinion most strongly to several influential members of the Club that it was most desirable that the Club should become possessors of the freehold, it seemed to be no one's business, and in consequence a Mr. Moses (who afterwards changed his name to Marsden) purchased the fee for £7,000. This supineness on the part of the authorities cost the Club very dear, for in 1866 Mr. Marsden sold them the freehold for the

sum of £18,313. The extent of ground thus acquired in 1866 amounted to about eight acres, including the sites of the buildings. In 1874 the Club purchased a slip of land extending from the north side of the ground to St. John's Wood Road and known as Guy's Garden, which brought the area up to nine acres. In 1887 the Club purchased for £18,500, from the Trustees of the Clergy Orphan Corporation, 3¼ acres of land, known as Henderson's Nursery, bounded on the north by Cavendish Road and on the east by Wellington Road. In 1897 the Manchester, Sheffield, and Lincolnshire Railway Company handed over to the Club the site of the Clergy Orphan Corporation School, extending to about 2¼ acres, and the total acreage, including sites of adjacent properties purchased from time to time, will amount to nearly twenty acres. What the number of members was from the Club's formation up to the year 1845 will never be known, and probably Thomas Lord never published any accounts; but in 1845 the number is put at 465. It is not necessary to show how from year to year the number has steadily increased. In 1866 it amounted to 980; in 1876 to 2,188; in 1886 to 3,107; and in 1896 to over 4,000, and there are the names of 9,000 candidates in the books. It will be gathered from the foregoing statements that the Marylebone Cricket Club has made steady progress in all respects since its original foundation by Thomas Lord in 1787; its existence has no doubt been in great peril on more than one occasion, but some genuine friend and supporter of cricket has always stepped into the breach. One other record only need be mentioned; in the year 1826 four practice bowlers and two boys were employed in the service of the Club; in 1836, owing to the increase of the number of members, these were increased to five practice bowlers and five boys; and the number of matches played was nine. In 1896 the professional staff amounted to fifty-two, the boys to fifteen, besides extra bowlers; and the number of matches played was 171.

H. PERKINS.

LYNX—Though the lynx affords as handsome a trophy as sportsman need desire, yet it cannot be regarded as a regular beast of chase. That is, the lynx is never made a separate object of pursuit, but rather forms a subsidiary object, ever welcome, while hunting other game. His strictly nocturnal habits,—truly feline—his relative scarcity, and the wild character of his haunts, would leave the chance of a shot altogether too precarious were lynx alone the hunter's sole objective.

In Europe are found two species:—the larger Northern lynx (*Felis lynx*), ranging throughout Scandinavia, Russia, and the North-Continental countries; and the spotted lynx (*F. pardina*), which is confined to the warmer latitudes by the Mediterranean, and is especially common in Spain.[1]

Of the **Northern Lynx** few are ever shot by British sportsmen. In my own experience of several seasons spent in the northern forests, it has never chanced to me to see, much less to shoot, a single lynx, though on several occasions coming across their recent spoor. Similar luck, I believe, befalls most Anglo-Norsk hunters, and the few lynxes (*Goup*, in Norwegian) that are killed in that country, are mostly secured in winter, when they can be followed on *ski*, or snow-runners. The total killed, on which the Government reward of twenty kroner was paid, was returned in the three years 1893, 1894, and 1895 at fifty-six, forty-four, and eighty respectively.

The northern lynx is a scarce beast, nowhere *localised*, and his home is in the wildest mountain-forest, where his stronghold is among the crevices of some bare rock-scaur that projects above the trees. There the beast, curled up among shaggy heather or dwarf-birch, passes the day on an open ledge which overlooks the woods and commands a view of approaching prey, or danger. The wolf, on the other hand, sleeps away the daylight hours in some dark den or hollowed cleugh far above timber line.

A favourable opportunity to shoot the northern lynx (and the bear also) occurs in early spring, when the goats and sheep are first driven out to the fjeld—tempting morsels to the hungry beasts of prey. Should the hunter have early notice of a "kill," a shot may be obtained at night.

The **Southern** or **Spotted Lynx** is a beast of the scrub and jungle rather than of forest proper. In southern Europe wide areas of rolling plain and the foot-hills of mountain-ranges are clad with shoulder-high heaths, cistus, rosemary, and other shrubs. Amidst these, in the hollows, where winter rains collect and moisture lingers, are denser growths of jungle, often twenty feet high, and all interlaced with twining thorny briar. These matted thickets, impenetrable to man, form the rendezvous of various wild animals. They are the favourite home of the lynx; but they also shelter the wild boar and red deer, besides minor beasts—wild cat, fox, badger, mongoose and others.

In shooting a country such as this, the primary objects are, naturally, pig and deer: but as the lynx alone concerns us here, I will endeavour to show how he may best be killed. While "driving" such countries (and it is the only way they can be shot), it may be laid down as an axiom that the first animals to appear will be fox and lynx. When the beat is joined, and

[1] Lord Clermont, in his *Quadrupeds and Reptiles of Europe* (1859), recognises two other species, to wit: *Felis cervaria* and *F. Borealis*, both confined to the remote parts of Arctic Europe and Siberia.

the distant shouts of the beaters come borne on the breeze, the different wild creatures enclosed within the circle are all aroused to the danger; but each has his own idea of escape. Deer, if lying in the open, move hither and thither, seeking a weak spot to break back; the pig never stirs till hustled by the dogs; but the lynx shifts at once and direct. Hence, during the first few minutes of the beat (more or less, depending on its extent), the concealed gunner will be well advised to load with *shot* (No. 2, or up to AAA if commanding an open space), and to *face into the beat*. At the end of those minutes, he may be assured that no lynx is coming his way, and shot should then be exchanged for ball. Five lynxes will be secured with the shot-gun in front of the line for one that is killed with the rifle behind it.

While expecting lynx, the gunner must be thoroughly concealed behind a breastwork of

SPOTTED LYNX.

Average height at shoulder, 17 in.; average length from snout to root of tail, 33 in.

bushes and remain rigid as death. He sees the partridge whirring afar before the advancing beaters, and scurrying rabbits dart across the opens. To these he pays no attention. But he *does* note a concourse of chattering magpies on his left front, and presently, from that direction, a grey form, moving silently between grey stems of cistus, catches his eye. Forty yards—thirty; now he sees the big cat's orbs glancing to right and left; but the head, carried low, never moves till the gun is raised. Then, for a fraction of a second, both pairs of eyes meet and the lynx is dead before he knows how he died. On one occasion the writer allowed a lynx to advance to exactly eleven yards.

Silent as it is, the approach of a lynx is sometimes audible to an attentive ear, and in wet seasons we have heard them splashing through water with almost as much noise as a dog. Their movements are slow, and, like most wild beasts, the lynx is reluctant to face the open; a big male will rather turn and give battle to three or four dogs than run into danger. Occasionally we have known them to "tree"; but (as stated) lynx are less often found in forest.

They prey chiefly on rabbits and partridges. The latter, our Spanish gamekeepers assure us, the lynx can catch on the wing as the covey sweeps low over some open patch or rushy glade. Despite his carnivorous habits, the flesh of the lynx is white and well-flavoured, if one can so far overcome prejudice as to try it.

ABEL CHAPMAN.

LYNX-SHOOTING IN RUSSIA—To ring a lynx, to set the beaters in their places, and successfully to drive the creature to his doom, which would be a charge of slugs if he came to it, is usually more than the intelligence and skill of the ordinary keeper can bring about. Indeed, to obtain a successful result it is necessary not only that the keeper, but also every beater engaged, and every sportsman should be on the alert. For, to begin with, the lynx must be noiselessly ringed and the beaters silently set in place. Now, no lynx, awake and worthy of the name, could be ringed—as though he were a mere dull-eared wolf, or a bear fast asleep in his winter lair—without knowing all about it; and even if ringed, the ceremony of placing the beaters could not be performed without awakening his suspicions. Hence, as a rule, he is off and away before the beaters and guns are placed. Should he, however, have been asleep or busy with his dinner, the odds are still in his favour, for each beater must be alert, and must stand close to his neighbour, or the cat-like creature will slink or spring past him unseen, and the beat will end in wonder and abuse, and without a lynx-skin. So quick and so cunning is the ringed lynx that he will successfully creep within a yard of the sportsman standing, gun in hand, on the look-out for him, and, watching his opportunity, spring past him and away, unsuspected until an inspection of his tracks reveals the fact that he is gone.

But there is one individual who vies with the lynx for cunning, and that is the "lugatch." The lugatchi, the original ones, were a company of three hunters hailing, presumably, from Luga, though their origin, like their method, is mysterious. These three men are, or were, able—for their successors and imitators fall far short of their skill—without assistance of beaters, to ring and drive any animal, even a lynx, to any spot they pleased. Let the "gun" stand where he would, the wolf, fox, lynx, or any other animal ringed would presently arrive by their mysterious insistence, at his very ambush. Their beating, or driving, was done almost in silence, the central huntsman entering the ring on the animal's track and directing the others by signals when and how loudly to clap hands or cough or bark, according to the course taken

by the quarry and its divergence from the required direction.

A possible but difficult method of hunting lynx is to run him down upon snowshoes with the aid of a dog. When the lynx comes in sight the dog barks, and instantly the lynx is at the top of a tree, from which sanctuary, foolishly sought in a moment of panic, a bullet will soon dislodge him.

FRED WHISHAW.

LYNX, AFRICAN, or **Caracal** (*Felis caracal*)—This animal, well known all over South Africa by its Dutch name, *Rooi-Kat* (red-cat), is to be found in many parts of the African continent, from the Cape Colony northward. Scientists place the caracal between the jungle-cat and the northern lynxes, but to the average observer this animal, although not spotted all over, is, with its tufted ears, short tail, and other characteristics, a true member of the lynx family. In colour the rooi-kat is of a warm reddish-brown, the underparts paler, faintly spotted with rufous markings; it stands from 15 to 18 inches in height, and is strong, savage, and wonderfully active. It does considerable damage among sheep and goats, especially in the lambing and kidding seasons, and is therefore, as far as possible, exterminated by South African farmers. The caracal is, however, extremely wary and suspicious, and not easily trapped or hunted. Essentially a nocturnal beast, it is only occasionally encountered by the gunner in daylight; a bullet, or, at close quarters, a charge of large shot will be found equally efficacious on such an occasion. A wounded caracal can, however, use its teeth and claws with great effect, and should be approached with caution. The Bechuanas hunt these animals systematically with dogs, and also snare them. The very handsome skins, warm, soft and furry, are in great request among these people, by whom they are neatly sewn together and made into valuable karosses or rugs. A good rooi-kat kaross, containing 16 skins, is worth £5 5s. and upwards at any Bechuanaland store. There is a widely prevalent idea in South Africa that the skins of this animal are, if used as a blanket, a great prophylactic against rheumatism. It is undoubted that the fur has a marked attraction for electricity, and at certain seasons a kaross, when stroked with the hand, will emit sheets of sparks and the well known crackling accompaniment. As a rule the African lynx seems to prefer a dry habitat to a moist one. In South Africa the parched and elevated plateaux of Bechuanaland and the Kalahari probably contain more of these animals than any other locality. The caracal is found in North Africa, as also in Arabia, Persia and parts of India.

H. A. BRYDEN.

MACKEREL—

MEASUREMENTS, ETC. Length of head 4¼ to 4⅓, of caudal fin 6⅓, of pectoral fin 9½, height of body 5¼ to 6⅓, in the total length. *Eye*—with broad, adipose lids. *Teeth*—in a single row of rather sharp ones in the jaws, in a deciduous patch on either side of the vomer, and in a single or double row on the palatines; a central row of teeth at the base of the tongue. *Fins*—dorsal commences at the beginning of the second third of the length of the body; spines weak, the second and third the longest, from thence they decrease to the last. Second dorsal low, and similar to the anal. Pectoral not quite half as long as the head; ventral one-fourth shorter than the pectoral A single, short, pre-anal spine between the vent and the commencement of the anal fin. Caudal deeply forked. *Scales*—minute, about twenty-one rows between the lateral-line and base of the first dorsal fin; along the sides and lower surface of the abdomen they become nearly indistinguishable. Several rows below the eyes passing across the cheek. *Lateral-line*—nearly straight. A keel along either side of the root of each lobe of the caudal fin. *Air-bladder*—absent. *Colours*—the upper third of the body is of a beautiful green shot with blue, while the sides and abdomen are radiant with gold, purple and silvery shades. About thirty-five V-shaped bands pass downwards from the back and terminate just below or on the lateral-line; a dark stripe, sometimes interrupted, goes from the base of the pectoral fin along the side a little distance below the lateral-line. A light yellow colour behind the eye. Fins dark, and generally with a black, white-edged outer line; or the body, to just below the lateral-line, may be covered with small black spots, or scribbled markings. Donovan asserted that the males have straight transverse stripes, and the females undulated ones, the correctness of which I have been unable to verify. It has likewise been observed that the male has a more slender form and an elongated gill-cover.

Day, *Fishes of Great Britain and Ireland*, vol. i. p. 84.

MARKHOR, or SNAKE-EATER (*Capra megaceros*)—Of this noble Asiatic wild goat there are four varieties known to sportsmen, and probably there are others still unknown. The several types much resemble each other, their chief difference being in the shape of their horns.

Description—A full grown buck of the Pir Punchal and the Kaj Nag ranges, westward of the Kashmir Valley, stands quite 44 inches at the shoulder. Its general colour, like that of most wild animals, varies with the seasons. During spring and summer, the predominant hue of its rough coat and its face is a dirty yellowish white. Towards winter it becomes tawny grey. Its legs and its very short tail are brown. From its shoulders, neck and chest, depends a shaggy beard, tawny brown above, almost black below, and sometimes reaching lower than the knees, which, with its massive V-shaped spiral horns, gives this king of wild goats a truly majestic appearance. The finest horn the writer ever measured was a single one of most exceptional length, purchased at a village in the Kaj Nag range. It was 63 inches long, following the twist. The usual size, however, of what may be termed fine horns of this variety, is from 40 to 50 inches, with two and sometimes three complete corkscrew shaped turns, and a base circumference of nearly a foot. The doe,

termed *buckree* or she-goat, is only about half the size of the full-grown buck. She carries comparatively thin spiral horns which seldom exceed about 15 inches, and she is hardly distinguishable in a band from the *rind*, as the young buck is called. The hoary old bucks only are termed Markhor, and they generally herd separately from the does and young bucks, except during the latter part of the year, from October.

The horns of the variety met with in the mountains of Astor and its neighbouring districts,

MARKHOR.

Average height at shoulder, 44 in.: average horn measurement, 45 in.; maximum horn measurement, 63 in.

northward of the Kashmir Vale, are much wider spread and have fewer twists, but they are about equal in length and circumference.

The markhor of the type found on the hills north and east on the Peshawur Valley, in trans-frontier and Afghan territory, carry horns of a shape and twist something midway between the above two varieties, and those found on the comparatively low and arid Sulimani range in the Derajat country north-west of the Punjab, are somewhat smaller and less shaggy, with horns screwing more sharply, like a twisted ribbon.

Equipment—The two Kashmir varieties affect very precipitous craggy ground, more or less forest-clad, and intersected by terribly steep slopes of short grass, and immense slips of bare stony earth or old snow. Consequently their pursuit is attended with much difficulty, and often with danger. The surface of these slips is usually so rotten and friable, and the short grass on the slopes is, when dry, so smooth and slippery as to make the footing there most precarious. Even in winter, the big-horned old bucks seldom descend from their lofty fastnesses, where they are said then to subsist chiefly on pine-shoots.

For such ground the writer found hob-nailed boots safer than *poolas* (sandals made of twisted straw or long grass), which, admirably suited as they are for foothold on hard snow, ice and rock, are worse than useless on those precipitous slopes of short slippery grass and rotten earth or snow which have so frequently to be traversed in Kashmir markhor hunting. It is as well, however, to have both handy for use as may be required.

The other two varieties affect difficult but more open ground, and are met with at much lower altitudes and in more arid localities.

Habits—In the Kashmir Mountains the great old bucks are always difficult to find, owing to their affecting such inaccessible places, where they are wont to keep themselves much hidden among the pines and birches growing thereon. Their agility, for animals of such a size, is extraordinary, but on being disturbed or even shot at, they seldom move off fast, but they almost invariably travel long distances ere they settle down again. Unlike the does and young bucks, these old patriarchs seem to trust their safety rather more to concealment and the inaccessibility of their haunts than to eye, nose, or ear. But when once they are found, except for the difficulty and danger of following them up, they can, with ordinary care, usually be circumvented with tolerable facility, and a wounded one seldom, if ever, turns to defend itself when approached.

Owing to constant pursuit, Kashmir markhor have considerably decreased in numbers in some of their more easily reached pristine haunts, for instance, in the Pir Punchal range, where they were once comparatively plentiful.

Armament—A ·450 bore double express rifle with projectile of soft lead and as much powder behind it as the barrels can stand, will be found the handiest weapon for Markhor-shooting as well as for that of all other Himalayan game of the goat and sheep tribes. The sportsman must be prepared to rough it in every respect, and an experienced local guide is indispensable for the difficult and dangerous ground which must necessarily be traversed if he hopes for success in hunting the markhor.

DONALD MACINTYRE.

MILITARY SPORTS—In the case of a nation devoted to athletic exercises of all kinds, and possessing honourable records of military prowess, it is natural that many sports, essentially military in their origin, have been adopted and become popular outside the ranks of the

professional soldier. This fact necessitates a division of the subject into two sections. The first includes all sports which, while not forming part of what may be considered the drills or evolutions laid down in the authorised drill books, are analogous thereto, and are really exercises with service weapons or blunted substitutes for them.

The second section embraces all sports not coming within such a definition, but adopted as affording amusement, while at the same time tending to develop physique, more especially in those directions which would be of advantage to a soldier under service conditions, such as running, swimming, climbing, and other similar exercises.

In recent years the sports most favoured by the army have varied from time to time, but the following may be taken as including those most usually practised at the present date :—

Polo (for which see POLO), fencing (see FENCING), shooting, tent-pegging, tug-of-war, artillery driving, heads and posts, lemon cutting, tilting at the ring, bayonet fighting, obstacle races, wrestling on horseback, tug-of-war on horseback, Balaclava melée, Victoria Cross race, ball and bucket, bareback riding or vaulting on horseback, of some of which we will proceed to give the main features.

Shooting has been greatly improved by the formation of rifle and gun clubs, which are personally assisted and encouraged by the officers of the army, especially by the musketry staff, as conducing to readiness of aim and quickness of eye. Military shooting competitions are usually carried out with service rifles, seven shots being fired at each of three ranges, the positions being defined by the executive. The distances depend very much upon the range available for the competition, for some are not safe at the longer distances with the new service rifle, the Lee-Metford.

There are also team competitions, combining drill and shooting, marching and shooting, or all three; while the mounted services have similar arrangements for teaching riding, shooting, jumping, and the steadiness of their horses under fire.

Tent-pegging appears to have been originally so named from the use of an ordinary tent-peg as a mark for a lancer's practice. The mark is now usually a specially prepared, well-seasoned piece of wood, 12 ins. long and 3 ins. wide, the length out of the ground being 6 ins. It should be hammered into clay puddled so as to dry stiff. The competitor is armed with a regulation lance, and must make the run at the full speed of his horse, while the point of the lance has to be kept up to within a certain distance, say 15 yards, from the peg. The usual method of allotting marks is : for touching the peg two, for moving it four, and for carrying it away (provided it is carried to the end of the running track, usually about 20 yards) six points.

Pace is considered of great importance, points being deducted if insufficient. In India they manage to combine tent-pegging with pig-sticking by driving in a peg in a position unknown to the competitors, who, being told the general direction only (generally by the blowing of horns), go in search of the peg. He who returns with the peg on his lance point is declared the winner.

In **Lemon Cutting** the lemons are suspended at the right of the track, about the height of a mounted man's shoulder, usually about 15 yards apart. For the first, cavalry cut one to the right is used, and for the second, cut two to the right, the sword being carried at the "right engage" until within 15 yards of the first lemon. The usual marks are three for either lemon cut singly, or eight if both are cut; the same pace has to be maintained as in tent-pegging, and the lemons must be severed by a clean cut. While the lemons are usually cut with a regulation sword at the height named, some expert swordsmen have varied and made the competition more interesting by having some of the lemons at the height of an infantry man, and by having sheep hung up to be cut alternately with the lemons.

Of course a heavy sword or lead-cutter is required for this, and it is usually rather a display than a part of the competition.

Tilting at the ring is not so frequently a matter of competition as formerly; the rings are $1\frac{3}{4}$ ins. inside diameter, and are suspended in the same position as the lemons, speed having to be the same. The competitor endeavours to take the rings on his lance, which must be held in the proper way behind the guard, which must be at the balance, and the ring or rings must be carried to the end of the running track, and then brought back to the official appointed to see that they are on the lance. The marks are, for one ring three, and eight if both are taken.

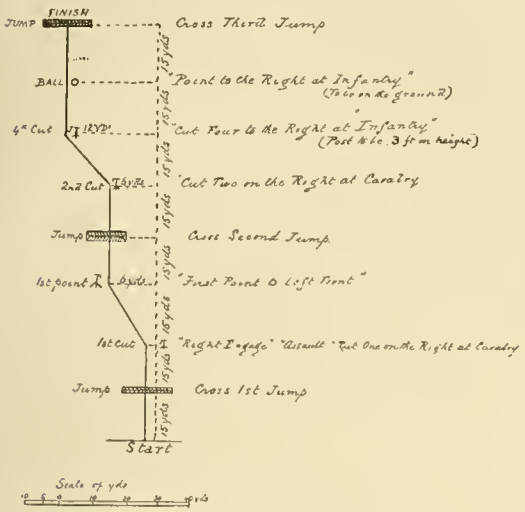
Heads and Posts—This is really a competition in the sword practice as laid down in the cavalry drill book. The position of the various posts for cuts and points has varied from time to time, but the present method is seen in the figure.

A variation of this is to have the heads appearing and disappearing above the post or bar at regular intervals, thus necessitating a careful timing of the pace, so as to make the cuts when the head appears.

Artillery driving competitions are for the encouragement of drivers in the Royal Artillery, and, by exciting emulation, aid in the attainment of that wonderful perfection which has gained for the British artillery the admiration of foreign experts. In England, gates and wooden blocks, called pegs, are arranged on the ground for the gun to pass through, the course to be taken being distinctly laid out. In India, instead of these wooden blocks, earthenware chatties or

pots are used, these going to pieces directly they are touched by the horses' feet or the wheels. The rules are as follows:

Distances—Between gate posts, 6 ft. 10 ins.;



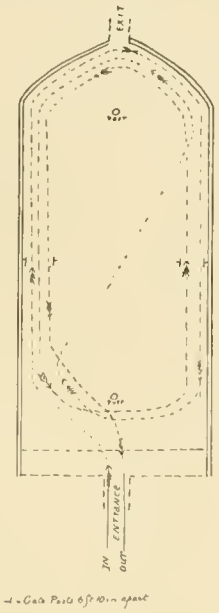
HEADS AND POSTS.

between pegs, 5 ft. 9 ins. Teams competing with mark one carriage will be allowed an additional inch between the gate posts.

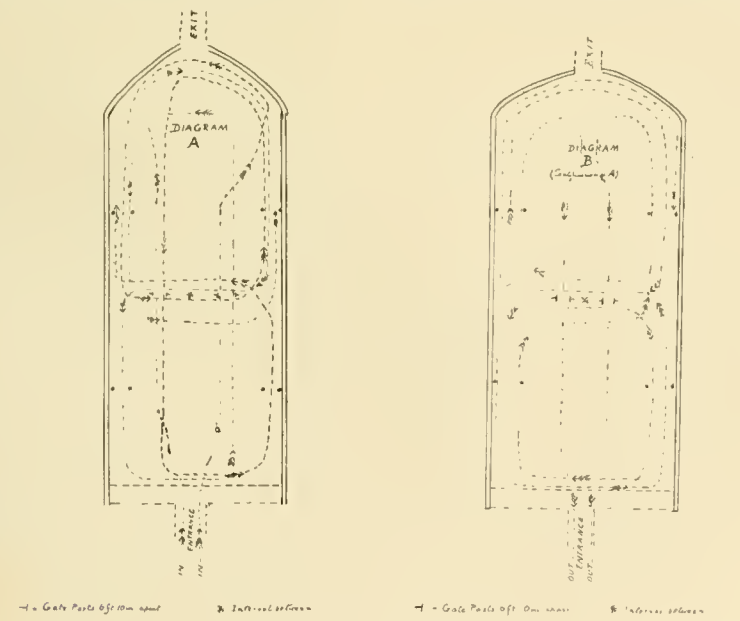
Times—In order to gain full marks the driving competitions must be completed in the time stated below, otherwise one mark will be deducted for each second over those times.

R.H.A. galloping 1 min. 5 secs.; R.A. trotting 2 min. 25 secs.; Auxiliary Artillery 1 min. 10 secs. The judges are authorised to deduct marks, not exceeding five, for want of style in driving.

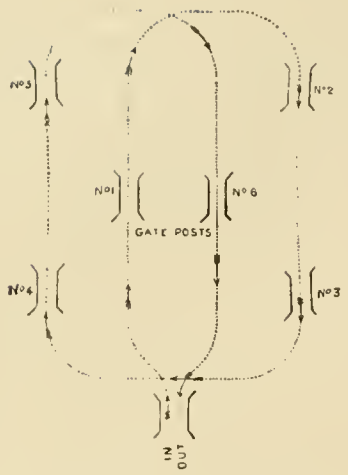
The time will be taken by chronograph from the time the first gun axle passes the centre gate, to the time the last gun axle passes the centre gate for the last time before leaving the arena. (See Diagrams.) The proper "aids for driving" to be shown correctly by the drivers in the several changes from right to left or *vice versa*.



ROYAL HORSE ARTILLERY GALLOPING.



ROYAL ARTILLERY TROTTING.



AUXILIARY ARTILLERY TROTTING.

Marks.—Going between each set of pegs or post, three. If a wheel passes outside a peg, or a gate-post is knocked down, no mark will be allowed for that set. For touching or going over a peg, touching a gate-post or any post, one mark is lost. No. 1 going outside posts or pegs loses one mark. If a horse touches a peg with his foot one mark will be lost; but only one mark will be lost if horse's feet and wheel touch the same peg. In the case of a horse coming down, the judges may allow another run.

Drivers only are to drive. No extra men are allowed for field artillery, but one limber gunner may accompany each horse artillery team to the place of competition in order to assist in cleaning up.

Tug-of-War is now a very favourite pastime. Teams of different regiments, usually consisting of ten per side, endeavour to pull their opponents over a mark. Each team has a captain or coach.

The rules generally acknowledged are that there should be two pulls out of three, competitors not to be allowed to sit down; no knots, or loops in the rope, or spikes in boots allowed, the distance of the pull-over to be 12 feet.

There are generally separate competitions for teams under 110 stone, and for catch weights. Umpires should check weights and inspect boots before starting the pull.

In the Navy, where space is restricted, the rope is frequently passed through a block, and on board ship competitors are barefooted, but this really makes no difference to the result.

In training teams for tug-of-war the chief point is to make them hang back steadily with their dead weight on the rope, only pulling together by signal or word from the coach. In practice it is found that this result is best obtained by tying the rope to some hold-fast and putting the team to pull steadily upon it. Afterwards put them to pull strong scratch teams in order to obtain the experience of the sway and give and take, which is the point the coach must feel almost without seeing.

Bayonet Fighting is a recent development of bayonet competitions; that is to say, that instead of there being one man against another there is team against team. There are two methods of arranging this competition, one in which a team of nine men (eight men and a commander) fight against an equal team in pairs, the defeated men to sit or lie down, and the team having the greater number standing to be the winner; but a far better way, when a sufficient number of judges are available, is for the eight men on each side to engage simultaneously under their commander, who gives general instructions, and any man who has beaten his opponent to be at liberty to assist one of his own side.

This manner of conducting the engagement more closely resembles such a *mêlée* as would occur on service.

Obstacle Races form a very useful means of testing the powers of endurance possessed by the soldier, and of showing who have been best trained for carrying their whole marching equipment in climbing, running, and creeping through narrow places, and over such artificial obstacles as generally represent the difficulties that would occur on service. When we read that the human pyramid, which is taught in the gymnasium of the army, has been found of considerable use in escalading, it is evident that such tricks may prove themselves of great practical value in time of war.

Wrestling on Horseback is another exercise which may be looked at from two points of view.

Usually six men compete with another team, and although it may appear that the success of a team depends on the better riding and strength of each individual of that team, it is often found that the weaker team wins, because of better arrangement in combination. Special leather jackets or extra strong football jerseys should be worn, and be clearly marked with the team colours. No boots are allowed; the horses have only bridoon and no saddles.

The same remark as to combination applies to tug-of-war on horseback, in which the rope, instead of being handled by men on foot, is in the hands of men on horseback. The teams having their backs to one another, it is quite evident that unless a team are sufficiently good horsemen to get their horses to work together as well as hold on their horses, they have not much chance of success.

A skilful combination is also the chief requisite for success in the **Balaclava Mêlée**, in which there are four or six men on each side, who wear singlestick or fencing jackets, and singlestick helmets, in which are stuck paper plumes of different colours for each team, the object being to deprive the opposing team of

these plumes, the *mêlée* continuing until the "Halt" is sounded, when the opposing sides form up and the plumes are carefully inspected to ascertain which party has the victory, as judged by the remnant of plumes left in the helmets or masks. This is usually provocative of laughter, the competitors eagerly searching for their plumes or tufts, oblivious of the fact that they are scattered over the arena. Spurs are not allowed.

The **Victoria Cross Race** is especially a training for a man who may have to carry away a wounded comrade from an enemy under fire. This is usually carried out by the party having to go over a jump to another hedge, behind which lie a number of dummies, there to fire a round, pick up their dummy comrades, carrying them back over the first jump to the starting place. The idea is that the wounded have defended a zeriba, which is still being attacked from one side, while the competitors represent a relief or rescuing party, who jump into the arena, fire through the farther side at the enemy, mounting the wounded (as shown by the dummies). The triumphant return with them to the main body can be made very realistic.

The competition known as **Ball and Bucket** is one requiring good horsemanship, a good eye and great judgment. It consists of dropping a tennis ball into an ordinary galvanized iron bucket, while at a canter, in such a way that it shall stop there.

Combats, or contests with weapons, form an important part of the military sports in the army, the mounted events being:—Sword *v.* sword, sword *v.* lance; dismounted events are sabre *v.* sabre, foils, bayonet *v.* bayonet; and the mixed events, sword mounted *v.* bayonet dismounted, and lance mounted *v.* bayonet dismounted. Horses should be in drill order, stripped saddles and without headropes, competitors in undress uniform, but with a mask and leather jacket instead of uniform jacket and cap.

Dismounted competitors should wear gloves and proper pads to prevent accident, and are usually allowed to wear flannels and gymnasium shoes.

Of each pair, one should wear red and the other a distinctive colour, usually yellow. It is a great convenience if the first man of a pair wears the red. The arm badges should be made red on one side and yellow on the other, so as to turn instead of being removed.

The dismounted combatants use sabres nearly identical in shape and weight with the regulation infantry sword, but with a button point, dummy rifles with solid bayonets sliding on a spring down inside the barrel and with a pad on the top, or the French foil; while mounted men use singlesticks in place of sabres, and dummy lances well padded at point and butt.

In England the bouts are usually decided by the winner of the first two hits, except in final, and throughout dismounted fencing competitions with foils or sabres, where the first three hits decide the bout.

In France, the headquarters of fencing, so small a number of hits would be considered indecisive, whilst they also prefer many more judges than the three usual in England.

In mounted combats competitors are ordered to canter round until the order "Attack" is given, and (as in all competitions) must fight on until stopped by a judge.

In combats where the opponents use different weapons, it is usual for the first man of the pair to take the first-named weapon—thus, if Jones and Brown were drawn together in sword *v.* lance, Jones would have to take the sword; but if in the next round the pair drawn together were Smith and Jones, Smith being the first-named would take the sword and Jones the lance.

In mixed competitions, where a mounted man has to meet a dismounted one, the rule applies to the mounted men; so that if two mounted men are drawn together, the second has to dismount, but of course men of dismounted branches do not have to mount.

Riding and **Jumping** is always a favourite display and competition, as in it men are under very different rules to those in a riding and jumping competition at an ordinary horse show, where the object is to get over. The judge of the military rider has to consider style, hands, and seat as well as jumping, and the swords and accoutrements are very likely to touch the jump.

In recent years the directors of military sports have adopted nearly every sport that has been found amongst civilians, so as to encourage competition among the soldiers and develop their physical training.

E. Vane Stow.

MOORS—In the *Encyclopædia Britannica* a moor is described as a "tract of land usually overrun with heath"; and in *Chambers's Dictionary* it is laid down that "a moor is a word sometimes used to express an heath or barren tract of ground."

Both these definitions are generally correct. For while it is absolutely necessary that a moor, to be a satisfactory one as regards carrying a large head of grouse, should be possessed of good heather-bearing qualities, nevertheless there are many which in a large degree could be classed under the definition of "barren tracts of ground."

That these latter do not produce so great a number of grouse as would be the case if they were better supplied with the various heaths, is of course obvious. But, as will be shown later, it is wonderful what a quantity of grouse are to be found on moors which are almost denuded

of heather. In the mountainous districts of Scotland there is far more bare, broken, precipitous and stony ground on a "moor" than is the case in England.

The main essentials requisite in a moor, if it is to produce a quantity of grouse commensurate with its size, are:—

(1) A sufficient amount of heather.

(2) An adequate supply of water.

As regards the first of these points, the necessary step to be taken to aid Nature to produce such a result is to burn every season certain selected portions of the ground. By so doing, the old rank heather is destroyed, and young fresh plants grow, and form the staple food of the grouse.

To **burn** a moor properly requires care and knowledge on the part of the keeper. The writer thinks that the following directions and remarks on this subject may perhaps be useful. They are the result of his own experience, and suggested after consultation with some of the most experienced keepers. The best time of year for burning is towards the end of January, during February and March. As long strips as possible should be burnt, the width of each being 40 to 50 yards. If the moor be sufficiently dry, and the wind favourable (both of these are matters for the careful consideration of the keeper in charge of the operation), then the fire will move nearly as fast as a man can walk, and two people should accompany it, one on either side, to beat it out should the flames be spreading too wide.

When, in the opinion of the keeper, enough has been burnt, those in attendance beat out the fire, and the blackened ground is then left to produce in due time the fresh young heather so requisite for the sustenance of the grouse.

Slight differences of opinion occur as to how long it takes before the new growth of heather appears. One English keeper, in whose judgment I have every confidence, writes: "The young heather just begins to appear the first year after burning." But others say that a considerably longer time must elapse before this is the case.

As a matter of fact, the depth to which the fire penetrates greatly determines this; the condition of the peaty soil at the time of burning is very variable, and is dependent on the amount of rain or snow that may have fallen before the burning was undertaken.

Accidental moor fires may at times be very destructive in their effect if the ground be thoroughly dry. A match dropped after a shepherd has lighted his pipe, a spark from an engine, should a railway run through the moor, heather intentionally set alight by some ill-conditioned ruffian, may destroy for years hundreds, and even thousands, of acres of heather. The worst conflagration of this sort which has come under the writer's notice is one which occurred in 1872 on the Marquess of Ripon's moors at Studley Royal, in Yorkshire, when considerably over a thousand acres of valuable grouse-moor were burnt so deep that up to two years ago (1895) but little new heather had even then made its appearance on the damaged ground.

With regard to the second point previously mentioned—viz., the necessity of there being enough water on a moor to meet the requirements of the grouse—a nicely balanced medium between over-draining and under-draining should be observed. Grouse require a certain number of swampy, damp places on a moor, and enough and easily reached water. But if a moor is too swampy and wet, then the heather gradually disappears, and so do the grouse. The writer is well acquainted with one large tract of low-lying ground which formerly consisted of beautiful heather. Owing to its becoming more and more boggy and wet in its nature, from what cause he can hardly say, the heather gradually disappeared, and what was admirable ground for holding grouse became practically useless for that purpose. Steps were taken to drain the land carefully, with the result that for the past few years the heather has been steadily reappearing.

Sheep, if there are not too many of them, do not do much harm to a moor. But an over-large number is very undesirable. Cattle are very objectionable on a moor, and, where there are many, the heather suffers greatly, and the rank grasses become strongly in evidence. Careful trapping of vermin (stoats, weasels, &c.) is necessary if a moor is to be good for grouse. Foxes do much harm; and crows are much too fond of grouse eggs.

Much might be written about moor poachers and their habits and customs, especially as regards those who hire small patches of arable land near the moor-edges and grow various kinds of crops to induce the grouse to leave the moor to feed thereon.

It has been mentioned that there are certain moors which fairly answer to the dictionary definition of "barren tracts of ground." On these but little heather is to be found.

Colonel Royds, M.P. for Rochdale, possesses a moor which is a good example of this peculiar kind of ground. It is within half an hour of the town of Rochdale, which has a population of some 70,000, and is in close proximity to several other large centres of industry.

Colonel Royds has forwarded to the writer an account of this moor, which runs as follows:—

"On the moor itself there is practically no heather (*Calluna vulgaris*, or common ling); in some very well drained situations it is just possible you might be able to find a sprig. There are several small patches of heather within two or three miles of the moor, and at a lower altitude; but it must be five or six miles before there is any moorland with any amount of heather upon it. Five-and-twenty or thirty

Grouse Drive

years ago there was any amount of beautiful heather upon this moor.

"The cross-leaved heather (*Erica tetralix*) grows fairly well, and seems to have improved the last few years, when there has been a smaller rainfall.

"The Bilberry (*Vaccinium myrtillus*) does not do so well as formerly, and does not fruit. The Crowberry (*Empetrum nigrum*) is also found, but in a diminishing quantity.

"The other plants to be found on the moor are:—Mat grass (*Nardus stricta*), Waved Hair grass (*Aira flexuosa*), Blue Moor grass (*Sesteria cærulea*), Hair-tail cotton grass (*Eriphorum vaginatum*), Narrow-leaved cotton grass (*Eriphorum polystachyon*), Common rush (*Juncus conglomeratus*), Heath rush (*Juncus squarosa*), Common brake (*Pteris aquilina*).

"The nests of the grouse are almost invariably found in the mat grass, which has the local name of 'white louk.' They feed in the spring largely on the hair-tail cotton grass, pulling up the stalks and eating the tender roots. Later in the season, they feed on the seeds of the moor or heath rush.

"Of course, some birds go morning and evening to the patches of heather in the vicinity of the moor, especially in bad weather; otherwise they do not seem to leave the moor. The birds breed well, their greatest enemies being the rooks."

From this interesting account it is evident that a "heatherless moor," on which grouse may breed and exist in numbers, is to be taken into consideration when at any time dealing with the subject of moors.

GRANBY.

MOOSE (*Alces machlis*), **Elk and Moose**—The largest, and in certain ways the most remarkable of all the deer is the moose. It is entirely confined to the New World, as is the elk to the Old World. Zoologists have not been able to separate these two forms by any well-marked line, although there are some very noticeable differences between them. Let us regard them, then, as a single species, and one that is circumpolar in its range. While, however, the elk ranges as far south as Prussia and the Caucasus, the lower boundaries of Manitoba and Assiniboia probably represent the moose's southern range.

Antlers, Colour, &c.—The antlers of the moose, springing from either side of a high frontal prominence, extend in a beam that is at right angles to the middle line of the skull, and expand into an extremely wide palmated bowl-shaped mass, divisible into an upper and a lower portion. The edges of these bear the numerous points. An exceptional pair of antlers may weigh as much as 60 lbs. A big bull moose has been found to measure at the shoulder 72 inches or 18 hands.

When in the full vigour of life the bull moose has a curious process of hairy skin, some 4 or 5 inches long, called the "bell," hanging from its throat. The function of this is not understood.

The colour of a bull moose in early winter is a glistening black, though he is lighter under his belly and on the legs. Later on in the season, its coat turns grey. Females and young are grey, and very old males sometimes incline to white. The colour of the skin of a newly-dropped fawn in the writer's possession may be

MOOSE.

Average height at shoulder, 66 in.; Average spread of horn, 52 in.; maximum spread of horn, 67 in.

thus described: sides and shoulders, the dark sable-brown of the British water-vole: a stripe, 3 inches broad, of lighter sable down the back, widening over the quarters and fading to chestnut down the hocks. From the neck to the lumbar region down the *centre* of the back is a dark "mule-mark."

The horns of the moose are shed about mid-winter. The coat is shed twice—in May and September. The rutting season, which begins in September, is at its height by October, and the calves, usually one, more rarely two in number, are dropped in May. Although a bull will in the rutting season travel great distances, challenging other bulls, moose appear to be largely monogamous. Each family holds together through the year, and a bull moose in the prime is not often found in the solitary state.

Moose feed principally on leaves and twigs of trees; they are particularly fond of young shoots of the spruce, of birch, willow, poplar, and the red dog-wood, the shrub whose inner bark or "cambium" is dried and smoked as tobacco by the Red Indians under the name of *kinikinik*.

The "Yard"—In winter several of these animals will congregate and form a "yard," probably for mutual protection against wolves.

These "yards" are not, in the writer's experience, the rectangular camps they have been said to be. Those that have come under his notice have all been alike in character, and may be thus described. Situated in the closest part of the forest, the snow is trampled down and scraped together into a kind of central "compound." From the centre, irregular paths or alleys run for a short distance in many directions, by which the animals go to feed.

Methods of Hunting—Moose are killed in a variety of ways. Sometimes they are taken by the Indians by means of a noose and running block fixed up in the paths along which they travel. Again, in time of deep snow when, under the influence of the sun and frost, the snow is covered with a hard skin, the Indian hunters pursue them on snow shoes. The hard surface of the snow bears the hunter well enough, but the moose, sinking deep at every plunge, and cut about the legs by the knife-edge of the ice, soon succumbs and is despatched. Indians have told me that they also kill the moose in the water when it goes in summer to bathe and feed on lily roots.

There are only two forms of moose-hunting, so far as the writer is aware, which can be fairly classed as "sport." The first is the "call." This is chiefly practised in Nova Scotia and New Brunswick, and in the early half of the rutting season. The bull is attracted to the hunter by a call blown on a trumpet formed of birch-bark. Success depends upon an intimate knowledge of the animal's habits, and on the perfect imitation of its voice. The writer has known a Sioux Indian who, with no better instrument than his own hands, into which he blew, lying face downwards on the ground, could call up a challenging bull successfully in the moonlight.

The other form of legitimate hunting referred to consists in following the animal in autumn on foot, and is known as the "Still-hunt," This might be classed as a form of stalking, were it not that it takes place in dense forest and its success depends entirely upon knowledge of woodcraft and the creature's habits; for the moose itself is invisible until the moment arrives for the shot.

AUBYN TREVOR-BATTYE.

MOUFFLON (*Ovis musimon*)—The moufflon of Sardinia and Corsica, and another variety from Cyprus (*Ovis ophion*), are the European representatives of the great tribe of wild sheep, whose wide range of habitation extends through Asia from Armenia to Kamschatka. Like all wild animals, its numbers are steadily decreasing, and its range of country becoming more contracted in proportion to the larger numbers and improved weapons of the human population.

Distribution—Moufflon are said to have inhabited parts of Greece and the Balearic Islands. It is certain that within historical times very large numbers were killed in Sardinia and Corsica. In the museum of the Capitol in Rome there is a sarcophagus, on the face of which is represented, in relief, a hunting scene in which the animal being pulled down by hounds carries a head very much resembling a moufflon. To-day the moufflon is practically confined to a few separate mountain districts in Sardinia. In Corsica there are known to exist at the present time a very few small bands. They are too few to afford any probability of an adequate return for the labour of finding them, and they are apparently in such imminent danger of extinction, that the sportsman will certainly not wish to hasten their fate.

Even in Sardinia, where every man carries a gun and is, in theory, as good a hunter as his neighbour, the moufflon is now restricted to the higher and less populated mountain districts.

Description—The moufflon ram in late autumn is a handsome and game-like animal of the true Ovis type. His figure and proportions are very much the same as those of the big-horn of the Rocky Mountains, or the *Ovis hodgsoni* of Thibet. His size is much smaller—his height being some 27 to 28 inches at the shoulder, and his weight probably about 100 lbs. The ram's general colour is a rich red-brown; belly, inside of legs and caudal disk, white; saddle, grey-white; throat, jet-black, with longer hair down to the breast; black line between the red and white on the side; black markings on shoulder and down the limbs after the fashion of the burhel. The horns are hollow as in all sheep, and have the same transverse corrugations. They vary in form of curve. In some heads the curve lies almost in one plane, as in the shapoo; in others it takes the well-known "ram's horn" twist as in *Ovis poli*.

Measurements—The greatest recorded length of horn known to the writer is 34 inches. This was an exceptional head. Quite lately, heads of 29½, 30, 30½ inches have been killed. Thirty inches may be called a good head. Anything over 25 or 26 inches may be taken as fair game; below that they should be spared, for there are none too many. The circumference is from 7 to 9 or 10 inches. The female is smaller, less conspicuous in colour, and generally without horns. The rutting season is in November or December, and the lambs are born in April or May.

Method of Pursuit—Like all wild sheep, the moufflon is difficult to stalk and tenacious of life when wounded. Moufflon ground in Sardinia is not precipitous. On the contrary, it is very easy walking. Crawling is not so pleasant. Rocks and gravel seem to have sharper points than ordinary; there is no soft ground, and, with the exception of "bruyère" heather, every little shrub is covered with thorns. The heather or "macquia" is another obstacle. It

grows from 2 to 6 feet in height, and covers large masses of the lower ground. A moufflon who suffers from either heat or cold, or who suspects danger, at once retires to the macquia, where he is as well concealed, as long as he stays there, as a rabbit in a furze bush.

The moufflon is very keen-sighted, and he makes full use of a very keen sense of smell. Mr. E. N. Buxton remarks on the habit of moufflon of lying just under the lee side of a ridge where two currents of air meet, and where they are quite unapproachable. They have another most aggravating habit. When "put away," they will make off at a great pace till they

MOUFFLON.

Average height at shoulder, 27 in.; average horn measurement, 26 in.; maximum horn measurement, 34 in.

are out of sight behind some ridge or shoulder of the hill; they then immediately lie down in a place where they get the wind of the sportsman, who follows under the impression that they are still a long way ahead.

Season—Probably the most sporting season in which to stalk moufflon is October or November. They are then still on the higher, barer ground, and are more easy to spy and to stalk, and they are less harassed by shepherds and their flocks. Moreover, the days are getting colder and the moufflon feed more during the day, instead of lying in the shade for many hours together. On the other hand, the rutting season is near, and the rams are constantly travelling from one place to another. Moreover, they are now generally in company with females, and an old ewe shows the most exasperating persistency in keeping her eyes upon any suspected quarter. In the early spring the rams are found separate from the ewes and are easier to approach. It is probable that larger numbers may be killed in the spring, but that the best rams are more to be seen during the autumn. Of course they are fatter and in better coat and condition at that season.

The native method of hunting used to be continual driving to passes. Nowadays, there is more than one Sardinian hunter who has acquired considerable knowledge of the art of stalking for a quiet shot and of using the glass.

The mutton is excellent when well hung.

S. H. WHITBREAD.

MOUNTAINEERING — History and Development of Mountain Exploration—Mountaineering exploration, the direct and immediate offspring of mountaineering, is the most modern branch of geographical exploration; and geographical exploration is the investigation and record of the form of the earth's surface in its relation to man. It is not enough to know the form alone. The traversability of any portion of the earth is even more important. Where man can go, and where he cannot go, these are the areas the limits of which require to be defined, and can only be defined by experiment. Geographical experiment is called travel. A careful and observant traveller is to the science of geography what a careful experimentalist is to other sciences. Both must approach their problem and pursue its solution in the same spirit. Many portions of the earth's surface are, under present circumstances, inaccessible to man. No diving apparatus yet invented can carry him far below the surface of the ocean. No climber has yet authentically succeeded in reaching an altitude higher than about 23,000 feet. No one has approached within a few degrees of the North Pole or come anything like so near to the South Pole. There was a time in the distant past when the surface of water was wholly inaccessible. The margin of the ocean met prehistoric man with a "thus far and no further." The invention of the craft of navigation opened the ocean to the passage of man. Similarly, the areas of perpetual snow were practically closed to human progress till a comparatively recent date. A few hardy and exceptional men now and then risked or lost their lives by venturing into such unknown regions, but it was not till the craft of climbing was invented that it became possible to traverse glacial areas with a certainty and safety not less than that which accompanies travellers by sea. How to penetrate the exceptional glacial areas about the Poles, where the ice floats on water, has only just been discovered by Nansen; that is a separate craft, the development of which is, perhaps, still in its initial stages. The crossing of great deserts, again, must have been impossible for primeval man. To discover and tame the "ship of the desert," to explore for water-stations, and thus to find and make traversable routes, must have involved the labour of generations of nomads. A European traveller, who, without the requisite knowledge and experience of the desert craft,

should attempt to cross the great Dahna of Arabia, would assuredly perish by the way. To penetrate forests, too, required at one time exceptional experience, and similarly was it with large swampy areas and other special regions of the earth's surface. Thus it is proved that geographical exploration has called into existence various crafts of travel. We are only concerned with one of these, the latest born—the climber's craft. The thoughtless reader will perhaps be inclined to pronounce it offhand the most useless of all the crafts for getting about. "Useless" is a presumptive word. High regions have their scientific secrets to yield up; they have their beauties, too, for the lover of nature; they may hereafter prove to possess economical importance. It is more than probable that gold will some day be found at high altitudes in the Karakoram Mountains. When it is found it will be worked, for there are no insurmountable difficulties to prevent such working. The question, to men equipped with a knowledge of the mountain craft, is merely one of organisation. The invention of the climber's craft is of recent date. It did not exist in the year 1850; it was fairly advanced by 1870; it is not yet completed. The coming generation of climbers and mountain explorers will carry it further. Before men came to attempt systematic mountaineering, the vague dread that hung over the regions of everlasting snow had to be removed. In ancient days there existed, and even now amongst backward peoples there exists, a belief that all the extraordinary and (to them) inexplicable actions of nature are produced by violent and evil spirits. The storms that suddenly rage over the Mesopotamian plain seemed to the ancient Chaldeans to be the passing of Ginn. The people of that strange and inhospitable land, Tibet, imagine themselves to be surrounded by invisible fiends of all sorts, eager to destroy them, and they take all manner of magic precautions to counteract the machinations of the devils. The tribes of the Hindu Kush believe the regions of perpetual snow to be the home of fairies who drive men mad. Such ideas were the foundation of the belief, lingering till recently in the Alps, that there were dragons in the recesses of the hills—horrible creatures that haunted the regions of snow, and sometimes appeared to belated woodmen in the upper margins of the forests. Even after the dragons were gone, the Alpine folk believed, and perhaps some of them still continue to believe, that snowfields and high rock peaks are the home of demons and the spirits of the damned. Such dwell even to-day amongst the crags of the Matterhorn, and to keep them from invading the Zermatt Valley there still stands the Chapel of the Black Lake, which they dare not pass, and whither annually a pilgrimage is made to celebrate mass at the altar and renew the power of the charm.

The mysterious dread of the hills which found such, amongst other, expressions had to be destroyed in the minds of sensible men before systematic mountain exploration could take place. The passes of the Alps, indeed, were crossed by regular routes in the most ancient times; but it was necessity alone that drove men over them. There was a prehistoric trade route, along which the Etruscans journeyed to exchange their bronze wares for the amber of the Baltic; and there was a contemporary pass into Gaul, perhaps the great St. Bernard, the mediæval history of which is complete. The Brenner was the pass of the Emperors throughout the middle ages. The Great St. Bernard was most frequently traversed by pilgrims, or "roamers," from the west of Europe. The pagan altar of Pennine Jove was at an early day supplanted by a Christian hospice, which, frequently rebuilt, and famous for its dogs, continues to the present time. We have some curious accounts of passages across it: for instance, that of Abbot Rudolf of St. Trond, in December, 1128, or that of John de Bremble, a monk of Christ Church, Canterbury, in February, 1188, both of which may be read in Coolidge's *Swiss Travel*. A translation of part of the latter account, given by Bishop Stubbs in his *Lectures on the Study of Mediæval and Modern History*, is brief enough to be quoted entire. "Pardon me for not writing. I have been on the Mount of Jove; on the one hand looking up to the heavens of the mountains, on the other shuddering at the hell of the valleys, feeling myself so much nearer heaven that I was more sure that my prayer would be heard. 'Lord,' I said, 'restore me to my brethren, that I may tell them that they come not into this place of torment.' Place of torment indeed, where the marble pavement of the stony ground is ice alone, and you cannot set your foot safely; where, strange to say, although it is so slippery that you cannot stand, the death (into which there is every facility for a fall) is certain death. I put my hand in my scrip that I might scratch out a syllable or two to your sincerity; lo! I found my ink-bottle filled with a dry mass of ice; my fingers too refused to write, my beard was stiff with frost, and my breath congealed into a long icicle. I could not write the news I wished." Clearly, the day for mountain exploration had not come in the twelfth century! When passes were regarded with such dread, peaks were not likely to be approached. They had an even more uncanny reputation. Was not Pilate buried in a pond on the top of Pilatus? and did not the devils dance and howl around the place? Nevertheless, now and again some curious person was led to visit the summit of a peak. Trajan climbed Etna to see the sunrise. In the eleventh century, an attempt was made to reach the top of the Roche Melon (11,600 feet) near Susa, and it was actually climbed and a

chapel built on the peak in 1358. In the last quarter of the thirteenth century, Peter III. of Aragon climbed Canigou in the Pyrenees. Sir Frederick Pollock tells us how Peter took with him "two knights of his companions whom he loved, and, having equipped themselves with provisions and fitting instruments (*congruentibus armis*—possibly alpenstocks), they set forth." They encountered a thunderstorm, and "the two knights began to fail in such wise that for exceeding weariness and for fear of the thunder they could scarce breathe!" Peter, therefore, like Mr. Bryce on Ararat, completed the ascent alone. When he came down, he told his companions how he had found a lake on the summit and cast a stone into it, whereupon there came forth a great and terrible dragon which flew away, breathing out a vapour which darkened the air. Moreover, he gave them leave to repeat the story as much as they pleased. We may suppose that he had accurately measured their credulity. In 1339, Petrarch climbed Mont Ventoux, near Vaucluse, "to see what the top of a hill was like"; and, in 1492, Charles VIII. of France sent one of his chamberlains with a party up the remarkable Mount Aiguille, and they too built a chapel or altar on the top—an indication that they thought the place decidedly uncanny. With the sixteenth century, a new spirit overspread the intelligent classes of Europe; the Humanists manifested its effect in their changed attitude towards mountains. If it had not been for the blight cast over intellectual progress by the religious differences and wars resulting from them, the seventeenth century would probably have seen mountaineering in full swing, and would have witnessed the completed exploration of the Alps. Leonardo da Vinci was perhaps the first in this, as in so many other matters, to manifest the new tendencies. He appears to have climbed high up to the south side of Monte Rosa, and to have reached the level of the snow-fields. He remarked nothing about dragons or devils, but made accurate observations on the state of the snow and its peculiar hail-like granulation. The philosophers of Zurich, especially Conrad Gesner and Josias Simler, paid in the middle of the century great attention to mountains. Gesner was a genuine mountaineer in spirit, and wrote in praise of climbing for its own sake. Simler published a very interesting book on the Alps, which is still well worth reading, and in it he gave practical advice as to the use of the rope and other precautions to be observed when going above the snow-line. It is with these climbers of the sixteenth century Zurich school that the craft of climbing may be said to have originated. In the seventeenth century, however, nothing was done. The people of Europe were too busy with their wars and squabbles. Ordinary travellers and "grand" tourists continued to think that the mountains were but hideous excrescences, and that all natural beauty resided in plains. Traces of this idea may be found so late as Sir Walter Scott, for instance in *Anne of Geierstein*. The reaction against this point of view was brought about partly by men of science, to whom glaciers became an interesting subject, first of speculation, afterwards of study, partly by the romancists, headed by Rousseau, for whom admiration of mountains was in harmony with their general attitude of revolt against accepted dogmas.

If a date were required to mark the commencement of this new period, perhaps the year 1739 would be the best, for in it the first snow mountain was climbed—the Titlis. Pococke and Windham's visit to Chamonix followed, in 1741. They went there from Geneva out of pure curiosity to see what Mont Blanc looked like from near at hand, and they climbed to the Montenvers and looked at the Mer de Glace. The first recorded attempt to reach the summit of Mont Blanc was made by a party of so-called guides in 1775. They are believed to have ascended as high as the Grand Plateau. Other attempts followed till, in 1786, the highest point was gained by Jacques Balmat and Michel Paccard, who took De Saussure to the top in the following year. The dread of mountains and of the regions of perpetual snow, if not thus destroyed, began at all events to be undermined. During the next half century it was gradually removed. The Jungfrau was climbed in 1811, the Finsteraarhorn in 1812; other peaks followed. Thus far, however, such climbs were sporadically undertaken. The climbing craft could not be properly invented till a set of men arose, who returned to the mountains year after year and gained, by repeated expeditions above the snow-line, experience of the conditions that obtained there and of their effects upon man. It was not till about the year 1850 that any such body began to form. Between 1850 and 1860 several men took to mountaineering as a sport. Mr. Justice Wills's ascent of the Wetterhorn in 1854 is usually regarded as the first important "sporting" climb. The highest point of Monte Rosa was reached in 1855, and Mont Blanc was climbed by a new route and without guides by a party of Englishmen in 1856. The Alpine Club was founded in London in the following year. Foreign countries one after another imitated the English institution, and thus mountaineering rapidly developed. The first generation of Alpine clubmen retained a good deal of the old respect for mountains, but this has gradually faded away. One accident after another revealed the nature of the genuine perils particular to snowy regions, and it was discovered how to guard against them: the proper size of a party, the way to use the rope on snow and rocks, the condition of the snow itself at different times, the probability of

avalanches of snow, ice, and rocks—all these matters and a hundred more had to be investigated by slow degrees, and experience of them had to be acumulated. We now know where men can go with safety, and how such safety is to be attained. This knowledge, skilfully put in practice, is the craft of climbing. The craft thus developed in the exploration of the Alps has been already to some extent applied to the exploration of other mountain regions. The Pyrenees are not a difficult nor a lofty range, and the exploration of them was no hard matter. The Caucasus was quite another affair. That range is loftier, snowier, and on the whole more precipitous than the Alps. It is, moreover, afflicted with a less good climate, the proximity of the Black Sea producing frequent and heavy falls of snow throughout every season of the year. The chief credit for the exploration of the higher regions of this range belongs to Mr. D. W. Freshfield, a recent President of the Alpine Club. He was a member of the first mountaineering party that ever visited the range (in 1868) and his writings prompted the journeys of other parties, by whom the exploration was carried to its present advanced stage. The second party went in the year 1873, the third in 1886, since which date there has hardly been a summer in which mountaineers have not climbed amongst Caucasian snows. 1888 was the great Caucasian year. In it the high peaks Koshtantau, Shkara, Janga, and Ushba (amongst others) were ascended for the first time by one or other of the three English parties that visited the range. The mountains, however, took a terrible revenge. Messrs. Donkin and Fox, with their Swiss guides, perished while attempting the ascent of Dychtau, and their remains have never been discovered. Proceeding to South America, and passing over minor elevations, there are two important parts of the Andes which have attracted the attention of European climbers; these are the great Andes of Ecuador and the Cordilleras of Chili and Argentina. The former were visited by Humboldt in the first decade of the present century, but though he made many interesting observations with respect to them, his journey was in no sense one of mountain exploration as now understood. In 1879–80, Mr. Whymper carried through his famous expedition to these mountains, during which he twice ascended Chimborazo (20,475 feet), climbed and spent a night on the summit of Cotopaxi (19,613 feet), and made the first ascents of six other high peaks. The importance of this journey lies not so much in the mountaineering exploits accomplished, as in the fact that it set an example of what a mountain explorer should attempt to do in a new region. Mr. Whymper carefully surveyed the country, carried mercurial barometers to the highest points, observed the effects of diminished atmospheric pressure on the human body, took a quantity of photographs, and made admirable collections illustrative of the geology, flora, fauna, and anthropology of the country. His work was of the highest scientific value. Mountaineering in his hands was raised from a mere athletic pursuit to the level of an important scientific method. Three years later, Dr. Güssfeldt explored the Cordilleras, a series of rugged peaks mounted on table-shaped masses of rock, and presenting exceptional difficulties to a climber. He encountered, like Mr. Whymper, incessant bad weather. He ascended the extinct volcano Maipo (17,752 feet), and made two attempts to climb Aconcagua, but was turned back by storms and the lack of good companions at a height of 21,000 feet. This peak was ascended to its highest point on two occasions by members of Mr. E. A. Fitzgerald's expedition of 1896–97. When the results of their work are published we shall know whether the height of this great mountain is over the 22,300 feet of Dr. Güssfeldt's measurement. The record of mountain exploration in Africa is a very brief one. The great mountain groups are all associated with long depression, the hollows of which are filled by the lakes. The principal peaks are named Ruwenzori, Kenia, and Kilima-njaro. The discoverers of Ruwenzori, the Emin Pasha Relief Expedition, ascended only its lower slopes, and no one has yet gone further. Kenia was recently climbed to about 17,500 feet level by Dr. Gregory. It is only, however, Kilima-njaro that has been the goal of a properly organised mountaineering expedition, led by Dr. Meyer and Herr Purtscheller in 1889. They made three ascents of Kibo (19,685 feet, aneroid measurement), the highest point of the range, and climbed to the top of one of the peaks of Mawenzi (about 17,000 feet), an extremely difficult ascent. A very important range of mountains in the Southern Hemisphere, the Alps of New Zealand, culminates in Aorangi (Mount Cook), a peak 12,350 feet high. Though the range is of but moderate elevation, it is snow-clad down to a level of about 7,000 feet, and produces large glaciers. The western slopes are steep, and broken up by many deep valleys, heavily timbered. In 1882, the Rev. W. S. Green, with two Swiss guides, made the first serious attack on these mountains. He explored the principal glaciers, and climbed to a point on the snowy dome of Aorangi. In the following year Dr. Lendenfeld climbed the Hochstetter Dome. These expeditions attracted the attention of the rising generation of colonists, a group of whom presently set themselves to acquire the mountain-craft for the purpose of continuing for themselves the exploration of their own range. Mr. Mannering's interesting work, *With Axe and Rope in the New Zealand Alps*, tells the story of their early efforts. The Colonial Government was thus led, as has happened in other regions, to cause an excellent survey to be made of the most important mountain group.

Photographers and holiday-makers were attracted to the valleys, a hotel was opened in the best centre, and in 1890 an Alpine Club was founded. On Christmas Day, 1894, the colonists made the first complete ascent of Mount Cook. In 1895 Mr. E. A. Fitzgerald, with the Swiss guide, M. Zurbriggen, made a series of very important first ascents of the chief peaks of the range, and discovered and crossed a pass over the central group. Last in order of our survey, but first in importance, are the great mountains of Asia, which cover a larger area, and reach higher elevations than any other mountains in the world. From the short north and south chain, forming the eastern wall of the Pamirs, the chief ranges diverge fan-like eastwards, whilst the Hindu Kush trends to the west. It would be useless here to give the names of even the chief earthfolds which enclose Chinese Turkestan and bound or divide Tibet. The southern range alone, the Himalayas, which forms the north frontier of India, is in any sense explored, and the exploration of that has been but begun. The ranges of the interior have only been seen by occasional travellers. None of them are explored. The Thian Shan, the Kuenlun, the Hindu Kush, are little more than names; some of their easier passes have been crossed, but that is all. They, and still more the mountains of Tibet, are to all intents less known than the Mountains of the Moon. Parts of the Himalayas have been included in the great Trigonometrical Survey of India, a work the magnitude and importance of which are little recognised at home. The surveyors ascended a large number of outlying points, many of them over 18,000 feet high, and fixed with great accuracy the position of the chief peaks and the trend of the ridges. Less attention was paid to glaciation, the object of the survey being practical rather than scientific; but the general form of considerable areas of the range is recorded, and some districts are very well represented,. notably a part of Kumaon. Only three professedly mountaineering expeditions have been made in Asia since the craft of climbing was invented; the first of these was Mr. Graham's attack in 1883 on the mountains of Kumaon and Sikkim, the second was my journey of exploration in the Karakorams in 1892. Mr. Graham was accompanied by Swiss guides, but he used no scientific instruments of precision, made no survey, and relied for information as to his position on his interpretation of the map. It must be remembered that the map makes no pretence to being a mountain map, or, save as to the position of the summits of peaks, of rendering, with even approximate correctness, the form of mountains above the levels of cultivation; it would, therefore, be extremely easy for a traveller, especially if he were not a topographical specialist, to mistake his position and believe (as men have often done) that he was on one peak when he was actually on another. Mr. Graham thought that he climbed a peak 24,000 feet high, named Kabru, but it is the matured conviction of English officials who were in the country at the time, and who discussed the matter with Mr. Graham, when his memory as to the things he had seen was fresh, that he was mistaken, and that he reached no such great altitude. At the height he did attain, neither he nor his companions experienced any of the effects of diminished atmospheric pressure such as have invariably been observed by all who have reached 20,000 feet and upwards. Mr. Graham's ascents are not, from a scientific-geographical point of view, thoroughly identified and authenticated. He did not measure his altitudes, and he did not fix his positions; the omission to do so deprived his expedition of some of the importance it deserved. The Schlagintweits, in their Nepal explorations, reached an altitude which they computed at 22,230 feet. This was the "record" up to the year 1892, when the Hon. C. G. Bruce and myself, with the guide Zurbriggen and two Gurkhas, climbed to the summit of Pioneer Peak, whose height is about 23,000 feet. Whether this record was beaten on Aconcagua will soon be known. The Karakoram range includes several of the highest mountains in the world and the longest glaciers outside the polar regions. We traversed the three chief glaciers from end to end; we made the first passage of the Hispar Pass, the longest glacier pass in the world, and we likewise made the first passage by Europeans of the Nushik Pass. We surveyed a considerable area of previously unexplored mountain country, and we accomplished a number of other ascents. All these matters are duly recorded in my book, entitled *Climbing in the Himalayas*.

In 1895 the famous rock-climber, Mr. A. F. Mummery, in company with Messrs. Collie and Hastings and the Hon. C. G. Bruce, attacked Nanga Parbat (26,629 feet) on the west frontier of Kashmir. After a series of bold attempts, Mr. Mummery and two Gurkhas were killed whilst endeavouring to cross a pass over one of the ridges of the mountain. It is to be hoped that hereafter Englishmen resident in India will make the mountains of Asia a subject of exploration and study. They would undoubtedly have done so long ago but for the attractions of sport in the lower ranges. As markhor and ibex become rarer, it is not improbable that the great mountains will assert their charm, and a group of climbers will arise who will accomplish much more remarkable ascents than any that have yet been done in other regions of the world. The mountains of the North Polar area have not attracted much attention. Beerenberg, in Jan Mayen Island, has never been ascended. The mountains of Spitsbergen formed the goal of two expeditions, under

the present writer's leadership, in 1896 and 1897, when various peaks were climbed, the most important being Mount Hedgehog or Hornsunds Tind. All these mountains, however, are small in scale, though many in Spitsbergen are precipitous and fine in form. The Antarctic continent evidently contains more noteworthy mountain masses, none of which, of course, have yet been approached. The date of their ascent lies, perhaps, in a remote future, but it will assuredly come in due season.

The Sport and its Dangers—Mountaineering may be considered from two points of view—as a craft, or as a sport. Sports bear to crafts the relation that arts bear to handicrafts. A fine art is the glorified form of some craft. Before we treat of mountaineering as a sport, it is necessary to frame some idea of the craft upon which the sport is based. The craft of climbing is the method by which a man travels safely through a region of mountains, and especially of snowy mountains. It is primarily the craft of getting about over glaciers and snow-fields, and of avoiding the dangers proper to such a region. Before you can avoid a group of dangers, you must know what they are. The dangers that snowy mountains provide are mainly of two kinds: there is the danger of things falling on to the traveller, and that of the traveller himself falling. The things that may fall on to him are rocks, ice, and snow. The traveller himself may fall down a hillside formed of rocks, ice, or snow, or he may fall into clefts or crevasses in the body of a glacier. Lastly, there are dangers arising from weather. Eight dangers in all: falling rocks, falling ice, snow-avalanches, falls from difficult rocks, falls from ice slopes, falls down snow slopes, falls into crevasses, dangers from weather. It is in the avoidance of these dangers that the climbing craft consists. They are here considered *seriatim*.

Falling Rocks—Every rock mountain is falling to pieces. The common phrase "old as the hills" expresses a common error. Geologically speaking, hills are seldom old. The crinkled-up ridges of the earth's crust are as rapidly pulled down again as heat, frost, and aqueous denudation can accomplish. The bigger and more precipitous a range, so much the newer is it, and so much the more rapidly being destroyed. Above the snow-line the process of destruction goes on faster than below. Snow collects on ledges, melts in the sunshine, and run into cracks, then freezes and acts as a wedge, opening the crack wider. Thus rocks become detached from their beds, and, when the thaw comes, one or another falls away, bounds down on others loosened like itself, sets them in motion; and they in turn set more off, till a whole hill-side becomes alive with falling blocks. To a man on the hill-side the effect is appalling, but the chances in his favour are very great. Falling stones on a rock-face seldom hit an individual. Generally a hill-side becomes ridged and furrowed by aërial and aqueous denudation. Then the furrows or gullies become stone-runs, and in them a climber is liable to be in real danger from falling stones. A steep and very narrow rock gully is called a chimney; a wider gully, the bed of which is filled with snow or ice, is called a couloir, either a snow-couloir or

Climbing a Chimney.

an ice-couloir. Stones do not often fall in chimneys. If they did, chimneys would be very fatal places. In couloirs stones frequently fall, but if the couloir is straight, falling bodies generally fly down the middle of it, where they make a deep furrow. If this furrow is carefully avoided, the danger will be reduced to a minimum. Of course, falling stones going down such a furrow carry some snow with them. This snow tends to form bridges over crevasses and bergschrunds (see below); and it thus often happens that the only way to cross a

bergschrund in a couloir is to go over the bridge thus formed, right in the track of the falling stones. The danger here, however, is small, for the bergschrund is always at the bottom of the couloir, whilst the stones fall from the top, so that there is always time enough to get out of the way before a block comes. The greatest danger from falling stones is in a bent couloir, for there the stones rattle and leap from side to side, and rake every point; but even then shelter can generally be found under some overhanging rock. Stones fall more on some days than others. When a mountain is well covered by recently fallen snow in good condition, stones seldom stir. As the snow melts the stones begin to come down. In very fine seasons, after several weeks of sunshine, stones fall most plentifully on rock mountains, such as the Matterhorn; and a wary climber will then hesitate before undertaking ascents specially liable to this danger. Much also depends on the way in which a mountain is built, and on the materials of which it is composed. When the strata dip inwards towards the mass of the mountains, stones do not easily fall. When the strata dip outwards stones fall more frequently. Some kinds of rock are more friable than others; mountains built of very friable rock produce a bigger crop of falling stones than do other mountains made of better materials. The Bietschhorn is a well-known example of a mountain that yields many falling stones. The whole mass of it seems to be rotten. On the other hand, the Chamonix Aiguilles, built as they are of very hard slabby rocks, though so steep, do not cast down many missiles. On the lower parts of glaciers, below the snow-line, where the ice comes to the surface and is not covered with snow, there are always more or fewer rocks on the ice. If the slope of the surface of the glacier be considerable, as at the sides it may be, and as at the snout it generally is, these stones, one by one, owing to the melting of the surface, become detached, and slither down the slope with increasing velocity. Such falling stones are very dangerous, for they may find a climber cutting steps up the slope and unable to stir an inch to dodge them; or they may fall on the head of a mere spectator standing on the solid earth near the edge or foot of the glacier. Fatal accidents have occurred in this manner. In the Himalayas stones fall in much larger proportional quantity than in the Alps. I have there seen enormous masses fall from a great height, and not come to rest till they have reached the very bottom of some deep valley. In this connection it may be best to refer to a peculiar kind of falling rocks, those, namely, which form mud-avalanches. They are rare in the Alps, but common in all the hot regions of the world where there are high mountain ranges. A mud-avalanche takes its origin from rapid thawing of winter snow in the early part of the summer. The upper parts of mountains are then dripping wet. The water flows down little gullies, and sets the loose stones moving. A small fall of rocks high up dams up one of these gullies. Water collects behind the dam and presently breaks it down. The muddy mass begins to flow and undermines the rotten banks of the gully. The sides fall in, and the moving mass is increased. Some big rock arrests it lower down and forms a bigger dam. This is again broken. Thus the avalanche increases in size. The gullies join together like the branches of a tree. One little avalanche joins another till the whole hill-side is alive with these serpent-like, creeping masses. Ultimately, the whole thing collects together into the trunk gully, and is vomited forth with thundering tumult into the valley below. Such mud-avalanches fill up the valley bottoms of Central Asia, and they have been the agents that formed, for example, the Pamirs. Mud-avalanches are so big and so noisy, that they do not constitute a danger of much importance. They have their regular tracks, easily identified; and unless a man were to pitch his camp in such a track and be over-turned in his sleep, he would hardly be likely to encounter danger from these hideous things. Of great hill-slidings and mountain-falls it is not necessary here to speak, for though villages are sometimes overwhelmed by them, and whole valleys rendered barren, they do not give rise to the mountaineering accidents which climbers have to take into consideration.

Falling Ice—Falling ice constitutes a kind of mountain peril for which climbers have to be on the alert; but ice does not fall casually about the place any more than do rocks. Just as a mountaineer, by observing attentively the nature of the place he is climbing over and the marks that falling stones leave on rocks and snow, can tell whether he is in danger and where safety lies, and thus, by training his observation, can learn to avoid perils that inexperience would lightly face, so the places where ice falls, or is likely to fall, can be even more easily identified and avoided. There is no quality more characteristic of a good mountaineer than trained alertness of observation. He knows the meaning of small indications that would escape the eye of any novice. He is as awake to observe the tokens about him as was any American trapper of old days for Indian "sign." He knows how the forces of nature act, and what are the marks of their action. Thus he is forewarned of dangers and able to avoid them. The attainment of this kind of capacity should be the aim of every young climber as much as the attainment of mere gymnastic skill.

Along the crest of narrow, snowy ridges of high mountains there is usually formed what is

called a cornice, a larger or smaller overhanging wave of snow or ice. A cornice is formed by some prevalent wind that carries the falling snow with it over the crest of a ridge. Beyond the crest is an atmospheric eddy which plasters the driven particles of snow against the crest. The cornice grows from year to year till at last it becomes too heavy and breaks away and falls; or it may reach a maximum at which the yearly melting equals the yearly increment, in which case it maintains itself unbroken for a very long time. Of dangers connected with falling from, or through, cornices, we must deal later. It is here only necessary to observe that small portions of ice not infrequently fall on hot or windy days from the edge of the overhanging part of the cornice, where icicles frequently form, and these, dashing down the steep slope below, may be a cause of peril to climbers on the slope. A glance aloft will tell a climber whether there is a weak or broken edge to the cornice that is likely to give way. A col, or pass, approached on both sides by steep slopes, whereof the one to windward is of snow or ice, is almost always crested by a cornice. If this overhangs a rock wall, lumps of ice falling from it are liable to set stones going, as happened when I was crossing the Forcla Pievlusa in the Engadine. After ascending the slope on the side which a cornice overhangs, climbers usually have to cut a tunnel through, or a gap in, the cornice, in order to climb actually to the crest of the ridge or pass. This is often a laborious process, and is dangerous when the cornice is in a rickety condition. Much depends, therefore, upon the point chosen for attack. This point should be selected from below, and the ascent directed towards it; for if the slope be steep and difficult it will be no easy matter, having arrived below the cornice, to work along to left or right beneath it, seeking too late for a suitable place to attack. On steep rock faces, where snow collects in small patches on ledges and in crannies, a few hours of sunshine produce a great deal of melting. Water drips down the rocks and pours over edges, often into shadows where frost still holds. Icicles are thus formed, sometimes on a very large scale—growths as thick as a man's thigh. When a really warm day comes, these icicles may fall in big lumps from directions that a casual climber would not suspect, and such falls may occasionally produce fatal consequences, though I do not remember any recorded accident of the kind. Every old climber, however, must have seen masses of ice falling from this cause, quite large enough to destroy any individual who happened to be in the way. Alertness in this case also is the only protector. An experienced mountaineer will recognise the kind of danger which mountains present on a particular day, and will be prepared to avoid it. The chief peril from falling ice, of course, arises where there are large ice-masses in a position from which they can fall. The only very large masses of ice formed in snowy mountains must be a part of glaciers. As long as a glacier flows evenly down a gentle slope, it is not broken into lumps which can occupy a position of unstable equilibrium: but if the bed of a glacier is interrupted by a precipice, or if the slope of the bed changes at a sharp angle or becomes very irregular, the ice flowing over it is rent and broken into dangerous forms. It often happens that, high up on a mountain, there is a hollow or corrie of suitable shape for snow to collect and a glacier to form. The glacier moves down regularly enough till it comes to the edge of the hollow, where a very steep slope or precipice falls away. Under such circumstances, the end of the glacier, being constantly renewed from behind, breaks off at more or less regular intervals of time and falls in a body down the steep slope, where it smashes into powder, starts all the loose stones and snow in its way, and pours down in a mighty and destructive avalanche to some level place, at which it is stopped and re-formed into a solid mass. Such hanging glaciers are easily seen, and the tracks followed by the avalanches they cause are discoverable from a great distance by trained eyes. A route that leads across such a track should be avoided by any man who is unwilling to hazard his life upon a chance over which he has absolutely no control. Almost every glacier at some point of its course flows down a slope steeper than the average steepness of its bed. Where it does so, it moves more rapidly than elsewhere, and thus it becomes rent in a manner that is more and more tumultuous in proportion to the steepness of the rapid and the unevenness of the rocky bed. A very uneven bed of gentle slope suffices to tear up the ice that flows over it into most irregular forms, as I constantly observed in the Karakorams in the case of glaciers that flowed across the strike of the vertically-tilted strata that there prevail. In the Alps, glaciers are seldom much broken up, except where their slopes are steep; then they are torn in a remarkable and picturesque manner into what is called an ice-fall. The towers and blocks of ice in an ice-fall are called *seracs*. As the glacier moves, the seracs are slowly tilted over, and, sooner or later, fall in ice-avalanches which overthrow other seracs below and pour down the ice-fall, spreading tumultuous ruin in their way. A young climber is not likely to underestimate the danger of an ice-fall. He will probably overestimate it, for seracs tumble much less frequently than their insecure appearance would suggest. An experienced mountaineer can form a very accurate idea of the probable stability of a serac. Often, however, though a serac itself may be firm enough, some undercut fragment of it may fall, a mere ton or so of ice, quite sufficient to overwhelm a climber. Ice-falls often have to be

climbed as the only possible way of getting up a glacier. They should never be attempted by inexperienced men without experienced guides. As a rule, they may be traversed by a judiciously chosen route, and no part of mountaineering is more fascinating than such work, done amongst the blue chasms and white towers that combine so beautifully. In the early morning, seracs seldom fall, but when the frost of night is gone, and the sun has been shining on an ice-fall for some hours, danger becomes greater and a safe route is hard or may be impossible to find. Then it is that unjustifiable risks are run, and the supreme penalty may have to be paid. Early in the year, say in June in the northern hemisphere, ice-falls are usually clogged with thick winter snow, which holds the seracs together and bridges over the chasms. They can then be passed with ease and safety; whereas in September, when all the snow has melted away, the self-same ice-falls may become very dangerous indeed, or quite impassable. There is a fourth kind of danger from falling ice, which, however, a climber rarely encounters. It occurs at the edge of some glaciers and at the snout of most. When a glacier is swelling in width, or advancing, its outside edge often breaks away in large lumps and falls outwards. This is more commonly seen in the Arctic regions than in the Alps or Himalayas. At the snout of every glacier, where the drainage river flows out from an icy cave, falls of ice frequently occur. Once, when I was encamped about 200 yards from the ice-cave of a very large glacier, a great mass of ice, weighing many thousands of tons, fell into the river, and dammed up a great part of its width, sending a huge torrent of water suddenly in a new direction. Our camp had the narrowest possible escape from being swept away in this unforeseen manner. It is always necessary to have foresight and caution when one is near what may be called the active parts of a mountain or glacier.

IN AN ICE-FALL.

Snow Avalanches—We must now pass on to consider the dangers that come from accumulations of snow falling upon a climber. These are some of the most insidious that the mountains present. Such falls, of course, are liable to occur only when snow is in an unstable condition, that is to say, either early in the year when the winter snow is rapidly melting, or after recent bad weather when there is a quantity of new snow about. Days when snow is in an unstable condition are very easily recognised; then it behoves the climber to be wary and keep his eyes about him. Small beds of snow that have accumulated on rock ledges then fall off, and suffice to upset a climber, notwithstanding their relative insignificance. Snow that has newly fallen upon slopes of ice is always liable to peel off and come thundering or swishing down in quantity sufficient to overwhelm or carry away a man. Couloirs are the normal lines of descent for such falling accumulations, and these places, usually pleasant highways for the step-cutting climber, become death-traps when snow is in bad condition. Snow avalanches may be said never to fall in unexpected places. They have their regular gathering grounds, their fixed lines of descent, and they pile themselves up below in easily recognisable cones or fans. Thus, they can always be avoided by a man with his wits about him. Many a snow avalanche falls from some high-planted slope over a rock precipice, which it may leap like a waterfall, leaving no plainly marked traces of its habitual route; the piled up fan below, however, betrays the danger, and the state of the snow on any particular day enables the climber to judge whether it be a present danger or not. Doubtless the chief peril of snow avalanches is that a

climbing party may start one: but instances have occurred of snow avalanches descending on climbers. Such accidents are always avoidable. They are likely to be more frequent in snowy ranges in hot countries than in temperate regions.

We have briefly treated of some of the dangers that arise from falling things; we now approach the larger and more important branch of mountaineering dangers, those dangers, namely, involved in the chance of the climber himself falling. The most obvious kind of place from which a climber is likely to fall is from steep rocks. In the avoidance of slipping from difficult rocks, the gymnastic skill of a good climber largely consists. Steep rocks are not necessarily difficult to climb, for difficulty arises only where there is a lack of holding for hands and feet. Rocks may be very steep, yet as easy to climb as a ladder. It is thus the quality and formation of rocks that must be considered rather than the angle of their surface. The first question to be asked is whether rocks be firm or rotten. On firm rocks you know where you are, but not on rotten rocks. Every kind of precaution needs to be taken. The climber must test every handhold and foothold before trusting his weight to it; but this testing is no easy matter, for, where all the material is loose, you might pull down the mountain before coming to absolute security. An experienced rock-climber comes to know whether a loose rock is firm enough to bear his weight. This is a matter that cannot be taught; it comes from practice only. The weight of a moderate-sized rock is large compared with that of a man. The friction between rock and rock is considerable, and, as a supporting force, it varies with the weight. The amount of this force has to be instinctively estimated. That is what a skilful rock-climber does with almost infallible accuracy. The route up some mountains lies entirely over rotten rocks without, perhaps, a single absolutely firm place; yet the ascent can be safely made by skilful climbers. Again, much depends upon how the climber throws his weight on a new point of support. If he moves in a jerky manner he may bring down tons of material which a more evenly moving person would not stir. In such places, a climber has to think as much about his companions as about himself. He must avoid putting himself immediately below the man climbing in front of him, and he must be careful not to send stones down upon his follower's head. One to move at a time is the only safe rule, and all must keep as near together as possible. In all places of difficulty or danger, a party of mountaineers wears a rope, chief instrument of safety for climbers. The rope usually worn is a strong manilla cord of the kind called Alpine Club rope, which is made only by Buckingham. A thinner rope, used double, is employed by some very skilful climbers, but the employment of it requires more experience, it must be discarded before it begins to be in the least worn, and it has other disadvantages to be set off against its most estimable lightness. As a general rule, there should be not less than three persons on a rope, and the strength of the party is approximately that of the weakest of the three. On snowfields, a large party may be united by a single rope; but on rocks, large parties are to be avoided. In the case of really good rock-climbers, two may go on one rope, but three are always better than two. Five are the maximum number for rocks. A party of six should be subdivided into two parties of three, which should keep well out of each other's way. The length of rope which should intervene between any two members of a party varies with the nature of the work to be done. In the case of very difficult rocks, when one man only moves at a time, and when firm resting places come only at long intervals, men need to be widely separated from one another. The leader, starting from one firm place, climbs to the next whilst the others (or at any rate the second man) remain stationary. When the leader is firmly anchored, he draws in the rope as the second man comes up, not helping him by a pull, but being always ready to prevent him from slipping by "nipping a slip in the bud" before the man slipping has acquired any momentum. If the rope is loose above a man when he begins to fall, he will come on it with a jerk, when he has fallen some distance, and the force of the jerk will be proportional to the square of the distance through which he has fallen. Thus a fall which might be stopped with ease if the rope were properly handled, may be fatal when the rope is allowed to hang loose between one climber and the next. To ropes fixed for the purposes of descent, or looped and cast up over catching points of rock to enable otherwise impassable precipices or overhangs to be surmounted, reference will be made hereafter; such refinements belong rather to the art than to the craft of climbing. To return to the rotten rocks from which we have deviated: the rope in such places must be handled with excessive care, for nothing is easier than, by means of it, to start loose stones and send them down on the heads of those below. Where rocks are much broken, there are many angles and crannies for the rope to catch in, and a rope thus caught may hold back a climber in the midst of some critical step, and be cause of annoyance, if not of danger. As a general rule it is enough, when one man only is moving at a time, that the man immediately above the actual climber should be firmly placed and should draw in the rope as the climber comes up; but with a party on a face or ridge of rotten rocks, where no one is really secure, the rope

had best be kept stretched throughout, so that all of them together are as one individual, and a shock at any point is sustained by all and distributed over the whole party. This is so much the more easily done and the more effective on rotten rocks because, in order that one should not cast down fragments on another, the ascent should not be made straight up, but diagonally. If the ascent has to be made straight up, the members of the party must keep as close together as possible, taking advantage of every piece of cover the hill-side affords, dodging from shelter to shelter as a dog in tropical countries rushes from shadow to shadow when the sun scorches. In ascending an *arête*, or ridge, of rotten rock, one side of it will generally be found more firm and secure than the other, facts that are known to guides in all fully-explored regions. The discovery of them has only to be made in the case of new ascents or by guideless climbers. Similarly, on faces of rock, some parts will be more rotten than others, and there will be safer and less safe lines of ascent which a knowing mountaineer will detect even from a distance. Naturally, ribs are to be chosen in preference to gullies. A face of rotten rock will vary in danger according to weather. It will be most dangerous after a long spell of fine weather; whilst if it be fairly white with recently fallen snow in firm condition, it may be absolutely safe. I once found the west face of the Zinal Rothhorn thus bound by hard frozen new snow, and was enabled to climb straight up it, a route no one has ever ventured to repeat.

Difficult Rocks—The dangers encountered on firm rock are of various kinds, but in the main they are to be met by the same precautions as those employed on rotten rock—the rope, foresight, care, and practice. Perhaps the greatest danger on difficult rocks is that they are liable to be attempted by inexperienced men. Competent climbing parties have seldom come to grief, even on the most difficult rocks. Accidents can generally be traced to the inexperienced member, or members, of a party. Experienced climbers, even when they are not, gymnastically speaking, good climbers, know what kind of work they can safely undertake, and confine their activities to that. Enjoyment ceases when a man ventures into positions where he is not master of his surroundings.

The difficulty of climbing firm rocks increases as the number of good handholds and footholds diminishes. Danger need by no means increase in the same proportion if proper care be taken, for this reason: when a single member of the party has reached a really firm position, he becomes a far more secure anchor than one man can ever be on ice or rotten snow. Rocks are very difficult indeed if good holding is not to be found at vertical intervals of about 10 feet. The risky spaces between can be robbed of their dangers by proper use of the rope. The proper way to use the rope depends upon the strength of the party, for difficulty in such places is inversely proportional to the skill of the climbers. One man may be able to traverse with ease a passage which another could not traverse at all. For safety's sake, even direct help may have to be given to weaker mortals. A strong and experienced leader is the first necessity. Nothing that comes in his way on the particular ascent

HOLDING HIM UP.

must be too hard for him, for if he falls the whole party will probably be dragged down, unless the second man is very firmly planted and very handy with the rope. General descriptions and theories, however, will not cover such cases.

A rope carelessly handled is dangerous on snow; it is much more dangerous on rock. For in falling from, or with, snow there is certain to be much friction; from rocks a man may easily fall through the air and attain a maximum

of acceleration in a given distance. Hence on rocks that are difficult to a given party of climbers, the only way to arrive at safety is for not more than half the party to be moving at one time, and for those who are stationary to draw in the rope as the others advance. When all are moving at once, the rope is liable to catch on knobs or in cracks of rock and thus to bring up one or another with a sharp jerk which may produce disastrous consequences. Guides and very good climbers are liable to become careless about the rope, for they judge others' safety by their own sense of security. If the rope is kept stretched no one can really begin to *fall*, except when traverses are being made, and I am now discussing direct ascents of rocks, not horizontal or diagonal traverses across them. All except absolutely first-class rock-climbers should make attention to the proper use of the rope a ceaseless care, both for themselves and their guides and companions. A party of first-class rock-climbers of experience know what they may venture to do, and are a law unto themselves.

One at a Time—Descending Rocks.

When a horizontal traverse has to be made across very difficult rocks, a dangerous situation may arise unless at both ends of the traverse there be really firm holding and plenty of it. Even then, the first and last men will have to rely upon themselves for salvation rather than on the rope. A middle man may be easily held up. Sometimes it is possible to climb to a point above the traverse and there fix a kind of extra pendulum rope, whereby perfect security may be attained; but the fixing of such ropes takes much time, and is not likely to be undertaken if possibly it can be avoided. Most climbers would rather take a risk than so much trouble. Fixed ropes are often used in places of extreme difficulty, especially in the descent,

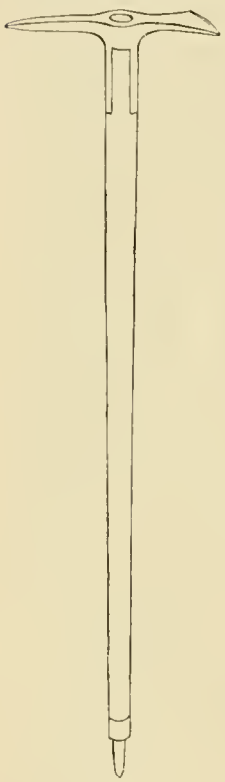
when they can be readily and quickly fastened and almost as easily detached by a clever jerk. To fix a rope to a point entirely out of reach, by casting, is not at all easy, and generally takes much time. Nails or pegs are sometimes carried to be driven into cracks, where holding is deficient and a slip would be destructive. Such elaborate developments belong rather to the art than the craft of climbing and need not be discussed here. Their use will be learned by experience, not from description. The climbing of mountains where ropes or chains are permanently fixed is no part of genuine mountaineering. Mutual assistance on difficult rocks takes all manner of forms. One man may climb on to another's shoulders, both leaning against some steep wall, and yet a third may use them as a ladder and so reach firm handhold and draw himself up. An axe may be reached forward to form footing, when nature has not provided any. Such manœuvres can only be learnt on the mountain side, not from books. The principle is that all the members of a party must co-operate, that none must consider himself solely, but each must climb with constant reference to his predecessor and follower. He must neither stop nor start without warning. The rope is more than a mere mechanical safeguard; it is a connecting bond that unites all the members of a climbing party into a single being, which acts, foresees, and moves as one man. To learn how to merge individuality into this larger unit is perhaps the chief element in the acquisition of the climbing craft. Walls and vaguely defined gullies provide on the whole the most difficult rock-climbing, but chimneys and ridges, or *arêtes*, are commoner, and, generally speaking, less difficult, because they have two sides and thus offer a constant alternative for a way. There is, however, no difference between the precautions to be taken in such places and those suited to rock walls. The greatest of all dangers on difficult rocks is a hasty scrambling sort of companion, a man who thrusts himself forward before he has made sure of his next step. Never quit a position till you know what your next position is to be. Make trial of handhold and foothold before transferring your weight to them, and then do so gradually, and, as far as possible, without jerks. It is seldom necessary, and never advisable, to jump. The best climbers advance with wonderfully little fuss or flurry, and worm themselves over difficulties. Steep rocks vary in condition with the weather in a most remarkable manner. After a long spell of fine weather, when the snow and ice that has collected in their nicks and crannies is all melted away and every ledge and crack is exposed, they are at their best and easiest. After a fresh fall of snow, the holdings are masked so that lengthy research is needed to find them. If this snow has been partially melted and frozen again, a quantity of thin ice will be formed which often constitutes a danger of the highest order or even renders progress impossible. Something

Cliff Scaling.

may be done with the axe to chip ledges in such ice or to clear it away, but the ice-varnish seldom

adheres strongly enough to the rock to make it safe footing, whilst a very thin veneer of what is called *verglas* cannot be obliterated by any process except nature's own melting. The one safeguard which has any value at all on iced rocks is the use of climbing-irons (*Steigeisen*, *Crampons*), which are fastened on the feet like skates; or their place may be to some extent supplied by long metal spikes, which can be screwed, when needed, into the soles of the boots. Good climbing-irons are not easy to get. They are commonly made in Tyrol only.

Ice-slopes and Step-cutting—Climbing-irons are one of the best means for avoiding many of the dangers of climbing on ice, the matter which next claims our attention. Few positions seem more dangerous on a mountain side, or are really more safe, than an ice-slope, unless it be extravagantly steep. Ice is a very firm and sound thing to stand upon, containing no hidden perils and hardly ever giving way without notice. The ice-axe is the weapon by means of which ice-slopes are ascended, and a knowledge of its uses is necessary for every accomplished mountaineer. The uses of this tool, as of all others, must be learnt and acquired. Some men cut steps more quickly, more neatly, and in positions less easy of access than others. A great deal has been written on "form" in step-cutting. Here let it suffice to say that the art must be learned by watching how an accomplished craftsman works, and by imitating him. The man who aspires to climb without guides needs to practice step-cutting; guideless climbing tests the capacity of a mountaineer better than anything else. Certainly, a man should be able to climb without professional assistance; but, in my opinion, if he wishes to be a really accomplished mountaineer, in the broadest sense, he will do well to indulge but moderately in this sport, for a climber who does his own guiding, step-cutting, and so forth, must have his attention entirely riveted on the work in hand. His powers of observation are thereby limited, and if he bear a heavy burden they are limited still more. To take full advantage of the opportunities of observation and enjoyment of all sorts which climbing affords, it is essential that the rough work of making the way be done by some one else. If the climber is also exploring, this is even more emphatically essential. But as accidents may always happen, and the amateur may at any moment be thrown on his own resources to bring his party out of peril, there is no doubt that he should learn the craft thoroughly in all its branches. The use of the axe is perhaps the most important branch of the craft. We are now discussing only step-cutting in ice; the security of a party on an ice-slope depends upon the way in which the steps are cut. If they are ragged, insecure, and outward sloping, they are a cause of danger. An ice-step must always be slippery; it generally therefore needs to be large. Here it is that spikes or climbing-irons are so helpful; they enable steps to be made smaller, less carefully, or, on gentle slopes, to be avoided altogether. Where to save time is to avoid danger from weather or falling things, climbing-irons are a great safeguard. The chief danger on an ice-slope is the danger of a slip. It is harder for the steady members of a party to hold up a falling companion when their own position is one of insecurity. Climbing-irons minimise the chance of a slip and multiply the chances of arresting it; they should therefore always be carried when ice-slopes are expected; the relative position of neighbouring steps is also an important matter; they should not be cut too far apart, for time is only thereby saved at the cost of safety. Let the step-cutter consider the next stride carefully before placing his blows. This is only one more instance of the constant foresight which mountain climbing calls for, and whereby it becomes so powerful an agency for character development in its votaries. Amongst difficult seracs an infinite variety of problems is raised by choice of a route. Once started in a certain direction, it often happens that one way only can be taken, so that an initial mistake may lead into insurmountable difficulties; nothing demands more experience than the selection of route through seracs. This art too can be learnt only by practice. Seracs present problems much more difficult than any ice-slope, for it frequently happens that quite vertical or even overhanging, though short, cliffs of ice *have* to be surmounted, and thus gymnastic accomplishments of the first order are required, especially for the step-cutting leader. It is seldom however that, under such circumstances, more than one of the party is in a position of peril, and the danger is generally minimised, or entirely removed, by the rope properly employed.



ICE-AXE.

Snow-slopes—The avoidance of falls from slopes of snow is usually a simple matter, but it cannot be very briefly treated, for the whole question of snow-craft is hereby raised. Snow

on high mountains exists in a multitude of different states and conditions; sometimes it is powdery like flour, sometimes granular like hail, sometimes firm and hard, almost like ice, sometimes slushy, rotten, and unsupporting; sometimes it binds easily and, when trodden down, produces firm footing, sometimes no amount of treading produces a firm foundation. Moreover what is under the surface-snow affects the quality of the footing. When snow rests on rocks it is usually rotten; when snow rests on other snow it is frequently good; when it rests on ice it may be, and generally is, very dangerous, unless steps be cut right through into the ice. Once you really know what is the condition of the snow and take the proper consequent precautions, you are probably safe; but to know this you need much experience, and the secret of divination is one that some men can never learn. The signs whereby experienced climbers judge of these matters are many and minute. They must be learnt on the hill-side. Old hands can often tell by merely looking, from a great distance it may be, at a snow-slope, what is its condition at the time. Sometimes the snow over a whole district is rotten at once, and a sample of it encountered anywhere shows what the rest is like. A young climber cannot do better than to pay continual attention to these matters. There are slopes which at one time consist of snow, at another of blue ice, at another of ice covered by snow. An ice-slope is easily recognisable from a great distance; an ice-slope covered with snow may be betrayed by the sliding off of a very small portion. Such indications may decide whether a certain ascent should or should not be forthwith attempted. Old descriptions of mountaineering often confuse hard snow with ice; there is really little similarity. Naked ice is a rare thing above the snow-line, and can only be formed under peculiar conditions. Most slopes and beds of any size are likely to be of snow. Snow cannot lie at a very high angle: few snow-slopes make with the horizon an angle of more than 40°, a steeper slope rapidly sheds the snow that falls upon it; snow in good condition cannot be newly fallen, it must have had time in which to settle down. Such snow may be treated in the most easy-going manner. It forms the natural highway of the mountains. Where it is steep, steps may be *sliced* in it with a single dragging blow of the axe swung pendulum-like in one hand; the foot, shod with climbing-irons, can take firm hold on it without any step at all. Firm, hard-surfaced snow of this kind seldom lasts after the morning sun has shone on it for an hour: the crust softens and in you go, probably into a rottener substance beneath. Still, however, you are safe. As the sun obtains more power the whole surface layer may change its consistency and become soft and rotten. Advance now becomes laborious, and danger may arise if the rotten mass lies on ice or at a steep angle: the danger is that it may begin to slide downhill, forming an avalanche. Snow avalanches seldom fall off slopes in the summer, except when the snow has recently been precipitated; it is almost always new snow that makes summer avalanches. This is one of several extra dangers that lurk in the hills just after a spell of bad weather; at such times incessant vigilance is required. That you may start an avalanche and go down with it is the greatest danger that snow provides, but it is not a danger that can be encountered unawares. It is easy to tell when the snow you are actually treading into is utterly rotten; inexperienced climbers are more likely to over-estimate than to under-estimate such a risk. The danger is greatest when such a slope has to be traversed and there is a cliff below it. Sometimes the impending fall is foretold by the formation of a crack right across the slope; it is best then to cross close to the crack and just below it. If

Traversing an Ice-slope.

the fall then occurs you will be at the top of the falling mass. Under such conditions it is advisable to dig steps in the slope as deep as possible, right into the hard and perhaps icy core—a very slow and laborious process. It is less dangerous to advance straight down rotten snow, because the slope is not then weakened right across. If an avalanche does start with a party, the rope may become more of a danger than a help. The thing to do is for each man to turn his face up the slope, and endeavour by a kind of swimming action to keep his head up out of the snow and to get to the back of the avalanche. As long as the thing is moving it remains soft, but the moment it comes to rest on leveller ground great pressure is set up, and the

STEP-CUTTING.

whole mass hardens, so that any person whose head is buried beneath the surface is almost certain to be suffocated; thus the vital matter is to keep the head above the snow. In descending snow-slopes in fair condition it is often easy to slide down, or "glissade." When the surface is fairly hard, the glissade may be made in a standing posture; but this, though not difficult, requires a little practice. Sitting glissades are less enjoyable, because the loose snow is likely to pervade the clothes, filling the pockets, and finding its way in at every opening; still the process is so time-saving that it is sure to be adopted whenever the opportunity occurs. The danger of glissading, for inexperienced persons, is that they may glissade in the wrong place. You cannot glissade down ice, for your feet slip away from under you, your axe-point ceases to act as a drag, and you become a mere falling body uncontrolled; thus, it is folly to begin glissading unless you are certain that there is no ice-glazing on the surface of the slope lower down, and it is wrong to glissade down snow that rests on ice: again, you must be in no doubt as to the nature of the slope below. If there may be cliffs or *bergschrunds*, hidden by some bulge or corner, no one should glissade who is not sure of being able to arrest his motion without fail. Finally, it is a mistake to glissade down very rotten snow, for you may start an avalanche and be carried down with it. Experience alone enables a climber to judge of such matters; the novice should always err on the safe side.

Crevasses.—We have thus very briefly completed the catalogue of the places a climber is likely to fall from and of the things that may tumble on to him. There remain to be considered the holes into, or the things through which a climber may tumble. These are practically summed up in the words "Crevasses" and "Cornices." Crevasses are of two kinds, open and concealed; they occur, of course, only in glaciers and their snow tributaries. Below the snow-line, that is to say below the level where on a given day the previous twelvemonth's snow-fall has just been melted away, crevasses are for the most part open and there is no mistake about them. If a man falls into an open crevasse it is his own fault, unless he is knocked into it by a falling mass or a blundering companion. Above the snow-line, where recent snow lies on the surface of a glacier or a snow-field, crevasses are frequently hidden—roofed over by the later accumulations of snow. Immediately after a heavy fall of snow has occurred it is sometimes impossible for the most observant eye to discover the faintest trace of a concealed crevasse. When a few days have passed there will probably be produced a slight dipping of the surface, or merely a barely perceptible change of colour or texture of the snow that roofs a crevasse over. Only the most experienced mountaineers perceive such slight indications with any kind of habitual certainty. Less skilful persons must probe with the axe to obtain the same information, though by keeping a sharp look-out to right and left and noticing carefully the form of the glacier surface—where it bulges or twists—many hints may be derived as to the nature of the ice under its snow-mantle at a particular spot. A master of snow-craft hardly ever falls into a hidden crevasse, or permits a member of the party he leads so to fall. It is remarkable with what security such a man can wander alone over snow-fields, but his example in this respect is not one that the amateur should follow. The great and sufficient safe-guard against concealed crevasses is the rope. If that is properly used, hidden crevasses

need have no terrors even for comparative novices. A party of ordinary persons on a snow-field should consist of at least three united by a proper rope. More skilful persons may, if they choose, go in a party of two, especially if they employ Mr. Mummery's double-rope precaution, which need not here be described. Assuming that there are three or more on the rope, they should not blunder along, as nine climbers out of ten are often wont to do, with the rope dragging on the snow, but each should gather up the slack of the line in front of him, so that in case of any one falling through, his fall may be arrested at once. If the rope is properly handled, no one need ever go more than waist-deep into a crevasse. The real trouble only begins when, owing to blundering, a man falls right through and hangs at the end of a longish piece of rope. The rope then cuts into the lip of the crevasse, and, when it is hauled in, the pendent person is not dragged out, but only against the side of the crevasse or, worse still, against the remainder of its overhanging roof. Men accompanied only by ignorant companions have hung in such a position for an hour or so and been nearly suffocated by the constriction of the rope. It is, of course, only the first or last member of a party that can come into such trouble; any middle member has a rope leading from him both fore and aft and is easily raised. The right thing to do if the end man falls deeply into a crevasse, is for his neighbour from whom he hangs to make himself perfectly firm with his axe well fixed and so forth. Then the next man unropes, or, if there are more than three, *all* the other members of the party unrope, and the loose end of the rope, with a loop tied in it, is tossed over to the pendent man, who by help of it, and of the cord round his own waist, climbs out himself rather than is hauled out by the others. The details of the process depend on the nature of the edge of the particular crevasse. If an extra rope is in the pack, the unroping is, of course, avoided. In the case of a party consisting only of two, and having no more rope than a single line to unite them, such a situation would be sensational in the highest degree.

The upper edge of a snow-field resting against rocks is generally quite thin. Its weight, therefore, being inconsiderable, and the friction of its bed great, it has no tendency to move and flow down after the manner of viscous matter as do great accumulations of snow and ice. A little way from the rocks, however, the snow will be deeper, and the mass will begin to partake of the movement of the glacier. It follows that at some point, not far from the rocks, a crevasse must be formed, dividing the snow that adheres to the rocks from the snow that forms part of the glacier. Each winter this crevasse will be filled up, but it will be as constantly formed again. Such a crevasse is called a bergschrund. The top edge of every normal glacier, where it abuts against rocks, is outlined by a bergschrund. As the summer season advances bergschrunds grow wider and wider. Early in the year they may be entirely bridged over, but any climber who knows his business can tell where one is certain to be situated, however deeply it may be buried. As melting proceeds, the roof opens, and skill is required to

GLISSADING.

discover the best point of passage. The strongest bridges, as stated before, are liable to be in the track of falling stones. Very large bergschrunds are wont to present problems of great complexity for a climber, and some, ultimately passed, have taken hours to get over, when the ice-wall on the far side has had to be climbed. Danger in all such places is avoided, by care, experience, and a rope properly used to suit the peculiar circumstances of the case. In the lower parts of glaciers, where there is no snow-covering and all the crevasses are open, there is sometimes

found an ice-bridge formed across a wide crevasse by some of the countless freaks that ice plays. The strength of such a bridge is difficult to estimate. I have seen one in the Himalayas, which my whole caravan of fifty men walked over unroped, yet it broke up by its own weight and fell crashing into the bowels of the glacier a few moments later and just when I was about to set foot on it myself. In a general way, it is well to give a wide berth to exceptional phenomena of this kind. The lip of an open crevasse rarely behaves in the same fashion, but cases have occurred of narrow escapes and even of fatal accidents from this cause.

Cornices—The only way to escape the danger of falling through a cornice formed on the crest of an *arête* is never to go on one. If a man knowingly walks on the top of a cornice and it lets him fall, the cause is his own folly. The trouble, however, generally is that people walk on to a cornice unwittingly. This means bad leadership. Any snow *arête* may be corniced; most narrow *arêtes* are. It follows that the condition of things must be investigated and the facts made certain in advance. Much may be inferred from small indications, or the whole problem may be solved by a distant view of the peak a day or two before the climb, for cornices are visible from a great distance under suitable illumination. If, however, the party arrives on the ridge in ignorance of the state of affairs, it is essential to make a careful investigation before proceeding. Fatal results from the breaking of a cornice under a party have been avoided by one of the number leaping over to the other side of the ridge and holding on, but such *tours de force* are likely to be rare. As a rule, when a cornice breaks, a party on it will be destroyed.

A Bergschrund.

A rarer danger is that of falling into tunnels of ice or snow. Such tunnels seldom exist after the early part of the season, for they are formed by streams flowing down gullies and under beds of avalanche snow or at the foot of some small glacier. It is not till their roofs fall in that their nature becomes apparent When the roof is becoming thin is the perilous time, for the tunnel is then at its biggest, and the torrent within is most swollen. The upper part of the gully will probably be filled with a strong, deep bed of snow, very inviting for a glissade. The place being low down on the mountain, the rope will have been laid aside, and the members of the party may be widely scattered. One will start glissading; before he realises his situation, he is shooting over the thin crown of the tunnel, which gives way and lets him through. He is stunned by a fall of perhaps twenty feet or more and then carried away by the torrent. Such are exceptional dangers which have to be specially guarded against.

Weather—We have now to consider the large group of dangers that result from bad weather in a high mountain region. Incidentally, we have already referred to some which need not be repeated in this place. Actual storms seldom destroy mountaineers directly, at all events in the Alps in summer, for though cold may be fairly intense, the persons subjected to it are likely to be strong men, well fed, and in good training. Doubtless there have been instances of climbers blown from a narrow *arête*, but such misfortunes are likely to be rare. Instances are on record of climbers being struck by lightning. It is remarkable that this does not happen oftener. The shock is not likely to be fatal at high altitudes, for it is seldom so intense as at low levels. Electrical discharges on rock mountains usually take place at a great number of points in rather rapid succession, and are individually small. Still, they are enough to stun a man. Accidents may have happened from falls from difficult rocks, caused by lightning stroke. The great danger from bad weather arises from the rapid change produced in the condition of a mountain, and from the difficulty which may arise of finding the way in fogs, clouds, and snow. Parties overwhelmed by storms have on many recorded occasions become so demoralised that they have simply taken themselves into destruction. The great thing to do is to remain

clear-headed, to keep moving, and not to lose pluck. There is nothing so demoralising as to sit still in a raging gale. Cold then becomes an increasingly potent enemy; the vitality is sapped, the power of initiative is diminished, foolish counsels attain the ascendant, and all manner of misfortunes are likely to ensue. Next to standing still, the most ill-advised line of action is one of frantic haste in difficult places. Never is patience more essential than when the elements are furiously raging. Never is caution more continuously called for. After a few hours of furious storm, some member of the party will probably beg to be left where he is, to sleep and die. There must be no paltering or yielding. The man must be forced to go on. Corporal punishment may be necessary. Lives have often been saved by its prompt administration. It is on such occasions that a strong leader, physically as well as morally strong, becomes invaluable. He keeps his party steadily, however slowly, advancing. His will supplies the lack of will in others. The lower you can come before black night descends, the better the chance of salvation. If you are ultimately forced by pitch darkness to stay where you have arrived, activity must still be maintained, and every step taken to keep up the *morale* of every member of the party. They must dance if there is a ledge to dance on. They must thump one another the long night through. They must eat whether they like it or not. In general, the opinion, not of the majority, but of the strongest, must prevail. Few well-led parties have ever come to grief through the rage of the elements. Half the accidents that have occurred to parties overtaken by storms have resulted from the climbers being insufficiently clothed. One hears of people being frozen to death, and then it transpires that they wore no flannel clothing and perhaps even no woollen socks. Such lack of foresight is almost criminal. However finely a day may open, it may close in storm, and for such an event preparation must be made. Warm clothing is essential for all climbers. To this matter we shall presently return. Another cause of misfortune is insufficient strength and condition in particular climbers. They come out, perhaps, enfeebled from home, overworked, it may be; they begin with climbs of too severe a nature for their powers; storm overtakes them, and their forces fail. Such mistakes should not be made. A strong and well-nourished party can weather almost any Alpine storm in the summer months if they are properly led. When all the surroundings are blotted out in fog and swirling snow, a larger gift of intelligence is called for in the guide than mere instinct can supply. It is extraordinary how soon the normal aspect of surroundings changes under such conditions. It is scarcely possible to recognise well-known ground thus masked. Moreover, the tendency of men to walk crookedly on featureless expanses of snow when fog envelops them, seldom fails to lead a party off the right track unless precautions are taken. The moment it becomes evident that a storm is brewing, the question whether an ascent should be continued or retreat sounded should be discussed. The fools of the party are always for going on. Those who are wiser base their decision on a consideration of all the circumstances of the case—the nature of the mountain, the character of the ground that has to be traversed in the descent, and so forth. A careful examination of the route to be followed should be made while there is yet time, points of turning noted, compass bearings taken, the position (in some circumstances) marked on the map, and so forth. Even if a halt has to be called to this end, it should be done; time thus spent is well invested. On rocks, it is generally as easy to find the way (unless it is a wholly new way) in fog as in clear weather, but on wide snow-fields this is far from the case. On these an intelligent man with a compass and a good map, if he knows exactly where he is on the map, to start with, can find his way as certainly and almost as easily in fog as in fine weather. I have myself guided a party in dense fogs day after day up mountains and across snow-passes, which none of us had ever seen before, by help of map and compass alone. The business requires a little judgment and intelligence, but it is beyond the powers of any professional guide I have ever known. For example, no decently led party should ever be lost through fog on the upper part of Mont Blanc; yet numerous fatal accidents have occurred there from this cause, owing to inefficient guiding. Probably the worst trouble to be faced in fog is a descent through a complicated maze of crevasses or an ice-fall. If the place can be seen before the fog comes on, the route to be followed should be discovered, and a good guide should be able to carry it in his head. That is the kind of special intelligence which a guide may be expected to possess. Of course if the ice-fall is round a corner, out of sight, till the fog has enveloped it, there is nothing but luck to depend upon.

Alpine Climbing for Beginners—We have thus very briefly and necessarily incompletely discussed the dangers which the climbing craft has been developed to avoid or overcome. In describing them, the nature of the craft itself has been described. The next point to be considered is the method whereby a beginner may best set to work to learn this craft. In an article like the present, written mainly for Englishmen, it is of course Alpine climbing that is chiefly kept in view, for the Alps are the natural playground of the English mountaineer. They are, at all events, the best place for a learner to gain

experience of the world of snow and ice. In Great Britain there are plenty of opportunities for a rock-climber to practice his skill. A handy guide-book, on *Climbing in the British Isles*, exists to point out the best scrambles and how to find them. But it is in the Alps that the arrangements for climbing are most complete, and for them there exist a series of "Climbers' Guides" (mostly written by Mr. Coolidge) which the intending mountaineer should not fail to study. The first point to impress upon a young would-be climber is to be content to learn the craft gradually and well. There are many accomplished guides who will undertake to drag the veriest novice up the hardest peaks. The temptation for a youngster to be able to say "I have climbed the Meije, the Grepon, the Dent du Géant, the Matterhorn," and so on, is a great temptation, but to begin by being hauled up such peaks is not the way to learn mountaineering. To become an accomplished rock-climber is chiefly a matter of gymnastics, and does not require much intellectual endowment. To discover by inspection the way to attack a new rock peak is another matter. It is merely the actual scrambling up rocks behind a good leader that I refer to with depreciation. Snow-craft is the thing that takes most learning, and it is with snow mountains, and still more with snow-passes, that a beginner should begin. Passes are, on the whole, more illuminating expeditions than peak ascents, for a pass shows you both sides of a range, thus explaining better the anatomy of the mountains; it also takes you up one glacier and down another, and so provides a more extensive acquaintance with glacier phenomena than you gain from most peak ascents, which are frequently made by ridges without touching glaciers at all. Begin, therefore, with such peaks as the Breithorn, the Jungfrau, Monte Rosa, and Mont Blanc, with passes like the Col du Géant, the Strahleck, the Lysjoch, the Adler, and the Trift. Leave the regular rock mountains for a second or third season. More important than anything else for a beginner is the choice of a guide. Most men make a sort of episodical commencement, picking up a casual guide (of whom they know nothing and who is very likely a fool) and attacking some peak that happens to attract their fancy. To such parties accidents often happen on the simplest peaks. The right way to start is to apply for advice to some experienced climber, and to hire for three weeks or a month the guide he recommends, a method which in the long run saves money. A second guide or porter can always be picked up from day to day as he is needed. A time contract with a good guide usually sets forth that he is to be paid so many francs daily for "off" days, so many francs for crossing a pass, so many for a peak. If you do a peak and two passes in a day you only pay for a peak. A very fair guide may be had for eight, twenty-five, and forty francs for these respective services, but higher prices will generally have to be paid. Of course the very difficult peaks are generally excluded from such an agreement, and the tariff has to be paid for them, only a few guides being competent for such climbs, and having almost a monopoly. When our tyro has secured a good leading guide (who, with a second guide or porter, is enough to conduct two amateurs) the next thing for him to do is to decide where he is going to climb. My advice to him is to avoid all the large climbing centres, such as Chamonix, Zermatt, Grindelwald, and Pontresina; that is to say, to avoid making them, or indeed any place, his head-quarters. The best way to learn the mountains is to journey through long stretches of them—to travel, in fact, not to be an excursionist. Take a long piece of mountain range, cross pass after pass, and climb peak after peak, up one side, down the other, changing your sleeping place from day to day. You will thus learn more about mountains in two or three seasons than a centrist learns in a dozen; you will find out what is the geography of the country, and how the mountains are related to one another; you will be brought, in interesting fashion, in contact with the natives of the district; you will have to sleep in strange places; you will meet with varied adventures, and you will avoid the fatuous stupidity found in the large hotels. The man who once acquires a taste for mountain travel will never be likely to slide back into a *flâneur* about centres. Perhaps the best mountain journey for a young climber to begin upon is the high level route from Chamonix to Zermatt, which he may continue eastward by way of Saas, Simplon, Binn, and so forth, finally crossing the Oberland to Grindelwald on his homeward way. Tyrol lends itself to wandering in this fashion even better than Switzerland, for it is better provided with high level huts, many of which are practically inns, where food can be bought during the climbing season. Probably the best way to learn self-reliance upon rocks is to go chamois shooting for a season. For this sport, Tyrol again is superior to Switzerland. Variety is what the young climber should seek after, rather than difficulty, and general rather than special experience. Let him constantly refer to the map and study details of the way upon it. He will thus become able to sketch out future climbs, and invent ways for himself through country new to him. When on any commanding point of view, let him study the panorama with the map before him, learning to identify the peaks in sight, and to know them as solid bodies in such fashion that when he sees them again from another side he may still be able to recognise them. Such a faculty, when highly trained, may often be of the greatest service, enabling a transient glimpse of some detail of ridge or glacier,

caught through a break in fog or clouds, to reveal the exact situation of a puzzled party.

When once a man has thus learnt the rudiments of the climbing craft by working behind a good guide, it will be well for him, in company with two or three companions not less experienced than himself, to begin to dispense with professional assistance. They should spend days on a glacier of moderate difficulty, cutting a way through broken ice and scrambling where fancy takes them, always, however, being careful not to attempt work that overtaxes their powers and not to hazard themselves in positions from which they are not certainly able to extricate themselves by retreat. Such a party will soon find themselves advanced enough to repeat some mountain ascent which they have already made with guides; then to attack some new mountain, and find out the way for themselves. Their further development from this point is a matter about which little advice is needed. Each man will follow his own bent, some taking more and more to rocks of increasing difficulty, others preferring to gain a wider experience and a better knowledge of some great mountain range for the pleasure of knowing it. Once the craft has been learnt, the pursuit of it to its most intricate developments becomes a sport—one of the most attractive sports in the world, as its votaries recognise. Certain climbs may be likened to most intricate problems, which it takes the entire capacity of an able man to solve, problems soluble only by skill, courage, endurance, strength, and a very high order of intelligence. It is in the exercise of all these qualities at once that the delight of the most difficult climbing consists.

Equipment—On the best equipment for mountaineering much has been written. The reader may be referred to a sixpenny pamphlet, published by the Alpine Club, which conveys a great deal of information on the matter. Few things are absolutely necessary. Warm underclothes, thick coat and knickerbockers, thick stockings, gaiters, or, much better, putties of the kind worn in India, and very strong boots are essentials. I have never seen a good pair of climbing boots made in England. Good boots are made by the village cobblers in Switzerland and by certain foreign bootmakers recommended by the foreign Alpine clubs. Few English bootmakers know how a climbing boot should be nailed; indeed it is difficult to procure in England nails proper for the purpose. There should be a row of flange-headed nails round the edge of the sole. The heel should likewise be outlined with big nails. All nails should be of iron, not of steel, and should be renewed as they wear down. It is well to carry an extra wrap and something wherewith to envelop the neck and ears in case of violent storm. For this purpose nothing is better than a long narrow strip of woollen material worn as a turban, which can be wound about the head in a variety of ways. On approaching inhabited places, it can be stowed away in any sack. Warm gloves should never be forgotten. For carrying purposes nothing is better than a bag of the kind called *Rücksack*. The best are made of Willesden canvas, and can be bought at the best London shops for travellers, such as Silver's. The chief climbing weapons are the ice-axe and rope. The best and cheapest axes are made in the Alps. Climbers often make a great fuss about the form of their axe; for a beginner, almost any shape is good enough. Balance is the principal matter, but it is not important. Every experienced climber has his own fads about axes. There is only one kind of rope worth getting: Buckingham's Alpine Club rope. Thinner cords may only be used by men who know exactly what they are doing. Climbing-irons are not made in England. They can be bought in

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Austria, and will be found advertised in the publications of the German and Austrian Alpine Club. It is necessary for them to fit accurately the sole of the owner's boot. The Mummery nails, by which some supply the place of climbing-irons, must be specially ordered and made. Articles that form part of the general equipment of a climbing party are numerous. A prismatic compass and a field glass should by no means be omitted. The best existing map of the district should always be at hand. It is pleasant if some one has a small hand camera. I have used the "Luzo" camera for many years. A larger one cannot be taken with profit. Roller-film cameras are best suited for mountaineering, notwithstanding their many disadvantages.

One of the great annoyances to climbers is sunburn. It affects a man most painfully when he first arrives amongst the snows, and especially if, on his first climb of the year, he has to spend the long hours of a sunny day on a big snow-field. Sunburn from light reflected from freshly fallen snow is particularly virulent. In any case

a climber expects at the beginning of each season to have all the skin burnt off his face. The first day it is inflamed and blistered, the next day it is tender and cracks, later it comes peeling off. The worst features of the process can be eliminated by suitable basting with grease, which should be freely applied before, during, and after the burning process. Toilet lanoline is the best grease for the purpose. Other medicines for climbers need not be specified. Every one has his own fads. The best form in which to carry physic is that of concentrated tabloids—a form, by the by, in which photographic developers may be obtained. The best cure for blistering feet is to soap the stockings plentifully, to make them quite stiff with soap at the normal points of friction. The process need not be repeated after a few days.

Alpine Clubs—In connection with mountaineering, a few words must be said about Alpine Clubs. *The* Alpine Club is the oldest. It was founded in London in 1857–8, before the great development of mountaineering as a sport was foreseen. It has had a career of continually increasing influence and prosperity. Its organ is the well-known *Alpine Journal*. All the members either are, or have been, active mountaineers, and no one can be a candidate for election who has not accomplished a number of regular mountain ascents in a series of years. The foreign Alpine clubs, whereof there is one in almost every civilised country, are not societies of climbers, but of persons who profess an interest in mountains. The membership even of the small foreign clubs is larger than that of the Alpine Club. The largest foreign club is the German and Austrian. The Swiss and the Italian Alpine Clubs are likewise very important bodies. The French Alpine Club has also a large number of members. These bodies concern themselves with developing and opening up the mountains in the particular parts of the Alps which fall into the domain of each. They control large sums of money, and they have been the means of publishing a great mass of Alpine literature. Each of the foreign clubs is split up into local sections, centred in particular towns, such as the Berlin section, the Milan section, and so on. The sections raise money to build mountain huts, to make footpaths in remote places, and to facilitate in other ways the access to the hills. The Central Committee assists the sections with grants of money for such purposes; it watches over the welfare of the whole society, publishes the chief annual volume of records, and sometimes promotes scientific observations of mountain phenomena. Members of these clubs have certain advantages in the districts they control and the huts they have built, so that it is an advantage to an English climber to become a member of one or two of them, especially of the German and Italian clubs. There is no difficulty about being elected.

Mountain Exploration—Thus far we have discussed mountaineering purely from a European point of view and as a holiday sport; but, as has been stated in the historical portion of this article, the craft has taken a much wider range, and become an important agent in geographical exploration. Mountain travel is still in its infancy. More will be heard of it in years to come as other areas of the unknown are traversed and surveyed. The object of the mountain explorer and of the ordinary mountaineer being far from the same, their methods correspondingly differ, though the essential craft does not vary. Rope and axe are used in one part of the world as in another where steep places have to be surmounted and glaciers traversed; but the whole organisation of a party of explorers differs and must differ from that of a party of holiday makers in proportion as their ends differ. The object of a journey of mountain exploration is not merely to make the ascent of so many peaks unclimbed before, still less is it to accomplish ascents of unusual difficulty for the sake of the achievement. That is all part of the sport of climbing, and finds its sole *raison d'être* in a region already well explored. Where the majority of the peaks of a range have been ascended, it becomes a legitimate aspiration to attain the summits of such other peaks as, by their difficulty or remoteness, have defied assault; but where all the peaks of a range are alike unclimbed and unknown, one ascent is as good as another, one summit is, as far as mere scrambling is concerned, as well worth reaching as another. The business of the mountain explorer is to bring back an account of the region he visits, as a whole. We look to him to tell us what is the character of the range, what the general type of the mountain, how the ridges run, what are the directions of the main valleys, where lie the chief elevations and depressions, what is the character of the snow covering, the nature of the glaciers, their elevation, their size, their pace of movement; whether they are in advance or in retreat, whether there are evidences of some former great extension of the glacial area: these and the like questions cannot be answered by the mere scrambler. The maximum of scrambling in a given season is accomplished by a party with a well-furnished central base from which they start for each expedition and to which they return. Exploration is not fruitful on such lines. Explorers must cover as much ground as possible, see things from many points of view, look at a range as a whole, and, if possible, observe its relation to other ranges. But to cover a large area of ground in a remote and probably little inhabited mountain region involves a great deal of organisation and foresight. You cannot blunder straight ahead and

trust to luck. Everything must be planned, difficulties must be foreseen and provided against. A week's bad weather will involve the utter break-down of a happy-go-lucky expedition. Bad weather prevails in all mountain regions; to be able to hold out against it is one of the conditions of mountain exploration. In all the great ranges out of Europe, long distances intervene between the icy fastnesses of the hills and inhabited places. It follows that provisions have to be carried, sometimes sufficient to sustain the party for weeks. Horses or mules may sometimes be used for this purpose. In Tibet, sheep serve as bearers. Generally speaking, porters must be employed. Whatever the burden-bearer, he requires to be considered, fed, and kept happy and willing to work. Where coolies only can be used for transport, the problem is complicated. Coolies may start with loads of 80 lbs., but they cannot carry them far, or over very difficult ground. Normal consumption, however, quickly diminishes the weight of the average load and readjustments can be made. It is necessary to reckon $2\frac{1}{2}$ lbs. as about the weight of a day's ration for one man. A coolie can thus start with about one month's food for himself on his own back. Half the caravan can thus carry a fortnight's food for the whole caravan. If walking mutton can be procured, the proportion may be changed. Supposing the explorers to be three in number, their food and equipment will amount to about ten loads. The problem is to carry these ten loads through the mountain region to be explored. The walking mutton, for the purposes of argument, may be set off roughly against these ten loads, and the problem comes to this—how long can a caravan exist on food carried by itself? Half the caravan will carry food for the whole for a fortnight. If at the end of a fortnight half the men can be sent back, the remainder may, as it were, make a new start, fully equipped, from the point reached in that time. The same would be true of a second fortnight, and of a third, and so on if food for the return journey of the dismissed men had not to be considered. Unloaded, and on their way home, they will cover daily three of the laden marches at least, and the problem may be further lightened by making *caches* of provisions at various stages of the upward way. With about 100 porters, as much as five or even six weeks may thus be spent between one base and another by a well-organised party. If the return journey has to be made by the same route as the upward journey, a new set of conditions obtain. Then it is well to take as large a caravan as possible about half way, or for a fortnight. At this point a heavy camp is formed, and from it half the men are sent back, with orders to collect more supplies and return. The remainder may stay above this point for so long a time as their provisions hold out. Let them all now push on a few marches further, where superfluous followers can again be got rid of. From this point the explorers go ahead with a very few men, leaving behind a responsible head man to see that orders are carried out. The latter arranges the men under him as a post, and sends them up by twos, lightly laden, to keep the highest camp supplied from day to day with necessaries. Other posts are established higher up to hand on what these men bring. Thus, supplies may be carried over three or four marches in a single day, if the coolies are the kind of people capable of such co-operation and obedience. I found that, with Gurkhas to look after them, Balti coolies could be thus organised, but the process is one not likely to be of very general application.

This disquisition on organisation has been introduced to suggest the problems that a mountain explorer may have to face, rather than as offering any solution of universal applicability. Each region of the earth has its own difficulties, which must be met by ingenuity and resource when they arise. Though it is always easier to go into and return from a group of high mountains by the same route, seeing that half the way is then known and may be victualled on the upward journey, this is always the least interesting and illuminating method that can be adopted, besides depriving travellers of the stimulating excitement provided by the unknown ever before them. Passes are always to be preferred by explorers to ascents. A peak may be climbed, and, if possible, should be climbed from a pass; but the ascent of no peak, with return by the same route, can be compared for geographical value to the passage of a range of mountains, up one side, down the other. Now ordinary mountaineers care less for passes than peaks—to that extent the traditions of the Alps are injurious to mountain-exploration. The peak a mountain-explorer should select for ascent should, if possible, stand either on the watershed of a range or well away from it. In the former case, it will permit a view over both sides of the range; in the latter, it will command a panorama of the range itself. The peak chosen should be the easiest that fulfils the conditions, for time will thus be saved. There is, in fact, nothing in which a good explorer shows his superiority over a bad one more than in the selection of points of view. Well chosen view-points reveal so much that is hidden from other more exalted or physically attractive positions. The side of one hill may tell you more than can be learnt from the top of another. The only certain guide to the formation of a judgment as to whither to ascend is a survey in process of being carried out. Unless the leader of an expedition is also surveyor, unless he is from day to day engaged in recording the progress of his exploration upon a map, he will not know what are the gaps in his knowledge which it is most

Hidden Crevasses.

essential he should attempt to fill. Photography is doubtless a great help to exploration, but, in mountain travel, at any rate, exposed negatives cannot be developed from day to day, still less can prints of them be carried for reference. It is only a plane-table sketch survey, kept constantly up to date, that clearly shows the bounds between the known, the suspected, and the unknown. Every mountain traveller therefore should acquire the simple art of plane-table surveying before launching forth into regions previously unvisited and unmapped. In addition to the needful survey apparatus, a mountain explorer must carry an instrument for the measurement of altitudes. Aneroid barometers are, as Mr. Whymper has shown, valueless for this purpose. They lie beyond cure. A boiling-point thermometer is more reliable, but still not trustworthy. The only instrument that can be recommended is the mercurial barometer. A form of mercurial barometer called the Boylean-Mariotti has given good results, and is fairly portable. Still more portable is the barometer devised by Prof. Norman Collie, in which all of the glass tube except the two ends is replaced by a tube of india rubber. Suitable thermometers are a further necessity of the scientific equipment, besides such light collecting apparatus as may be needed to contain plants, insects, and the like. The general equipment of an exploring party is, of course, very different from that needed in ordinary mountain climbing. There exists nowhere in the world any mercantile firm that can be trusted to supply the needful apparatus, the whole of which must be light in structure and light in packing. Travellers' shops will sell very light cooking stoves, and then pack them so that the weight of the packing does away with the advertised lightness. The intending traveller will have to wage a continual combat with all the people who want to sell equipment to him. Let him see that his tent is the smallest and lightest possible. A tent for actual use on high mountains should not weigh more than 3 or 4 lbs. The cords to hold it should be no heavier than can be avoided. Ice-axes will serve for tent-poles. A very light rubber sheet, in which sleeping-bags can be wrapped on the march, should form the ground sheet. Sleeping-bags should be of best eider-down, 1 kilo. of down to a bag. If high altitudes are to be gained, clothes should be of the warmest, alike for hot or cold countries. Photographic materials should be so packed that they can be taken out of their packing and transferred to the camera in the cramped area of a tiny tent and by fingers blue with cold. They should be easy to repack in the papers and boxes

they came in, and they should be finally enclosed and kept in air-tight, self-opening tins, that require no cutting open and no soldering up. Every opportunity should be taken (they will be few enough) to develop specimen negatives for information as to the condition of the cameras, the quality of the light and its actinic power at high altitudes, and so forth. For this purpose, it is well to make two duplicate exposures at the beginning of every spool of film, so that the first may be developed and thrown away if it cannot be fixed and dried. Glass plates or cut films are pleasanter things to handle than spools of film, but the weight and cumbersomeness of double-backs (when as many as thirty exposures may be needed in a day) render them unsuitable for mountain-explorers.

Now that so many mountaineers are capable of climbing without professional assistance, it might seem that an Alpine guide need not be taken to other parts of the world by an exploring party. Nothing, however, is more certain to my mind than that, if the leader of a party of explorers has to do the guiding, to cut all the steps and concentrate his attention on the details of the way, he will bring back very insignificant results and insufficient observations. It is essential that the man who is *par excellence* the geographical explorer of the party should be in command of the party, and should be its official leader. Such an officer must have his mind and attention free for general observations. Some one else must be looking after details, and must undertake the labour of actually hewing out the way. The observer must not be burdened with a load to carry, or steps to cut. It follows that the guide must be a different man. He may be a skilful amateur or he may be a paid Alpine expert. If the skilled amateur can be found, by all means let him be preferred. Such professionals as Mathias Zurbriggen (my guide in the Himalayas, Fitzgerald's guide in New Zealand and the Andes) will always be exceptional. Alpine guides are seldom good travellers. They become home-sick; they cry aloud for red wine and Swiss cheese; they hanker after the guide's room and the luxuries of big Alpine centres. Mountaineering centrism and the high tariffs of fashionable peaks have spoiled them. They are not likely to be rehabilitated in the esteem of travellers. A skilful amateur is in all respects superior to them. He is more willing to launch forth into the utterly unknown; he understands better the interest and relative importance of the work in hand. He will not be always bringing Swiss standards to bear on, for instance, Asiatic peaks. A party for mountain exploration would be ideally constituted if it consisted of a leader, who should be the surveyor, geographer, photographer, and general organiser; an amateur guide, who might also be a geologist; and a third man, who should be a naturalist and collector. Such a party, with the needful local following, may go anywhere.

Highest altitudes—One of the matters which is sure to attract continually increasing interest in the future, is the question of the greatest altitude attainable by climbing man. The highest measured mountain in the world is 29,000 feet in altitude. The record of high altitudes thus far reached is unfortunately very unsatisfactory. Mr. Johnson, a surveyor in the employment of the Indian Government, is stated to have ascended to a point over 23,000 feet in height, but the record is not accepted by the officials of the survey, and is believed to be inaccurate. The brothers Schlagintweit, in their expedition of 1855–56, climbed to an altitude of 22,240 feet on the slopes of Ibi Gamin (25,500 feet) in Gurhwal. In 1883 Mr. W. W. Graham made ascents in the Himalayas, and believed that he reached one of the summits of Kabru (24,015), estimated at almost 24,000 feet, but it was the opinion of the Indian survey officers on the spot that the peak climbed was not Kabru, but a lower mountain. In 1892 the present writer and the Hon. C. G. Bruce, with the guide Zurbriggen and two Gurkhas, reached the summit of Pioneer Peak, a point trigonometrically measured as 23,000 feet, barometrically as 22,600 feet. This year members of Mr. Fitzgerald's party, including the same guide, Zurbriggen, have climbed Aconcagua, in the southern Andes. At the time of writing, they are engaged in measuring the height of the mountain, which they believe to be 24,000 feet. Several other climbers have reached altitudes of over 20,000 feet. Every one of them, with the sole exceptions of Messrs. Johnson and Graham (whose altitudes are disputed), have experienced at heights of over 18,000 feet exactly the same discomforts and impediments owing to the rarity of the air, and the consequent imperfect oxidisation of the blood. Such symptoms often make their appearance at much lower levels, but it seems probable that healthy persons in good training can overcome them by habituation up to a certain level. Obviously, there must be some level where they are not to be overcome but must be endured; this seems to be about 18,000 feet. The longer a man lives above that altitude, and the higher he goes, the more acute are his sufferings. There seems to be little difference between one man and another in this matter. On the same day, at the same point, all the members of a party generally begin to feel inconvenience together. The discomfort is greater in sunshine than in shade, in still air than in a breeze, on snow or ice than on rocks. Dryness appears to be a disadvantage. Damp air is less provocative of mountain-sickness than dry air, but the air at high levels is always relatively dry. When the sickness takes an acute form, vomiting may result; but this is generally to be traced to

food unsuitable to the deranged condition of the body. The normal sensation is one of general debility and *malaise*. To do anything requires an effort. Any movement that in the smallest degree constricts the lungs is provocative of a paroxysm of heavy breathing. To hold the breath for a moment, or even to interfere with the absolute regularity of breathing, is most painful. It is obvious that, under such conditions, climbing is not at all the same thing as at lower levels. My own experience led me to believe that we might have reached an altitude of 24,000 feet if our mountain had been so high. We spent two nights at 20,000 feet, and I think we might have slept 1,000 feet higher without much additional suffering, but I doubt whether men could be found to carry even the lightest camp to more than 21,000 feet, where, by the bye, the cold at night is intense, and the need imperative of protection and warmth for bodies in which the blood is feebly circulating. The future will show whether any precautions can be taken, or appliances devised, by which these difficulties, discomforts, and dangers can be diminished. Under present circumstances, I doubt whether a height of 25,000 feet will be authentically reached. I am convinced that peaks of more than 25,000 feet will not be climbed for many years to come.

W. Martin Conway.

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A. C. C.

CAVE EXPLORATION—As the *sport* of cave exploration and the descent of potholes is a comparatively new one, and as little is known about it in England outside those districts where it is practised, a few words on its evolution are necessary to the understanding of its methods.

Caves and potholes are most frequently met with in limestone regions, and are mainly formed by the dissolution of the lime in the stone by the carbonic acid in rain-water. This chiefly takes place in the line of fissures and divisions of the strata, thus forming in the former case, the shafts, and in the latter, the caves. The mechanical or erosive action of water also assists in the work.

In Yorkshire and Derbyshire in England, in Ireland, France—notably in the district called Les Causses—Austria, Asia Minor, Australia, America, and many other parts of the world, these caves and holes abound, and in some cases their depths exceed 600 feet, and caverns of immense size, containing stalactites and stalagmites of great beauty, are met with.

Some of these caves were made use of by prehistoric man and animals as habitations, and it was in the exploration of these for scientific and archæological purposes that the early systematic work was done—notably by Professor Boyd-Dawkins; but deeply interesting

as is the result of such work, yet, in an article treating of the exploration as a sport, this phase cannot be dealt with.

This early work ceased where the difficulty of access was great enough to preclude the possible, or at any rate probable, use of the cave by animals and prehistoric man, and therefore the scientist, arriving at this point, would finish his notes on the cave with the words "inaccessible beyond."

This point is now being pushed further, and it is with the sporting qualities and methods of such exploration that this article is concerned.

Cave work may be roughly divided into two kinds, that dealing with caves entered directly on an approximately horizontal plane, and that where entrance has to be effected by means of a "pothole," or "swallow hole," as the deep and more or less vertical clefts and shafts in the surface of the fell limestone are called.

The former is generally a much simpler and easier business than the latter. The course of a subterranean stream or river may possibly be encountered, and then the interest will be increased and the fun may begin, but at the same time the peculiar risks of this branch of the sport may appear in the form of a possible inrush of water from heavy rain outside. Such places should only be attempted during settled fine weather, thundery weather being especially dangerous, for the bursting of a storm on the hills and the rapid drainage of the water into its underground channels might quickly result in retreat being cut off. For this sort of work a party of three or four men is usually ample and convenient.

That branch of the sport which includes the descent of a shaft hundreds of feet in depth, is a more serious and more sporting class of work, and more likely to afford adventure to its votaries. It has been aptly termed "mountaineering reversed," and Alpine climbers are the most suitable men on account of their training and special qualifications. For this class of exploration a larger party is usually required, varying from five or six for a place which can be dealt with by rope-ladders to three or four times that number where the difficulties demand more elaborate methods, although in the former case special conditions may be met with, requiring more men.

The foregoing rough classification cannot be considered as final, although indicative of the main differences. Caves are of very varied structure, and a passage may lead to a deep descent and, after it, may continue again, while "potholes" often have passages leading from them which may be simple or consist of a combination of "pitches" and galleries. At any time the explorers may be confronted in the darkness by unexpected difficulties, and the understanding of these facts at the outset will explain the need for the extensive apparatus subsequently described.

By far the best and most enterprising work has been, and is being, carried out by the Société de Spéléologie of Paris, whose secretary, Mons. Martel, is probably the most enthusiastic exponent of the sport, and whose works on the subject should be read by all who seek for further information.

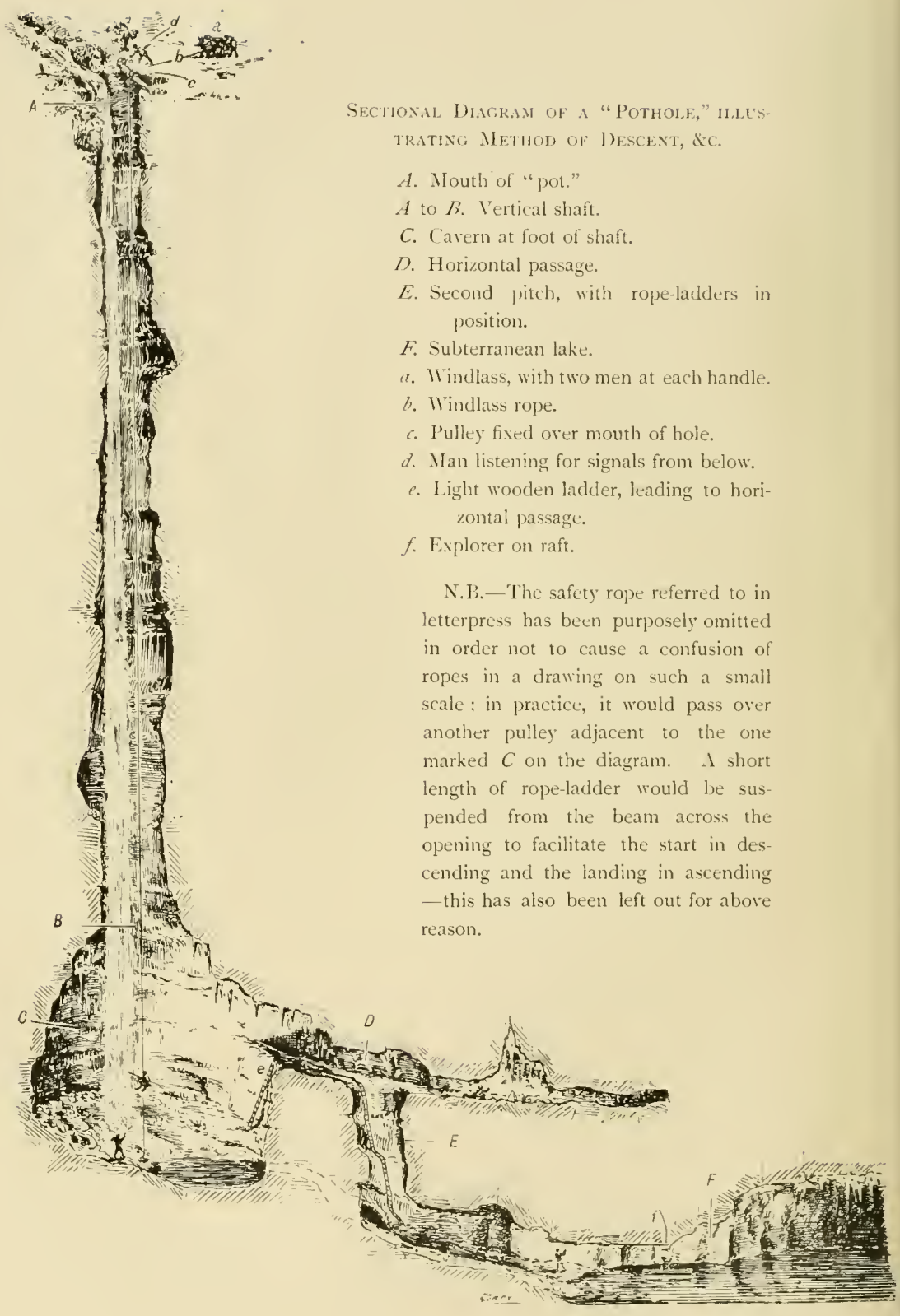
Tackle—It is imperative that all tackle should be of the best procurable quality and workmanship, as it may be subjected to great and unforeseen strains.

The **ropes** are the most valuable and important articles. They should be specially made by hand and of selected Manilla hemp. This is extremely strong for its weight, and stands any unavoidable rough usage and friction better than ordinary qualities. The rope afterwards referred to as the *windlass rope* should be not less than $\frac{5}{8}$-inch diameter, and the *safety rope* $\frac{1}{2}$-inch diameter, for, although this latter might be lighter without being too weak for its purpose, it must be remembered that a thin rope is bad to handle, and a man's hold on it is thereby weakened. For English work these ropes are most useful in 400 feet lengths. Shorter lengths would frequently necessitate joining, thus weakening the rope and adding an increased difficulty and possible danger by the liability of the knot to catch in clefts, with the probable result of dislodging loose fragments and of being difficult to free. *Strong sash cord* is useful for a variety of purposes, and in particular for lashings and guy ropes. Lengths of old rope may be cut up where short pieces are required.

Rope-ladders—The ladders used are made with sides of half-inch rope, and rope rungs of slightly smaller material spliced in. A wooden rung in every four or five may be added to keep the sides apart, but to have all the rungs of wood is too great an increase in weight and bulk to be recommended, though some explorers prefer them. The ladders are most useful in lengths of 40 or 50 feet, made to join either by spring hooks or by lashing. One of the ladders should have its top bar made of wrought-iron and provided with three rings or eyes, the use for which will be seen later.

The Windlass—This should have a drum with a circumference of not less than 3 feet and a length of 18 inches, so as to take the 400 feet of windlass rope without too many laps. It must be strong, and made in sections to bolt together for portability, as, with all the other apparatus, it will probably have to be conveyed over rough ground. It must be provided with two crank handles set at right angles to each other and securely fixed on the drum spindle to prevent their working off. A strong ratchet check should be affixed.

Sundries—*Snatch blocks and other kinds of pulleys, pitons or holdfasts, wooden stakes,*



SECTIONAL DIAGRAM OF A "POTHOLE," ILLUSTRATING METHOD OF DESCENT, &C.

A. Mouth of "pot."
A to *B*. Vertical shaft.
C. Cavern at foot of shaft.
D. Horizontal passage.
E. Second pitch, with rope-ladders in position.
F. Subterranean lake.
a. Windlass, with two men at each handle.
b. Windlass rope.
c. Pulley fixed over mouth of hole.
d. Man listening for signals from below.
e. Light wooden ladder, leading to horizontal passage.
f. Explorer on raft.

N.B.—The safety rope referred to in letterpress has been purposely omitted in order not to cause a confusion of ropes in a drawing on such a small scale ; in practice, it would pass over another pulley adjacent to the one marked *C* on the diagram. A short length of rope-ladder would be suspended from the beam across the opening to facilitate the start in descending and the landing in ascending —this has also been left out for above reason.

crowbars, *planks*, *strong carpentry tools*, &c., are also requisite.

The following *instruments* are necessary for surveying: *aneroid barometer*, *thermometer*, *prismatic compass*, *clinometer*, *surveying tape or chain*.

A *telephone* is probably the best means of communication between the explorer and those at the surface, especially when an exploration lasts any length of time. It enables the requirements and movements of the party to be *fully* and *rapidly* made known.

A simple but less perfect device is a strong string lowered with a note-book and pencil attached. If this be fastened to the lever of a loud bell or gong at the surface, a pull at the string from below will announce when a note has to be drawn up.

Lights—From a varied experience, the engineer's torch lamp, pint size, can be recommended as probably the best. It is made of double tin, in shape somewhat like a coffee-pot, with a fixed handle over the top and a copper spout for the wick. Fed with the best Gallipoli oil, this kind of lamp burns with a good clear light and gives off little smoke and no smell, both important points when space is confined. Each member of a party will also carry a reserve of two or three thick *tallow candles* in a tin case, and a supply of waterproof matches, rendered so by dipping in melted paraffin wax. *Magnesium ribbon and powder* are used for lighting up large places and for photography. *Naphtha flare lamps* may be useful, but are dangerous and unpleasant. At a depth of 200 to 350 feet down a shaft open to the sky, artificial light will not be needed, unless the orifice at the surface be very small.

We will now proceed to show the method of using the above apparatus by describing the descent of a pothole. Obviously, the first essential is to find the approximate depth. This may be done by plumbing with a thin strong line marked off in divisions of say 20 feet, and with a weight of 4 or 5 lbs. on the end. If a long line of any considerable thickness be used it will be difficult to tell when the weight touches the bottom, owing to the heaviness of cord. Let us assume that the depth is found to be about 300 feet and that, being a clear and vertical drop, it is decided to use a windlass and rope as the means of descent. The windlass should be fixed some 20 feet back from the mouth of the shaft, and on ground as level as possible, so that those working at it (two at each handle) may have freedom of action. It must be thoroughly guyed back, have heavy stones piled on its platform, and if possible, stakes driven into the ground directly in front of it. The windlass rope should pass over a pulley fixed in the best position well over the mouth of the pot, so that it may run clear of the sides.

Fixed to the end of the rope should be a "boatswain's chair" or other contrivance in which the explorer can sit. Around his body should be a leather belt with a spring hook to attach to the windlass rope near its junction with the chair. This will keep him in an upright position, allow the free use of both arms, and act as a safeguard against the possible chance of his slipping from his seat.

Another and very necessary rope, to be paid out by hand, should be tied around his body as a safety line. A stake should be driven into the ground within easy reach of the man or men paying it out, in order that they can, on occasion, stop and hold the rope by what is nautically called "taking a turn." The object of paying this out by hand is that there may be touch between those on the top and the man descending, as, if let out from a second windlass, the speed might differ from that of the main rope; if quicker it would hang loose and be useless, and if slower would cause unpleasant compression of the man's body. Before the first man is lowered, a length of sash cord sufficient to reach to the bottom should be tied to the seat and let down the shaft. Its uses are various. It serves to steady the seat, preventing much of the oscillation and jerking consequent upon the lowering of a weight on a long length of elastic rope. Again, when the seat is being drawn up empty, by preventing this spring it reduces the chance of the seat dislodging fragments of rock by knocking against the walls of the shaft, and also may be useful in drawing the seat clear of any projections on which it might catch.

As is generally known, there is a considerable amount of "spin" in a long rope, however well it may be made and stretched. The unpleasant consequences of this can be much lessened by the man who is being lowered carrying in his hands a bamboo or other light rod of a length suited to the diameter of the shaft. With this, a slight touch on the walls is sufficient to counteract the spinning tendency, and even if out of reach, by swinging it sharply round at arm's length in the opposite direction to the twist of the rope, the same effect can be obtained.

Signals—A *code of signals* for regulating the descent must be arranged. Possibly the best is one by whistle, the voice not being sufficiently articulate at great depths on account of echoes and reverberations.

One whistle should mean "Stop!" two, "Pull up," and three, "Lower." The whistle used ought to have a loud, shrill tone, but its use is not arbitrary, as the code will apply to any method of signalling.

As the first man descends he must keep a good look-out for, and clear away, any loose stones which are likely to fall or be dislodged by the ropes, and great care must be taken that all loose stones, &c., round the mouth of the hole on the

surface are cleared away, so that nothing may be accidentally knocked down while men are below. A tiny stone falling 300 feet would kill a man as surely as a bullet.

All the signals must be responded to with the utmost promptitude, especially when the bottom is being neared, or the man who is being lowered may get a nasty bump.

Another method of descent is by rope-ladders, This is suitable for places which descend in a series of drops or "pitches," where there are ledges of varying widths. With a total length of 150 feet of ladder much may be done.

Having plumbed a depth of, say, 100 feet from the surface, the ladder is tied to two ropes (or to both ends of one rope) of not less than ½-inch diameter, one at each end ring of its top bar. If possible, a plank should be fixed across the mouth of the shaft, over which the ropes attached to the ladder may hang, in order to avoid knocking down any loose earth or rock. The ropes carrying the ladder should be made fast to a couple of stakes driven into the ground a little distance from the lip of the "pot," and then, secured by a safety rope, paid out by hand over a pulley fixed into the plank, the exploring party will in turn descend. It may be found that the place the party have reached is not the bottom, and that the plumb-line is again required. Assuming that it reveals another considerable drop, the ladder will have to be lowered until its head is level with the ledge occupied by the party, and then either be made fast there or, preferably, above.

The raising and lowering of the ladder will be facilitated by a length of sash cord being tied to the middle ring of the top bar of the ladder, passed through a pulley on the beam, and allowed to hang down the hole. Then the men on the first landing place will be able to help, by steadying and holding it while the ropes on the surface are being secured. This procedure may be repeated until the actual bottom is reached.

It must be remembered that the descent and ascent by rope-ladders is a very toilsome proceeding, and *that practically no rest can be taken while on the ladder itself beyond getting breath*, as the ladder swings away from the vertical line, which throws the man's weight almost entirely on his hands and arms.

For this reason, if for no other, a windlass is to be preferred for a deep descent which cannot be negotiated by a series of drops where rests may be taken.

It must also not be forgotten that if a man becomes exhausted through extreme exertion or exposure to cold and wet, or meets with an accident to a limb, he cannot well be got out without a windlass. It would be well to disabuse the inexperienced mind of the idea that a man can be drawn out of a deep hole by his safety rope, as, although this might be done, and has been done, by a large party of strong men on the surface, it would, at best, be a painful and slow experience, and for a small party probably an impossibility. Therefore let the safety rope be considered only as a means of checking a slip from the ladder and for affording support when a halt is made for any purpose.

Having reached the bottom of the "pothole," it should be thoroughly examined and a plan made. Passages may be discovered running out of it, which should be followed so far as is possible.

Horizontal Caves and Passages—One hundred feet of Alpine climbing rope should be taken. An ice-axe or a modified form of that tool will be found useful in many ways. Before leaving the foot of the shaft, a string should be made fast, and paid out by the last man of the party. This is an imperative precaution, as passages may be found to ramify and multiply in a bewildering manner, and if a wrong turning be taken on the way back, the result may be more than disagreeable. With the guiding string a man *might* find his way back in the dark—a possible contingency if much water is encountered to put out lamps, &c.

The characteristics of a single passage may be various. It may be wide and shallow, or lofty and narrow, through every gradation. A drop in the level of a passage may necessitate climbing, which must only be undertaken with all possible precautions, for while a man may be a brilliant mountaineer and cragsman, he may now have to deal with rotten rock, and with only such light as is given by lamps or candles. In fact, any operation of difficulty must now be treated with increased respect, as the party is practically cut off from immediate outside help, and no unnecessary risk should be taken.

In some passages, streams and pools of water are found. The general temperature of these places being about 48°F. winter and summer, it follows that inflowing water is speedily reduced to that temperature. So long as not more than hip deep, it is not very uncomfortable, but, when deep enough to cover the body, the chilling effects of such a temperature are soon felt. For this reason, if it be thought desirable to swim across a pool to see if further progress be possible, the swimmer should have a light rope tied round him. On some expeditions, large lakes and streams are encountered, and for these special preparations have to be made. A *raft* of hermetically sealed tins with a covering of laths made in sections to bolt together, has been used by the present writers with success. Its great advantage over a Berthon or other collapsible canvas boat, is its power to resist the rough usage incidental to getting it to its launching place. A raft made in this fashion, to carry 200 lbs., weighs about 60 lbs.

Having briefly described the main methods of exploring potholes which require the use of mechanical appliances, it is hardly necessary to

refer to the manner of dealing with those smaller holes, which can be safely explored if the ordinary climbing precautions taken by mountaineers are adopted.

Knots, Hitches, &c.—As may be readily inferred, where there is so great a need of the constant use of ropes, safe knots only should be used, and knowledge and practice in making these should be previously acquired.

The following axioms should be invariably borne in mind:—

Clear away all loose stones, &c., from the surface near the hole.

All planks, struts, &c., in use at the top of the shaft should be securely lashed back so that in case of a breakage they do not fall down.

A party should never start on the exploration of a passage without a sufficient length of climbing rope. This is due not only to themselves but to their friends above ground, who cannot know when they are in danger.

Like its kindred sport, mountaineering, cave exploration has its own peculiar fascination and charm. The adventure, the charm of entering the unknown, the delight of pioneering, the weird and beautiful effects of dim light on fantastic surroundings, of difficulties faced and overcome by combined effort, all help to counteract the hard work and that occasional hardship inseparable from any manly sport. Its scientific aspects also are varied, and a knowledge of them adds greatly to the lasting impression made on the imagination.

JOHN A. GREEN.
EDWARD CALVERT.
FRANK ELLET.
THOMAS GRAY.

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GLOSSARY.

Aiguille—A pinnacle of rock, so called from its generally sharply pointed outlines.

Alp—The word in Swiss denotes a summer, or mountain, pasture, and not the mountain itself.

Alpine Club, The—Was established at the end of 1857. Foreign alpine clubs have since been formed.

Alpenstock—A spiked staff used in mountaineering. It should be of ash, and of length and thickness suitable to the height and weight of its owner. It is, however, now generally displaced by the ice-axe.

Arete—The highest ridge of a mountain.

Avalanche—A mass of ice, snow, or stones falling from higher parts of the mountains, generally owing to thawing. The word is generally understood to mean snow only.

Axe—An instrument of manifold uses, comprising both axe and pick. The length should not be more than about 45 inches.

Bergschrund—The highest crevasse (*q.v.*) which separates the snowfield from the mountain.

Boots, Bootnails—Special attention to these is necessary. The boots should be laced, and both the soles and heels should project beyond the uppers. The soles should have nails arranged both longitudinally and round the edge, and the heels should have nails on the inner, as well as on the outer edge. The heads of the sole nails should be slightly bent.

Cairn—A heap of stones made for landmarks, &c.

Chimney—A very steep and narrow gully, resembling the interior of a chimney, with one side removed.

Chock = Chockstone—A mass of rock, blocking a chimney.

Climbing-irons—A contrivance fastened to the boot (and removable), generally in form of a cross with a spike at the end of each arm, or even more = *Crampons*.

Col—*Pass* (*q.v.*), but in the Tyrol it means a hill, not bare of vegetation.

Cornice—Overhanging snow on a ridge.

Corrie—A curved depression on the mountain-side.

Couloir—A steep gully; it may be in rock, ice, or snow.

Crampon—[*See* CLIMBING-IRONS.]

Crevasse—A fissure in a glacier, or snowfield. The edge is called the *lip*. It is *longitudinal* or *transverse*, according to its direction on the glacier. When due to the curve in the glacier, it is *marginal*. If covered with loose snow, it is *concealed*. A practicable *bridge* of ice or snow across a crevasse frequently occurs.

Crest—The highest line of a ridge.

Croda—In the Tyrol a bare ridge or peak, as opposed to *Col* (*q.v.*).

Curtain—The precipitous wall of rock between two peaks.

Dirt-bands—Streaks of fine *débris* extending in curved lines across dry glaciers.

Dolomite—A hard magnesian limestone, offering special difficulties to the climber.

Eave = Cornice.

Föhnwind—A warm south-east wind in the Alps, most common in spring and autumn. It is more common in some valleys than others, and has important influence on the snow and ice.

Frost-bite—An evil due most frequently to wind, or to wet; against which precautions must always be taken. The injury is a freezing of the tissues, and consequent mortification of the part affected.

Gendarme—A tower of rock on a ridge.

Gîte = A shelter, hence a halt and rest for the night.

Glacier—The accumulation of frozen snow in a valley, down which it is gradually moving. If there is no snow on the surface of the ice it is called *dry*. A *hanging* glacier is a mass of ice clinging to the walls of rock.

Glacière—A cave containing ice.

Glacière-table—A block of stone supported on a pillar of ice.

Glazed rocks—Rocks with a surface or film of ice.

Glazing-ice—The film of ice on glazed rocks.

Glissade—The action of slipping or gliding down a steep incline; if made on the feet, it is a *standing* glissade; if on the back, a *sitting* glissade.

Grapnel—A steel or iron claw attached to a rope, and thrown in order to obtain a hold.

Gully—A narrow and deep ravine.

Handhold—Projections or crevices in the rock, by which the hand can support the body.

Hogsback—A long, narrow ridge.

Hot plate—A surface of rock, exposed by the breaking away of a glacier.

Ice—Is called *soft* when the snow of which it is composed has not become solidified; *hard*, or *black*, when it is perfectly homogeneous.

Ice-cap—The permanent covering of a given area by ice or snow.

Ice-fall—A part of a glacier hanging sharply over a cliff.

Ice-tongue—A projection of ice at the foot of a glacier.

Ice-wall—A perpendicular cliff of ice.

Ice-worn—Of rocks, worn and polished by the movement of ice upon them.

Jammed—Of a *chimney* (*q.v.*) blocked by a fallen rock.

Kamm—A broken rocky ridge.

Knife-edge—A very narrow ridge.

Letter-box—A split rock.

Moraine—The *débris* on a glacier, the downward movement of which carries the stones, &c., in long lines. *Lateral* moraines are those at the sides, *medial* are those in the centre, generally formed by the union of glaciers coming from different valleys. *Terminal* moraines are those finally deposited at the foot of the glacier.

Moulins—Shafts bored through glaciers by water.

Mountain-sickness—A malady due to rarefaction of the air. The chief symptoms are extreme weariness, headache, difficulty of breathing and nausea.

Needle=Aiguille.

Névé—A tract of snow, as distinct from a glacier, which is ice.

Pass—The lowest point in a ridge.

Piotet=Ice-axe.

Pitch—A small cliff or perpendicular obstruction in a gully.

Piton—An iron stanchion with a ring at its head, to which a rope can be attached.

Platform—A small level surface on the face of a precipice, &c.

Platte—A wide ledge.

Rake—A scree-gully.

Randkluft=*Bergschrund* (*q.v.*).

Roches Moutonnées—Rocks rounded by glacier action.

Rope—Ropes are used principally for connecting the members of a party, so that, in case of accident to one, he is supported by all the others. The "Alpine Club Rope" is made of pure manilla hemp, is 1¼ inch in circumference, and is marked by a red thread between the strands.

Rücksack—A bag of simpler form than the knapsack, and carried much lower in the back.

Run—The stretch on a loose rope when suddenly pulled.

Sand-cone—A cone of hard ice covered with sand or grit.

Scarpella—A pointed shoe with hempen soles used in rock climbing.

Scree—*Débris* lying at the base of a cliff.

Serac—A tower of ice on a glacier, formed by the intersection of crevasses.

Shoulder—A rounded projection from the mass of a mountain.

Snout—The foot or lower end of a glacier

Snow-blindness—Inflammation of the eyes, caused by the glare of sunshine on snow surface.

Snow-craft—The headwork of ice and snow climbing.

Snow-line—The average lowest line of perpetual snow.

Snow-masked—Of a crevasse hidden by snow.

Snow Spectacles—Should be of smoked or neutral-tinted glass, and should be in the form of goggles, the sides being of wire gauze.

Stanchions—Iron stakes driven into rocks to make a permanent track. See *Piton*.

Traverse—1. A path across the face of a cliff or wall. 2. The surface across which the path is made.

Verglas—The film of ice on "glazed rocks."

Virgin peak—One as yet untrodden.

Writing desk—A form assumed by limestone rocks, somewhat resembling the angles of an open desk.

A. C. C.

MOUSE DEER (*Miminna indica*)—This little hornless deer is found in Ceylon—parts of India, and is nowhere so plentiful as in the Tavoy and Mugui districts of the Tenasserim Provinces. It seldom exceeds 18 inches in length and 12 inches in height; generally its height is nearer 8 inches. The body is heavy in proportion to the small length of limb. The skin is mottled ash grey covered with dark spots. The jaw is furnished with sharp tusks similar to those of the muntjac or barking deer. It lives principally upon berries and fruits, and has been known to go to earth on an emergency. The tail is very short, and the coat is more spotted during the rains and cold weather than in the hot, there being then two or more streaks along the flanks in addition to the spots. I once spent a week at Bassien, near Bombay, and in following the pugs of a tiger up the hill I roused several of these deer, and, after a fruitless hunt for the larger beast, I bagged a couple of these tiny deer in the hope that they might afford a pleasant change at table. The meat, however, had a peculiar and not altogether agreeable flavour. In parts of Tenasserim I have been offered a dozen of these deer for a dollar. They are caught by nooses laid on the ground and attached to a bent bamboo; when the snare is trodden upon, the little brute is suspended in the air by its leg, and its pitiful cries attract the poachers, who are never far distant. There are varieties in the Malay Peninsula and in Java. This deer is easily tamed if caught young.

F. T. Pollok.

MULE DEER (*Cervus macrotis*)—This deer, deriving its specific name from the size of the ears, is found in considerable numbers throughout the Western States of America and British Columbia, although, in the larger portion of the area over which it is distributed, it is known as the "Blacktail" deer. According to Caton, there is another variety to be found in Southern California. With the exception, perhaps, of the ears, it may be described as a handsome deer, although it has not the majestic appearance of the Wapiti (*Cervus canadensis*) nor the gracefulness of the common deer (*Cervus virginianus*).

Colour—This varies according to the season of the year, the summer coat being a dull yellow turning towards autumn and winter to grey. The belly is very dark, almost black, becoming lighter towards the groin, while between the thighs it is nearly white, this colour extending to

the rump, and making a conspicuous mark when the animal is viewed *a posteriori*. Below the knees and hocks the legs are of a dark cinnamon colour, which, however, becomes lighter as the season advances. The forehead is generally dark, in some cases nearly black, to a point ending between the eyes, while the throat is frequently almost white. The tail, which varies from 6 to 10 inches in length, is of a yellowish white colour, with the exception of

MULE DEER. (No. 1.)

Shot Sept. 29th, 1888, on the Williams River, Colorado, U.S.A.

a tuft of hair at the extreme point, which is black. Different individuals, however, vary somewhat in regard to colouring.

Antlers—These appear to be subject to considerable variations in shape, in some individuals the beam and tines having a greater general inward tendency than in others. The average pair of antlers shows 10 points (although a much greater number is by no means uncommon) and may be described as spreading laterally and upwards from the head in a line with the face with a double bifurcation of the beam, each bifureation forking into two tines. One or more snags appear from 2 to 3 inches above the burr. The accompanying illustrations are from photographs of the heads of deer killed in Colorado, and are good specimens, although, perhaps, a little above the average in the cases of Nos. 1 and 2 and far above in the case of No. 3.

In No. 1 the right horn is 25 inches long, round the burr is $7\frac{1}{4}$ inches, while 2 inches above the burr the beam is $5\frac{1}{2}$ inches in circumference. The left horn is $24\frac{3}{4}$ inches long, round the burr $8\frac{1}{2}$ inches, and 2 inches above the burr $5\frac{3}{4}$ inches. The width between the horns is $26\frac{1}{8}$ inches. The points are 22. This head is an example of the general inward tendency of the beam and tines.

In No. 2 the right horn is $27\frac{3}{4}$ inches long, round the burr is 8 inches, and 2 inches above the burr $5\frac{3}{4}$ inches. The left horn has the same length while round the burr is $7\frac{3}{4}$ inches and 2 inches above it, $5\frac{5}{8}$ inches. The width between the horns is 29 inches. The points number 12.

No. 3 is by far the most remarkable set of antlers I have ever met with. It will be noticed that the horns grow out laterally in nearly horizontal positions, no other species of deer except the moose (*Alces machlis*) possessing this lateral projection of horn. The result of this abnormal projection is that the horns show the astonishing spread of 41 inches, the actual measurements of the horns being as follows:—Right horn 30 inches in length, round the burr $10\frac{1}{4}$ inches, $2\frac{1}{2}$ inches above the burr, $5\frac{3}{4}$ inches. Left horn 30 inches, burr $10\frac{1}{2}$, $2\frac{1}{2}$ inches above burr, $5\frac{3}{4}$ inches. Width between the horns 41 inches. Points 18. When it is remembered that the average number of points cannot be said to exceed 12 in any event, while the average width is about 25 to 26 inches, it will readily be understood what a marvellous head this particular deer carried.

Weight—The average live weight is about 200 lbs. (25 stone) although individuals have been killed up to 300 lbs.

Habits and Shooting—The *Cervus macrotis* is probably the most sporting deer on the American continent, for it is occasionally possible to stalk him in the orthodox fashion, although by far the larger number are killed by what is called "still hunting" in America, namely, by crawling after him in thick timber and chancing a shot at close quarters. They feed at night, and the older bucks generally betake themselves in the early morning to the highest available timbered ground, and lie down for the day. They are not so gregarious as the wapiti, although considerable bands of does, young bucks and fawns may often be met with, and consequently the stalker will not be likely to meet more than one buck at a time. They are also much shyer than wapiti, and have a trick of creeping away unseen, but when "jumped"

and thoroughly alarmed, bound rapidly away, all feet leaving and striking the ground at the same time, a means of progression which soon seems to become fatiguing. They have four paces, a walk, a shambling kind of trot, a gallop, and this rapid and exhausting bound above referred to. Notwithstanding its awkward movements, it is astonishing what a great distance a wounded buck will travel. The rutting season commences early in October, the horns being, as a rule, out of the velvet by the beginning of September. When the heavy snows commence on the mountains, a considerable migration takes place to lower grounds and it is at these periodical movements that the Ranchman takes so heavy a toll on the herds for winter meat. A sure but by no means sportsman-like way of shooting this deer is by watching a salt "lick," and many a good buck and even doe is killed in this way. A ·303 rifle can safely be recommended for mule deer, although the majority of sportsmen on the American continent use a Winchester of various models.

MULE DEER. (No. 2.)

Shot, Sept. 30th, 1888, on the Wilhams River, Colorado, U.S.A.

In recent years most of the State legislatures have passed enactments protecting game within their jurisdictions, and in consequence of these laws (which, however, it may be stated, are unfortunately often exceedingly

MULE DEER. (No. 3.)

difficult to enforce), the mule deer shows no sign of diminution in numbers, in fact in some districts, appear to be actually increasing. Aided by protection and its own habits and favourite locations, it will probably hold its own as long as any deer in America.

HENRY A. JAMES.

MULLET, GREY (Thick-lipped)—

MEASUREMENTS, ETC.—Length of head $4\frac{3}{4}$ to 5, of caudal fin $5\frac{1}{2}$, height of body $4\frac{1}{2}$ to 5 times in the total length. *Eyes*—without adipose lids. Snout obtuse; upper lip rather thick, with two or three rows of papillæ on its lowest portion. A narrow strip of the chin is uncovered. *Teeth*—fine, labial ones in the upper lip. *Fins*—the dorsal commences somewhat nearer the caudal fin, or midway between it and the end of the snout; spines stout, the two first of the same height, and equalling that of the post-orbital length of the head. The interspace between the two dorsal fins equal to, or slightly exceeding, that of the base of the first dorsal. Second dorsal anteriorly slightly higher than the first. Pectoral inserted somewhat above the centre of the depth of the body, and its length equalling that of the head excluding the snout. Ventral inserted midway between the origins of the pectoral and first dorsal fin. Anal below the second dorsal and rather higher than it. Caudal forked, the length of each lobe being about equal, and rather less than that of the head. *Scales*—about twenty-six between the snout and the base of the first dorsal fin. *Colours*—Grey shot with bronze about the head, cheeks golden, sides silvery dashed with gold; a dark line along each row of scales along the back and sides.

Day, *Fishes of Great Britain and Ireland*, vol. p. 232.

MUNTJAC (*Cervulus muntjac*)—This animal is also known as **Barking Deer** and as **Rib-faced Deer.** In the Himalaya mountains and their vicinities it is called *Kakar*; *Ratwa* in Nepal, and in Madras, by the anomalous name **Jungle Sheep.**

Distribution—This small deer is more generally distributed throughout Asia than any animal of its tribe, although it may vary slightly, as regards colour and size, in different localities. It is found in almost all the more or less hilly forest tracts of Hindustan, including the Himalayas, up to an altitude of about 8,000 feet. It occurs also in Assam, Ceylon (there called **Red Hog Deer**), Burmah, the peninsula and many of the islands of the Malay Archipelago, and in China, but is seldom met with north of latitude 32°.

Description — Muntjacs are distinctly jungle-loving animals, and usually solitary, although two or even three may sometimes be found together. The height of an Indian kakar is about 23 inches. The hair is short, smooth, and bright rufous bay in colour, becoming darker on the delicately formed limbs; white on the throat and beneath the tail, which is comparatively long for a deer. The head is peculiar, that of the buck being surmounted with two prolongations of the V-shaped, ribbed frontal bone, about 3 inches long and covered with skin and hair. On these hairy pedicels grow the horns, which, in a good buck, are 4 or 5 inches in length, curving

MUNTJAC.
Av. height at shoulder, 23 *in. Av. horn meas.*, 4½ *in.; Max. horn meas.*, 7 *in.*

inwards near their tips, and having one short prong just above each burr, projecting forward and slightly upward. The buck's upper jaw is provided with a pair of sharp canine teeth, sometimes extending quite half an inch over the lower lips. For what purpose they are intended is uncertain. Care is necessary when handling a wounded buck, lest in its struggles it might inflict a nasty cut with one of them. The doe is similar to the buck, with the exception that it lacks the hairy pedicels, the horns, and the long canines.

Habits—The kakar is most frequently found where thick cover is interspersed with patches of cultivation. In the latter, when the crops are green, it may often be found out feeding in the early morning and the dusk of evening, but usually so close to cover that, in the grey dawn and twilight, it is not easily detected until the white of its tail is seen bobbing off into the jungle, whence its alarm note—a hoarse, single bark, more often heard at night—comes at short regular intervals. When moving quickly through cover, it carries its head low and its tail high, and generally makes a succession of clicking sounds, but how these are produced the writer has been unable to ascertain.

In some parts of China a darker variety, with a tuft of long hair on the top of the head, is found.

When guns are posted, the drivers should move as noiselessly as possible, otherwise kakar are as likely as not to break back. Up to about 30 yards a charge of No. 5 shot will roll one over, but where met with in partially open, hilly tracts they often afford pretty shots for the rifle.

DONALD MACINTYRE.

MUSK OX (*Ovibos moschatus*)—**Description**—The **Musk Ox** bears, as implied by the generic name, considerable affinities to the sheep. The hair is so long as to make the beast appear larger than it really is, and to conceal the ears and tail. The massive horns, which are rougher and of lighter hue at their base than at the tips, curve downwards in a remarkable manner; and the head is, in fact, much like that of sheep. The limbs are short, a character emphasised by the thick hair with which they are clad; and the flesh has a peculiar flavour that has suggested the beast's trivial name.

Habitat—In the early ages of the world's history, the musk ox was widely distributed throughout the northern parts of Europe, Asia and America, but its present range is limited to the little known corner of North America lying to the north and east of a line drawn from Fort Churchill on Hudson's Bay to the mouth of the Mackenzie and the adjacent islands of the Arctic Sea. Its occurrence in Greenland has been noticed several times lately, and Lieutenant Peary met with this animal at the most northerly point of one of his journeys: so we may reasonably suppose that the musk ox exists as far to the northward as the mosses on which it lives.

Two methods of reaching this country are open to the sportsman. The first is to take a small vessel through Hudson's Straits in the summer

and sail as far as the ice allows up Chesterfield Inlet. From there a short inland expedition would no doubt bring you among the musk ox, but this plan would probably entail a long, dreary winter's inactivity with vessel and crew lying idle, for the Straits are closed by ice early in autumn. Until recently an agent of the Hudson's Bay Company used to make an annual visit to Marble Island from Fort Churchill to meet the Esquimaux, and many musk ox skins were brought there by the inhabitants of Chesterfield Inlet, but this trading expedition has lately been abandoned.

By far the easiest method of reaching the musk ox country is to start from one of the Hudson Bay posts on the Great Slave Lake, easily reached by the company's ordinary trade route from Edmonton. If a man is capable of making up his mind that he will really start the next summer, his best plan is at once to notify the Hudson Bay Company officials at Winnipeg of his

MUSK OX.

Av. height at shoulder, 50 in. Av. horn meas., 27 in.; Max. horn meas., 36 in.

intention. A winter packet is sent to the north from Winnipeg every year, and arrangements can thus be made by which the sportsman will reach the Great Slave Lake by the middle of July and find hunters, canoes and everything he wants in readiness, instead of having to wait perhaps a couple of months before he can get any one to go with him. Early in August he should be at the north-east end of the main lake ready for a start to the Barren Ground. A large and a small canoe should be carried over the mountain to any of the chains of lakes well known to the Indians.

Hunting—Let the hunters take their wives, dogs and household gods with them to the last bunch of straggling pine trees about one hundred miles from the big lake. Here a main camp should be made, with due consideration of the habits of the caribou and the chances of catching fish; during the absence of the hunters the women will be fully occupied in drying meat and making snow-shoes and mocassins. No attempt to carry any great amount of provisions should be made, as the Indians insist upon eating everything promptly instead of carrying it. Take an abundance of tea, tobacco and ammunition for trading purposes—a small barrel of powder assumes a fabulous value in the Barren Ground when the caribou are passing. By September 1st the hunters should be off to the north, taking with them the little canoe for crossing lakes and streams—one man can carry her easily except in a strong wind. The direction chosen will probably be towards the copper mine on the Great Fish River, according to Indian advice. Musk ox are pretty sure to be found within a few days, and caribou are everywhere abundant at this time of year, so there will be no difficulty about provisions. Skins and heads could be *cached* away among the rocks, to be hauled in later by dog sleighs. They should be made as light as possible, but it is not necessary to clean them perfectly, as the weather will be cold already. The musk ox, when found, are easily approached with the most ordinary precautions. When enough have been killed, a return should be made to the main camp and a few weeks passed in hunting caribou till the ice in the lake admits of travelling with dog sleighs. Should the hunt have failed, another journey must be made in November, but this involves hauling wood for fuel besides all the usual discomforts of Arctic travel in winter. It is a dirty, miserable experience, and ends in finding a band of musk ox which are held at bay by dogs and slaughtered to the last one, or, worse still, in a disastrous flight for the shelter of the woods, if no musk ox are found, for all the caribou take to the woods when the intense cold sets in.

By the middle of December the ice on the Great Slave Lake has set right across, and if the hunter is in a hurry to reach civilisation he can quite easily continue his journey to Edmonton on snow-shoes. There are trading posts at convenient distances where he can replenish his provisions by the way.

WARBURTON PIKE.

MUSKALONGE (*Lucius maskinonge*)—The muskalonge is a fish of the pike family, inhabiting the Great Lakes, the St. Lawrence basin and waters to the northward, the Upper Mississippi Valley, the basin of the Ohio, and lakes in Western New York and Western Pennsylvania. It is not now abundant in any part of the Great Lakes region, but is still common enough in the St. Lawrence, Northern Michigan, Wisconsin and Minnesota, and in Chautauqua Lake, New York, to maintain the enthusiasm of anglers who seek large fish.

Name and Characteristics—The origin and meaning of the name are unsettled, and, in fact, the priority of the Indian word, *Maskinongé*, is well supported; but, whether it be a "long

nose" or a "spotted pike," the species is a highly-prized member of a widely distributed family of game fishes, and is so well set off by important characters as to be easily distinguished from its kinsfolk, the pike and the pickerels. First, it has no scales upon the lower half of the cheek and gill-cover, in this differing from all other members of its family. Second, its gill-membrane is supported by a much larger number of bony rays than in the pike and pickerels. Third, it is usually grey on the upper part of the body, pale below, the sides with many roundish, distinct or confluent dark spots, the fins being separating the fishes of the pike family than the anatomical characters above mentioned.

Races of Muskalonge—The latest classification of the varieties of muskalonge admits three forms—the typical black-spotted fish of the Great Lakes region and northward, the Ohio muskalonge, which is also black-spotted and appears to differ little from the northern type, and the unspotted muskalonge of lakes in Wisconsin, Minnesota, New York, and Pennsylvania. If this last variety has been correctly interpreted, the bands become obsolete with age and spots are never present. The writer

MUSKALONGE.

also black-spotted. The small eye has a ground colour of silvery-white overlaid with lemon-yellow, at least in the muskalonge of Chautauqua Lake. The latter variety lacks dark spots and has numerous irregular, dark cross-bands interspersed with half-bands and blotches. There is also, in lakes of Wisconsin and Minnesota, a variety which lacks both spots and bands and has the sides uniformly bluish-grey.

The pike has elongated, pale blotches on a dark grey ground, while the pickerels have more or less distinct dark bands or a network of narrow dark lines upon the sides. Differences of colour, however, are far less important in has seen only the head of an Ohio muskalonge. This was obscurely black-spotted, but those who saw the fish stated that the head was spotted with dark, regular, round spots on the jaws and gill-covers, and that the entire body was similarly marked.

The muskalonge of Chautauqua Lake is very beautiful and is in good repute as a food and game fish. The body is olive-green with golden tints. The lower third of the pectoral fins is pink. The eye is silvery-white overlaid with lemon-yellow. The sides bear about twenty irregular cross-bands with several intervening blotches and partial bands. The fins of the

back, tail and anal region have dark blotches forming pseudo bands. Series of tubes resembling those of the lateral line are distributed over various parts of the body with little regularity.

Ferocity—A glance at the inside of the mouth of a big muskalonge will suffice to determine its character as a predacious animal. In a fish 44 inches long the head measured 9 inches. Besides the formidable bands of teeth in the jaws, there is, in the middle of the roof of the mouth, a patch $3\frac{5}{8}$ inches long, and a band on each side of the palate $3\frac{3}{8}$ inches long. The tongue has a long series of sharp teeth, coming to a fine point in front and widening out behind; the fronts of the gill-blades are heavily armed with forty or more clumps of stout, spiny tubercles. This armament, in connection with its great size, often exceeding 50 lbs., and its giant strength, makes the muskalonge one of the most formidable of the fresh-water fishes of prey.

Habits—The species is not gregarious, but usually occur in pairs, and there is a strong bond of personal attachment. It feeds upon smaller fishes, and, sometimes, upon vegetable substances growing under the water. Favourite feeding-grounds are over shallow bars, whereon water plants grow and almost reach the surface. In Chautauqua Lake, the fish feeds in summer and winter in nearly the same places, and always near to the weeds. When the lake becomes very clear (in February) it goes into deeper water, but it is found in the depths more or less all the year. It is reported that the fish feed and are often caught on bright moonlit nights.

Spawning begins in April, soon after the ice leaves the lakes. The fish go into water 10 to 15 feet deep and spawn on the mud, generally in bays, or they may go among the rushes and grasses near the shores of streams. The eggs are free, non-adhesive, and about one-tenth of an inch in diameter. Some writers state that they are slightly adhesive and stick to water plants. A large female in Chautauqua Lake furnished sixty thousand eggs. In artificial hatching the ova are placed in boxes provided with screen tops and bottoms; the boxes are sunk from 1 foot to 2 feet under the surface, and every day or two they are drawn up, the covers removed, and all the sediment and bad eggs cleaned out. In Chautauqua Lake the males are four times as numerous as the females, but the females are much the larger.

Game Qualities—As a game fish it ranks below the salmon, most of the trouts, and the black bass; but it is the best of its family, and, in Chautauqua Lake, at least, it is highly esteemed for its fighting qualities and its delicate flesh. September is a favourite month for the fishing, and the frosty, moonlit nights of October and November often afford fine sport when one is trolling with chubs or suckers for bait. The muskalonge does not strike fiercely at live fish, and it must usually be allowed to hook itself. When hooked, it may leave the water two or three times and shake its head to dislodge the hook, or it may go to the bottom and sulk there as sullenly as a salmon. An hour or longer may be required to bring the fish to boat, and in handling such a giant with light tackle, great care and skill are necessary.

The muskalonge is usually caught by trolling with hand-line or rod and line, using a spoon hook or spinner, or with a live frog or minnow for bait. A rod $8\frac{1}{2}$ or 9 feet long, weighing 7 to 10 ounces, about 300 feet of No. 9 Cuttyhunk line, and spoons of the sizes Nos. 7 and 8 are recommended. The boatman will row along, about 20 feet distant from the edge of the reeds. The angler, with about 50 feet of line, casts a live bait or spoon among the weeds, especially the lily pads, or the line may be trolled astern. The rod should be held parallel with the surface of the water, with its tip well down when the fish leaps, as it is almost sure to do, and the line must be kept as taut as the strength of the rod permits. It is equally important to gaff the fish carefully when exhausted, unless circumstances may render necessary the less sportsmanlike method of killing with a club or a pistol-shot.

TARLETON H. BEAN.

NILGAI (*Portax pictus*)—The **Nilgai** is the largest of Indian antelopes, and belongs to the Tragelaphine group, of which two types only are found in India, viz., the nilgai and the four-horned antelope (*Tetraceros quadricornis*), both of them being peculiar to Hindustan.

Description—Nilgai literally means "blue cattle," and the name is derived from the iron-grey or blue colour of the adult male. The females and young males are light brown. The male, if castrated when young, remains a light brown and does not become grey. The old males are marked with white rings on the fetlocks, a white patch on the throat, and white spots on the cheeks. These white markings are common in the Tragelaphine group of antelopes, and are found in several of the African species of that section, *e.g.*, the koodoo and the lesser koodoo. Immediately below the white patch on the throat, the male nilgai has a long tuft of black hair 6 or 8 inches long, and a short upright mane is found in both sexes. Only the males have horns, which are smooth and recurved, slightly corrugated at the base. They are, in good specimens, between 9 and 10 inches long.

The nilgai, or, as he is often called, "The Blue Bull," stands about $13\frac{1}{2}$ hands high at the shoulder. His back slopes downwards towards the tail, which is about 20 inches long, with a tuft of black hair at the end. The females are much smaller.

Habitat—The nilgai is found throughout India, though rarely in the north and south : it is, generally speaking, a jungle animal, but also inhabits the cultivated fields of Guzerat and Katywar. In the latter places it is remarkably tame, and allows of a close approach. In the

NILGAI.
Height at shoulder, 54 *in.* *Av. horn meas.*, 7 *in.*
Max. horn meas. 9¼ *in.*

jungles it is as wide-awake and as difficult to stalk as any other animal. The old males are often found solitary. The herds are sometimes composed of a large number, but more usually half a dozen or so. The smaller herds have usually one old blue bull in charge ; a herd of twenty would perhaps have as many as three old bulls. The female brings forth one or two young ones.

Shooting—The nilgai carries but a poor trophy, and is seldom shot by Indian sportsmen. When found in cultivated lands, they can often be approached by the simple process of walking so as to pass within shot. Stalking them behind a cart or horse, which is driven or led near them, in the same way as black buck are shot, can also be resorted to. In the jungle they are wary enough, and not easy to get near. They can be stalked, for the sake of the stalk, without firing at them. If you shoot one, you waste time that is better occupied in looking for deer, for, if shot, the animal has to be skinned, cut up, and the meat carried to camp ; for this reason it is as well to let them alone. Tigers often kill them, and I have found an old female killed by a panther. The solitary male I have seen more than once feeding in company with a herd of wild buffalo.

Nilgai have been frequently ridden and speared when found away from jungle. They should be pressed at top speed at first. Shields are made from the skin. Natives look on the nilgai as an ox, and those to whom the cow is sacred object to their being killed.

J. D. INVERARITY.

OORIAL—The oorial or shapoo (*Ovis vignei*) is a wild sheep, covered with hair instead of wool ; about nine hands high, reddish-brown in colour, with white markings on the lower part of the body and legs.

The old bucks are darker in colour, bearded from chin to chest, goaty in appearance, and show a saddle-mark on the body, of longish sepia-coloured hair, with a central crescent-shaped curve of white.

The horns are circular, and in some districts reach 30 inches in length, but the more massive specimens seldom exceed 26 inches. The animals are found in small herds on the lower ranges of the hills on the north-west frontier of India, in the Peshawar valley, and in the Salt Range, between the Indus and Jhelum rivers. They are restless, keen-sighted animals, but a persevering stalker will generally get within 150 yards of them, when any light Express rifle will do all that is required, provided the powder be straight.

On the western slopes of the Salt Range, about 9 A.M. on December 15th, 1895, I sighted a herd of fifteen oorial, which I followed for six hours before an opportunity occurred for a shot at the best buck, as he grazed at the foot of a cliff some 300 feet vertically below me, my shikari holding my legs while I craned over the edge. We descended and dismembered him, and the meat was placed in a bag

OORIAL.
Av. height at shoulder, 32 *in.* *Av. horn meas.*, 24 *in.*
Max. horn meas., 39½ *in.*

extemporised from his skin : two men were despatched with it to camp, while I—having detached scouts to the flanks to reconnoitre—carefully proceeded towards Vasnal Peak, near which my tent was pitched, on the central plateau of this range.

During the next hour we discovered and stalked two herds, but the bucks' horns did not exceed twenty inches; so we continued to plod along, as the hill-shadows were lengthening, and we had a stiff three hours' trudge before us to gain our camp.

The shikaries had joined me on a narrow track, the only way up the slope, when suddenly I descried two old bucks gazing at us from the opposite side of a deep and broad chasm to our left. Sinking to the ground, I ordered the shikaries—who had not yet seen the oorial—to continue moving on, while I described to them the position of the bucks, which were still standing at gaze on a red crystalline bank some 200 yards distant.

The shot was a difficult one—for they were enveloped in the shadow of a high hill which lay behind me towards the setting sun; but the telescopic sight on my rifle, a .400 Express by Fraser, gave me a fairly clear definition of the animals, while it also enabled me to select the best horns.

When I fired, the buck bounded forward in a tucked-up fashion, and disappeared into a ravine along with his companions, but after the lapse of a minute one of them reappeared and, slowly ascending the opposite brae, soon vanished over the crest.

Telling the shikaries that my aim had been steady, and that the second buck was probably badly wounded, I despatched one of them, Kootub by name, down into the valley to reconnoitre. In a few minutes he struck their tracks, and carrying them into a ravine, presently emerged in a high state of excitement, signalling vigorously that the buck was ascending a rocky slope towards the peak of Vasnal. The wounded oorial soon came in view. Being unable to face the steeper slopes, he was making his way slowly up a ravine below them; so I ran forward to cut him off, and posted myself on its brink, some 200 yards higher up. Kootub, however, signalled that the buck had halted lower down, so, descending by a *détour*, I again approached the ravine, and when within fifty yards of it, the buck raised his head above some long yellow grass in its bed and stared towards me for a few seconds. He then lowered his head, whereupon, beckoning to Kootub to advance, I crept quickly forward to a boulder overlooking the ravine, some seventy yards higher up the hill. The buck soon appeared, and as he was in the act of gathering himself together to jump up a sheet of rock in the watercourse, I shot him through the heart.

The first bullet had struck a little high and in front of this spot. His horns were nearly perfect at the tips and 26 inches long; his long gray beard almost reached the ground, and his dark skin displayed a handsome and well-defined saddle-mark.

ARTHUR POLLOCK.

OPOSSUM AND RACCOON HUNTING—The prefixes to both of these names might as well be dropped, for in actual practice the two animals are never spoken of as anything but "possum" and "coon." They are utterly dissimilar beasts: one a low grade marsupial with dirty white fur and a scaly rat-tail, the other a distant kinsman of the bear, but in appearance like a semi-arboreal fox, with a ringed tail; but they are ordinarily hunted in precisely the same way, and so, as regards their chase, can be treated together.

The recognised method of hunting the coon and possum is at night, with a pack of dogs trained to their pursuit. They are nocturnal in their habits, coming out after nightfall to wander around the ground beneath the trees and around the edges of the streams or in the cornfields, after their food; and the method of pursuit is simply to walk through likely ground until the dogs strike the trail of some unhappy wanderer and follow it up. Each man carries a torch, and of course goes on foot, and the dogs may be of any breed, provided only they will follow the track of a coon or possum, and will not follow that of a rabbit. It is not a very lofty kind of sport, but for pure fun nothing can come much ahead of such a midnight scramble. The coon

OPOSSUM.

is found in the forests all over the United States, and the possum as far north as the latitude of New York; but both are most plentiful in the southern States, and it is there they are most commonly hunted. On the plantations, negroes are usually taken along

with the white hunters, to manage the dogs and perhaps to cut down a tree or so.

Both the coon and the possum are exclusively beasts of the woodland, which usually spend the daytime in hollow trees, and take to a tree when followed. When a party of sportsmen start out on a hunt, they simply trudge along, with the dogs working all about, until one of the latter strikes a trail. As soon as he gives tongue, everybody runs in the direction of the cry, getting through the tree-trunks and brushwood as well as he can, with due regard both to himself and his torch. With a possum there is not usually a long run. The possum is a singularly slow and stupid creature, and speedily takes to a tree, around which the dogs gather in an excited, barking ring. Unless there is a hollow in the tree, a careful search with the torches soon discloses the possum, its eyes shining in the light as it sits on a branch or clings to the trunk. Somebody then swarms up the tree, grabs the possum, and climbs down with it. It opens its mouth wide, and will bite if it has the chance, but it is so sluggish that it is perfectly easy to seize it by the back of the neck and pluck it off its perch as if it were some large hairy fruit. It is then popped into a bag, and the hunt proceeds. If caught by the dogs it shows no fight, but "plays possum," that is, feigns death.

The coon offers much more excitement. It can run at quite a good pace, in addition to swimming and climbing, and it is a very game fighter. There is thus usually a smart run, and if the coon is overtaken on the ground, there is a savage worry. If he is treed, the tree may have to be cut down; otherwise the coon must be knocked off its perch with a bludgeon, for he is much too tough a customer to be seized as if he were a possum. It would be about like seizing a fox. A coon's fur is valuable, and negroes eat the flesh of the possum; but white men never pursue this method of hunting, except for sport only.

Of course the amount of game that can be procured depends entirely upon its abundance in the locality chosen. I remember one night that our party got thirteen possums at Quantico Island, some thirty miles down the Potomac from Washington. A secretary of the British Embassy and a professor of the Smithsonian Institution accompanied me down, under the guidance of a Washington friend, who had spent a year or two in his early boyhood as a kind of amateur bushwhacker in the Confederate army.

In the north, coons hibernate, but frequently come out and wander around over the snow if the weather grows mild. I once got one in very deep snow in northern Maine, spying it as I was riding on the mail sled that ran out of Island Falls. Both the coon and possum, being nocturnal beasts, and hiding closely during the daylight, often exist in some numbers, even in thickly settled localities, provided there still remain considerable patches of woodland. I gave my eldest small son, when he had just passed his fifth birthday, his first experience in the chase, by an exciting and successful im-

RACCOON.

promptu coon hunt, near a little pond beside the wood-pile, a couple of hundred yards from my stable at Sagamore Hill. One cold Thanksgiving, two or three years later, he and I celebrated our return from a long walk, taken for the purpose of chopping out an overgrown bridle-path, by the capture of a possum, after dark, in the woods but two or three hundred yards from the house.

THEODORE ROOSEVELT.

"OPOSSUM," AUSTRALIAN—The so-called "'possums" of Australia are, it may be premised without dipping deeply into their anatomical peculiarities, quite distinct from the true North American opossums treated of in the foregoing remarks, the differences consisting mainly in their bushy tails and the union of the toes of the hind feet, from which the Australian "opossums" are more properly denominated phalangers.

Opossum-shooting ranks high among the national pastimes of Australia, and the young colonial, as soon as he is old enough to shoulder a gun, spends all the moonlight evenings abroad,

roaming through ring-barked timber, his dog sniffing the air and, like its master, keeping its gaze fixed on the moon. When the dog has indicated the presence of an opossum in a tree, the sportsman tests its veracity by endeavouring to call it off; but if, refusing to quit the foot of the tree, it stakes its reputation on the presence of game overhead, then must its master step backwards and from side to side, with the object of running the moon over each limb; and it is during this operation that his attention is often riveted so exclusively on things above, that he not seldom falls foul of logs and stumps, or becomes more than slightly entangled in an outlying wire fence. Wire fencing is all but invisible by moonlight.

All the excitement of the expedition may be said, indeed, to lie in this "mooning." If the dark object which the hunter fondly imagines to be an opossum lie higher than the line of the moon, he must perforce fix his eyes on it and walk steadily backwards until the moon is directly behind it. In doing this, he more often than not lands himself in a water-hole. The beast can obviously be mooned from one spot only at any given moment, and so it will sometimes happen that two companions start 20 yards apart on the same errand and "bump" at that spot.

The "new chum," at whose door is laid the perpetration of all that is ridiculous, very often slaughters lumps of bark or the great nests of the white ant; but the old hand never fires until the rounded head and upright, pointed ears are unmistakably outlined against the moon. Sometimes the afore-mentioned solitary point from which the opossum can be mooned is occupied by a tree, in which case, unless, as rarely happens, it can be persuaded to shift its position, the opossum is safe for the moment.

Some unfortunates have been known to mistake a "native bear," or koala, for an opossum, and, after emptying a dozen cartridges into its hide, have returned to camp under the impression that they are bewitched, for the "bear" treats ordinary 'possum shot as dirt, and refuses to budge for anything under a handful of slugs or two or three bullets.

A thoroughly trained dog is a great help, as it undertakes all the preliminary hunting; and once an old "'possum-dog" barks up a tree, its master is certain that it has not erred, nor will it rush in and worry when the opossum falls to earth, which it sometimes does at the least touch. Then ensues a general *mêlée*, in which men and dogs tumble over each other in the half darkness in futile pursuit of a small animal that runs and doubles like a hare, often indeed gaining another tree and disappearing down a hollow limb ere it can be mooned again.

All these arboreal beasts have the trick of climbing the *far* side of a tree, and even the great iguana will keep its pursuer running round and round a tree without affording a sight of more than the tip of its tail. An educated ear is of great use in this work, and the experienced 'possum-hunter listens, after he knows that the shot has struck home, for the drip of blood on the ground and the scratching that tells of the struggle to maintain a foothold. If the little beast is touched, it remains motionless, if unhurt it bolts for the nearest hollow.

Beginners cannot by any argument be persuaded to leave their victims where they fall. They have, in weak moments, promised rugs to friends in town, and, as each rug contains from fifty to eighty skins, they tackle each morning the pile of stiffened corpses in the hope of making some headway. As a matter of fact, however, the amateur will find two or three as many as he can skin carefully at a sitting. Those, of course, who hunt these animals for a living are able, if good shots and quick skinners, to make a fair wage, as the skins sell at present for something approximating 10*s*. the dozen, and fifty an evening are no unusual bag for one gun.

The beautiful little **Flying Squirrels**, as a still smaller group of marsupials are called, are shot by moonlight in much the same fashion, though, owing to their capricious distribution—for they abound on one slope of some ranges without ever occurring on the other—their pursuit is far less general. Again, they frequently disappear from their haunts to re-appear after an indefinite absence.

The chief point in which their chase differs from that of the opossum is the fact that a dog is, in this case, worse than useless, for it would make them so shy that they would fly from spot to spot before their pursuer could get them in line with the moon. Moreover, as they do not touch the earth, but fly from tree to tree, there would be no scent for the dog to follow: and their incessant chattering makes them easy to locate. So silent indeed is the bush, that even the noise of their flight can be heard at some distance.

When struck, they mostly fly 40 or 50 yards before falling, and their appearance, as they cross the moon's rays with distended membranes, gives an exaggerated impression of their size, just as their skins are invariably disappointing to the new-comer, for the fur, though long, soft, and thick along the back, is very thin on the sides, and all but disappears on the "wings." This moonlight shooting for such small game reads as feeble judged by the standards of old-world sport, but there is in it a charm all its own, not alone for born Australians, but also for many from home who pay the bush a visit.

ARTHUR EDEN.

ORYX—Distribution—The oryx is a large and very remarkable antelope, of which four species are to be found in Africa, while the fifth,

(*Oryx beatrix*) has its habitat in Asia and is to be met with chiefly in the Arabian deserts at the head of the Persian Gulf. This Asiatic species is much smaller than its African congeners. It attains little more than half the size of the well-known gemsbok of South Africa (*Oryx gazella*), and its horns bear no comparison with the magnificent trophies of the oryxes of Africa. In North Africa is to be found sparingly the **Leucoryx** (*Oryx leucoryx*), whose horns extend, in the best specimens hitherto secured, to some 39½ inches. In Somaliland and North-east Africa the **Beisa** antelope (*Oryx beisa*) is the representative of this family. The beisa, like the next species, is about equal in size to the gemsbok; it, too, carries fine horns, which occasionally run to 39 inches in length. In East

ORYX.
Av. height at shoulder, 48 *in.* *Av. horn meas.*, 38 *in.*
Max. horn meas., 47½ *in.*

Africa the handsome *Oryx collotis*, which for some time was confused with the beisa, is to be found. This oryx may be easily singled out by the black ear tufts, which are not to be found in any of the other species. In North and East Africa the oryxes are chiefly bagged by stalking, and as they are shy and suspicious antelopes, they are, when secured, valuable and well-earned trophies. The horns of the East African oryx are shorter than those of its African relations, seldom exceeding 30 inches in length.

In South Africa is to be found the noblest of all these handsome antelopes. The **Gemsbok** (*Oryx gazella*, *Kukama* of the Bechuanas) formerly abounded in considerable troops from the Karroos of Cape Colony to the Lake Ngami country, including the Kalahari, Great Namaqualand, Damaraland, and Bechuanaland. Its most easterly limit seems to have been the Ramokwebani River in South-western Matabeleland. A few gemsbok still linger in the arid north-west of the Cape Colony, just south of the Orange River. The northern portion of the Kalahari Desert is now the chief stronghold of these fine antelopes. Here in the waterless solitudes of these regions they still wander in large troops. They are also found here and there in the desert portions of Khama's country, and occasionally in the lower Kalahari and the western parts of British Bechuanaland.

Description—The gemsbok stands about 4 feet at the withers and is a heavily built antelope, strikingly marked upon the legs, croup, and flanks with black. The belly and extremities are white. The body-colouring is of a warm grey. The tail is long, black and sweeping. The head is remarkable for the strong black markings, which resemble at a distance a head-stall. The horns are long, straight, sharply pointed, and annulated for some distance from the base. Those of the female are longer than the male's, the greatest length hitherto recorded being 47½ inches. The gemsbok, which in South Africa is pursued on horseback, is a notable beast of chase, fleet and enduring. It requires a very good horse to run into one. These animals seem, in the Kalahari, to be perfectly independent of water. When wounded and brought to bay the gemsbok often defends itself fiercely, and ought to be approached with great caution. Its long horns, which it wields most dexterously, have slain many a good dog. There is a persistent legend in South Africa that this oryx defends itself successfully even from the lion's assaults.

H. A. BRYDEN.

OSTRICH—**Classification**—Most systematists at the present day agree in recognising three great primary divisions or groups of the class *Aves*, namely (1) the *Saururæ*, or lizard-tailed birds, represented by the fossil form *Archæopteryx*: (2) the *Carinatæ*, or carinate birds, characterised *inter alia* by the possession of a keel (*carina*) to the sternum or breast-bone for the attachment of the muscles which move the wings in flight, and (3) the *Ratitæ* or flightless birds, in which the keel is absent and the sternum presents the appearance of a raft (*ratis*) rather than a keeled boat.

The Ostrich (*Struthio camelus*) is by common consent the typical representative of the last-named group.

"The genus *Struthio*," says Professor Newton (*Dict. Birds*), "forms the type of one group of the sub-class *Ratitæ*, which differs so widely from the rest . . . as to justify us in regarding it as an order, to which the name *Struthiones* may be applied; but that term, as well as *Struthionidæ*, has been often used in a more general sense by systematists, even to signify the whole of the *Ratitæ*." The most obvious distinctive charac-

ter presented by the ostrich is the possession of two toes only (the third and fourth) on each foot—a character absolutely peculiar to the genus *Struthio*.

As in the present work we have to consider the ostrich chiefly in its relation to sport, it will be unnecessary to refer in detail to its peculiar structure, to its natural history, or to its commercial value as the producer of far-famed feathers. Nor will it be incumbent on us to say much of its relatives, the South American rheas (*Rhea americana* and *R. darwini*), the Australian emus (*Dromæus novæ-hollandiæ* and *D. irroratus*), and the various species of cassowary and apteryx, inhabiting Australia, New Guinea, New Britain, and New Zealand, of which full descriptions may be found in a monograph by the present writer.[1] Attention may be here

OSTRICH.

confined to those species only which enter into the category of sport, and are hunted as "big game" in Africa and in South America.

Distribution—Whether there is more than one species of ostrich in Africa is a question which is not satisfactorily settled. It has been remarked that birds from North Africa have the skin of the naked parts flesh-coloured, while those in the South have the same parts bluish, which has led to the specific separation of the latter form as *Struthio australis*. On even more slender grounds the ostrich of Somaliland, with leaden-coloured naked parts, has been separated as *Struthio molybdophanes*. The statement that ostrich eggs from North Africa are smooth, while those from the South are pitted, is probably to be explained by the fact that the former are usually procured from the Arabs, whose practice it is to get rid of the rough surface, and to improve, as they think, the appearance of the eggs by rubbing and polishing them between their hands with sand.

The most northerly limit of the ostrich's ordinary range at the present day, says Professor Newton, cannot be further than that portion of the Syrian Desert lying directly to the eastward of Damascus. In Palestine it is regarded as a straggler from Central Arabia: and from the confines of Barbary to those of the European settlements in the south it appears to inhabit every waste sufficiently extensive to afford it the solitude it loves, and, to be still almost as abundant as ever in many wide districts where the influence of the markets of civilisation is feebly felt.

Methods of Capture—In the case of a bird whose feathers form so valuable an article of commerce, it is not to be wondered at that many and various methods should be devised for its capture.

In Arabia, as a rule, the hen bird is killed while sitting on its eggs. The hunter, after burying the blood and laying the dead bird again on the eggs, digs a hole in the sand at a little distance. Here he conceals himself until sunset, when the male returns only to share the same fate. (Finsch and Hartlaub, *Vögel Ost Afrikas*, p. 606.)

Between Alexandria and Dernah, Minutoli found that the ostrich hunters resort to the old device of the screen and stalking horse, behind which they conceal themselves, and so cautiously steal upon the birds unawares. (*Reisen in der Libyschen Wüste und nach Ober Ægypten*.) The great difficulty is to get to leeward of the flock, for if once an ostrich winds the hunter, away they all go, and his trouble is taken for nothing.

In Morocco, according to Dr. Leared (*Morocco and the Moors*, 1876), the ostrich is hunted by Arabs, mounted on desert horses. The party advance cautiously against the wind, and with long intervals between each horseman, until tracks of the birds are discovered. These are followed up until the game is in sight. A dash at full speed is then made, until the ostriches turn and face their pursuers. They do this because their pace is interfered with by the action of the wind upon their wings. The gauntlet has then to be run among the armed sportsmen, who either shoot the birds or maim them by throwing at their legs a short thick stick formed of hard-grained and heavy wood. In the use of this implement the Arabs are extremely dexterous.

The mode of hunting the ostrich in other parts of North Africa has been well described by Hartmann in Cabanis's *Journal*, and, so far as the Sahara is concerned, by Canon Tristram in his work, *The Great Sahara*. Hartmann's statement that certain of the Bedouin tribes hunt the ostrich on dromedaries is confirmed

[1] *Ostriches and Ostrich Farming*. By J. E. Harting and J. de Mosenthal. 8vo. London, 1876.

by the observations of Captain Sir Richard Burton, who states that in Somaliland the natives hunt the bird on camels, and shoot it with poisoned arrows.

In the Sahara it is ridden down on horseback, and its capture in this way, says Canon Tristram, is the greatest feat of hunting to which the Sahara sportsman aspires.

The Bushmen, like the Somalis, kill the ostrich with poisoned arrows, or catch it very cleverly in pitfalls, or with the lasso, and the Sukurieh and Hadendawah tribes likewise use the lasso, with which the bird, when once fairly caught, is strangled. (Hartmann, *Journal für Ornithologie*, 1863, p. 318; 1864, p. 154.) A favourite plan is to wait for the birds in a place of concealment as near as possible to the pools to which they come for water, and then, with a gun loaded with swan-shot, to fire at their necks as they stoop to drink, when perhaps half a dozen are laid low at once.

Another plan to which the Bushman often resorts is simpler still. Having found an ostrich's nest, he removes all the eggs, and, ensconcing himself in the nest, quietly awaits the return of the bird, which he shoots with a poisoned arrow before it has time to recover from its surprise at finding him there instead of the eggs.

In Senaar, the Abû-Rôf bring it down by throwing a curved flat stick from two and a half to three feet long, not unlike the Australian boomerang, and made of tough acacia wood or hard zizyphus.

Heuglin states that the Eisahirt people (*Eisahirten*) keep tame ostriches on purpose to hunt the wild ones (just as tame elephants are employed to hunt wild ones), and that they profess also to charm the wild ostrich with the soft notes of a reed pipe.

None of the above-mentioned devices can properly be termed sport; they are rather the methods adopted by those who hunt the ostrich for food or for the value of its feathers.

The legitimate form of sport is to pursue the bird on horseback at full gallop, and, having got within range, to dismount and shoot it with a rifle—a feat requiring both skill and practice. A graphic description of this modern plan, written by Mr. Arthur Glynn of Leydenburg in November 1895, will fitly close this portion of the subject. The country described by him is that portion of the South African Republic lying between the Sabie and Crocodile rivers, bounded on the east by the Lebombo Mountains, and on the west by the Drakensberg. A few years ago this was regarded as one of the best game countries in Africa, and ostriches were fairly numerous. In the year referred to, Mr. Glynn's party made a splendid bag of game, including thirty-one ostriches. These birds were found in a particular locality, attracted by the berries of a creeper which there grows along the ground and to which they appeared to be extremely partial. The *modus operandi* is thus graphically described by Mr. Glynn:—

"After proceeding about three miles we sighted a troop of twenty ostriches. The country was covered with rather low thorn bushes, and slightly undulating but still moderate galloping ground. On sighting the troop at about 200 yards, we immediately gave chase. There was a single bull wildebeeste amongst them. After a stiff gallop of half a mile we got within 70 yards of the troop, so reining in, we both dismounted and fired, bringing down one ostrich and the wildebeeste bull. The latter was hit in the head, and how he was hit at all is strange, for neither of us saw him when we fired. We quickly mounted and continued the pursuit, the ostriches never running for any distance in a direct course, but always turning and twisting, which made it difficult for us to keep them in sight. We were well mounted, and did not fear losing them for want of speed on the part of our horses. After proceeding a mile through bushy country, we entered an open glade about half a mile in length, and let out our horses at their best pace. We went sailing on, neck and neck, regardless of holes or anything else, only thinking of the grandly plumaged birds in front of us, our horses straining every nerve to overtake them, as only old hunting horses know how to run when in pursuit of game. We had now approached within 50 yards, and, jumping down, we fired at two cock birds running separately from the troop, bringing them both down. Hastily mounting, we continued on after the retreating troop, but at this juncture my friend's horse trod in a hole, sending his rider over his head, thereby completely putting him out of the run. My friend immediately jumped up and fired a few long, fruitless shots at the birds, but did not continue the chase, as one of his stirrup leathers had broken. We had an after-rider, but he was considerably in the rear, being mounted on a slow horse. I now continued the chase by myself. For a mile the ostriches gained on me, as they continued to run in a straight line, thereby not enabling me to cut off at any point, but obliging me to keep in their rear all the time. The country here was more open than that we had already passed through, and more broken. I got off twice and fired several fruitless shots, and then continued the chase for certainly two miles without dismounting once. My horse was wet from head to foot, and I was just thinking of relinquishing the pursuit, when I saw five cock ostriches emerge from behind a patch of bush and join the troop I was in pursuit of. This influenced me to continue, and I urged my tired steed on, using my spurs freely. I now got within 100 yards and jumped down, thinking to have a few parting shots and then return to look up my friend. The first shot I fired brought down a fine cock bird, but the second struck

over the others, turning them to the right along a low ridge. They appeared very much exhausted, and ran with their wings spread out. I fired several shots at 120 yards, but none of them took effect. One bullet struck in advance of them, turning them in my direction. I saw they were coming direct for me, so waited until they were close. In the meantime I felt my cartridge belt, and to my mortification discovered that I had only one cartridge left besides the two in my rifle. Anyhow, when the ostriches approached within 15 yards I selected the best looking bird and put a bullet through him. He ran on for about 20 yards and fell dead."

Pace of Ostrich—Two points of interest remain to be noticed: the length of stride in the ostrich, and its rate of speed.

When going at its best pace, the length of stride, as measured by Canon Tristram in the Sahara, varies from 22 to 28 feet, and its rate of speed has been estimated by Dr. Livingstone at 26 miles an hour. He says:—"The ostrich, when feeding, has a pace of from 20 to 22 inches; when walking at other times about 4 inches more. In general the eye cannot follow its legs. I was once able to count the steps by a stop-watch, and if I am not mistaken, the bird made thirty strides in ten seconds. Reckoning each stride at 12 feet, we have a speed of about 26 miles per hour."

Rhea Coursing—The Rhea, or, as it is often called, the South American ostrich, is

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hunted in the province of Buenos Ayres, with half-bred greyhounds, and, in the words of an eye-witness, it is difficult to conceive anything more exciting than a run after one of these birds. Their speed is astonishing; they almost invariably run down, or side on to, the wind, and, if there is a good stiff breeze blowing, as is almost always the case on these pampas, they raise one wing, which acts as a kind of sail, and when this happens few horses or dogs can live with them. It is only by fairly wearing them out that they can eventually be approached; to succeed in this, however, both horses and dogs must be in excellent condition.

Captain C. S. Smelt, formerly of the 98th Regiment, describing this sport on the pampas of Tapalguan on the south-western frontier of Buenos Ayres (*The Field* of June 24, 1876) says:—"I have often seen runs that lasted for an hour and a half, and more. The pace was always most trying, and although there are no fences to be negotiated the riding is far from easy, or free from danger. Frequently large tracts of country have to be crossed which are entirely covered with tufts of high coarse grass, where it is all blind going. In other parts the ground is full of holes, and undermined by biscachas, foxes and other animals, and it is only the wonderful cleverness of the horses that prevents many awkward accidents from happening. Frequently, however, one gets a run over as fine turf as any man would wish to ride over, where the ground is perfectly sound, and nothing is to be met with to prevent the most perfect enjoyment of the sport.

"In running these birds, when the dogs get alongside of them it is wonderful to see the manner in which they double just as a hare does before greyhounds, but apparently shorter and with greater ease, if such a thing be possible."

Use of the "Bolas"—The natives of Buenos Ayres and the Indians never hunt any kind of game with dogs; they use the *bolas* or balls. These are three pieces of lead or hard heavy wood or stone, rudely fashioned into a round shape, cased in raw hide, and attached to thongs of the same material, which are joined together in the centre. In use they are swung round the head with great rapidity, whilst the horseman rides at full speed, and, when within throwing distance, they are launched at the game. They twist round its legs, head or wings, and completely cripple it, and, indeed, often stun it, if one of the balls happens to strike the head or any sensitive part. The distance to which these *bolas* can be thrown, and the wonderful precision which is exhibited in their use is said to be quite marvellous.

Distribution of the Rhea—According to Mr. Ronald Bridgett, H.B.M. Consul at Buenos Ayres, the rhea twenty years ago existed in this province only beyond the Indian frontier, and was plentiful in the provinces of Entre Rios, Santa Fé, and Cordova, as well as in the republic of Uruguay. So great has been the slaughter of these birds, however, during the last few years, for the sake of the feathers, which are largely exported to the United States and

Europe, that one may now ride hundreds of leagues from Buenos Ayres without seeing one. From another source we learn that for some years back the number of birds killed has averaged 400,000 per annum, and as a consequence the species has already disappeared from nearly half the territory of the River Plate.

In Patagonia a smaller species is found known to naturalists as **Darwin's Rhea.** It differs from the common rhea in its smaller size and shorter legs, which are feathered to the tarsus, and in having the plumage mottled, or less uniform in colour. An interesting account of this bird has been given by Darwin in his *Naturalist's Voyage Round the World*, and he remarked that it does not expand the wings when starting at full speed, after the manner of the northern bird, but keeps them close to its sides—an observation subsequently confirmed by Mr. Chaworth Musters in his entertaining volume *At Home with the Patagonians*, 1872.

Of the other species of struthious birds it is unnecessary to treat here, since neither their habits nor the modes of capturing them seem to bring them within the category of sport.

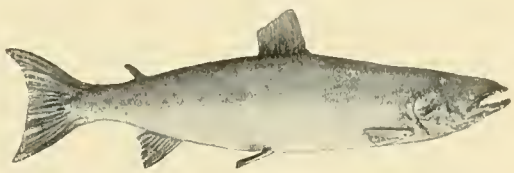
J. E. Harting.

OUANANICHE (*Salmo trutta*) — The ouananiche, falsely called the land-locked salmon, is a salmonoid inhabiting some of the rivers and lakes of the Great Labrador Peninsula. The fish is said to be the same salmonoid which inhabits various lakes in the Province of Maine on the north-eastern corner of the United States territory. There, from the name, Sebago, of the lakes that it inhabits, it is known as the *salmo salar* (Sebago). Whether the land-locked salmon of Maine be identical or no with the Canadian fish, it is known to be somewhat different in some of its habits from the ouananiche—notably in not rising to a fly—and it is of the Canadian fish, the ouananiche itself, that I now write.

Classification—Before going into further details, I must justify the name which I give to this hitherto unclassified fish of *salmo trutta* (ouananiche), instead of assuming that of *salmo salar* (ouananiche), which my friend and angling companion, Mr. E. T. D. Chambers, of Quebec, is inclined to assign to it in his splendid book on the fish, entitled *The Ouananiche and its Canadian Environment*. Mr. Chambers, in suggesting this nomenclature for the fish, accepts the opinion formed by Professor Samuel Garman, of Cambridge, Mass., that the ouananiche and the sea-salmon—the *salmo salar*—are one and the same fish. From this opinion I have always dissented. In my introduction to Mr. Chambers's book, I find that I made use of the following sentences:—

"From the observations I took of the behaviour of the fish, my previous opinion, that the ouananiche was a salmon trout and not a salmon, was confirmed. Except in two cases, all of the fish confined themselves chiefly to jumping, as is the way with all the varieties of sea trout (be they known as whitling, sewen, salmon peel, truff, or merely salmon trout), which we catch in the British Islands from the northernmost island of the Shetland group down to the southernmost extremity of Cornwall. Now, as all salmon fishers know, the *salmo salar* may jump occasionally, and in fact, unless an unusually heavy fish, will throw himself out of the water once or twice—three times even: but his principal tactics lie in making spirited dashes up and down the stream, making the reel screech again, and bringing the angler's heart further up into his mouth with every extra yard of line taken out."

These were my words regarding the fish in 1892, and further experience of the ouananiche—his habits, customs and general appearance—in 1896 have but convinced me more firmly than ever that the ouananiche is not a land-locked salmon, but a land-locked salmon trout.



Ouananiche.

I merely use the word land-locked here in the sense of a fish that does not go up and down to the sea. Land-locked in the rivers and lakes of the Labrador Peninsula he never really is: he has everywhere free access to the sea, and in almost all the rivers and lakes where he has hitherto been found, he would, did he so choose, with his enormous leaping powers, be able to re-ascend to the waters whence he originally came. But with one or two very rare exceptions, when he has been taken in the higher tidal waters of the Saguenay River, the fish has never been found in the salt water. As regards his appearance, I have, within a few days of writing these lines, compared together a Scotch salmon trout and a grilse, or small salmon, of similar weight. The former was so like a ouananiche that I would have defied any Montagnais Indian to have been able to select him from among a heap of the latter fish. The grilse was not like a ouananiche at all. Therefore, after having taken the opinion of an experienced angler who has, like myself, caught *salmo salar*, *salmo trutta*, and ouananiche galore, I am convinced that the correct generic name for this hitherto unnamed species of the salmon tribe should be that with which I have

headed this monograph—*salmo trutta* (ouananiche).

But now to describe the fish and its habits from a sportsman's point of view.

Habitat — The word ouananiche — pronounced *whan-ā-niche* — is the Montagnais Indian name for a small species of the salmon tribe which was, until lately, considered to inhabit solely the waters of the Lake St. John in the northern part of the Province of Quebec, the magnificent rivers feeding the lake, and the upper waters of the mighty Saguenay river by which the lake discharges its flood into the Atlantic Ocean. Although in very recent years Mr. A. P. Low, of the Geological Survey of Canada, has established its presence in many far-away rivers in the hitherto unexplored portions of the enormous Labrador Peninsula, such is the inaccessibility of those rivers, and so many hundred miles of trackless forest separate them from civilisation, that for many years to come it is to the Lake St. John rivers that the ordinary angler will still have to go who wishes to form a closer acquaintance with this very sporting specimen of the salmon tribe.

Habits and Methods of Capture—In these rivers the ouananiche loves to dwell in the most furious and rapid waters. The foaming eddies at the sides of the most frightful rapids, the whirlpools at the side of the main stream just at the foot of some mighty cataract, are usually, after the ice has melted, the best places for the artificial fly, the phantom minnow, or some other small artificial bait. In the still waters of Lake St. John itself, in Lake Tschotogama, which is a beautiful lake far up the Peribonca River, in the Lac à Jim and various other lakes, he is also taken, and all the year round by the Montagnais Indians, and the French Canadian "habitants" of these districts, by trolling with a spoon and with various natural baits. In the winter season, they take him in Lake St. John by nets cunningly set under the ice. The ouananiche, as caught by the angler in the terrible waters of the Grande Décharge—as the main issue of the River Saguenay from Lake St. John is called—vary much in size, according to the season of the year. They can be caught with a fly there from the beginning of June till the middle of August, from half a pound in weight to four or five pounds, all the larger fish being taken in the earlier part of the year. As the season advances the large ones travel round the lake and ascend the great feeders, the Peribonca, Little Peribonca, Ashuapmouchouan, Mistasibi and Mistassini. Further down the Saquenay, some seven or ten miles from the Grande Décharge, both large and small fish can be taken with fly all the season in the awful rapids and whirlpools round the "Ile Maligne;" but none but those who have a stout heart will care to trust themselves, in a birch bark canoe, to run the tremendous rapids, while the return up the river is still more alarming. By far the best fly fishing after the third week in June is to be found up the Mistassini and Peribonca Rivers, where a small Jock Scott used on a trout rod, with a strong trout cast, will be found to give the most successful results. A very good second fly, to be used as a dropper, is the Haggard fly on a No. 8 or No. 9 hook. It is tied as follows: Body, yellow wool with gold tinsel ringing; partridge hackle, and a woodcock wing. These rivers must be ascended with Indian or half-breed guides in birch bark canoes, and a camping-out kit must be taken, which can be obtained at the Hotel Roberval at the terminus station of the Quebec and Lake St. John railroad, 190 miles from Quebec.

The best river of all in August is undoubtedly the Metabetchouan, which flows into the lake from the south side at a point twenty-five miles from Roberval village. It is, however, the phantom minnow rather than the fly which will take the fish in the Metabetchouan at that time of year, when they are running up to spawn.

Dimensions—The ouananiche has rarely been known to exceed 8 lbs. in weight, and it is indeed doubtful if any fish caught with fly or bait, and said to be of 8 lbs. in weight, has ever been weighed in such a public manner that there could be no doubt about his dimensions. For all practical purposes a 7 lb. fish is a very large one indeed, 6-pounders even, although I have caught them, are not at all common. Here is a list of the largest known to have been caught and names of the captors:—

Louis Webbe, of New York, in 1892, with fly, one of 8 lbs.; Mrs. J. B. Lee, at the Grande Décharge, August 10th, 1894, with a spoon, one of 7½ lbs.; Thomas La Roche, a French Canadian guide, with bait, in Lake St. John, one (said to weigh) 8¾ lbs.; A. J. Ritchie, with a small Jock Scott fly, at the Ile Maligne, in July, 1896, one of 7 lbs.

I saw this last fish myself after he had been out of the water many hours. He then only weighed 6¾ lbs., but he had dried up considerably with the sun.

Sometimes a very free rising creature, at others most capricious and hard to move, when actually hooked the ouananiche is probably the most elastic fish in creation. He has an enormous tail for his size, and, making the most tremendous leaps, tears away at the fly in the air like a bulldog shaking a rat. Naturally he often escapes. He is in colour and marking usually just like a salmon trout that has been some time out of the salt water.

His flesh is pink, or rather red, being a different shade to that of a salmon. To be really good, he should be cooked absolutely fresh—within half an hour of catching if possible. If kept a few hours, the flesh becomes woolly.

For any further information on this most lively and game trout of the inland waters of the Labrador Peninsula, the sportsman should turn to Mr. E. T. D. Chambers's book, which was published by Harper Brothers of New York in July, 1896.

ANDREW C. P. HAGGARD.

OVAL, KENNINGTON — The Oval, that is, in its present form of a cricket ground, reached its Jubilee some two years and a half ago. Mention of Kennington Oval itself can be found as early as 1818, when the river Effra, which ran on the south side of the ground at the time, overflowed its banks and caused considerable destruction in the neighbourhood. At that time "The Oval" was a market-garden, as it remained for years afterwards. It was still a market-garden in 1844, when the demolition of the Beehive Tavern at Walworth compelled the members of the Montpelier Club, then the largest cricket club on the south side of London, to seek new pastures.

Their choice fell on the Oval, which was then, as it is now, the property of the Duchy of Cornwall. A lease of thirty-one years was granted by the Duchy in 1844 to Mr. William Baker, a local resident of influence, and one of the best cricketers of the period. An entry in the diary of Mr. Briant, of "The Horns" Tavern, shows that the first sod of the new cricket-ground was laid in March of the following year. In the previous autumn a meeting of the old members of the Montpelier Club had been held with the object of forming a County Club for Surrey. The proposal met with considerable favour, so much so that, at a dinner held in the autumn to give effect to the suggestion, seventy members of the Montpelier Club enrolled themselves as members.

With the club once constituted, no time was lost in getting the ground in order, with the result that 1845 saw the first match played on the Oval. The Mitcham Club had the satisfaction of being selected to meet the Montpeliers on this historic occasion, which was not inappropriately celebrated by an exciting game ending in a tie. Yet the Oval in those early days was not altogether secure for cricket. At one time, indeed, bad management had brought the club to such an enfeebled state that it was quite on the cards that it would be broken up and the Oval, as an open space, lost for ever. The generosity of a few enthusiastic sportsmen happily prevented this, but it was still some time before the danger was really over. The vigorous policy of Mr. John Burrup, who succeeded Mr. W. Denison, the original secretary, in 1847, gave the Oval a new tenure of life. The lease of the ground had just then fallen into the hands of the Surrey Club, and the Duchy of Cornwall was induced to grant a term of thirty-one years to three trustees representing the Surrey County Club. Since that time, though there was a succession of bad years from about 1870 to 1882, when Surrey cricket was hardly of the most attractive, the Oval has enjoyed a well-deserved and latterly increasing popularity. In the spring of 1855 another change took place in the secretaryship. Mr. John Burrup, who had held the post with the most beneficial results to the club for eight years, gave it up to his twin brother William. Under the latter's management the Oval soon underwent several much needed improvements. Hitherto the accommodation for players as well as members had been of the most primitive character. All this was changed in 1858. In that year the pavilion which has just been taken down to made way for a larger and more commodious structure was built, mainly through Mr. W. Burrup's personal influence. For some fourteen years it remained practically in the same condition, while the Surrey eleven were at their best and Surrey cricket was in its palmy days. But in time Mr. William Burrup's tenure of the secretaryship came also to an end. His resignation suggested the advisability of having a paid instead of an honorary secretary. The selection of the executive fell on an old Harrovian, Mr. C. W. Alcock, who at the time was well known both as a cricketer and a football-player. Just then Surrey cricket was in a bad way altogether. Young players had been to a great extent overlooked, and, as a consequence, for some ten years or so the Surrey eleven had more than their fair share of ill-success. The visit of the first Australian team to England in 1878 had some little to do with the renaissance of the club. The memorable match between England and Australia two years later brought the Oval again prominently before the public notice. The same year saw another great addition to the accommodation on the ground in the shape of the terraced banks, which have provided such an excellent sight of the game to hundreds on the occasion of big matches of late years. Meanwhile, the experiment of an open stand had been tried with such success that this was in time roofed in and still another covered stand provided. A new wing was added to the pavilion and the accommodation for members as well as players materially increased. Latterly, the rapid increase in the number of members compelled the committee to consider seriously the necessity, not only of a large and more up-to-date pavilion, but also of a club house with provision for catering for the public frequenting the ground. The result has been that both the old pavilion and stand have come down, and in their place are in course of erection new buildings, to be completed by the commencement of the season of 1898. For a long time better quarters have been needed, and in view of a match-list increasing year by year the only wonder is that some steps were not

taken before. At the present time, in addition to the large number of inter-county fixtures (amounting to thirteen first-class without count of second-class) played at the Oval, there are also matches against the Universities, as well as the time-honoured match between Gentlemen and Players. These are augmented in the case of the visit of an Australian team by England and Australia, and one or more engagements against the touring combinations from which hardly a season is free. Its convenience of access from most parts of London has made the Oval popular with all classes of the cricket-loving public. In the match between Surrey and Notts, in August 1892, in the three days 63,763 persons paid for admission. This is the largest number so far recorded at a cricket-match in England. Originally some 11 acres in area, the playing part of the ground is now about 9½ acres. With the one exception of Lord's the Oval has been the scene of more historic cricket-matches than any ground in the kingdom, which is as much as to say in the world.

C. W. ALCOCK.

OVIS AMMON — **Nomenclature** — In dealing with this sheep it is necessary to discriminate between the true Ovis ammon and the so-called Ovis ammon of the sportsman. About the former, which is an inhabitant of the desert ranges of Southern Siberia, but little was known until lately, whereas the latter, which should be termed more correctly "**Ovis hodgsoni**," is the familiar "**Ovis ammon**" of the Himalayan sportsman, and is known to the Tibetan as *Nyan*.

Horn Measurements and Shape—As regards the true *Ammon*, recent measurements give the length of the horns up to 63 inches round the curve, with a circumference at the base of 20 inches, whilst the record length of *Hodgsoni* is 50½ inches, and girth at base, 19¾ inches (Rowland Ward's *Horn Measurements*). It will be noticed that though the length of the horns in the two species is very different, the girth at the base does not seem to be proportionately so—a fact which gives to the head of *Hodgsoni* a very massive appearance. The horns are rugose, especially at the base.

As far as the shape of the head is concerned, in the horns of the true *Ammon* the lateral twist which is so prominent a feature in those of *Poli* is observable, whereas the horns of the *Hodgsoni* terminate with a forward and upward curve, close to the head, and but slightly turned outwards. In fact, an instance is known to the writer in which the eye is so completely covered by this upward turn, that a lateral view must have been an impossibility to the animal. A circumstance which renders it difficult to get an absolutely accurate measurement of the horns of these sheep is the fact that in almost all the heads of old rams that are obtained, a portion, often some inches in length, is broken off the tips of the horns, the result of fighting.

Habits — The habits of both species are very similar, the rams separating themselves from the ewes during the hot months, and living in isolated herds or groups. Two facts have been

OVIS HODGSONI.
Av. height at shoulder, 48 *in. Av. horn meas.*, 43 *in. Max. horn meas.*, 50½ *in.*
(*From sketches supplied by the author.*)

especially noted by sportsmen who have pursued the *Ammon*: first, that while several good herds may be found upon ground not apparently very favourable, the hunter may subsequently search a locality for weeks without seeing a track, though the country may appear in every way suited to them; secondly, that it is the old rams which are the most difficult to find, and that herd after herd of females and young may be encountered before any ram worth shooting is met with. Not infrequently the sportsman has to leave the ground without having added the coveted trophy to his bag, though, if he is lucky, or knows where to look for them, he may come upon a herd of rams, any one of whose heads would amply repay him for the trouble he has taken.

Ovis hodgsoni—As very little is known of the Siberian sheep, we will now turn to the **Ovis hodgsoni**, the "**Ammon**" of the Himalayan sportsman. This is one of the largest known sheep, though the horns of the true *Ammon* and of *Poli* are longer. A full-grown ram stands, on an average, about 12 hands,

and weighs from 200 to 300 lbs. In colour they are dark brown on the back, with a slightly defined medial line, shading off into a lighter tint on the flanks and quarters; the tail is very short. An old ram has a very distinct ruff of light-coloured hair on the throat, while the neck of the female is of a darker shade, her horns being thin, and seldom exceeding 20 inches in length. By any one unaccustomed to the appearance of the *Nyan*, great difficulty is at first experienced in appreciating the probable length of the horns which are being scanned. This is due partly to their colour, and, more especially, to the peculiar curve which makes it very hard to see the horns clearly from a distance. Thus the inexperienced sportsman will not infrequently be very much disappointed when he comes to measure the head of the animal that he has successfully stalked and shot; let us hope that this is the cause of so many heads being obtained of which the possessor has no reason to be proud, and which would have been much better left to grow into legitimate trophies. Though the actual length of the horns is so difficult to determine, there is no mistaking an old ram when he is sighted, both from the darker colour of his body and from the ruff of long white hair on the throat, which is a very noticeable feature in a patriarch. A fact that is

OVIS HODGSONI HEAD.

(*From sketches supplied by the author.*)

very striking in the form of these mountain sheep is the almost deer-like slenderness of the legs, which seem quite disproportionate to the sturdy body which they support; but any one who has seen a herd racing away after his shot has been fired, will realise the fact that they are eminently well adapted to the work of carrying their owners over the rough stones of the desert hills where they are to be found.

Stalking—The shooting of a fine specimen of the *Ovis ammon* has been described as "The Blue Riband of Himalayan Sport," and there is no doubt that the pursuit of this animal is one of the most fascinating that any sportsman can desire; even the most *blasé* may well be excused an access of "buck fever" as he levels his rifle at the shoulder of a veteran ram; such a splendid fellow does he look with his white ruff and his massive head. By many writers he has been described as being very difficult to stalk, but it is probable that though his sense of sight and scent, more especially of scent, is very acute, the chief difficulty lies in the shifty winds that prevail at these altitudes, notably in the vicinity of snow, and in the extremely open nature of the ground where he feeds and takes his midday siesta. As is the case with most wild animals, there is always one wary sentry taking his turn to watch while the others sleep. Should there be any sort of cover, or should the wind hold steady, the writer has not found him more difficult to approach than other mountain animals; but should a puff come at your back, even though you may be at a distance of half a mile, up will go all the heads in an instant, and you will be lucky if you get a shot that day, as a *Nyan* travels a good deal quicker at, say, an altitude of 17,000 feet, than does any human being!

Weapon—As regards the weapon to be used, every sportsman knows what suits him best, but the vitality of this sheep is extraordinary, and the writer has known a case where the bullet from a ·450 express did not miss the heart by an eighth of an inch, yet the ram went off with the rest of the herd apparently unhurt, and did not lie down until he had covered eight miles of rough ground and snow-slopes; though (fortunately for the sportsman, who was watching through his glass, and might otherwise have thought that he had scored a miss) he very soon turned away from the remainder of the herd, a sure sign with most animals that they have been seriously wounded. In fine, the sportsman who pursues the *Nyan* in his native fastnesses amongst the snowy summits and many-coloured plains of Ladak and Tibet, as he gazes on the lifeless form and massive head of the ram that he has successfully found, stalked and shot, will feel that he is well rewarded.

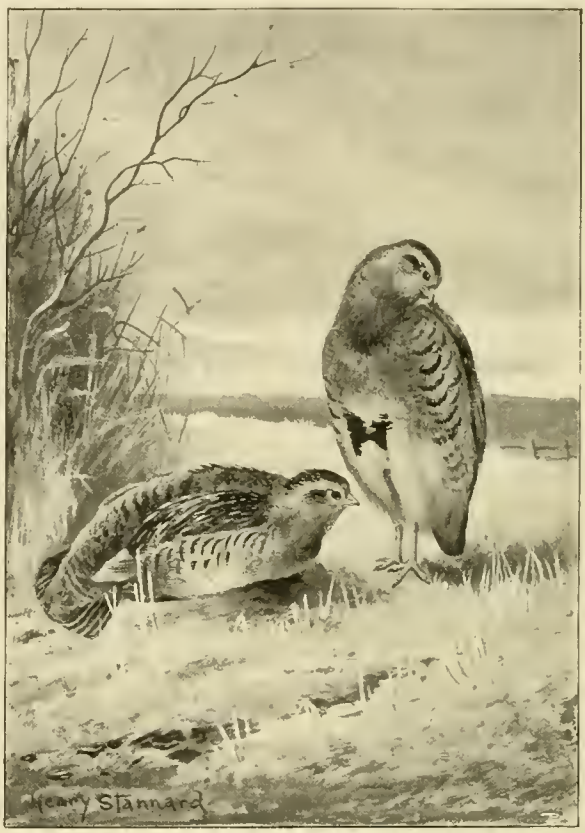
F. E. S. ADAIR.

PARIAH HUNTING—People must be very hard up for sport when they take to spearing pariah dogs. Not that one of these beasts cannot give a good run, but because it is a somewhat ignoble and rather cruel sport. Pariahs are a great nuisance at times in India; they

yelp at and annoy Europeans, but they also act as scavengers, for they are seldom fed by their owners, if they have any. Every year they are poisoned by order in dozens, yet they never seem to diminish, and when a party of griffs undertakes to ride and spear them, they act beneficially to their comrades—the Europeans.

The method is much the same as in jackal spearing. A pariah is separated from the others and the chase begins. Many possess considerable speed and turn and twist in the most approved style. A horse, to run one down successfully, must not only be speedy but handy, obeying the slightest touch of rein or spur. Although in my opinion very ignoble, yet it is not a bad training for a horse for the noblest hunting in the world, that of the boar. Now and then, but very seldom, villagers object to their dogs being killed. If any objection is made, it is as well to give in to the prejudices of the natives. When greyhounds have been kept and have been visited by the Pariah sluts, a strong, swift, sturdy race of mongrels has been produced, notably in the Moulmein and Tenasserim provinces, where they are used, not only to guard the villages, but also to run down and kill hog-deer.

F. T. POLLOK.



PAIRING TIME.

PARTRIDGE—REARING AND SHOOTING—Partridges found in this country are of two kinds, the common Grey Partridge (*Perdrix cinerea*) and the French, or Red Legged variety (*Caccabis rufa*). Partridges follow the plough, and although found in considerable numbers in grass countries, yet arable land is necessary to support a large stock. Some preservers maintain that partridges and pheasants require the same insect food, and that a large head of pheasants cannot be maintained without a corresponding diminution in partridges. Partridges are seldom confined in aviaries for the purpose of producing eggs, though a considerable number are annually reared under foster mothers. Wild birds pair from the middle of January to the third week in February according to the locality and the season, and begin laying towards the end of April. Eggs from nests that are cut out by the mowing machine, as well as those that are laid on the boundaries, or in public situations, should be collected and hatched under foster mothers.

There are two modes of increasing the stock of partridges on a manor—one by the exchange or purchase of eggs, and the other by turning down Hungarian birds. Exactly as in the case of pheasant rearing, the practice of buying eggs indiscriminately is open to grave objections, and the remark applies with double force to the case of partridges' eggs. Rather than buy eggs of strangers, we much prefer to recommend the purchase of Hungarian birds. These can be bought at about nine shillings a brace in December. If time is not a matter of great moment, the stock of birds may be increased by turning out a few Hungarians every year, and shooting lightly for the first two or three seasons. The earlier they are turned out the better. Birds should always be turned down at night in the neighbourhood of their water and food supply. If this does not exist, provide both. On the night that your keeper turns them down, let him first separate the sexes, and then place about four hens in one spot, and the same number of cocks at a distance, repeating the process while the birds last. This will give them the chance of mating with English birds the same season. In preference to hand-rearing partridges, some keepers adopt the plan of placing the eggs that have been picked up under other wild hens. An experienced keeper tells us that the nest of a wild bird may always be safely made up to twenty-three eggs. Of course the eggs thus transferred must be as nearly as possible in the same state of incubation. On large estates it is a good plan to change eggs found on one part for those taken from another nest three or four miles distant. English partridge eggs placed in a red leg's nest seldom do well, but English birds make capital mothers to the young French birds. When foster mothers are

Partridge

required, a cross between bantam and game are the best. These will take twenty-five eggs each, and should hatch 90 per cent.

Partridges can be reared easily enough if a supply of fresh ants' eggs can be got for them twice a day. It is best if the coops can be placed where ant hills abound. In addition, they will require mixed food three times a day, a little at a time. Diarrhœa is the chief source of loss amongst young partridges, and is frequently to be traced to the use of sour food and stale eggs. After they are three weeks old, there is little trouble in rearing them. When the birds are old enough to move from the rearing ground, which is at about six to eight weeks, they should be taken, in lots of from ten to fifteen, and placed by the side of roots in different parts of the estate out of hearing of each other. This prevents the birds from packing. If there are wild birds in the immediate neighbourhood, they will probably join each other unless they are too thick on the ground, which must be avoided. If turned down in larger lots, they are apt to pack and go off the manor.

Some preservers obtain their change of blood by removing the wild birds from one part of the estate to another. The ordinary coop trap is set, and the birds are taken while at feed. Kill two out of three cocks, and remove the remainder to the spot where you intend to turn them out. Keep them still under the coop and feed them sparingly. In two or three days they will get quite tame. Then go in the evening, tilt up the coop, and the birds will walk out quite quietly. Poachers take partridges with long nets, and many sorts of vermin destroy them and their eggs (*see* PRESERVATION OF GAME.)

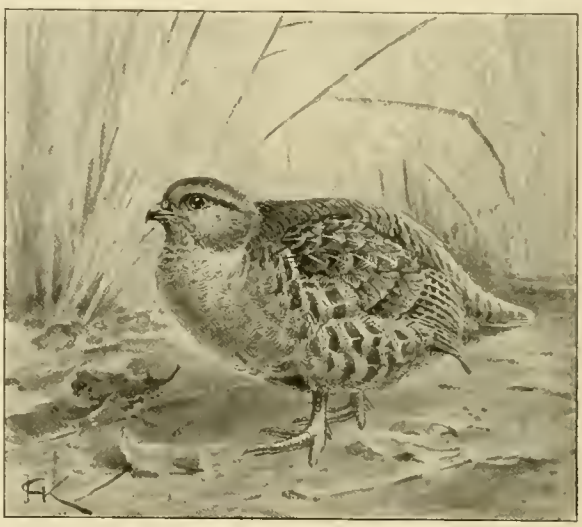
SHOOTING — **Driving Partridges** has become of late years so popular, and has been found to be practicable in so many parts of the country where formerly it was unheard of, that it is fast superseding the older method of shooting over dogs. From some points of view this is to be regretted, because the working of well-trained dogs adds pleasure to sport.

Where fields are large and birds numerous, so that the party consists of many guns, the best plan is to half-moon each field, having one or more beaters between each gun according to the ground to be covered. The line should be stopped as seldom as possible, but there should be under-men with retrievers in attendance, whose business it is to collect runners and birds that are not immediately recovered. These men, however, should be out of gunshot and in rear of the line. In some counties characterised by small fields, deep valleys, thick and high fences, and few roots, driving is impossible, but good sport can be had by a couple of guns walking up the birds. They should be accompanied by a steady pointer, a couple of retrievers who can face thick fences, two men to carry the game and beat, and two markers. The latter should be smart, active men, who can climb trees and have the eyesight of hawks. On such occasions, as on all others where you are following partridges, silence on the part of every one is the first essential. A noisy keeper or talkative gun is fatal to sport. When you have settled which way you intend to work, send your markers well forward. They must take up their position on high ground or in the tops of some convenient trees, placed well apart so that the areas covered by their vision do not overlap. They must keep their eye on every root field, brake, rough pasture, or favourite fence where the birds are likely to pitch. Give the markers plenty of time before you attempt to find birds. If you flush birds and shoot, it is not necessary that the keeper should shout "mark," but if you do not shoot, he may shout—once. The report of the gun or the one cry should suffice to put the markers on the alert. Each marker should be provided with a whistle, as partridges hate the human voice, but do not take much notice of a whistle. When either of the markers has marked birds, he should blow his whistle once, to which signal the keeper replies with a single whistle. Unless you are following birds you yourself have sighted, it is best to go at once to the marker and find out where the birds are. It is not a good plan to holloa to him across two or three fields and let him shout back at you. In the first place, he cannot explain exactly where the birds lie: and in the second place, your shouting makes them wild. Having ascertained the position of the birds as nearly as possible, go at once for them. If they are in a fence, put one gun on each side: this is most deadly where roots are scarce. Having reached the spot where the birds pitched, the marker should blow his whistle once: if the birds do not rise, try your pointer and follow him up till you find them. In such a country as we have described, the day's sport will almost entirely depend upon the competence of the markers, and their competence will be a matter of patient training. Some men can never be made good markers. They will neither notice the flight of birds, nor yet be able to describe the spot where they pitched, in the rare case of their having caught sight of them. A good marker always has his eyes and ears open. A covey may be flushed by some distant labourer, or by a blackberrying party, or the marker may see birds feeding on the stubble, or hear them calling: occasionally, also, a towered bird may fall within his sight. In any of these cases a single blow of his whistle will call the attention of the keeper and inform him that he has information to give. It is always best to work the same ground in the evening that you have worked in the morning. You will do no good with fresh birds after four o'clock. If satisfied from your keeper's observations, or from your own, that there are plenty of birds on the beat, but you cannot find them, try every corner, especially round corn ricks, old quarry pits, rough brakes, and old lanes. After a wet, rough night, birds are often found packed together anywhere where they can find shelter, while on hot days they prefer dusting in shady lanes and open fallow.

As an instance of how partridges will sometimes elude the gun, we may quote the case of

a farm which was shot over in the autumn of 1895. This farm was well stocked, and the keeper, two days before, had put seventy brace off one stubble, yet on this day scarcely a bird could be found. The beat was along the seashore, and by chance a single bird was knocked down and fell over the cliff. An underkeeper, sent down to recover it, put up covey after covey from the shingle. They came up on the highest ground and a good bag was the result. It was a very hot day, and the birds had gone down to the cool sand and the shade of the rocks. When nearing the end of your beat, send the markers back, and let them take up similar positions for marking the birds, which will now be driven towards them from the opposite direction.

Driving For driving, many people like a sprinkling of red legs. They go singly over the guns, and generally rise before the English birds. A manor should be large for driving, with farms from 300 to 500 acres each, mostly arable, intersected with belts of fir, or high hedges. A thousand acres is about the right size for a good day's "driving." To make a good bag, the end of September is as good a time as any, as then the birds know their way about. It is not wise to make the drives too long, for, after the birds have risen the second time, they are nearly sure to go back over the beaters in order to reach their own ground. There should be two sets of beaters, from twelve to twenty in each set. While one lot are driving, the other lot should be getting the birds together for the next drive. The beaters should approach the guns in a half-circle, with the most experienced men on the flanks and a good way in front. To prevent the birds breaking away, a man or two with flags should be placed on each side, a long way behind the guns; these will often turn the birds into the next beat. In an open down country, with no fences or belts to drive over, pits are sometimes dug at intervals about forty yards apart in a row, and planted with brushwood. Each pit is netted in with sheep-netting, and the brushwood is kept clipped; these pits answer well, not only for driving, but for sheltering the birds in rough weather and for nesting. As a rule, the stock kept for breeding purposes on the manor is too small. To secure a good quantity for driving, your keeper should be able to show you 100 brace of birds on the 1st of February, and, if the beat is a large one, say, 1,000 acres, still more birds should be left. Although partridge driving is becoming every year a more popular form of sport, yet we are convinced there are many parts of the country where it is not yet introduced, but where it might be practised with considerable success. We will quote from the letter of an excellent sportsman, who has had considerable experience in partridge driving in what would ordinarily be called a bad country, and who has favoured us with his views on the subject. "The country referred to is hilly, the roots few and far between, and the fields mostly stubble. On such land the chief requirements are a good stock of birds, and a head keeper who knows his work. For driving purposes a far larger stock is absolutely necessary than for shooting over dogs. Having had a favourable breeding season, and acquired a fair stock of birds, make up your mind in August what part of your shooting you intend to drive, and do not fire a shot there till you begin driving in the last week in September. Shoot the outsides as much as you like, it will send birds on to your driving ground, but treat the latter as sacred. A month before you intend to drive, ride carefully round each beat, note the position and condition of each root piece, especially the hedges, for it is on these that you must depend for your sport. In a country with small fields, thick fences, and knolls, it is impossible to drive a big bit of country at one drive. Birds are sure to take the fences, and, when pitching on small fields, fallow, meadow, or stubble, will soon run together. Under these circumstances, it is not possible to get the deadly scattered drives so often met with in the eastern counties. It is a good plan to go out with your keeper over your driving ground a few times on off days, of course without a gun. Drive all the birds you can into the roots, and then drive them over the fences. It will accustom the birds to the fences, and



An Old Partridge.

will enable you to determine their ordinary line of flight. As a rule, it takes a great deal to drive birds against their will, especially away from their feeding ground. Unbroken coveys must be driven in the direction they would naturally take; when scattered, you can put them where you will. Having settled your plan of campaign with your keeper, stick to it, unless the wind is contrary. When good cover exists, the beaters may be divided into three parties. Ten or twelve will be under the head-keeper, who must have thoroughly good men for the flanks. Two other parties, of four or five men each, must be under the control of competent under-keepers. While the head-keeper with his men drives the birds from the roots to the guns, the under-keepers and their men must keep on sending birds into the fields which are next to be driven. These men must watch the flight of the birds from each drive, and, if they do not go into the roots, get round them quickly and put them there. The success of the drive will depend greatly upon the efficiency with which this manœuvre is carried out. The head-keeper should have driven as many birds as possible into the first roots by the time the guns arrive. He must not do this too early, or the birds will run out. Meanwhile the under-keepers have driven their birds to the next drive, and are on the look-out for birds coming from the first drive. The same process is repeated for the rest of the day. The guns being in their places, blow your whistle once; the keeper should then direct his men silently over the field, at once pushing his flanks well forward. There must be *no* noise among the drivers; no man ever stopped a bird that meant to go back by shouting at it. In the first drive (supposing there are no Frenchmen) the bulk of the birds will come over in coveys, and the result will not be very deadly, but if all has gone well they will fly to the next root field and scatter.

"You will probably have arranged in your plan to drive the second root field back to the first, and then the first again as before. By the time you have picked up your game and got into your places for the second drive, the drivers, under the direction of the head-keeper, will be in theirs. After finishing this drive, you return to the first roots, in which you should find not only the birds you have sent back from the second field, but those which have been driven there by your under-keeper's party. It will be best then to leave this ground and return to it in the evening, when you will probably have many more single birds. By the time you have driven field one the second time, your under-keeper should have driven into fields three and four, which you treat in the same way. It is far better to return over the same ground in the afternoon, rather than go on fresh ground after big coveys. Good bags are made out of single birds, not out of big coveys. You will probably find on a well-stocked manor, at the end of the day, that you have had some eighteen to twenty small drives, averaging from six to eight brace, so that the bag should be from 100 to 150 brace. But the guns must be able to hit a driven partridge. In a good season you will probably be able to have a small second day on the same ground, or to put in a few drives when covert shooting. Birds must not generally be expected to stand driving three or four days in the season, as they will in the eastern counties, for the ground will not carry so many birds, and owing to the number of large thorny fences to which they run for protection, they are lost to the drivers."

There are a few golden rules applicable to all driving:—

First. Let the drivers stand some hundreds of yards from the first drive until the guns are in position; otherwise their talking will drive every bird away.

Second. Do not talk or show yourself when going to take your stand. If ladies are out, you should try and impress this on them; you may sometimes succeed; at any rate, it is worth trying.

Third. If the fence is low and you have to keep down, see that your loader stoops also. It is no use screwing yourself into the form of an "S" if you have an erect loader behind you.

Fourth. Before blowing your whistle to start the drivers, look round and see that your field is clear of keen agriculturists; they would spoil your sport and might get shot.

Fifth. If, during the drive, birds go back, or break out, let them go, rather than shout at the keeper.

Sixth. If it can possibly be avoided, do not drive from one root field into an adjoining one, as it is much harder to pick birds up.

Seventh. Always, if possible, have your guns in line.

Eighth. Always drive down wind, if possible; if this is not possible, drive across the wind, with your down-wind flank well up.

Ninth. If you deviate from your original plan let your under-keeper's party know.

Tenth. Impress upon your keeper, though this may be your most difficult task of all, the absolute necessity of keeping his flanks in proper position. They must be well advanced, but not too much so.

CHARLES C. TUDWAY.
JOHN F. HALL.

SPECIES SUITABLE FOR ACCLIMATISATION—The partridges form a large portion of the family *Phasianidæ*, the second family in the order Gallinæ.

If we include the Francolins and Odontophorinæ (American partridges) we have the enormous number of 152 separate species: of these by far the larger number are inhabitants

of tropical climates, and therefore are omitted from this article. Of the few species available for introduction, the first is the so-called Snow-grouse of India, or Lerwa partridge.

Lerwa lerwa. This fine bird is of the size of a grouse, and chestnut red below, variegated with greyish stripes and bars above; it inhabits the high ranges of the Himalayas and is a very sporting bird. It would do admirably if turned out in Scotland, and as it flies strongly would prove a most welcome introduction.

The next to be considered are the Snow partridges, *Tetraogallus*, of which there are six species; they are all large birds, the size of a female capercailzie, and, coming as they do from very high mountainous regions, would live easily in Scotland and the north of England. Of all the partridge tribe, they are the shyest and wildest, and certainly the very best of all species not yet established in this country. The Caucasian and Himalayan Snow partridges, *Tetraogallus caucasicus* and *T. himalayanus*, are the best to attempt to introduce, as their homes are easier to get at than those of the other four species. Every sportsman ought to strive to get these grand birds introduced, for they undoubtedly are the finest and best of the partridge tribe. We next come to the Red-legged partridges, *Caccabis*, of which our well-known bird is a good example. There are altogether five species of these, only two affecting us, namely, the Arabian Chuckar, *Caccabis melanocephala*, and the Greek partridge, *Caccabis saxatilis*. The former would, from its large size and more desert habitat, be excellent to introduce into all the sandy parts of the south coast of England, while the Greek partridge would do well in the rocky parts of the north of England and Scotland. The two Sand partridges, *Ammoperdix heyi* and *A. bonhami*, now claim our attention; they come from Palestine, Syria, Persia, and Afghanistan, and therefore would be very desirable sporting birds if introduced into sandy places. Of the Francolins, which come next on our list, three only of some fifty-two species are suitable for our climate and conditions. These are the common Francolin or Black partridge, and the Chinese Francolin, *Francolinus francolinus* and *F. chinensis*, and the so-called "pheasant" of the South Africans, *Pternistes nudicollis*, a large grey bird with a naked red throat. Of the three true partridges, not natives of England, the Bearded partridge, *Perdix daurica*, is the only one worth considering. As it comes from Siberia, it would most likely be a much better bird than our common partridge if introduced into Scotland. Of the American partridges, only three or four would do well here. The painted or Valley quail, *Oreortyx pictus*, ought to do well in the south of England, and the Californian quail, *Lophortyx californicus*, in the Hebrides. *Ortyx virginianus*, the Virginian colin, ought to do in most parts of Great Britain, and has several times been introduced in numbers, but somehow did not find favour with sportsmen, and was allowed to die out.

Of all these birds, however, the very best are the Snow partridges, and every one ought to try and get them introduced.

WALTER ROTHSCHILD

PARTRIDGE, DISEASES OF—The diseases from which partridges suffer resemble in the main those of the pheasant, but as the former are not reared and brought up in artificial surroundings to anything like the same extent as the latter, their diseases are less numerous and less is known about them.

Those forms of disease, such as enteritis and tuberculosis, &c., which are associated with the presence of some bacterial organism, are especially favoured by man's interference with the natural condition of things. They are intimately connected with overcrowding, too close confinement and inter-breeding; all of which aid the transference of the disease from one bird to another, and, by lowering the average of health, render the bird a more easy prey to disease.

On the other hand, if proper care is taken, it is comparatively easy to keep birds under control free from the grosser parasites, such as thread- and tape-worms; but when these do make their appearance, they naturally spread more quickly amongst birds in a state of semi-domestication than amongst wild ones.

Partridges, like many other gallinaceous birds, suffer from tuberculosis. For this there is no remedy. Judging by the analogy of the fowl, the tubercle bacillus of birds differs from the corresponding microbe in man and cattle, both in its morphology and in the characters of the cultures which may be prepared from it. It is important to destroy by burning—or burying in quicklime—the bodies of birds that have fallen victims to this disease, and to try to strengthen the survivors by the introduction of new and vigorous stock.

Fowl enteritis, sometimes termed the "Orpington Disease," is also not uncommon amongst partridges, and may be acquired from pheasants or fowls. It is an acute infectious disease, accompanied by diarrhœa and drowsiness, ending in the course of a day or two in death. The walls of the intestine become congested and lined with a yellowish grey mucus, crowded with bacilli, which also occur in the blood. This disease spreads rapidly, as the infective material passes into the soil and is readily taken up. Where possible, the affected birds should be destroyed and their bodies burnt.

Young partridges, especially when overcrowded, not infrequently become blind. This is due to a form of purulent ophthalmia which is very infectious, and often destroys fifty per cent. or more of the young birds. The eyelids first become inflamed, and the inflammation spreads until the eye becomes completely closed up. It may extend into the lacrymal duct and throughout the nose, and often ends in the death of the sufferer. Another disease of the head which affects partridges is in appearance and symptoms very like the "canker" of pigeons.

The most destructive disease prevalent amongst partridges is the "gapes," which is caused by the presence of a Nematode worm in the trachea or wind-pipe, and in the larger air passages of the lungs. The "worm" is known as *Syngamus trachealis*, v. Sieb., and popularly as the gape- or forked-worm. It always occurs in couples, a male and a female, and the posterior end of the male is firmly and permanently attached to the generative pore of the female, which is situated about $\frac{1}{3}$th of the body length from the head. The females are from $\frac{1}{2}$ to 1 inch and the males about $\frac{1}{4}$th to $\frac{1}{3}$rd of an inch long. Both male and female are attached by their mouths to the walls of the windpipe, &c., and their combined organisms have the form of a Y.

The worms are red in colour, which is unusual in the group to which they belong, but they probably derive their colour from the blood of their host. They were first recorded at the end of the last century in the United States of America, and it is not unlikely that they were imported from the New World.

Young birds are most usually attacked, but not exclusively. The symptoms they show begin with a whistling cough something like a sneeze, and this is followed by a marked gaping or yawning, accompanied by a stretching of the neck, and in bad cases by the appearance of a foamy mucus at the mouth. There is a loss of appetite, general dulness, and a ruffling of the feathers. Unless the cause be removed, death usually occurs, though the old birds show much more power of resistance than the young. The number of couples which proves fatal varies; two or three will kill a young bird, whilst it takes as many as twenty-five to thirty to asphyxiate an adult pheasant.

The disease spreads very rapidly; the female worm is crowded with eggs which in a short time contain fully formed embryos. The birds frequently cough them up, and they are at once seized and eaten by other birds in the neighbourhood. Either in this way, or through the

death and decay of their host, the embryos, after rupturing the walls of their mother's body, reach the ground and hatch out in water or damp earth in from one to six weeks, according to the temperature. They are then pecked up with the food. The eggs are capable of resisting adverse circumstances, such as drought, to a remarkable degree ; even when swallowed up by earth-worms they are not destroyed, and if an earth-worm has eaten them and is in its turn eaten by a bird, the latter becomes infected with the parasite.

The amount of loss occasioned by this parasite is considerable ; the worm attacks a great variety of birds, and is especially fatal to poultry. Crisp has estimated that in England half a million pullets are annually destroyed by it ; and, speaking of partridges, the authors of "*Shooting*," in the Badminton Library, state that it is not unusual in certain seasons to find three or four nearly full-grown birds lying dead together where a covey has brooded for the night. Hundreds of young partridges have been found during harvest dead or dying from this most destructive complaint.

Such remedies as seem efficacious are described under the article on the Diseases of the Pheasant. These are difficult of application to the comparatively wild partridge, but the conditions of breeding lessen this difficulty in the case of the pheasant.

Three other Nematodes infest the partridge : *Heterakis papillosa*, Bloch, and *Trichosima longicolle*, Rud., live in the intestine and cæca, the former in very great numbers, and *Ascaris compar*, Schrank, has been found in the intestine. They apparently do no great amount of damage. A tape-worm, *Tænia linea*, Gœze, is also recorded.

ARTHUR E. SHIPLEY.

PECCARY (*Dicotyles*)—The peccary is the small but very fierce wild hog of America, where it is found all through the tropical and sub-tropical forests. There are two species, the white-lipped (*labialus*) and the collared (*torquatus*) ; the latter alone reaching the southern border of the United States. My own experience with peccaries has been gained in hunting them on the banks of the Nueces River in Texas.

Peccaries can sometimes be killed by ordinary still-hunting ; and as they often spend the night in caves or hollow tree-trunks, leaving a sentinel posted at the entrance, they can be killed by lying in wait at such places. More commonly, however, they are followed with dogs. In the thick forests the hunters have to go on foot ; but in Southern Texas, where the peccary frequently haunts the dry, open *mesquite* woods, they should be followed on horseback ; and this is of course much more fun. Although only weighing about sixty pounds, the peccary has extremely sharp tusks, and is a wonderfully game fighter. It does not rip like the wild boar, but inflicts exceedingly severe bites, and not only fights to the death with reckless courage against any odds, but at times makes entirely unprovoked attacks upon both man and beast. Untrained dogs, even those of large size, will speedily be killed by a single peccary, and if they venture to attack a herd will be literally torn into shreds. A big trained dog, however, can, single-handed, kill a peccary, and I have known the feat performed several times, the dog seizing the savage little pig either by the back of the head or between the haunches. Two or three well-trained dogs will bring a whole herd to bay, barking and threatening, but never actually seizing, while the peccaries stand in a compact mass, their backs hunched, their bristles standing, and their teeth chattering like castanets.

In Texas they are not often found in large droves ; and in hunting them the riders and hounds travel leisurely to and fro over a likely country until a trail is found. This is then followed, the active cow-ponies dodging at full speed among the spiny tree-trunks and huge cacti. When the game has once been put up, the run is not long. In spite of their tiny legs and feet, peccaries go very fast for a few hundred yards ; but they are both short-winded and bad-tempered, and after a couple of minutes' galloping they usually come to bay, by preference backing up in a cluster of bushes. They then charge recklessly at man, horse or dog ; and, if not stopped, inflict very ugly wounds.

PECCARY.

Av. height at shoulder, 20 *in.*

It is easy to kill them with either a rifle or revolver, although a man approaching them on foot with a revolver must exercise caution unless he is a very good shot. Personally, I found the long rides through the semi-tropical landscape, the sudden, headlong, scurrying runs, and the death stand of the savage little beasts, very good sport, even though firearms were used ; but the true way to kill them would undoubtedly be with the spear. They could probably be speared on horseback in most cases, and they are so small that a skilful man could readily kill them single-handed on foot. As I know nothing about the spear, however, I should strongly recommend that the first trial be made by two men acting together. For convenience in finding the game, dogs are always useful, and indeed probably indispensable.

THEODORE ROOSEVELT.

PEEWIT, LAPWING OR GREEN PLOVER (*Vanellus vulgaris* or *cristatus*)—*Kiebitz*, German; *Dixhuit*, French; *Kiewiet*, Dutch; *Pavoncella*, Italian. This is the most abundant of the plovers (*Charadriidæ*) in temperate Europe, where familiarity diminishes the admiration it deserves for exceeding grace and beauty. The plumage is very similar in both sexes, the female differing only in having a slightly shorter crest than her mate. In winter the throat, which in summer is black, becomes white, the crest shorter, and the black head tinged with brown. Though this bird is usually classed as a resident species, being commonly seen at all seasons in most parts of the British Isles, it is in truth as regularly migratory as the rest of its kin. The birds bred on British ground move southwards in autumn, and are replaced by others reared further north. The northern limit of winter habitat runs not far north of the Moray Firth, for lapwings are wholly absent from Caithness between the

PEEWIT.

middle of October and the middle of February, though exceedingly abundant there in the breeding season.

The lapwing is one of the best and most industrious friends to agriculture, its food consisting exclusively of worms, grubs, insects and small molluscs. In some recent books on sport directions are given how to approach and shoot it; but one of the old school of sportsmen would as soon think of making his target of thrushes or larks. It is true that, when persecuted, the lapwing becomes shy and watchful; but by nature it is more confiding than any other plover, especially in spring and summer, and its wavering flight and conspicuous colour render it an inglorious quarry. In addition to their habits as an admirable land police, these birds deserve more consideration than they receive by reason of the abundant supply of "plover's eggs" which they afford. Concern is sometimes expressed lest the heavy toll levied each spring on the nests should unduly reduce the stock; but there is no danger of this, provided the parent birds are not shot down. The race is replenished by second layings, which do not suffer so much as the first from egg-gatherers, owing to the growth of young corn and herbage concealing them better. It is much to be regretted that the consignments of lapwings to the London market have greatly increased of late years. The flesh is very inferior to that of the golden plover, though hundreds of lapwings are eaten annually in restaurants under the name of the greater delicacy. *It is the only wild bird of which civilised man devours habitually both eggs and parents.* It is a cruel, yet not uncommon, sight to see strings of lapwings hanging above baskets of their eggs in poulterers' shops; and sportsmen are earnestly entreated to refrain from shooting the pretty peewit.

It is not uncommon to see the peewit paying grievous penalty for its beneficial love of insects and slugs by imprisonment in a garden, of course pinioned. It is a barbarous practice to deprive a bird of its leading characteristic—flight—especially when it is considered how strong is the migratory impulse in all the *Limicolæ*.

HERBERT MAXWELL.

PELOTA—"Pelota" means literally "ball." But, as now understood in Spain, the Basque Provinces of France, and in Spanish-American countries, the word stands mainly for the spectacular sport or exercise in the large public halls built for the purpose, of which Madrid has three or four. Originally the game was played with the hand, naked or gloved, or with a stick, and had some affinity with fives. Now the **cestus**, or stout basket-work gauntlet, is used universally for public performances. The cestus was a Basque invention, and was used first at Ascain in France. It has revolutionised the old pastime by enormously increasing the propelling power of the players and the carrying force of the ball, and also by giving scope for niceties of manipulation.

Pelota, in some parts of Spain—notably Bilbao—is a close rival with the bull-fights for public popularity, and the expert pelota player readily earns £20 in an afternoon's game of less than a couple of hours' duration. Long before it fell into the hands of professionals comparable to our football players, the enthusiasm it evoked in the Basque districts was such that the priests and parishioners of the different villages were wont to make long journeys across the mountains to respond to challenges for championship. One is rather sorry to remember that these good clergy even then put money on the game. This may perhaps be held to be the beginning of the abuse which now, wherever the game is played in Spanish countries, detracts somewhat from the outsiders' interest in it. The players are in fact paid only out of the betting percentages: the bookmakers are employed by the Pelota Hall Companies as registrars and intermediaries

in the bets made. As may be supposed, under these circumstances, there are ways of getting at the players themselves, and for them the temptation to play dishonestly is not always resistible. For this reason the affection of the pelota public for such players as are absolutely trustworthy is extreme.

The game is played in a covered and glass-lighted hall, with a cemented area that may be as much as 80 yards long by 40 wide. At least two walls are required, though four might be used. Of the two, the playing wall proper is the length of the breadth of the playing field: the long side wall is of course the length of the hall itself, and both are about 12 yards in height. The third wall, opposite to the playing wall, though very useful in the modern game, may be considered an addition to primitive pelota. If a fourth wall (completing the hall's enclosure) were used, there would be no accommodation for the public, who at present here mass in boxes, galleries and on chairs on the level. A line is marked about a yard from the floor on the two chief walls and also about a yard from the top of the walls. The ball is only in play between these two lines. When it hits the wall above or below them, it is a fault, and the opposing side scores a point towards the fifty which is commonly the number of points in a game. The playing pitch is marked with straight lines, 4 yards apart, parallel with the playing wall. Four players are usual to a game; a back and a forward to either side. Each wears the cestus, or sickle-shaped basket, fitting to the forearm, with glove for the fingers. Both arms may be used, though it is only the finest players who are equally skilful with either arm. If there were two side walls instead of one, both arms would be called upon to about the same extent for those tricky straight deliveries which skim the side wall.

The ball is of solid rubber, small, and weighing about 4 ounces. The velocity with which it is used makes it a dangerous missile, and accidents, more or less serious, are not infrequent. Two judges are customary to a game. They sit near the boundary lateral playing line, and fulfil the part of referees. The starter of the game stands midway between the seventh and the eighth of the spaces already mentioned as belonging to a field some 80 yards in length; the ball must, in its initial rebound, fall between the fourth and the seventh space, or a point accrues to the opposing side, which then begins in its turn. With a fair start, it is for the opposing forward to deal with it. The game may then be said to be in full swing.

It is astonishing with what accuracy, force, and celerity the Basque professionals, who have played pelota and little else from boyhood, whirl the ball to and fro. Whenever an opponent fails to take this on the rebound, or returns it out of play, a point is scored, and a fresh start takes place. But often for many minutes at a time there is no break, though the ball flies from the one wall the whole length of the hall to the other facing it without touching ground; in spite, too, of the difficult angles of its rebound and the deftest of quick low hard strokes only just above the playing line. The spectators, at such times, shout themselves hoarse with admiration or anxiety, if they are deeply interested in the dollars of the game, and this is in a critical stage; the players perspire considerably, though clad only in flannels. The variety of the strokes—overhead, underhand, with the arm at full stretch, &c., and the pitting of craft against skill in the delivery and acceptance of balls that cross from wall to wall, make the game very fascinating to watch. The back stroke, in particular, given with the back to the playing wall, seems to the mere spectator an exceptionally remarkable achievement..

There are many technicalities and elaborations in pelota as now played by the professionals: but the above may suffice as a general outline of the game. If it were introduced into England, a great future would be assured to it.

C. Edwardes.

PERCH—

Measurements, etc.—Length of head $3\frac{3}{4}$ to 4, of caudal fin $5\frac{3}{4}$ to $6\frac{1}{2}$, height of body $3\frac{3}{4}$ to 4 in the total length. *Teeth*—villiform in the jaws, on the vomer and palatine bones, but absent from the tongue. *Fins*—dorsal spines rather strong, increasing in length to the third, which slightly exceeds half that of the head; they decrease in height from the fifth to the last; second dorsal fin lower than the first. Pectoral two-fifths the length of the head, but not so long as the ventral. Second anal spine slightly longer than the first and rather above half the length of the rays. Caudal with rounded lobes. *Scales*—ctenoid, 15 or 16 rows between the lateral-line and base of the ventral fin: 75 rows descend from the back to the lateral-line. *Colours*—bright olive-green along the back, becoming lighter beneath, where it is often yellow or dark yellowish-white, occasionally tinged with pink. About five transverse black bands descend from the back down the sides, the first from just in front of and below the two first dorsal spines; the second from the fourth to the ninth; the third from the base of the last two and commencement of the soft dorsal; the fifth below its end, while a sixth often exists at the base of the caudal fin. Sometimes these bands arise from two roots, or are Y-shaped. First dorsal fin grey, with two black spots, one anteriorly, the other over its last spines.

Day, *Fishes of Great Britain and Ireland*, vol. i. p. 3.

[*See also* Angling.]

PHEASANT REARING AND SHOOTING—Coverts are generally stocked in these days with hand-reared pheasants. The wild hen pheasant is a bad mother, and will very seldom bring up a large brood. Pheasant eggs are procured either by purchase or by picking up the wild birds' eggs, or by collecting those laid in pheasantries. The last plan we consider to be the best and most economical. The reasons are obvious. Where a pheasantry ex-

ists and the required number of hen pheasants have been obtained, the rest of the stock may be killed down. When the birds are in the pheasantry, not only are they and their eggs safe from vermin, but they can be fed much more economically. In feeding wild birds in the woods, the keeper will use much more food, for, besides satisfying the wants of his pheasants, he will have to stop the mouths of the squirrels and wood-pigeons, &c.

Pens—The two plans of construction which find most favour with pheasant rearers are: the one, a series of small pens, in each of which one cock and five or six hens are confined, and the other, the large pen enclosing a considerable area of ground, where any quantity of birds proportioned to the size of the pens may be kept. The large pens, which appear to be superseding the small, are generally erected on ground near to the keeper's house. If in a covert, a spot is selected where there is a good undergrowth; if in the open, the ground must be suitably planted with privet, small spruce, or

RING-NECKED PHEASANT.

any close-growing shrub. The size of the pen must be proportioned to the quantity of stock required. Half an acre of ground will accommodate forty hens, which should mean between 700 and 800 birds brought to the gun. A gamekeeper of large experience describes his pen as follows:—

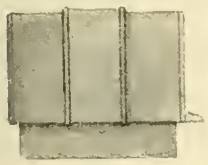
"I have about an acre of ground sheltered from the north-east winds, including a clump of spruce and other trees. This ground is enclosed with fir poles about 9 feet high, which are boarded up 3 feet from the ground, the remaining 6 feet being covered with galvanised wire netting. In this pen I put eighty hen birds, which are renewed every season by exchange with some other preserver. I always let our own cock birds go in as they like. The plan answers well, as the pen is in the middle of a wood. I get about 2,000 eggs by the 10th of June, and rear about 75 per cent. of them, after which I turn out the old birds." It is very important that the sides of the pen, up to the height of 3 feet, should be cased in all round, to prevent disturbance to the birds; but this may be effected with branches of spruce quite as well as with boards, a less expensive method. We have known pens of this construction used for some years without change of ground. Lime was freely used to sweeten the ground, and, as the pens were empty half the year, it remained wholesome. But we should advise that the pen be removed to a fresh spot every fourth or fifth year. If, in constructing the original pen, it is borne in mind that the whole structure will have to be shifted periodically, it will obviously occur to the carpenter to use half-driven staples instead of nails, and to make the attachments as few as possible, consistent with firm work. Small pens must be shifted much more frequently than large. It is best to fill the pheasantry before the shooting season commences, because by this means a stock of perfectly healthy birds is secured. No good keeper would think of permitting an injured bird in the pheasantry. Hens are best caught at their feeding places in hazel rod traps made by the keepers. Every pen ought to contain a heap of powdered oyster-shells, and, if it is not a light soil, sand for dusting should be provided. In addition to ordinary grain, green food is essential to the health of the birds, and we have found it a good practice to supply the keepers with surplus garden stuff and mangolds to scatter about in the pen during winter and spring.

"When birds begin to lay, which in ordinary seasons is about the middle of April, eggs must be collected daily and placed in safety. At the same time, up to the end of May, all eggs of wild birds should be gathered and added to the stock. After the middle of June the penned birds can be turned out, and care must be taken for a time to see that they are well supplied with food. Penned pheasants may be expected to give on an average twenty strong chicks.

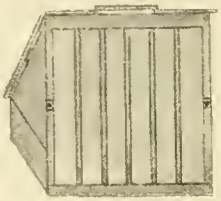
"**Broody Hens**—Wherever pheasant-rearing is pursued on an extensive scale, it will probably be found necessary to purchase a number of broody hens; these hens should not be heavy, and should be good sitters and mothers. The black red game is one of the best, and a first cross with the Wyandotte, which is a good sitter, will produce an excellent variety. When a keeper buys hens from a farmer, he ought always to take them off the nest himself, so as to be sure they are thoroughly broody. A well-known keeper writes:—"I find the best plan with freshly-bought hens is to set them temporarily in very dark boxes in a quiet, cool barn, where nothing can disturb them. The best plan for feeding them is to place a number of coops in rows just outside the barn, on grass. This is a better plan than tethering them. When they are thoroughly quiet, which is generally after three days, I take them to regular sitting-boxes, which are on the turf. If the turf is fairly light and porous, I simply beat a depression in the ground and place in it a little soft hay, beating it down so that the hen does not get entangled and break the eggs. I generally contrive to keep one hundred broody hens in advance of those actually sitting on eggs. The first eggs are set about April 23rd, and then I continue setting batch after batch, every three days, through the laying season. For the first three days I allow my hens ten minutes for feeding, and gradually increase the time allowance, till at the end of sitting they have about three-quarters of an hour. The time allowance must depend a good deal on the weather. As soon as you find the eggs of one batch are well chipped, select a time when the hen is quietly feeding, and take three-quarters of the chipped eggs from each nest. Place these eggs in an incubator to hatch; but leave each hen three or four eggs so as to make a mother of her. By this means fully ten per cent. of the young birds are saved in hatching. Young birds hatch out well in the incubator, and are immediately placed in the drying-box at the top. It will generally be found that they are ready to go out at the same time as those that have been hatched under the hens. It is important to observe how the hens behave with the few chicks hatched under them, as this enables you to pick out the best mothers. The coops to receive the young birds should be placed on level turf not contaminated by poultry, as close to home as possible. The coops and guards are placed in rows at intervals of two yards with the fronts facing east, so that the hens and birds get the morning sun only, and not the meridian sun, which is too powerful. In this position give the birds three days, making up any birds that may have been lost during that time by trampling, &c.

"My rearing fields, let me say, are at a distance of five miles, and there the empty coops are all placed ready in rows to receive eighteen broods of eighteen young phea-

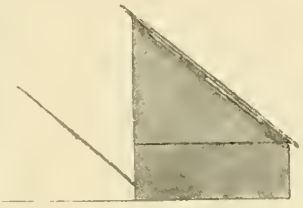
sants and eighteen mothers. The horse and light spring-van being got ready, and my appliances for carrying young birds being brought out, I have four men at my disposal. These take out of the coops six hens in rotation, and place them in separate compartments in numbered crates. Then one man moves to the front of each coop and runs the brood into it and slips on the front board. He then catches the birds very gently, and drops them through a small hole in the sliding-lid of the box used for transporting them to the field. When all the broods are thus secured, the appliances are quickly loaded, and the van is drawn off to the rearing ground. On arrival, the process of loading is reversed, and the birds taken from the transport boxes are placed in the coops with the fronts on. The proper mother is dropped in to each lot of birds, and is allowed to brood them for, say, ten minutes. The fronts are then taken off and the birds fed, but if the weather is rough they may be guarded a few hours longer. It is unwise to remove the guards when the winds are rough, as you may lose young birds by so doing."



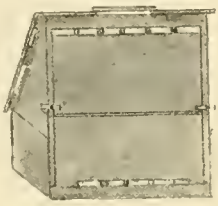
Coop showing Sliding Back.



Coop with Front Board off.



Coop showing Front Board ready propped for stopping Birds in.



Coop with Front Board on for the Night.

An acre of ground is the usual allowance per hundred birds, and the selection of this ground is a matter of great importance. Birds must never be reared on stale ground, nor should any field be used where the coops have already been placed within a period of three years. In-breeding and stale ground are two of the chief causes of the mortality of young pheasants. Keepers like to get their young birds into a good feeding pasture which has been well eaten off, and so let young birds and young grass grow together.

Feeding—No water should be given at any time to the young birds, nor to the hens, for moist food, consisting of Embden groats or boiled maize, is given at least once a day. There are many different foods and different ways of feeding, especially since the introduction of so many artificial meals, &c. We give one specimen of the feeding adopted by a most successful rearer:—"Our birds are fed five times a day, commencing at 6 A.M. and ending at 6 P.M. The food at first is composed chiefly of hard-boiled eggs, rubbed through a sieve, and a small proportion of Spratt's medium game meal. This must not be soaked, but steamed, so as to make it soft, but not wet. To these must be added sharps, sufficient to make the whole into a crumbly paste. This food is scattered broadcast among the coops. When the birds are a fortnight old we begin to add well-boiled rice with the Spratt's meal. We now discontinue steaming, and add a little seconds flour to the sharps in the proportion of one to two. We also boil old rabbits' or sheeps' heads and hinges; mince the meat and add to it the food, using as an alternative Spratt's best granulated greaves, which in wet seasons is perhaps the best food of all." Many keepers use custard with boiled rice and chopped green food, and some prefer canary seed and maccaroni boiled and chopped as a change. When coops are in the rearing fields, it is best to keep them facing east while the birds are small, irrespective of rough weather. If the ground be bare of shelter, branches of spruce or some tree in leaf should be placed near every coop, so that the young ones may have shelter from the sun as well as from the hawks. The birds will remain in the rearing ground till from five to seven weeks old.

Diseases—One of the greatest sources of mischief to young birds is the use of stale food. A lazy keeper mixes his food overnight, so as to save trouble in the morning. The food becomes tainted, and thousands of birds are lost annually by eating this sour indigestible stuff.

Gapes are common among young birds. When the disease first shows itself, lime-dust blown into the coops early in the morning is a good remedy. Subsequently, garlic, chopped fine, should be given once a day, mixed with the food. Ground ginger added to the last feed at night is also recommended.

Diarrhœa is generally due to stale eggs or sour food. It must be stopped at once. Arrowroot mixed with the food soon checks it.

Cramp is one of the worst diseases, especially on sandy soil. In hot Mays, with frosty nights and north-east winds, it is almost sure to make its appearance. The best treatment we know is to move the birds at once on to some sheltered low-lying field on a heavy soil.

Ophthalmia and Blindness seem to be more prevalent in some districts than in others. They may be due to heat and exposure, but we are inclined to think that in some instances the disease is induced by rearing the birds on a new clover field. The pollen from the rye grass gets into their throats and eyes, producing a sort of hay fever. If the birds are being reared under such conditions as these, move them away.

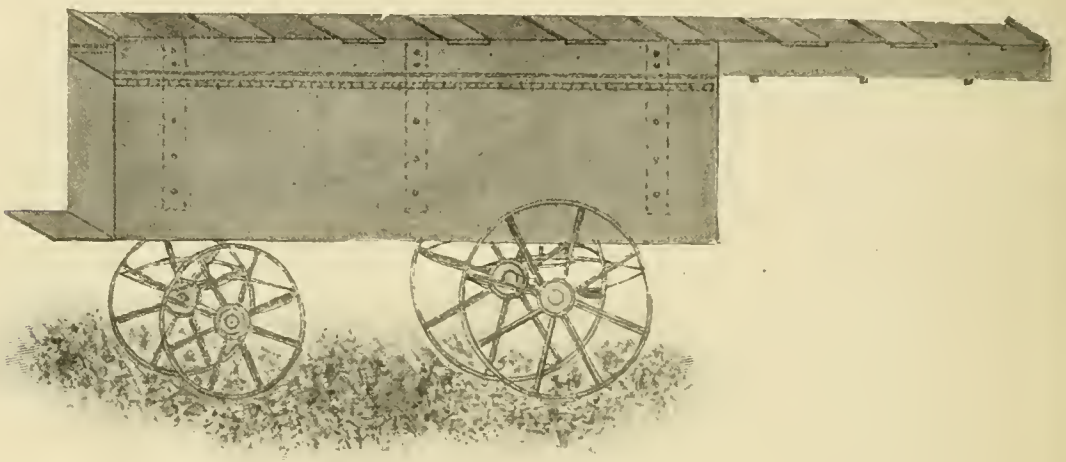
Foster Mothers—The food of the hens while birds are young should be steamed or boiled, for, if fed with hard uncooked food, the young birds are apt to get killed by swallowing it. Whole maize is very fatal in this respect.

Common Pheasant.

Good food will consist of two parts of finely kibbled maize and one part wheat. The whole is put into a bucket with boiling water just to cover it. When cool, sharps are added sufficient to thicken. Barley meal may occasionally be substituted for sharps.

In ordinary cases, where only a moderate number of birds are brought up, it is the usual practice to move the coops from the rearing grounds direct into the coverts; but when a very large number of birds are reared, and there is a danger of stale grounds, the rearing ground may be situated some miles away. In the latter case, many keepers prefer to shift their coops in the first instance to some fields in the immediate neighbourhood of the coverts. After the birds are about five or six weeks old, there is trouble in getting them to enter the coops, so it is unwise to defer the process of moving longer. The plan adopted by the authority already quoted is thus described:—

"On the night when I propose to move my birds, I have thirty loose bottoms ready. One man takes the front of the coop and raises it gently till it rests on the back part of the bottom board. He then draws the coop with its contents on to the board, and, whilst he is doing this, another man, kneeling down at the back of the coop, works his hands underneath it to prevent the hen and birds from being nipped. A screw-driver should always be carried to tighten the buttons and make the front board secure. The bottom board should be as tight as



Wagon for transporting Coops.

possible, and should be made fast to the coop by string. When the required number of coops are ready, the wagon is led between two rows, and they are carefully lifted in on either side. As they are placed in position in the wagon they should be tied firmly. Everything requires to be done expeditiously, and yet carefully. On arrival at the field, take the coops off carefully, and place them in rows. If the field is very bare of cover, range them by the hedges.

"The operation of liberating the birds on their new ground must be conducted with equal care. When the coops are unloaded and in position, first untie the strings so as to release the bottom board, and turn one of the wooden buttons on the front. Shortly after, when the wagon has left, one man goes carefully round and turns the other front button, quietly moving the front board about six inches from the bottom. When daylight dawns he will find his birds draw out as readily as if nothing had happened. I may say that by adopting these precautions, which to some people may appear too minute, I have removed thousands of birds with merely a fractional percentage of loss."

When the birds have been a week or two in the field they will begin to draw into the coverts, and then the coops may be dragged in too.

The Feeding—As the birds gradually get older, the soft food is replaced by Indian corn, tail wheat, &c. In certain spots in the wood, low frames of woodwork are erected by the keeper, and these are thatched with unthreshed barley straw. These not only form shelter for the birds, but keep them amused. Barley straw may also with advantage be scattered along the principal paths and rides.

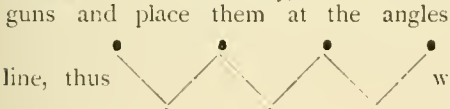
Many keepers summon the birds to feed by whistling, but this is a practice which we cannot approve. Not only may poachers avail themselves of it to collect birds, but we are also of opinion that it tends to render the birds tame. The best pheasant-rearers that we know are in the habit of broadcasting the grain and feeding the birds in silence.

Dangers from vermin and from poachers attend pheasants in all stages of growth (*see* Preservation of Game).

SHOOTING—**Coverts** vary very much in their adaptation, natural as well as artificial, for the purposes of pheasant-shooting. Amongst the natural advantages we place, first, a good supply of water, which tends to keep the birds at home, and, second, position on the side of a hill, which ensures good sporting shots. Amongst other important advantages are small coverts placed in the centre of the estate, and a sound undergrowth of copse wood. The craft of the forester is often a valuable auxiliary to that of the keeper, and if underwood is allowed to get hollow through the ravages of rabbits or through general neglect, the difficulties of a keeper are greatly increased. If, however, a covert has fallen into bad condition, and the head of game is large, much may be done to show pheasants by bushing corners and flushing places with cut evergreens, such as spruce or laurel. One practice which keepers adopt is much to be deprecated, that of splashing saplings at the rising places. In every covert there should be good roosting trees; if spruce does not exist, tell the forester to allow the ivy to grow on a certain number of trees. When a wood is cut it will often not hold game

for three or four years; in such a case, rake over the soil and plant rape, mustard, or buckwheat.

Beats—Keepers make a mistake in not having more corners or stands; long waits are fatal to beating and annoying to the guns. The maxim to be impressed on the keeper should be "little and often." There should never be a sound in covert except from the person who is directing the beaters. Beaters should always be numbered, and should keep the same relative positions, so that they can be called by their number. The position of the head keeper is in the centre of the line of beaters, and he is supported at each extremity by the best men he has got. A good line is imperative. Beaters should wear emigrants' smocks. In small coverts, and where there is a large head of game, it is best to have two or three sets of beaters, and so drive the birds backwards and forwards, and avoid delay. To beat birds from covert over a given point, the best possible way, if the covert admit, is to form the beaters into a horseshoe, keeping the flank men well forward. The end men should then halt and let the centre bring the birds forward. It is a mistake to hold back the beaters when birds start to go back. If the birds are going forward in too great numbers, let the beaters halt, but do not stop them because birds are going back. Drive birds away from home, if possible. There is no fear of their not returning to the coverts in which they roost, and the chances are you get better shots. If birds are likely to fly low, strain a piece of wire netting about forty yards from the end of the beat—a line of feathers or "sewin" will do as well. If a number of pheasants are driven to another covert, shoot that covert as quickly as possible. In other words, follow your birds. Always, where birds are numerous, and the ground admits of it with safety, have two lines of guns and place them at the angles of a



line, thus with the sporting shots at the back. Many extra birds will then be accounted for. Good high birds go far to making shooting a success.

It is a good plan, where turnips or very rough grass, heath, or gorse adjoin a flat cover, to drive the birds into it. Get the guns in line, and, if the piece be a large one, say forty acres, halt them half way through it. Let the beaters then go round and bring the birds back. They will always go home, and generally fly high.

The best way to avoid all suspicion of partiality towards the guns is to let them draw for places and move down two each time.

To the guns we would say, "Do not depend upon your host to provide you with a loader at the last moment." Either bring your own loader, or intimate beforehand that you will want one. Kill all birds in front of you, if you can, and do not take birds for choice which have passed you. Always kill cocks in preference to hens. See that your loader has two cartridges ready between his fingers—if he is a smart loader, he will.

Stops—The passing of the Education Act has rendered it almost impossible to obtain boys as stops, but their place is ably filled in some parts of the country by elderly females. The number of stops may be materially reduced by the use of the sewin.

Dogs—In a big day's covert-shooting retrievers are not much used, but there should be some out with under-keepers in order that every wounded bird, if possible, may be collected.

The tendency of modern shooting is undoubtedly towards excess. A great number of birds is neither conductive to good shooting nor to sport. There must be a lot of low flyers, and a large proportion are good for nothing after they are shot. On the other hand there remains the argument that the public profit by the low prices at which pheasants are placed on the market.

CHAS. C. TUDWAY,
JOHN F. HALL.

SPECIES SUITABLE FOR ACCLIMATISATION—The pheasants form a section of the family *Phasianidæ*, which is the second of the four families of the great group *Gallinæ*. Though convenient to treat the pheasants as a distinct section of the *Phasianidæ*, it is structurally almost impossible to separate them from the partridges, as the spurfowls (*Galloperdix*) and the bamboo partridges (*Bambusicola*) form connecting links. However, for all practical purposes, they are easily distinguished. The pheasants are a large group, as they number fifty-nine species, all of which are sporting birds, and good for table purposes.

These fifty-nine species are divided by ornithologists into twelve genera, of which *Phasianus*, containing the true pheasants, with twenty species, is the largest.

In addition to these fifty-nine pheasants, there are eleven other birds which, although really peafowl, are called pheasants. These are the seven peacock pheasants (*Polyplectron* and *Chalcurus*) and four argus pheasants (*Argusianus* and *Rheinhardtius*). These eleven so-called pheasants may at once be dismissed from a sportsman's point of view, and from any scheme of acclimatisation, for they do not fly well, and come from tropical marshy climates.

We have therefore only to consider the fifty-nine species mentioned first, and will commence with the true pheasants of the genus *Phasianus*.

This genus is at once distinguished from the other pheasants by the very long wedge-shaped tail and the absence of a crest.

Of the twenty species of true pheasants, sixteen are more or less like the familiar common pheasant (*Phasianus colchicus*), and will cross freely with it and with each other and produce fertile offspring.

We will now take these sixteen species in detail:

1. **Common Pheasant** (*Phasianus colchicus*)—This bird was certainly introduced into Western Europe by the Romans, though it is doubtful if they, as alleged, introduced it into England. Its true home is South Russia, Transcaucasia and Asia Minor, but it is now, both wild and semi-domesticated, found all over Europe. However, in Great Britain, France, Holland, parts of Silesia, and North Italy it is now practically, if not quite, impossible to find a pure bred true "Common Pheasant," as, through the introduction of other pheasants, the true race has been swamped, and we find only hybrids showing traces of three or four different species, which might almost be called mongrel.

The pheasant in Europe is a polygamous bird, a cock in a wild state mating with from four to ten hens, each of which lays fifteen or twenty eggs; but in its own native country it is said more often to pair than not. This is, however, thought to be an erroneous statement.

2. **Persian Pheasant** (*Phasianus persicus*)—This pheasant is nearest allied to our "Common Pheasant," but differs from it in having nearly white wing-coverts, very narrow bars on the tail, and very dark red on the sides of the belly. It inhabits Western Persia and Transcaspia. This pheasant would be a first-rate species to introduce, as it is a very wild and shy bird, is extremely hardy, and flies high and fast.

3. **Prince of Wales' Pheasant** (*Phasianus principalis*)—This very fine pheasant inhabits North-East Persia and Afghanistan, and is much like *Ph. persicus*, but differs from it in the whiter wings, the maroon patch under throat and the wide purple bars on the flanks, as also in the orange-red upper tail coverts. It is one of the best pheasants to introduce into our coverts and has twice been imported, but not in sufficient numbers, so that it was never turned out.

4. **Zerasthan Pheasant** (*Phasianus zerasthanicus*)—This only differs from *Ph. principalis* in its plain brown scapulars and the much narrower borders to the breast feathers. It would be equally desirable to introduce, but, living in a more inaccessible locality, is most likely impossible to procure.

5. **Yarkand Pheasant** (*Phasianus shawi*)—This again is nearer to our common pheasant, but differs in the yellowish-brown rump and whitish wing-coverts. It would prove a fine addition to our coverts and might easily be imported—*via* India.

6. **Siberian Pheasant** (*Phasianus tarimensis*)—This is very closely allied to *Ph. shawi*, only differing in the greenish rump and buff wing-coverts, and is not worth considering for introduction.

7. **Oxus Pheasant** (*Phasianus chrysomelas*)—This pheasant from Amu-Darya is one that would, if introduced, be a great addition to English sport, for it is hardy, strong of flight, and ought not to be difficult to procure. It is easily recognisable by the sandy-brown colour of its feathers and the very broad green bars on almost all feathers of the underside.

8. **Mongolian Pheasant** (*Phasianus mongolicus*)—This is the pheasant which of all others sportsmen ought to strive to introduce into this country, for it is the hardiest, largest and most sporting of the true pheasants, besides being by far the best for the table. It is readily distinguished from all others by the rich red of the flanks, the green gloss on the plumage, the very broad white ring round the neck, and the white wings, in addition to which it is very large and full feathered.

9. **Stone's Pheasant** (*Phasianus elegans*)—This magnificent pheasant is distinguished from all others but *Ph. versicolor* by its almost green colour, except upon the flanks and shoulders, and there are only three specimens in existence. It cannot, therefore, be regarded as adequately known.

10. *Phasianus vlangalii*—This Tibetan pheasant is distinguished by its pale sandy-red upper surface and golden buff flanks. It would be worth introducing, but, considering its inaccessible habitat, this is hardly likely to be accomplished.

11. **Prejvalsky's Pheasant** (*Phasianus strauchi*)—This pheasant differs from *Ph. elegans* by having fiery orange-red flanks instead of dark green, and dark red scapulars with whitish buff centres. It is a fine, distinct species, and would do well in Scotland and Wales, but its far-off home in Gansu will prevent its introduction for a good many years.

12. **West Chinese Pheasant** (*Phasianus decollatus*)—This differs only from *Ph. torquatus* by the absence of the white collar or neck-ring, the dark green crown of the head, and the green, not purple, borders to the breast feathers. It would do very well in any part of Great Britain, and should not be very difficult to import. It would not, however, be of any special value for sporting purposes, and is therefore better excluded.

13. **The Ring-Necked Pheasant** (*Phasianus torquatus*)—This pheasant was introduced into the western half of the Old World as early as the year 1513, when it was brought to St. Helena. There it thrived wonderfully, and affords good sport even now. It has also been introduced into New Zealand and other places. The date of its introduction into England is doubtful, but the result has been that now there are no pure-bred pheasants left in England, though the resulting cross-bred birds are much larger and finer both for eating and sport than either the ring-necked or the common pheasant.

14 and 15. *Phasianus formosanus* and *Ph. satchenensis*—These two pheasants are closely allied to the ring-neck (*Ph. torquatus*), and only differ in slight colour details. They would be no benefit to the sportsman or fancier if introduced, as they differ so slightly that by cross breeding they would rapidly disappear.

16. **Japanese Pheasant** (*Phasianus versicolor*)—This very distinct pheasant, which is at once recognisable by its dark green breast, was introduced into Great Britain by the Earl of Derby in 1840. It is a most hardy bird, and, when crossed with either *Ph. torquatus* or *Ph. colchicus*, produces enormous birds of great beauty, and excellent for the table. They fly, moreover, splendidly, and give great sport.

We now come to the four remaining species of true pheasants of the genus *Phasianus*. These are very different from the type of the other sixteen, and, if crossed with any of them, the hybrid offspring are unfertile. Although very fine sporting birds, therefore, unless introduced in great numbers into a cover where there are few or no other pheasants, they will not repay the trouble.

17 and 18. *Phasianus elliotti* and *Ph. humiæ*—These two very fine white- and copper-coloured pheasants are more suited for the aviary or as garden pets, as they do not, when turned into a cover, increase in sufficient numbers for sporting purposes, and fly badly.

19. **Copper Pheasant** (*Phasianus sæmmerringi*)—This magnificent copper-coloured pheasant, with the long-barred tail, is a native of Japan, and is eminently suited for introduction into our coverts, but it has not as yet been found possible to import it, or breed it in sufficient quantities for turning down.

20. **Reeves' Pheasant** (*Phasianus reevesii*)—This is undoubtedly the finest of all the true pheasants, being over six feet in length. It has been an inhabitant of our aviaries and parks for many years, but, owing to lack of appreciation as a sporting bird, has only succeeded in establishing itself in a few places on an equal footing with the common pheasants. Being a very hardy bird, and capable of enduring any amount of cold, it is much better suited than ordinary pheasants to the climates of Scotland and Wales, and ought, therefore, to be generally

introduced into those countries. As it will fly higher and much faster than common pheasants, it affords much finer shooting and is also most excellent eating. It is at once recognisable by its yellow and brown spangled plumage, and by the gigantic tail which, in very old birds, reaches six feet in length. It is an inhabitant of China.

We now come to the remaining thirty-eight pheasants, which differ structurally from the true pheasants and are divided into eleven genera.

The first of these genera is *Chrysolophus*, which only contains two species, both inhabitants of China.

1. **The Golden Pheasant** (*Chrysolophus pictus*)—This gorgeous bird, with the scarlet breast and large gold and black tippet, has been a well-known inhabitant of our aviaries for about 200 years, but has not succeeded well as a game bird. It might, however, if turned down in a large cover far from any other pheasants, be gradually established as a sporting bird, for in some parts of the United States it is as common a bird as is the common pheasant in England.

2. **Lady Amherst's Pheasant** (*Chrysolophus amherstiæ*)—This is, if anything, a finer bird than the last, and would, in Scotland, make a good game bird. It differs chiefly from *C. pictus* in having a white instead of a scarlet breast, and a black and white instead of black and orange tippet. It was introduced in 1869, and has bred freely in aviaries and small ornamental covers, but has never been tried on a large scale for shooting.

The next pheasants are the **Pucras Pheasants** (*Pucrasia*), of which there are six more or less closely allied species.

They are bulky birds, more like fowls than pheasants, and with broad wedge-shaped tails and long tufts of feathers like horns on each side of the head. The prevailing colours are grey, chestnut and black. The only one that could be introduced is the common **Pucras** (*Pucrasia macrolopha*) from the Himalayas, which would do well in Wales and the North of England.

After these come the eight **Kalege Pheasants** (*Gennæus*) all of which are well-known inhabitants of our aviaries. The only two that can be considered other than as ornamental birds are the **Silver Pheasant** (*Gennæus nycthemerus*), which can be easily reared as a game bird, but is not desirable on account of its pugnacity and heavy slow flight; and the fine **Swinhoe's Pheasant** (*Gennæus swinhoei*), which resembles the Silver Pheasant in shape, but is blue, brown and white in colour. This is a much more active bird, and would make a fine game bird if it were not for its fierce nature. The remaining six species are quite unfit to turn down in any English cover.

The **Eared Pheasants** (*Crossoptilon*) are big, bulky pheasants with soft feathers either slate-blue or white, and with two tufts of narrow feathers behind the ears.

There are two species—

1. *Crossoptilon mantchuricum*—This has been long kept in aviaries, and if turned out, as has been done in Wales by Mr. Stone, breeds freely and does well. It does not, however, fly well, and is therefore no sportsman's bird.

2. **The Eared Pheasant** (*Crossoptilon auritum*)—This bird has been assigned to four distinct species, *C. auritum*, *C. harmani*, *C. leucurum*, and *C. tibetanum*, but the large series in the Paris Museum show every intergradation.

C. auritum is uniform slate-blue, and *C. leucurum* is nearly white. This bird flies better than *C. mantchuricum*, and so might be a good introduction.

Bulwer's Pheasant (*Lobiophasis bulweri*) is a magnificent bird with its blue, black, and dark crimson body and snow-white tail, but would only do in an aviary, as it comes from the tropical island of Borneo.

The three large cock-like **Firebacked Pheasants** (*Lophura*) are also only aviary birds, as they are tropical and moreover bad flyers. There are also three other Firebacked Pheasants of the genus *Acomus* which are fit only for the aviary.

We now come to the magnificent **Impeyan Pheasants** (*Lophophorus*), of which there are four species, but only two of these concern us.

The Resplendent Pheasant (*Lophophorus refulgens*)—This magnificent bird is somewhat like a turkey. Its rufous tail is square, and about twice the size of an ordinary pheasant, with most gorgeous gold, blue and green plumage. It is quite hardy, flies well when driven, is good eating, and is altogether a most desirable bird to introduce into Scotland and the islands round.

Secondly we have the **Chinese Impeyan** (*Lophophorus Thwysii*), which is still finer, and has a blue tail. This would be even better than the commoner **Resplendent Pheasant**, or **Monaul**, as it comes from a colder place.

The **Tragopan Pheasants** (*Tragopan*) are much the same in shape as the Impeyan pheasants, but are greyish or brown, speckled over with scarlet and black circular spots. There are five: *Tragopan satyra*, *T. melanocephala*, *T. temminchii*, *T. blythi*, and *T. caboti*, all of which would be good for introduction into the north of Britain; but *T. temminchii*, being from China, is perhaps the best.

There now only remain four pheasants: 1st, the **Cheer** (*Catreus wallichi*), which has been introduced, but, being an ugly brown bird, never found favour; and lastly, the three **Blood Pheasants** (*Ithagenes cruentus*, *I. sinensis*, and *I. geoffroyi*)—which resemble large partridges, and have pale apple-green or greyish-green feathers streaked with red.

This concludes the list of the fifty-nine pheasants; and it can further only be said that, out of this list, the best of all, not yet introduced, are the **Mongolian Pheasant** (*Phasianus Mongolicus*) and the **Yarkand Pheasant** (*Phasianus shawi*). Of those which have been introduced, sportsmen ought, undoubtedly, to strive to establish in our covers in large numbers the **Monaul** (*Lophophorus refulgens*) and the **Reeves' Pheasant** (*Phasianus reevesii*).

WALTER ROTHSCHILD.

PHEASANT, DISEASES OF—Amongst the chief pheasant diseases may be mentioned a form of catarrh which is prevalent amongst the young birds in wet seasons, and which sometimes passes into the "roup," accompanied by purulent discharge from the nostrils of a very infectious nature. When overcrowded, or too closely interbred, they are subject to attacks of a tuberculous nature, the tubercles being usually situated in the lungs or liver. In all these cases it is wise to kill the affected birds, and carefully to destroy—preferably by burning—their bodies, to remove those that remain healthy to fresh ground, and to pay renewed attention to their diet and sanitary condition generally. In the case of tuberculous disease, overcrowding must be avoided, and new, healthy stock introduced for purposes of breeding.

The "cramp," which causes the death of young pheasants in considerable numbers, has been investigated by Dr. E. Klein. It commences with lameness, followed by inability to move the legs, and soon ends in death. Post-mortem examination shows that the bones of the leg are soft and often broken, and that the bony tissue has been destroyed. The cause is "a bacillary infection" which ends in "corrosion and fracture of the bones." Another disease investigated by Dr. Klein is a cutaneous disorder ending in necrosis of the skin, and finally in the death of the bird. This disease is contagious, and is usually caught from diseased farm-yard poultry employed in rearing the young pheasants. It can be eradicated by destroying and burning the affected birds, and may be checked by removing all birds showing

traces of the disease from amongst the healthy ones, and placing the latter on clean new ground.

Fowl enteritis also attacks pheasants, and usually ends in death in a day or two; this inflammation of the intestine is also a microbic disease, and very easily communicable from one bird to another. In this, as in the other cases, the affected birds should be destroyed at once, and the healthy ones removed to clean soil; the place in which the disease was rife should be disinfected by spreading quick-lime, or by some such means.

The most dangerous and fatal disease of pheasants is caused by the presence in the windpipe of the Nematode worm (*Syngamus trachealis*, v. Sieb). This parasite and its life history have been described in the article on diseases of partridges (*q.v.*). It is equally or even more destructive to pheasants. Megnin estimates the loss in one pheasantry at Rambouillet at about 1,200 victims daily. When an outbreak occurs, it is of the utmost importance to isolate the birds attacked, and to remove those which remain healthy on to new and untainted ground. The bodies of those that succumb must be burned at once, and the pheasantry must be disinfected by sprinkling with a one per cent. solution of salicylic or sulphuric acid. The food must be looked to and kept from contamination, and Megnin recommends adding two or three drams of salicylic acid to every quart of water used for drinking.

In individual cases the worms may be removed by dipping a feather stripped of its barbules except at the tip, into a mixture of one part of oil of turpentine and two of olive oil, or into oil of cloves, and then inserting it into the trachea; on its withdrawal it will probably bring with it the worms. The operation requires a little care, or asphyxiation may result. Garlic mixed with the food and rue mixed with the water have also proved successful. Theobald recommends injecting a few drops of eight per cent. solution of salicylic acid or eucalyptus oil, by means of a fine pipette, into the trachea. This, he states, is invariably successful; another of his methods, which requires less skill, is to place the diseased birds in a box in which powdered chalk and camphor, in the proportions of two to one by weight, is so sprayed that the bird must inhale the mixture. Inhalations of tobacco smoke and the vapour of carbolic acid are also well spoken of.

Another Nematode worm which attacks pheasants is *Heterakis papillosa*, Bloch. It is found in the cæca, sometimes in prodigious quantities and causes typhlitis, which may prove fatal. Its eggs develop in water. *Trichosoma longicolle*, Rud., also occurs in the intestines and cæca.

At least three species of tape-worm infest the pheasant. *Drepanidotænia infundibuliformis*, Goeze, whose larval form is said to inhabit the common fly, *Tænia cantaniana*, Pol and *Davainea friedbergeri*, which in young forms often produces a fatal enteritis.

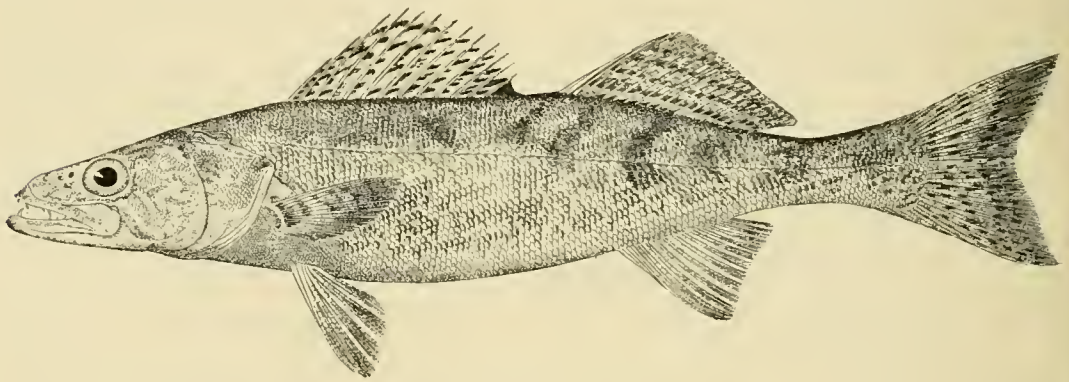
"Scurfy legs" are common when pheasants are reared by farm-yard hens, and are caused by the presence of a microscopic mite known as *Sarcoptes mutans*, Rob., which burrows under the scales and sets up gall-like swellings. In the centre of the swelling the female mite, swollen out with eggs, is to be found. The infested pheasant suffers considerable irritation from the presence of these galls, which are usually confined to the legs, but occasionally occur on the naked parts of the head. In fowls, the trouble can be removed by soaking the legs in warm water, breaking away the galls and washing with carbolic soft soap. Common paraffin is also recommended, applied to the legs. The coops should be limewashed and cleansed.

For further details of disease in pheasants the reader is referred to the works of Klein and Tegetmeier.

ARTHUR E. SHIPLEY.

PICKEREL OR DORÉ (*Stizostedion vitreum*)—

Nomenclature—The pickerel, or doré, is common in the fresh water rivers and lakes of Upper Canada and in some parts of the United States, and is known by a variety of names. In addition to the above, it is also called the wall-eyed pike and the pike-perch, and in some parts of the North American continent it is dignified by the singularly inappropriate nomenclature of salmon.



PICKEREL.

Appearance—In appearance it is by no means ungraceful, but its enormous mouth and peculiar eyes give it a very vicious appearance, which its character does not belie. The body is rounded, the eyes are luminous, and, even when the fish is dead, shine with a green lurid light similar to those of a panther or a cat in the dark. The mouth is filled with big teeth. The sides of the doré, as the fish is usually called in Canada, are, as the French name betokens, of a golden hue, the belly white, the back dull brown. It tapers very much towards the tail, all its fighting power, which is considerable, being in front. The dorsal fin is much like that of the perch, having projecting from it bony spines which are not pleasant when in

contact with the fingers. The scales are rough and coarse on the larger specimens. It is a very common fish in Canada, where it inhabits with great impartiality the rapid waters of rivers and quite calm inland lakes and ponds. I have no data to go upon as to what size this fish may grow to—probably about 10 lbs. in weight; but I have taken them up to 6 and 7 lbs. in weight. This was in a far-away lake in the backwoods, known as the Lac des Aigles.

Methods of Capture—The doré will rise to a salmon fly readily; he is equally, indeed still more ready to take a minnow or spoon. In the evening, just before dark, he is particularly voracious. Any kind of dead bait, any refuse or offal, is not despised by the pickerel, for he will eat anything. A very good bait for a doré is the eye of another fish, but for that matter both the speckled trout of Canada (*Salvelinus fontinalis*) and also the ouananiche itself will, when everything else fails, seldom decline to accept with alacrity the same dainty morsel. When hooked, he makes a very good struggle for existence, and will frequently spring out of the water like a trout. After being captured, the doré is very difficult to kill; for that reason he is a very disagreeable fish to have with you in a birch bark canoe, as an hour after he is supposed to be dead he will come to life again, and then, with his large teeth and sharp spines, make that canoe an unpleasant place of residence.

As Food—A small doré of from 1 lb. to 2 lbs. weight is a most excellent table fish. When freshly caught, and nicely cooked by some Montagnais Indian on the banks of a distant Canadian stream or lake, he forms a very agreeable variety to the eternal trout which is frequently the sole food upon which the hunter or angler in those places has to subsist. Indeed his flesh, which is white and firm, is often far more delicate in flavour than that of the lake trout.

ANDREW C. P. HAGGARD.

PIG-STICKING—Pig-sticking, or **Hog-hunting**, as it is sometimes called, is a sport unique of its kind; it is the first sport of India, and is one which especially commends itself to the Briton, owing to the fact that it includes the use of a horse in bringing to terms a fast, bold, and dangerous quarry.

Towards the end of the last century, our forefathers in India were given to riding down bears with spears, and as the supply of bears gave out wild boar came to be hunted in their place. It was then found that the "understudy" for the part of quarry—as sometimes is the case—was a far better performer than the principal, and thenceforward to this day pig-sticking has held the pride of place as the premier sport of India.

The Sport—The company of sportsmen having assembled overnight in camp at an appointed place and date, an early start is made to beat up the pig. A line of beaters is employed, assisted by elephants. The sportsmen, grouped in parties of three or four each, ride either with the line or are posted outside the cover, according to the nature of the jungle—much as when shooting in England, in turnips or in coverts. Each man carries a spear.

When a boar breaks away, the party which happen to be nearest to him start after him, and for three-quarters of a mile or so it is generally as much as they can do to keep him in view: he then begins to slow down a little, and it becomes a race among the riders to try and get up to him and be the first to spear him. To the man who wins "First spear" are credited the honours of the run, but it is by no means certain that he who is foremost in the race is the one who ultimately wins, for, as his pursuers draw near him, the boar gives up the idea of escape by fleetness of foot and determines, according to his individual character, to get the better of his foes either by cunning or by pluck. In the one case, waiting till the spear is almost at its ribs, he makes a sudden dart or "jink" to one side or the other with such rapidity as to leave his pursuer several lengths to the bad. This jinking he repeats every time he is overhauled until he either gains some friendly cover or is finally tired down and speared. In the other case, where he uses his pluck—and I will say, to the credit of the boar tribe, it is their more usual line of action—he allows the hunter to come fairly close and then, edging off his former line for a few paces, he shortens his stride and, with ears pricked and glittering eyes, he turns and comes straight for the horse with a powerful rush. If not met with a well-aimed firmly-held spear, he will, as likely as not, overturn both horse and rider, leaving an ugly memento on the former in the shape of a gash from his sharp-edged tusks. A few charges of this kind eventually bring him to his death, but as a rule he carries them on until he is borne to earth, disdaining to the last to turn to fly.

Half a dozen beaters come and sling the mighty carcase on a pole and take him back to camp, where the flesh is divided among them, while the tusks go to the man who was the first to spear him. The elephant that bears upon his pad the priceless "drink-box" is meanwhile called up, and the thirst which exceeds all others, —viz., the "pig-sticker's thirst"—is quenched.

And then with fresh horses the party once more join the line to seek for further sport.

This, very briefly, is the nature of the sport which stands *facile princeps* among those of India, if not of the world. But so bare a recital can give no idea of the undercurrent of excitement that runs through every phase of it, from the breathless expectant waiting for the pig to

break covert up to the final thrust—sometimes on foot—at the savage monster fighting for his life.

The Boar—It is the nature of the animal himself that adds so greatly to the quality of the sport.

A powerful, shaggy brute, he stands from 30 to 38 inches at the withers, and is generally a mass of thew and sinew. In spite of his weighty build, he is very quick and active in his moves, and very fast upon his legs. For three-quarters of a mile a horse can scarcely live with him across the roughish ground where he is met with. His weight carries him through bush and jungle, and his activity affords him power

the fight begins, for now he stops to contest his way to some patch of cover, where he can come to bay and display a pluck and toughness such as no other animal can boast of. He never loses head nor heart, and so long as life remains in him he will force himself on to the hunters' spears in a mad longing to get at them.

There are several local varieties of pig in India (*Sus indicus*), severally known as :—

I. *Tatainya*, *Tatira*, or *Mooghun*—well-bred, fierce, fast, and active.

II. *Meilier*, *Muckna*, or *Gágas*,—large, coarse-bred, and slow.

III. *Kookhunnee*, or *Táana*,—smallish and light-coloured, and very fierce.

First Spear.

to jump anything that a horse can take and sometimes more. He has a wondrous knack of jumping sideways over walls of lanes where the horse can get no run to follow him.

He always has his wits about him. While running before his pursuers he will take advantage of every form of cover or obstacle and put it between himself and them, and will endeavour by dodging to evade them. Water has no terrors for him, and the most break-neck places are favoured by him in his flight.

Then he is further possessed of the nastiest temper of any living animal, and has a very useful instrument wherewith to vent his rage, in his sharp and curving tusks. These he uses with unerring aim and quickness, and often with deadly effect.

Thus, when the boar has been overtaken and the excitement of the race is over, the fun of

IV. *Soocur*, a compact shape, also lightish in colour and very fierce.

A boar is full grown at five years, but fills out in muscle up to eight. After nine his powers begin to wane with age, and his temper becomes worse—and up to twelve or fourteen he is a nasty customer to meet. After that old age sets in, and though he lives to sixteen or twenty he is in his dotage.

The following are the measurements of a record sized boar:—Height at withers, 38½ inches : length, 62 inches ; girth, 55 inches ; girth of fore-arm, 14 inches ; tusks, 8½ inches : weight 300 lbs.

Haunts—Pig are found in most parts of India, even in the most civilised and cultivated districts. Their local haunts vary according to the season of the year.

They inhabit tracts of bush-grown country,

or long grass, tamarisk and reeds in the river-beds, marsh land, ravines, clumps of prickly pear, &c.

Beating—The usual method employed for finding pig for the run is to employ a line of native beaters, from thirty to 150 strong, as circumstances may demand. The line is generally under the direction of a head shikari, mounted on an elephant or pony, and seconded by assistant shikaris, commanding different sections of the line. In open grass or bush country the line advances quietly, beating and tapping with sticks as they go, the horsemen riding in parties immediately in the rear of the beaters.

In the case of thick patches of cover, crops, &c., the line advances slowly but noisily, with drums and shouting, in order to induce the pig to sneak quietly away before them. The riders are in this case posted outside the cover at points near which the pig are likely to break cover. Such parties must keep very quiet and motionless, and so remain until the pig has left the cover a good distance behind him; for the boar is very shy of leaving a good sanctuary and will only do so when he thinks the coast is quite clear. If he finds himself being followed before he has gone far, he will nip round and slip back to cover at a lightning pace, and will probably decline all further inducement to quit it.

Tracking—In some parts of India, where jungles and covers are few and far between, boar are found by tracking or "pugging" them from their feeding places to their lairs—and this is a most interesting and sporting way of getting them.

Of course, for this purpose, native professional trackers are usually employed, but at the same time the art is one which can be learned by any keen sportsman who has a good eye, unlimited patience, and a knowledge of the ways and habits of his quarry. Continual practice is then necessary to obtain a practical ability.

Season—The best season for pig-sticking in Northern India is from February to July, the crops being all cut then, and the land dry and fallow. These months should adapt themselves very well to the English sportsman's programme, enabling him to put in two months' pig-sticking in the East after his hunting and before his autumn shooting at home

Spears—Two kinds of spear are used in India, some clubs preferring one, some the other.

They are, (1) *The Long or Underhand Spear*, which is grasped at about two-thirds of its length from the point, with the knuckles downwards, the shaft lying underneath the fore-arm. The length of this spear is from seven to eight feet. (2) *The Short or Jobbing Spear*. This is grasped close to the butt with its head pointed downwards, the knuckles to the front, thumb uppermost. Its length is about six feet, and it is weighted at the butt with lead.

The respective merits and disadvantages of the two spears are frequent subjects of argument, but while the long spear is the easier to use and theoretically the best, the short spear is the more handy and the more deadly.

The best spear-heads are the "Bodraj" (made in India), narrow, leaf-shaped, with a sharpened rib up each side, and the ordinary "bayonet" with the three faces slightly hollowed. The edges and point should be kept sharp from day to day. The spear shafts are generally of male bamboo, which should have been specially selected.

Horses—The main desiderata in a pig-sticker are that he should be quick, handy, clever over bad ground, bold, staunch to pig, and, if possible, fast and not too big.

The breed of horse in which these qualifications are most readily found are the Waler (Australian), of small size, and the Arab. Good country-breds may also be found, but their staunchness is not always to be relied upon.

Several mediocre horses are better economy than one or two very good ones for pig-sticking. They have less chance of becoming stale. A sportsman coming out from England for pig-sticking in the spring will find that this is the best time for buying horses in India, as the leave season commences in April, and men going home or to Kashmir, &c., are all selling off.

Riding to Pig—Riding to pig is an art or knack like that of riding to hounds, and in both there are points of minor etiquette between sportsmen which it is most necessary to observe.

"Old Shekarry" summarises the qualifications that go to make a good man to pig thus:—"Strong nerves, good eye for a country, keen sight, firm seat, a light hand, and more especially a bold heart and a cool head. Add to these judgment of pace, dexterity with the spear, and an intimate acquaintance with the habits and cunning of the boar."

And Bacon—not Francis, but a worthy successor—writes:—"A firm seat, a delicate hand upon the bridle, *a quick eye*, a steady and skilful delivery of the spear, and good pluck, are indispensable in this nice sport. *The eye must be kept upon the hog, and the horse must be left to select his own footing through broken ground or other impediments*, for if the attention be for an instant withdrawn from the chase, ten to one are the odds that the hog will run to cover unmarked and the game be lost!"

I commend to special notice the points which I have put in italics.

Bacon, who had plenty of experience of both sports, and who wrote in the days of muzzle-loading smooth-bores, also says:—"Hog-hunting

is not only more scientific, but it is also a more dangerous sport than tiger-shooting. If the horse be borne to earth in the charge, the rider will have little chance of escape, unless very expertly supported by his companions, who must make a diversion in his favour."

"Keep your eye on the pig and ride straight" is the best principle to go on in riding, and while out in the field subject yourself to the orders of the master or captain, and to the unwritten rules of courtesy and good sportsmanship.

Always remain with the party or at the post to which you are assigned, until otherwise ordered by the master. Do not interfere with the beaters or shikaris in any kind of way—that is the master's work only. Ride fairly and in a sportsmanlike way, *i.e.*, when a man is fairly on the pig do not hustle or try to oust him, but let him have his chance at spearing. The object of the run is to kill the pig, and not entirely for getting the honour of "first spear." Ride your own line, and "back up" in bad ground or in jungle to drive the pig out of it on to better country.

If you find the pig after which you have started is a sow, hold up your spear horizontally above your head as a signal to the rest of your party to pull up.

In spearing, the impetus of the horse is sufficient to run the spear well in without much of a lunge, which is very liable to divert the aim.

Spearing on the near side of the horse is not allowed and is dangerous. The spear should never, under any circumstances, be let go from the hand. It should be carried, when riding, grasped about the centre of the shaft, and pointing diagonally across the body; in this way it is fairly ready for action, is least dangerous to one's friends when riding, and to one's self when falling.

Aim the spear for the pig's heart, which lies rather far back from the shoulder. When charged by a pig, keep your horse going at the best pace you can command; it lessens the liability to get him ripped.

In tackling a wounded boar on foot, at least two men should go together, as, even if your spear goes into him, his rush will roll over a single man easily, and his keen tusks do their work in an instant.

Tent Clubs—At most large stations in India there exist local pig-sticking hunts called tent clubs.

To such a club men are elected as members, paying a monthly subscription for maintenance of native staff of shikaris, expenses of preserving, of club equipment, &c.

The tent club usually provides the mess out in camp—each sportsman who attends the meet bringing out his own tent and camp furniture.

The expenses of the meet, such as messing, beaters, &c., are divided up among the members attending that meet, and as these expenses do not as a rule amount to anything much, this sport has the merit of not being limited to the wealthy.

Taken as a whole, pig-sticking is one of the best, if not the best, of all the wild sports of the world. In addition to its intrinsic merits as an exciting diversion, it develops in a man, to a greater extent than any other practice, good riding, a quick eye, use of weapon, eye for country, woodcraft, and pluck and determination, and it gives him healthy occupation and exercise in a trying climate.

R. S. S. Baden-Powell.

Glossary.

Boar—A genus of Pachydermatous Mammals in the family Suidæ. The best known species are *Sus scrofa*, the European variety, and *Sus indicus*, in India. The height of a fine boar taken at the wither averages between 30 and 33 inches, but instances have been recorded up to 42. The weight runs between 200 and 250 lbs. The Indian boar is polygamous, as is probably the European. The former is said to have one, two, and sometimes three litters in a year; the latter only one. They are frugiferous for the most part, but have no objection to a certain amount of flesh with their diet.

Boar spear—[*See* Spear.]

First spear—The first thrust which draws blood from the boar after he be fairly started from the cover. Transferred frequently to the man who makes it. Also called "*Spear of honour.*"

Frank—Old term for an enclosure in which boars were kept.

Head—The steel point at the end of a boar spear, generally about 8 to 12 inches long, with neck and socket. Made in various shapes, of which the best are the "Bayonet" and the "Bodraj." The former is a tapering, three-edged spike, the latter a flat oval blade tapering to a point. Blades with shoulders, or diamond-shaped, should be avoided, as they are often difficult to withdraw if the boar twists a little.

Horses—Those most strongly recommended are true-bred Arabs, which are very quick at the turn, and Walers, Australian bred horses of considerable speed and bottom. Native and Persian horses are also used, but the hard going knocks the English horses to pieces in a very short time.

Jhow—Indian for tamarisk, a favourite cover for boars.

Jink—Of the boar; to turn suddenly at a sharp angle to right or left.

Jobbing spear—[*See* Spear.]

Long Spear—[*See* Spear.]

Mark down—To keep in view or memory the spot at which the boar went to cover.

Nullah—An Indian term for a dry watercourse, usually with precipitous banks.

Overhand thrust—[*See* Spear.]

Pig—Used as a verb; to hunt the boar.

Pug—The footmarks of a boar. As verb; to trace the footmarks.

Rear—To put the boar out from his cover.

Ride to hog—To hunt the boar.

Rootings—The marks of the burrowing of a boar's snout left in his search for food.

Sanglier—Old term for a full-grown boar who had separated himself from the rest of the *sounder*. Hence also *singular*.

Soil—The place where a boar has wallowed in the mire. To "take soil" is to fly to water for refuge when hunted. Also used as verb; to wallow in the mire.

Sounder—A family of wild swine.

Spear—The chief weapon in Indian boar hunting. There are two kinds most in use, but all consist of a bamboo shaft with a steel head.

The first, the *long* or *underhand* spear is generally used in Southern and Western India. It is from 7 to 8 feet long (formerly it was still longer), but only weighs from 2 to 3 lbs.

The second, the *short* or *jobbing* spear, is some 6 feet long and loaded with lead. It weighs from 2 to 4 lbs. It is the favourite weapon in Bengal and the north.

The thrusts made with them are *under* or *overhand*. In the first the spear is carried nearly horizontally, with knuckles down and thumb along the shaft. In the second, usually confined to the *short spear*, the knuckles are in front and above, and the thumb points upwards.

Spear of honour—[*See* FIRST SPEAR].

Squeaker—A young pig not yet three years old.

Tent club—*See* p. 92.

Tush and Tusk—The enlarged canines of the boar. They are four in number, but the two upper tushes merely serve for a defence, and for a whetstone to the lower pair. The average length of the latter is 8 to 9 inches, but only about 3 inches are without the jaw. They have been recorded up to 12¼ inches.

Tusker—Used loosely for a well-grown boar.

Underhand thrust—[*See* SPEAR].

PIGEON SHOOTING—The difficulty of defending pigeon shooting from the imputation of cruelty is scarcely lessened by the reflection that its claim to be considered as a sport rests rather on the element of skill required in its exposition than upon the higher qualities of nerve, daring, or hardihood. There exists, indeed, a very wide feeling of prejudice against it among a large class of people, and not perhaps without reason; yet, in spite of the sentiment that underlies this prejudice, the sport of pigeon shooting retains an undiminished hold upon a very large section of sportsmen, and as a test of skilful shooting it affords the most ample and undeniable opportunities for the display of first-class marksmanship.

It is conceded by authorities that pigeon shooting is perhaps the fairest method by which the relative skill of two guns in shooting on the wing may be decided. The conditions of the test equalise the chances of everybody, and there is room for neither foul play nor favour.

The method of procedure is this: There are five traps arranged at a certain equidistance from the peg at which the gun (or shooter) is stationed, and each trap is placed five yards from its neighbour, the whole five forming thus the arc of a circle of which the gun is the centre. A bird is placed in each trap, and to each trap is attached a wire communicating with an iron case (technically called "the puller") which stands twenty yards from the trap, in front of the gun. Inside the puller there is concealed a mechanical arrangement of springs, working on a cog-wheel, to which in turn is attached a single string only. Beside the "gun" a man stands, whose duty it is to pull this single string at a given word.

Directly this string is pulled, it operates upon the springs in such a way as to release at once one of the five traps, but which one of the five neither the man who pulls, nor the gun, nor indeed anybody else, can form the least idea before the actual fall of the trap itself.

It can be seen at a glance how favourably this modern method of freeing the bird contrasts with the old one, which consisted in the casting of dice behind the gun, each die bearing the number of one of the traps to be pulled. It was not impossible for the number of the trap to be thus communicated to the gun in a stage whisper at the moment of pulling the string. That contingency is by the present system absolutely nullified. The centre trap is usually considered the easiest one from which to kill your bird, since the eye is always kept directed in the first instance to the centre trap, in order that the field of vision embraced by the arc of the traps may be best commanded. Consequently a bird issuing from the centre trap involves no readjustment of the eye, and affords a more immediate target.

The distance from the peg to the traps varies from twenty-two to thirty-one yards, according to the qualifications of the competitors, and handicapping is arranged by diminishing or adding to this distance. Matches are usually made for money, but the most unscrupulous elements of bookmaking are fortunately absent as a rule from these meetings.

The favourite method of determining the relative merits of marksmen is by means of a **sweepstake**, in which perhaps a dozen guns may take part. This leads to more general and sustained interest than a match between two individuals only, and at the same time the claims in dispute are settled with equal conclusiveness and satisfaction. In shooting off a sweepstake of this character, each competitor first shoots at his five birds. Should any of the competitors after the fifth round be found to tie in respect of the birds killed, it is usual for such ties to shoot singly (that is to say, at one bird only) till one of them misses his bird, whereupon he is ruled out of the match. This continues until two competitors are left. The first who then succeeds in killing the winning bird (*i.e.*, one bird more in the same number of shots than his adversary) wins the sweepstake.

A boundary of sixty yards from the centre trap is allowed for the bird to drop in, after being hit; but the distance of this boundary need not be arbitrarily fixed, various clubs affecting various distances.

The Hurlingham Club boundary, for instance, is about ninety yards in a straight line from the centre trap; the Gun Club boundary, sixty-five yards; and the Monaco boundary a little less than twenty yards from the centre trap.

Within the boundary the bird must be retrieved, or else it does not count to the gun; should the bird fall within the allotted boundary but succeed in fluttering beyond it, even though

it lie dead a yard on the other side, it must be counted a "lost bird." Moreover, a bird that has once been out of the bounds must be scored a "lost bird."

Except the shooter whose turn it is, no other gun is allowed to fire at a trapped bird. It sometimes happens that a bird, on being freed from the trap, will not rise on the wing, but walks away from the trap; it is then the shooter's option to take the bird or not, as he likes; but, if he declines, it he must immediately call out "No bird," and another pigeon is thereupon substituted in its place. If, however, the bird has once risen, it is too late for the shooter to refuse it. It is not permissible to shoot at a bird until it is on the wing; but the shooter having fired his first barrel at the bird while on the wing, is allowed to fire his second barrel at it even though it be on the ground. This is a very important rule, as the bird may rise again and drop out of boundary, and is too often disregarded by less informed guns. A bird that is shot at on the trap, or on the ground, with the first barrel, is a "no bird," if killed, and a "lost bird," if it escapes. The shooter must not leave his position until both barrels have been discharged—should he do so after the first barrel and then return to his mark, he is not allowed to fire his second barrel at all.

After taking up his position at the mark, (directly opposite the middle trap), the shooter, when he is ready, calls out "Pull." The man in charge of the string thereupon pulls the single cord, which operates upon the machinery of the "puller" (the iron case referred to above), and one of the five traps is instantly liberated and the pigeon flies out. The pigeons are kept in a kind of hamper, technically termed a "pigeon flat," and from this hamper, or pigeon flat, the man who is in charge of the trap (technically the "trapper") selects a bird, carries it to the "sprung trap" (*i.e.*, the trap from which the bird has just been expelled, and which lies flat), and there imprisons it to wait its turn—that is to say, the number of its pull.

Should the trap be pulled before the shooter calls "pull" he may refuse to take the bird, but in this case he must not fire at it; should he fire and miss, he cannot then demand another bird on the plea that he was not ready.

From this short summary of the technicalities of the sport, it may be seen that pigeon shooting is not without its exacting conditions, and that for a man to hope to win fame as a pigeon shot, he must possess at least coolness, quickness, and readiness of resource. In comparison with the less artificial forms of shooting, it cannot be urged that pigeon shooting should be expected to rank high as a sporting pursuit; but none the less it is a form of marksmanship in which only the possessor of an eye trained by long apprenticeship to the vicissitudes of pheasant and partridge shooting need ever expect to excel. The sudden demand made upon one's resources by the unexpected whirr of a pheasant or partridge rising without warning from unanticipated quarters is an alien experience to the tamer sport, where the *battue* is prescribed by the limits of a line of plainly visible traps. Moreover, there must always exist a lingering prejudice in the breasts of sportsmen against the annihilation in cold blood of either birds or beasts to whom is not given a fair and equal chance of escape; and though it may be contended that the pigeon in the trap is offered its reasonable chance of escape by the opening caused by the trap falling flat, it cannot be denied that that chance is a very poor one, when only thirty yards divide the pigeon from the cartridge of an unerring marksman.

The character of domesticity which, further, clings round this class of bird renders it doubly an object of commiseration, and the reflection that a large percentage of the pigeons consigned to the pigeon flat are not killed at all, but are doomed to drag out a maimed existence, is one that causes a grave feeling of doubt whether after all the sport has sufficient counterbalancing advantages to justify its encouragement.

Types of Pigeon for use—The Pigeon most in request at these matches is the small blue rock pigeon, since it is the quickest on the wing and the sharpest flying bird for trap shooting. The ordinary tame, fan-tail pigeon, is at once too heavy and too slow for this purpose. The flight of the pigeon and the flight of game are appreciably different, and it is obvious that in pigeon shooting judgment of distance (one of the most important features in successful field shooting) is scarcely called into requisition at all. Equally obviously, the practised snap shot in the field has an immense advantage in shooting at the traps.

BLUE ROCK.

Hints on Shooting—In "trap shooting" the object of the crack shot is to bring down his bird as near to the trap as possible—for the further it flies from the trap the stronger its

flight becomes, and consequently the more difficult becomes the shot.

When the bird instantly directs its flight in a straight line away from the shooter, it is a maxim with experienced guns to "hold well over your bird"; that is to say, the shooter instead of firing *direct* at the bird, will invariably aim a little over it (*i.e.*, above it), so that the shot may catch the pigeon as it rises in its flight. The necessity for this precaution becomes apparent when we add that the tendency of the bird is to rise immediately on leaving the trap, and to continue to rise for some distance afterwards.

On the other hand, in the case of a bird flying directly *towards* the shooter on leaving the trap, the gun, especially if a novice, is apt to shoot *under* his bird. An experienced marksman, however, will not permit himself to be taken unawares by such an emergency. When the pigeon flies towards him he will shoot *straight over the bird's head*, and if the aim is accurate the bird will be well killed. There is no doubt that a pigeon adopting this line of flight becomes a very puzzling bird to deal with, but the successful shot is usually he who does not allow himself to be baulked by any contingency. Should the bird take a cross flight, the gun who knows his work will aim a little in front of it, and sufficiently high to allow for its gradual rise.

Choice of Ground—In selecting the *venue* for a match, the chief point to be considered is open space; it is advisable to choose the flattest ground, and the further from a house or a road the better. Trees should, if possible, be sedulously avoided in the vicinity of the traps, and a clear, unhampered stretch of distance beyond is of incalculable advantage in providing a good "sight" for the shooter.

For the sake of expediency a wire netting should be placed round the boundary, in order to prevent the escape of wounded birds, since a "winged bird" counts towards a shooter's total equally with a "killed" one.

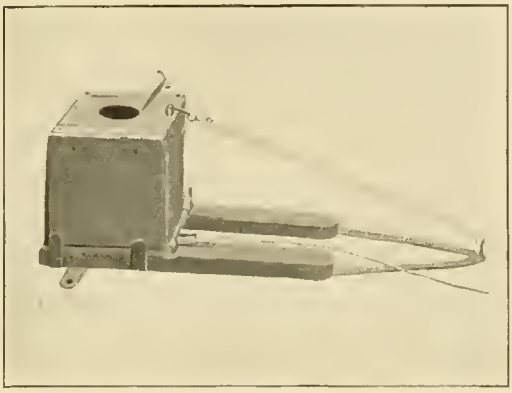
Care should be taken by shooters to put in their cartridges immediately after taking up their position at the mark, and putting their gun off safe; there have been cases known where a winning bird has actually been lost through a careless inadvertence in this matter.

Guns and Powders—In pigeon shooting a long chambered twelve-bore gun is generally used, so that a three-inch cartridge may be fired within the chamber, without causing the recoil which tightness at the end of an exploded cartridge will often produce. Most shooters adopt "number seven" shot, though some prefer to use "number eights" in their first barrel.

The regulation charge of shot is limited to one ounce and a quarter, but there is no restriction with regard to powder.

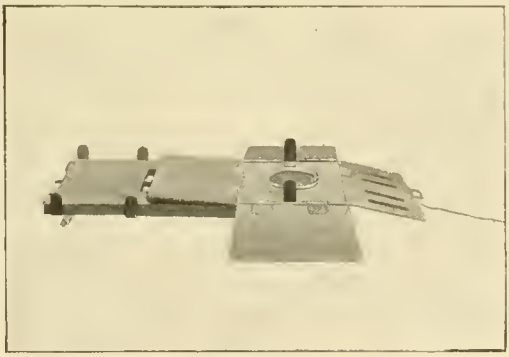
Of powders, perhaps nitro powder is the best for the purpose, for it is clean, smokeless, of penetrating force, and allows a quick sight to be taken for the second barrel if the bird be missed with the first.

The Trap—The trap in which the pigeon is concealed is composed of six sides, five of which are made of sheet iron, and the sixth



TRAP SHUT.

(and front) one has openings like a cage, so that the bird is enabled to enjoy a full view of the country before it, but none of the gun behind. Thus, directly the trap is pulled and falls flat to the ground, the liberated bird is instantly off in any direction that it may have chosen for its flight. The time of year most in favour for



TRAP OPEN.

pigeon shooting is during the winter months, when the birds fly better than in summer, and are more cheaply procured for the sport.

One of the most famous *venues* for Cup shooting and Champion matches is the Hendon Shooting Ground, the headquarters of the National Gun Club.

Appended are the rules of this Club.

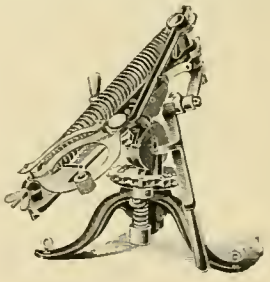
HENRY STANNARD.

RULES OF THE NATIONAL GUN CLUB.

1. The referee's decision shall be final in all cases.
2. A miss-fire is no shot.
3. It is a "no bird" if the first barrel misses fire, but if the shooter fires his second barrel the bird must be scored. If the second barrel misses fire, the shooter can claim another bird; but he must use a blank cartridge only in the first barrel, and must not fire until the bird is on the wing, and he must not pull both triggers at once.
4. If the trap is pulled before the shooter calls "pull," he may refuse to take the bird, but if he fires, the bird must be scored.
5. If the bird does not rise when the trap is pulled, it is the shooter's option to take it or not; if he does not take it, he must distinctly call "no bird."
6. The shooter cannot refuse to take a bird that has been once on the wing.
7. If a bird is shot at on the trap or on the ground with the first barrel, it is a "no bird" if killed, and a "lost bird" if it escapes; but a bird may be shot at on the ground with the second barrel, provided only it was on the wing when fired at with the first barrel.
8. *Single shooting.*—If more than one bird be liberated it is a "no bird." It is at the shooter's option whether he shoots or not, but in any case it is "no bird"; one bird to be paid for by the club, the other by the bird purveyor.
9. If the shooter stand at a distance less than his handicap distance, the bird is a "no bird" if killed, and a "lost bird" if it escapes.
10. If the shooter has fired his first barrel and left his mark, he cannot return to it to fire his second barrel under any circumstances whatever.
11. When once a bird has been out of bounds, or settles on the top of the fence, it must be scored a "lost bird." If a bird escape through any opening in the wire fence it shall be a "no bird."
12. If a bird should fall within bounds, having been fired at by a person other than the shooter, the referee alone must decide whether it is a "dead bird," or "no bird."
13. If when the shooter is at his mark, and has called "pull," the gun fails to go off through his own negligence, the bird must be scored a "lost bird."
14. The minimum number of shooters for Club Prizes —Members' Even Distance Champion Cup, 4; Club Challenge Cup, starlings, 5; Club Challenge Cup, pigeons, 7; Free Prize at starlings, 5; Free Prize at pigeons, 7.
15. After the first three sweepstakes have been shot for on any day, members present not joining in them must stand one yard beyond their handicap distance, if over five shooters.
16. Winners of Cup Objets d'Art, or sweepstakes, if over five shooters, to go back one yard, about £10, two yards. Two members dividing, if over five shooters, to go back one half yard each, if over £10 one yard each. Any member shooting in three successive sweepstakes, and not winning or dividing, to go in one yard.
17. The handicap distances are from twenty-one to thirty-one yards. If a member wins at the maximum distance, the other shooters taking part in such handicap to go in one yard from their distances in the following handicap of like or less value in stakes.
18. If, in the opinion of the referee, the shooter is baulked by any antagonist, onlooker, trapper, or dog, whether by accident or design, such shooter to be allowed another bird.
19. The maximum weight of a gun to be 8 lbs.
20. The maximum charge of shot to be 1¼ oz.
21. Breechloaders must not be loaded before the shooter reaches his mark, and he must remove any loaded cartridge that may remain in his gun before he leaves the mark. Any shooter infringing this rule renders himself liable to a penalty of 5*s*.
22. Wire cartridges, concentrators, and foreign substances mixed with shot are strictly prohibited. Any shooter infringing this rule shall at once be disqualified and render himself liable to a penalty.
23. If when shooting in a match or sweepstakes, a shooter shall be found to be using more than his specified quantity of shot, he shall at once be disqualified.
24. Any shooter may challenge another to exhibit the quantity of shot he is using, but should he not be using more than the specified quantity the challenger renders himself liable to a penalty.
25. The following fines to be strictly enforced:—Pointing a gun at any one, 10*s*. Firing without permission, except at the mark, 10*s*.
26. All fines to go to the Club Fund.

INANIMATE BIRD SHOOTING—This, the youngest of English sports, had its home in the United States of America, and has there, for many years past, claimed its votaries by the thousand; indeed, from the latest reliable sources, it is said there are no less than 6,000 clubs in active existence; and meetings, at which valuable prizes are offered, are being constantly held throughout the country.

History of the Sport—In England, the movement was originated by the Ranelagh Club, which, under the favourable auspices of royalty, held meetings as early as 1875. From various causes, however, success did not crown the efforts of the promoters, and after a brief existence the club ceased; and, but for occasional exhibitions given by various American and German champions, clay bird shooting would probably have been lost sight of altogether. These exhibitions, however, gave little incentive to sportsmen to take up this particular form of shooting, either as amusement or as practice for game shooting, the clockwork regularity with which breaks were recorded relegating the performance to the region of trick shooting rather than real tests of skill. This was caused by the parabolic flight of the target, the shooter having only to wait until the apex or culminating point was reached, when scoring became a matter of the greatest ease. Improvements in flight were gradually effected, and, on September 28, 1883,

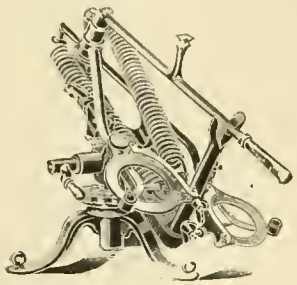


SINGLE RISE TRAP.

the first English patent for flying targets was lodged at the Patent Office in the name of C. J. Barrett, Secretary of the Anglo-American Clay Pigeon Company, from designs transmitted by J. E. Bloom, of Cincinnati, Ohio. The

patent was most extensive, and embraced no less than twenty claims in relation to flying targets. For ten years but little progress was made, although the demand steadily increased.

In 1887 Messrs. Cogswell and Harrison



Double Rise Trap.

brought out the well-known Swiftsure trap and bird, and started the manufacture for the first time in England, substituting a pitch compound for the red clay that had hitherto been the material employed.

Clubs—It was not until 1893 that any serious attempt was made to establish clay pigeon clubs in England, when shooting rules were drawn up, and the **Inanimate Bird Shooting Association** was inaugurated at a meeting held at Anderton's Hotel, its *raison d'être* being the promotion and affiliation of clubs. Following this, the St. George's and Wealdstone Clubs were started, and at once secured a numerous membership. The governing body of the Association was, however, composed entirely of members of trades interested in the movement, and, although progress was made, this fact militated against success. In 1894 the Constitution of the Association was changed and proportional representation introduced, giving a club one delegate for every twenty-five members. This change has worked well, and the subsequent advance has been rapid, as may be gauged from the yearly Championship Meetings held by the Association. The first, in 1893, occupied but a few hours; the second two days; and at the last, held in June 1897, five whole days did not suffice to get through the various events, whilst shooters from the Midlands, Scotland, and Ireland were present in large numbers.

Shooting Schools—One of the most remarkable results attendant on the introduction of artificial target shooting has been the establishment of shooting schools, where the young gunner is quickly taught to handle his weapon in a workmanlike manner, and errors of fit are discovered and rectified by the try-gun and other means. It is now also admitted by the most conservative sportsmen that clay bird shooting is excellent practice for field shooting generally, and that a season at a clay bird club will enable the average shot and novice to render a far better account of himself at "fur and feather" than would otherwise be the case. The same result would of course be obtained by pigeon shooting, but the cost is many times greater.

Method of Shooting—The two chief Metropolitan Clubs are the Middlesex (A. H. Gale, Hon. Sec., 178 New Bond Street), and the Surrey County (Col. E. M. Alexander, Hon. Sec., 67 St. Ermins Mansions, S.W.). At both resorts clay bird shooting in its most advanced and perfected form can be indulged in, and, if there are left any sportsmen who still doubt the educational value of this class of shooting, a visit at one of the weekly meetings will probably dispel the illusion. The traps, of which there are fifteen in use, are entirely out of sight of the shooter, and are worked by trappers concealed in a trench some 25 yards in length. Shooting is conducted in teams or squads of six, one man being always in waiting, and ten birds to each shooter is usually the number adopted for sweepstakes in shooting and ordinary club competitions. The competitor does not know which one of three traps is to be pulled, and each trap is set to throw a different angle.

Handicapping—One of the many difficulties which the Association, in common with all sporting and athletic associations, has had to face has been the handicapping question. A voluminous correspondence in the *Field* newspaper in 1895 led to the formation of the present rules, which appear to give general satisfaction, although it is still a debatable point what start the shooter should have who breaks 75 per cent. and upwards of his birds.

Owing, doubtless, to the increased distance the birds now travel, a full-choke gun is the one usually adopted, the favourite load being 45 grains and $1\frac{1}{8}$ ozs. shot, or 42 grains and $1\frac{1}{16}$ ozs. shot.

Champion shot, 1897—W. R. Leeson.

Score—Twenty straight, known traps. Unknown angles. Eight out of ten. Unknown traps and angles. Eighteen yards rise.

Winner of International Shield, 1897—(Competed for by teams of eleven shooters.)

England 263 out of a possible 330.
Ireland 261 „ „ „ 330.

Address of Association—Effingham House, Arundel Street, Strand, London. *Secretary*, Mr. Max Baker.

F. C. Borer.

OFFICIAL RULES OF THE INANIMATE BIRD SHOOTING ASSOCIATION.

General Rules.

I.—Not less than five traps shall be used in any competition.

II.—The traps shall be arranged in a straight line, and numbered 1, 2, 3, 4, 5, No. 1 being that on the extreme left and No. 5 that on the extreme right.

III.—The traps may be arranged in any one of the three following ways, that numbered 3 being recom-

mended as giving the best results :—(1) Five traps in all, each one behind a screen numbered as stated in Rule I. If it be desired to shoot at known angles, the trap behind No. 1 screen should be a right-quarterer (viz., throw the bird at an angle of 45° in a right-hand direction) ; No. 2 a left-quarterer, No. 3 straight away, No. 4 a right-quarterer, No. 5 a left-quarterer (viz., in the order of the strokes forming the Roman numeral XIX). If it be desired to shoot at unknown angles, the traps should be re-adjusted at the end of each round to throw in diverse directions, and the screening should be effectively carried to prevent the shooter from knowing at which angle his trap is fixed. (2) Ten traps in all, fitted in pairs behind the five screens. For known angle competitions the two traps at each position should be set at the angles described in System (1), the additional trap at each screen serving as a reserve in cases where the first bird thrown is a "no bird." For unknown angle competitions, the ten traps should be adjusted to throw in diverse directions, and it should be arranged that no two traps at one screen throw in the same direction. The traps should be re-adjusted from time to time to prevent the two angles at each screen from being known. (3) Fifteen traps in all, fitted in sets of three behind the five screens, the left-hand trap at each position to be a left-quarterer, the middle trap straight away, and the right-hand trap a right-quarterer.

IV.—Shooters shall stand 18 yards from the traps, and the traps or screens shall be about 5 yards apart, measuring from centre to centre.

V.—No gun of a larger calibre than 12 gauge shall be used. The charge of shot shall not exceed 1⅛ ounce, the ordinary cartridge case of 2½ inches (nominal) in length when empty being used.

VI.—The gun or cartridges of any shooter may be challenged by a competitor as not being in accordance with Rule V., and if found on examination to be a breach of the Rule, the holder of such gun or ammunition shall pay a fine of 10*s.* 6*d.* to the Club funds, and be disqualified from the current competition ; but if the challenged gun or ammunition be found correct, the challenger shall pay 2*s.* 6*d.* to the Club Funds.

VII.—A shooter who, from any cause whatever, shall discharge his gun, otherwise than in accordance with the regulations, shall be excluded from taking part in any further competitions during the day.

VIII.—If a shooter, in firing at a bird, shall let off both barrels practically at once, and kill his bird, that bird shall be scored a no-bird, and if he misses, the bird shall be scored a miss.

IX.—A Referee shall be appointed to judge all matches, and his decision shall be final.

X.—The Referee shall see that the traps are properly set, and throw as defined in Rule III. He shall also see that all due precautions are taken by shooters for the safety of the trapper, shooters, and others.

XI.—A bird shall be called a no-bird if thrown broken from the trap, or if, in the opinion of the Referee, it be not fairly thrown ; and it shall be counted a no-bird whether fired at or not.

XII.—If the shooter's gun, being properly loaded and cocked, fails to fire at all from any cause whatever, excepting through the fault of the shooter, the bird shall be counted a no-bird. If the gun misses fire with the first barrel, and the shooter fires the second and "breaks," the shot shall be scored a "kill" ; but if he fires the second and misses, it shall be scored a "miss" ; and if he does not fire the second it shall be "no-bird." If the gun misses fire with the second barrel the shooter shall be allowed another bird, using the second barrel only.

XIII.—A bird to be scored broken must have a piece visibly broken from it whilst in the air. The Referee shall be the sole judge as to whether a bird is broken, and any person impugning his decision shall be disqualified from the current competition. No bird shall under any circumstances be retrieved for examination.

XIV.—Each bird broken shall score one point.

XV.—Every club affiliated to the Association shall keep an official score-book, showing in detail the results of every competition, and such score-book shall always be available for examination by any person duly authorised by the Association. Broken birds or "kills" shall be indicated by a 1, and missed birds by a 0.

XVI.—No betting shall be allowed.

XVII.—All firing at passing birds, animals, or other unauthorised objects shall be strictly prohibited.

XVIII.—All guns must be kept open at the breech while the traps are being refilled and until the trappers have returned to their places. Any person infringing this rule shall be fined one shilling.

Handicapping and Shooting-off Ties.

XIX.—Handicapping shall be on the system of giving points, the numbers varying from 2 to 7.

XX.—The handicap points allowed shall be as nearly as possible one point for every 10 per cent. of misses (out of birds shot at) recorded against the shooter during the month on which the handicap is calculated, it being understood that no account shall be taken of fractions of 1 per cent., and also that should the percentage work out midway between any two values of points, the shooter shall be awarded the larger handicap allowance.

XXI.—Each competitor shall be re-handicapped at the end of each calendar month, provided he shall have fired at not less than 100 birds during that period, and no fresh handicap shall be calculated for him until he shall have fired at 100 birds at least since his last handicap was framed.

XXII.—A shooter shall be penalised one point for each and every prize or sweepstakes, over the subscribed or declared value of 20*s.* he shall win during the current month ; this penalty, and any additional ones subsequently incurred, to continue in force until a new handicap is calculated. In the event of a division, the shooters dividing must arrange and declare which of them shall be penalised. This system of penalties shall equally apply to scratch events.

XXIII.—The points awarded to a shooter at the beginning of each month shall not be varied by more than one point from the points he possessed, as a result of averages and penalties, at the end of the previous month.

XXIV.—Ties shall be shot off at not less than ten birds each shooter.

XXV.—The highest score possible in each ten-bird competition shall be twelve points, and in similar proportion for competitions of a greater number of birds.

XXVI.—In the case of an optional sweepstakes being added to a special competition, it shall be treated as a separate event on the question of penalties.

XXVII.—Every new member joining a club shall be allowed four handicap points, unless he is already a member of some other affiliated club, in which case his points at that club shall be given him in the new club ; in the event of his belonging to more than one other club, and having different points in them, the points allotted to him in the new club shall be the smaller number.

Directions for Handicapping.

Simple Rule for Calculating Percentage of Misses.—Add two noughts to the number of birds missed, and divide by the number fired at (ignoring any remainder that may occur).

Rule for Fixing the Handicap Points from the Percentage of Misses.

A shooter having	65 % or more	of misses has	7	points.
,, ,,	from 55 % to 64 %	..	6	,,
,, ,,	45 % .. 54 %	..	5	,,
,, ,,	35 % .. 44 %	,,	4	,,
,, ,,	25 % .. 34 %	,,	3	,,
,, ,,	24 % or less	..	2	,,

In regard to the above directions, it must be remembered that, whatever points may be obtained by a calculation based on the percentage of misses, the points actually awarded can only vary by one point either way

from those possessed by the shooter at the end of the month or months, on the records of which the handicap is calculated. (See shooter B. in the following examples):—

EXAMPLE.

Name of Shooter.	Number of Birds shot at.	Birds missed.	Percentage missed.	Handicap on previous month.	New Handicap.
Mr. A..	100	64	64	7	6
Mr. B..	242	69	28	5	4
Mr. C..	380	209	55	6	6
Mr. D..	349	53	15	3	2

EXAMPLE OF A POOL SHOT.

Handicap Sweepstakes, Ten Birds Each.

Name of Shooter.	Birds shot at.	Birds broken.	Handicap points.	Score.
Mr. A..	1 0 1 1 1 1 0 0 1 1	7	7	12
Mr. B..	1 0 0 1 1 0 1 1 1 1	7	5	12
Mr. C..	1 0 0 0 1 1 0 0 1 0	4	6	10
Mr. D..	1 1 1 1 0 1 1 1 1 1	9	2	11

A. makes two points above the highest score allowed, and they are accordingly cancelled.

Mr. A. and Mr. B. tie and shoot off at the same number of birds, Mr. A. scoring 12 points, and Mr. B. 11, Mr. A. therefore being the winner. Mr. A.'s handicap is as a result reduced for the rest of the month to 6 points, provided of course that the subscribed or declared value of the prize or pool is worth 20*s.* or more. In case Mr. A. and Mr. B. had decided to divide the pool, it would have remained with them to decide mutually which should be penalized one point.

It will, of course, be understood that 2-point men cannot be penalized.

SPECIAL RULES FOR CONTINUOUS FIRE.

XXVIII.—There shall be six shooters for the five traps. Five shooters shall face the five traps, and No. 6 shooter shall stand behind No. 1, waiting his turn. No. 1 shooter shall fire first at No. 1 trap, No. 2 shooter at No. 2 trap, and so on in rotation down the line. At or during the completion of the round, No. 1 shall take the place of No. 2, and No 6. shall face No. 1 trap, No. 2 shooter shall face No. 3 trap, and so on, No. 5 becoming No. 6 in waiting.

XXIX.—When the shooter is at the mark, the puller shall call out the number of the trap, and the shooter shall then call "pull."

XXX.—If a shooter fire out of turn, the bird shall be a no-bird, and the shooter who fired out of turn shall lose his shot, and be judged to have missed.

XXXI.—In case of a trap or traps throwing a no-bird, they shall not be refilled until the end of the round, when the shooter or shooters shall again be called to their marks.

XXXII.—When the traps are set to throw at unknown angles, and there are two or more traps behind each screen, the puller should be informed by any suitable means which trap behind each screen he is to pull. A number of cards marked A. and B (or where three traps are in use A, B, and C) should be exposed as each trap is to be pulled, A indicating that the puller is to release the left-hand trap, B the right hand trap, or, when three traps are in use, B shall represent the middle trap, and C the right-hand trap.

SPECIAL RULES FOR SINGLE FIRE.

XXXIII.—The shooter shall stand opposite the centre trap and fire at five birds, one from each trap, before leaving the mark.

XXXIV.—When the shooter is at the mark, and prepared to fire, the puller shall call "ready," and the shooter shall then call "pull."

XXXV.—In case of a trap throwing a no-bird, it shall be refilled forthwith.

SPECIAL RULES FOR SINGLE FIRE COMPETITIONS AT UNKNOWN TRAPS.

XXXVI.—The shooter shall stand opposite the centre trap and fire at five birds before leaving the mark.

XXXVII.—When the shooter is at the mark, and prepared to fire, the puller shall call "ready," and the shooter shall then call "pull."

XXXVIII.—In cases where there is only one trap at each position, all five traps shall be filled before the shooter commences to shoot. The referee shall indicate to the puller, by means of a pack of five cards, each bearing the number of an individual trap (1, 2, 3, 4, 5), which trap is be pulled next. The cards shall be shuffled for each shooter, and turned up one at a time until five birds have been shot at. In the event of a no-bird, the trap throwing it shall be at once refilled, and the referee shall re-shuffle the remaining cards, and then turn them up one at a time until five birds have been shot at.

XXXIX.—In cases where there are two traps at each position, all ten shall be filled before the shooter commences to shoot. The referee shall indicate to the puller by means of a pack of ten cards (or other suitable device) which trap is to be pulled next. The cards, which shall each bear the number of an individual trap, 1A, 1B, 2A, 2B, etc., should be shuffled for each shooter and turned up one at a time until five birds have been shot at, the next card to be taken when a no-bird is thrown.

XL.—In cases where there are three traps at each position, the same conditions as in the preceding rule shall apply, except that, instead of ten cards, fifteen shall be used, marked 1A, 1B, 1C, 2A, 2B, 2C, etc.

SPECIAL RULES FOR SINGLE FIRE COMPETITIONS AT UNKNOWN TRAPS WITH DOUBLE RISES.

XLI.—The shooter shall stand opposite the centre trap and fire at five birds, one from each trap, before leaving the mark.

XLII.—When the shooter is at the mark, and prepared to fire, the puller shall call "ready," and the shooter shall then call "pull."

XLIII.—In the case of a trap throwing a no-bird, it shall be refilled forthwith.

XLIV.—Any suitable means, such as a pack of cards, each numbered or marked to correspond with an individual trap, shall be used. Two cards shall be drawn simultaneously, and the puller shall release the corresponding traps when the shooter calls "pull."

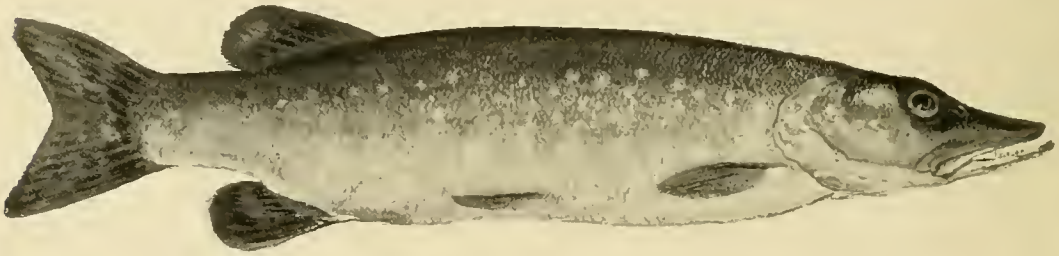
PIGMY HOG—Here and there in the Dooars I sometimes came across a sounder of tiny hogs without encountering any large ones near, and came to the conclusion that they were squeakers who had lost their parents. I never fired at one, until my last trip, and then, there being a scarcity of food, I went into an island in the bed of the Manass to shoot hog deer. I shot several deer and a boar as large as a big hare, but noticing that it had tusks and was very savage, I examined it, and, to my delight, discovered that it was a very fine specimen of the pigmy hog.

The pigmy hog is blackish-brown and irregularly shaded with sordid amber; iris hazel; nude skin, dirty flesh-colour; hoofs glossy brown. Length—snout to vent, 26 inches; tail little more than 1 inch. Height—10 inches. Weight—7 to 10 lbs., rarely 12 lbs. The

young are striped like the ordinary little ones of the wild pigs. There is no mane, but the general pilage is ample, and there is a mystacial tuft. The false molars are compressed, and the face is proportionally less long than in the boar. The female has only six mammæ, and the tail is not so long as the hair of the rump. It wants the normal nasal bones of the wild boar. The stomach is narrower, and the orifices more terminal; it has also a smaller cæcum and shorter intestines. The full-grown males live constantly with the herd, which consists of from five to twenty individuals, and are its habitual and resolute defenders against harm. They eat roots, bulbs, &c., and also birds' eggs, insects and reptiles. The female has a litter of from three to four young ones.

F. T. Pollok.

PIKE—The pike is the largest and most voracious of the purely fresh-water fish found in these islands. His shape, as will be seen from the illustration, is admirably suited for piercing a way through the weedbeds and rushes, among which, as a rule, he makes his home. The colour of his back and sides—green with yellow markings—harmonises with his surroundings, and, no doubt, in a large measure serves to hide him from the smaller fish on which he preys. The roof of his mouth literally bristles with small teeth, which are hinged to work one way only, yielding to food in its passage down the capacious throat, but readily opposing exit therefrom. Along the edges of the lower jaw are long sharp teeth which can inflict a very nasty wound.



Pike.

Local Names—The name "pike" is, no doubt, derived from the old English word meaning pointed, or peaked, in allusion to its shape. *Jack Pike*, *John Pike*, *Luce*, and *Pickerel*, are names rarely heard nowadays, except the last mentioned, which is only used in America, where it is the popular name for *Esox reticulatus*. In America, I may mention, there are considered to be four species of the genus *Esox*—namely, *Esox nobilior*, or Muskalonge (also known as *Lucius maskinonge*); *Esox lucoides*, the Great Northern Pickerel, or Pike; *Esox reticulatus*, the Common Pickerel, and *Esox fasciatus*, the Pickerel of the West, which does not often reach a pound in weight, while the pickerel proper, though sometimes reaching 6 or 7 lbs, does not, so it is said, average over 2 lbs. It is quite possible that some of these are local varieties of the same fish. *Gedd*, and *Gade*, are terms used in the lowlands of Scotland, while in Northumberland the pike is sometimes called the *Gullet*, the reason for which will be obvious to any one who has had occasion to open its mouth to its fullest extent. *Haked*, another name for the same fish, is occasionally heard in Cambridgeshire. In the southern and midland counties of England this fish mostly goes by the name of *jack*; in fact, on the Thames, the word *pike* is not often heard. In Scotland and Ireland, on the other hand, *pike* is the most common word. Not a few fishermen regard the pike as simply a very large jack, but the words are used loosely.

No creature has been the hero of a larger number of remarkable stories than the pike. There is probably a *soupçon* of truth in many of them, but most may only be accepted with caution. When very hungry and very large, this fish will, no doubt, at times exhibit extraordinary daring. One remarkable instance of ferocity I can personally vouch for. While fishing with a very large spoon-bait in Lough Derg, I caught a pike which had the tail of a trout sticking out of its mouth. I pulled up the trout, which had only just been swallowed, and had the two fish put in the scales. The pike weighed only 2 lbs., the trout exactly 1 lb., so that the former was able to swallow a fish half its own weight, and then, still unsatisfied, seize the very large spoon I was using.

Monster Pike—The capture of the big pike crops up regularly. As a rule, the exact weight of the fish is given, but, on inquiry being made, it is equally the rule to find that the fish has not been weighed. In those cases where it has been weighed with great care, my experience is that the body of the fish has almost invariably been disposed of, in Ireland usually being given to the pigs. In Kenmuir Castle, County Galway, is the head of a pike measuring 9 inches across. The body of the fish when complete is said to have weighed 72 lbs.

The following weights and measurements,

furnished by Mr. Alfred Jardine, a very successful pike fisher, may be found useful for the purpose of comparison :—

A thirty-seven pound pike caught in Buckinghamshire ; extreme length 47 ins., length eye to tail 39 ins., length of head 13 ins., girth 25 ins. A thirty-six pound pike ; extreme length 46 ins., length eye to tail 38 ins., length of head 12½ ins., girth 25 ins. A thirty-one pound pike, a female in good condition and well-proportioned ; extreme length 44 ins., length eye to tail 36½ ins., length of head 11 ins., girth, 24 ins.

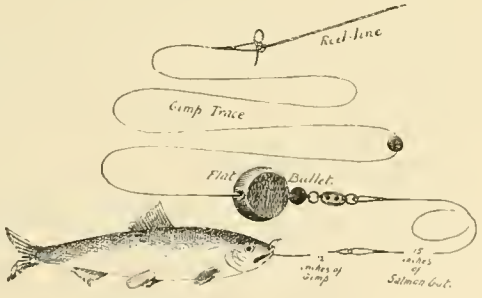
The pike-fisher should certainly carry a spring balance guaranteed to weigh accurately up to 50 lbs., especially when fishing remote waters such as one finds in Ireland, Scotland, and Sweden. I shall never cease to regret that a pike I caught in Lough Derg, which measured exactly the same as Mr. Jardine's 31 lbs. fish last referred to, was not properly weighed at the time it was caught, for the naturalist who set it up when it arrived in Dublin, some days after its capture, informed me that it weighed only 25 lbs. One of the largest fish caught recently was the Cheltenham pike, picked up dead in the reservoir at Cheltenham. The weight was stated to be 60 lbs., but on inquiry I found that the fish had not been put in the scales. Its measurements were, however, taken, I hope with accuracy, and the fish has been preserved by a Cheltenham naturalist and is placed in the public library. The following alleged measurements and weights, if carefully compared, afford food for reflection :—

Cheltenham pike : Length, 53 or 54 ins. ; girth, 23¾ ins. ; weight, 60 lbs., admittedly not weighed, see *Field*, May 30, 1896.
Lough Romer pike : Length, 54½ ins. ; girth, 25 ins. ; weight, 37¾ lbs.
Pike caught by Mr. Jardine : Length, 47 ins. ; girth, 25 ins. ; weight, 37 lbs.

Breeding and Preservation—This is a subject to which anglers who love to catch these fish should pay considerable attention, for good pike-fishing is rapidly getting more difficult to obtain. Rivers in which, twenty years ago, I could under favourable conditions almost make sure of 5 or 6 brace of good fish in the course of a short winter's day, now yield only three or four jack to the most skilful and patient angler. In some waters the fish are so harried by anglers that they have no time to grow to any size. They are caught before attaining any considerable weight. But the most important point connected with the preservation of pike is sadly neglected. These fish run up ditches to spawn in the early spring, and an enormous percentage of the spawners are caught by rustics armed with a long pole, at the end of which is a wire noose. The bigger the fish, the more easily it is caught in this fashion. After the spawn is deposited among the weeds, there come the farmer's ducks, and the Queen's swans, to say nothing of wild fowl, to eat it up : and the marvel to me is that there are any jack left at all. During the fence-months the ditches require as careful watching as any game preserve.

Habits—To come now to the more practical portion of this article, it may be as well first to describe the haunts of the pike at various seasons of the year. The open season commences on June 16th, and the fish will be found from that date and throughout July close to and among weeds and rushes ; if in rivers, they prefer a nice stream to dead water. A good many pike, too, are found in weir pools at this time of the year. In fact, wherever roach and other small coarse fish are to be found, there are the jack. In August and September, though they still haunt the reeds and weed-beds, many shift into rather deeper water, but still show a preference for a slight stream. As soon as the weeds have died down, they spread over the river, and spinning is then the most successful way of catching them. With the first flood, they cease to be found in mid-stream, and lie close along the banks, at the tails of islands, in eddies, and especially just below the hills on which the reeds have grown during the summer. A very heavy flood will drive them into still backwaters, and in any case they will be found in these soon after Christmas.

Live Baiting—Live bait may be presented to the fish in two ways : It may be (1), carried down to them by the stream, or cast out to them on float tackle, in which case the lead is above the fish, and between it and the float ; or (2), it may be placed on a line without a float, in which case the lead is either at the end of the line, and the tackle is called a Paternoster, or the fish is at the end of the line and the lead is a yard above it and rests on the bottom, in which case it is called a Leger. I should

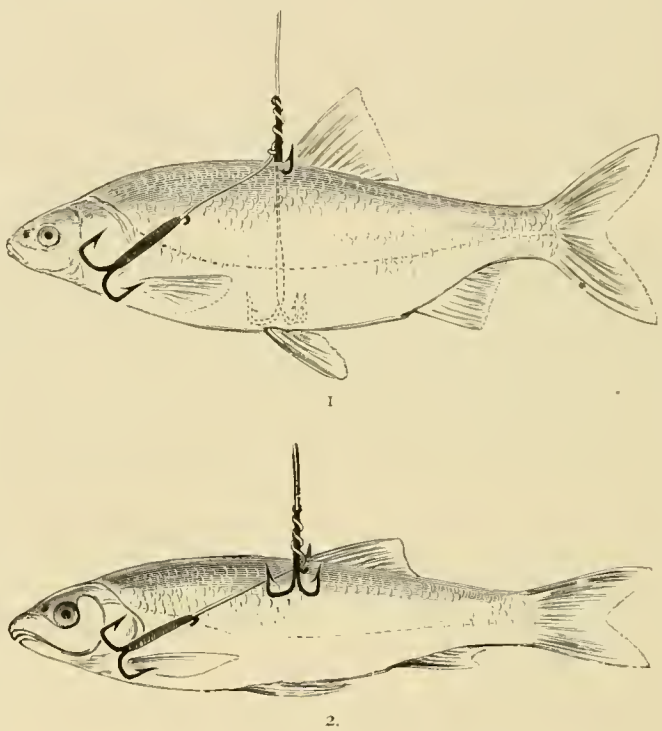


Pike Leger, with Single Hook.

explain that the various tackles I am about to describe are probably the very best that can be obtained, so far as our present knowledge goes ; but I need hardly say that, with cheaper and rougher tackle, good sport is often obtained by competent hands.

Float Tackle—The best float is that named after the *Fishing Gazette*. It has a slit in its

side through which the line can be passed, and many a time, when the bottom has been too weedy to work the paternoster, I have simply slipped one of these floats over the paternoster tackle and used it as ordinary float tackle with much success. The next illustration shows the two best Snap tackles (the old-fashioned Gorge tackle is altogether out of date). No. 1 is used for large baits, or those of average size, while No. 2 is better suited for small baits. For what I may term very small baits—that is to say, three inches in length, or less—a single hook is best. The hook is mounted on gimp of not less than 12 inches in length. This is connected by means of a hook swivel to 1½ yards of the stoutest salmon gut. In weedy lakes, where immense fish are likely to be caught, twisted gut may be used, and rather stout gimp, but in most rivers nowadays ordinary salmon gut is quite strong enough, and the hooks may be mounted on ooo gimp. Gimp of the next size larger is termed oo, and the size larger still, o.



Snap Tackle.

[*Copyright, T. Upcott Gill.*

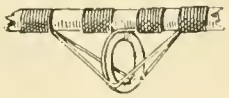
Line—The line, or running-tackle, should be solid 8-plait silk, thoroughly well dressed with an oil dressing, and as smooth as possible on the surface. The pike fisher should *have nothing to do with lines which contain an inner core*, or are hollow, or have so hard a dressing as to crack when bent, or so rough a dressing as to impede the running of the line through the rings.

Reels—For a reel, nothing is better than one 3½ inches in diameter, of the Nottingham type, and fitted with either Bickerdyke or Slater guard, to prevent the line untwisting and getting out of place. It should have an optional check. If made of wood, it should be taken to pieces and well vaselined or painted inside with enamel, to prevent the wood from getting wet and swelling. Not a single steel screw should be used in its construction. I am now using an ebonite reel made somewhat on the Nottingham principle, called the "Simplex," and am inclined to believe it is about the best reel yet made. It has a "Bickerdyke" guard, which a slight pressure with the finger turns into a brake on the rim of the reel, by means of which the check can be increased. Other excellent reels deserving of mention are the Silex, Duplex and Ariel—the last mentioned so light that a puff of air moves it.

Rods—The rods should be about eleven feet in length, and should be furnished with three tops of different lengths and degrees of stiffness. The best makers are now turning out such excellent pike-rods that very little advice is necessary on this point. For material, some anglers prefer greenheart, while others, because of its lightness and toughness, prefer bamboo, but use greenheart for the top joint. Very important are the rings with which the rod is fitted. These should all be equally large, with an internal diameter of at least ⅝ inch, and should be fitted with an internal revolving ring of phosphor-bronze. Steel is sometimes used for the purpose, but it is not so good, for it invariably rusts. The ring on the butt next the reel should be of the shape shown in the illustration, and, indeed, this is one of the best shapes for all except the end ring, for which I find nothing better than one of my own inventing, which works on pivots, adapts itself to whatever angle the line makes with the rod, thereby increasing the life of the line considerably. If a fixed ring be used, it should be placed at right angles to the rod, and should, like the others, contain an interior ring of phosphor-bronze. As these rings add considerably to the cost of a rod, I should mention that the well-known snake ring may be used for all rings except the one at the point of the rod and the one next the butt. For strong tackle the rod should be stiff; for light tackle it may be lissom, to avoid a break when striking a heavy pike, or when

the fish makes a sudden rush. But it is not really necessary to have two rods, sufficient alteration in stiffness being effected by simply using the long, medium, or short top. The

Bickerdyke Top Ring.



Bridge Ring

rod, reel, and line described will do for practically any kind of jack-fishing, but a long rod has its uses, as, for instance, when fishing from the bank over a belt of weeds or reeds.

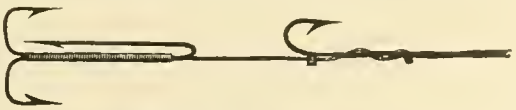
Baits—The baits which can be used with float tackle are numerous. They include small dace, chub, gudgeon, roach, gold-fish, small carp, and lastly, minnows, which, in very clear, low water, will kill when larger baits are of little use. After having baited the set of hooks and rubbed vaseline over twenty yards of the line to make it float, it remains only to adjust the float to its proper distance from the bait, and to cast the tackle out, or let it float down to the fish.

In very clear water the float should be placed so that the bait swims a little below mid-water, unless the depth is considerable, when the baits may swim somewhat nearer the bottom. In thick water, the bait should be within a foot of the bottom, or less, or the pike (unless travelling about in search of food) will not see it.

Casting—In lakes, streamlets, and backwaters it is necessary to cast out this tackle some distance; and this is done by unwinding a quantity of line on the ground, or floor, of the punt, and then swinging out the float in the direction required, releasing the line, which shoots through the rings and enables the bait to travel in the right direction. Another plan which, for this method of fishing, is certainly preferable, as soon as the angler has acquired sufficient skill, is to cast off the reel. To do this, the check is removed from the reel, which is kept from revolving by the first finger of the left hand, which holds the rod below the reel. The float, bait, and lead are swung backwards, then forward with some force, and, if the reel is released at the right moment, they fly out over the water, the reel automatically paying out the line. The speed of the reel, however, is apt to increase while the speed of the bait decreases, and, in order that the reel may not overrun, it is necessary, when the float, &c., are halfway to their destination, to check the reel slightly by touching it on the rim with the finger. A good deal of practice is necessary before casting from the reel can be done satisfactorily.

Striking—With the tackle I have mentioned, the angler should strike as soon as the float goes under, and the more distant the bait, &c., the harder should be the strike to overcome the elasticity of the line. After the fish is struck, a reasonable and constant strain should be kept on him until he is in the landing-net, the line being on no account allowed to go slack. The rod should be held as much as possible at an angle of 45°. If the fish makes a sudden rush, the rod should not be yielded to him, *i.e.* lowered, but the fish should take the line off the reel on which, immediately after the cast, the check has been applied. In rivers, unless fishing from the bank, it is not necessary to make a cast of any considerable length, the better plan being to drop the tackle in the water and allow it to be carried down by the stream over the various pike strongholds. In summer time, as much water should be fished as possible, letting the bait work along the sides of reed-beds, over submerged weeds, and other likely places. But in winter, when the fish get collected in backwaters and lay-bys, it is often best to wait a considerable time in one place, only shifting the float a yard or two every ten minutes or so.

Paternostering—Paternostering is a very deadly method of catching pike. As a rule, a single hook is used, but the arrangement shown in the illustration is best where the baits run over three inches in length. To use the paternoster with much success requires considerable skill and experience. This tackle is particularly suited for fishing in rather small rivers or in small pools, and generally in rather weedy waters where the line can only be got in here and there through openings among the weeds. It is a good tackle for use in old-fashioned weir-pools, where there are many corners, eddies, and lay-bys. Its use is simple enough, though it requires considerable practice. The lead is



Improved Paternoster Hook.

Baited Paternoster.

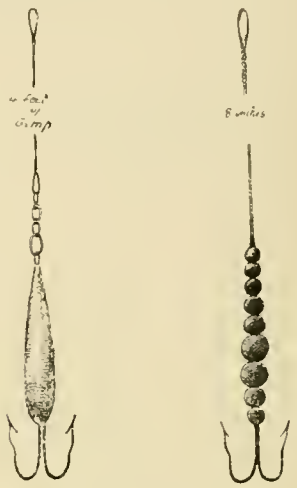
swung out pendulum fashion; a few loose yard of line, held in the hand, are released, and the lead and bait dart into the water and sink rapidly to the bottom. Then the rod is held

steadily with the line taut for two or three minutes. If there is a fish on the feed a pull may be felt, or, what is more often the case, a gentle shake of the line or a series of little tugs which only suggest the struggles of the bait to be free from the hook. It is very remarkable how quietly a pike will often take a bait on a paternoster, and yet with what vigour they always seize and go off with a bait presented to them on float tackle. If tackle and bait of the size recommended are used, the angler may strike at once; but if he has the *large* bait on a *single* hook, it is almost absolutely necessary to allow the pike a couple of minutes to turn the bait and commence swallowing it.

In winter time, when the weeds are down, a paternoster may be used in a somewhat different fashion. Wide reaches of the river may be searched with it by casting out a long distance in the manner I have described for float-tackle, leaving it lying on the bottom for a few minutes, then drawing in half-a-dozen yards, waiting as before, and continuing these movements until all the water has been covered.

Legering for Jack—The object of legering for jack is to fish not only near the bottom, but in such a way that the greater portion of the tackle is hidden from the sight of the fish by being below the line of vision. This tackle is, as a rule, cast out and left for a considerable time in one place. In thick, shallow water, when the fish congregate in an eddy, it is at times very killing; and, paradoxical as it may seem, it will sometimes take jack when every other method fails, owing to the water being exceedingly low and bright. Either the single hook, or the triangle and single hook recommended for the paternoster should be used, according to the size of the baits.

Fishing with Dead Bait (Trolling)—The very ancient method of fishing with dead gorge, termed *trolling*, is, every true sportsman will be glad to know, rapidly dying out. Not that it involved any absence of skill on the part of the angler, but because the method involves the fish swallowing or gorging the bait before it is landed. Thus, in almost every case it has to be killed, whether undersized or not, before the hook can be extracted. Even when not killed, it is so injured that it rarely survives the operation of hook removal. The illustrations show a trolling hook unbaited. The baiting is performed by placing the loop at the end of the gimp attached to the hook in the eye of a baiting-needle, and passing the needle in at the mouth and out at the tail of the fish. The tail and sometimes the gills of the bait are then bound round with thread. The gimp is next attached to the main line, or, if the line is coarse, to a yard of fine gimp connected with the main line, and the arrangement is complete. The bait is dropped smartly into the water and allowed to sink as rapidly as possible by its own weight nearly to the bottom, and then drawn up sharply twice or thrice and allowed to sink again. Immediately a run is felt, the fish is allowed to take the bait and go off with it to its lair, the line being paid out. When five minutes have elapsed from the time the fish has



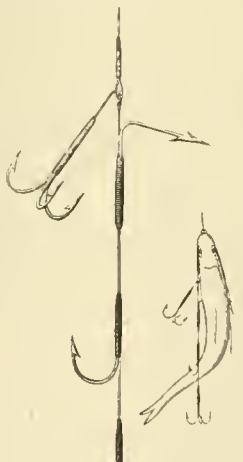
Gorge Trolling Hooks.

ceased running, it may be considered to have gorged, if it is going to gorge at all, and the double hook being in its entrails, it is easily hauled up to the side of the bank or punt. The method is only permissible in densely weeded places where any other kind of fishing is impossible, or in rivers where pike are not preserved, and it is desirable to kill as many as possible in the interests of other fish. Some years ago, however, I devised a *snap* trolling tackle. This is cast out and worked in the ordinary way, but, the bait being adorned with two triangles, the angler strikes directly he has a run from the pike. I have killed a good many fish with this tackle, particularly when the water is coloured and the fish lie close under the bank.

Spinning—This is certainly the most interesting and sportsmanlike of all the methods enumerated. The hanging of the lead below the level of the line is of the greatest importance to prevent the running tackle from getting twisted by the revolutions of the bait, and kinking. All the swivels should be placed below the lead. There is nothing better than a *double* brass swivel immediately below it; and if this works properly, no others are required. The trace may be of fine gimp or twisted gut; as a rule, I use the latter. Strong salmon gut is excellent for the purpose. Of artificial baits there are many hundreds, but few better than the Devon minnow, phantom minnow, and spoon. Of spoons, the best are the rather long, shallow variety, half-gilt and half-silvered on both sides. Small

sizes of artificial baits should be used when the water is low and bright. When it is coloured, or on very rough, dark, windy days, large baits may be used. The best natural spinning bait is a bleak which has been toughened for some weeks in spirits of wine, formalin solution, or other preservative. Small dace are almost equally good, and so are sprats, and, for clear water, gudgeon. The use of natural bait requires what is termed a flight; that is to say, an arrangement of hooks which, when adjusted to the bait, will so twist the tail of the bait as to cause it to spin. Or the hooks may be connected with a couple of fans or propellers, which are placed at the head of the bait, which then remains straight. The Chapman and the Bromley-Pennell flight are, of the two varieties mentioned, the best, though there are many others. I hardly ever miss a pike when using a Chapman spinner, provided the hooks are the right size and shape, and I am able to strike sufficiently hard. The old-fashioned Thames flight, in which a number of triangles are placed in the bend of the fish, involves the loss of a very large percentage of the pike which are run.

Skill in spinning is only to be acquired by practice. The bait may be either cast Thames fashion, or off the reel, Nottingham fashion, as described under the head of "live-bait." On reaching its destination it should be allowed to sink, unless the water is very shallow or weedy, until it reaches about mid-water, and then drawn in with alternate pulls of the line, and draws off



Bromley-Pennell Flight.

the rod, to keep the bait constantly spinning. It is not desirable to draw in the bait faster than is necessary to make it spin and to keep it off the bottom, and the fish should be struck as hard as the tackle will bear. A lissom rod is certainly a mistake for pike-spinning, pleasant as it may be to cast with. In immense lakes, in which the fish are much scattered, the spinning bait is usually trailed behind the boat, success depending on keeping as close as possible to the weeds.

The pike-fly is no fly at all, but a fancy bait made with bright feathers, which the pike possibly takes for a young bird. It can be cast, or trailed, in exactly the same manner as a spinning bait, but need not spin. In very shallow, weedy meres it is sometimes worked near the surface, but it is a very clumsy bait for casting, even with a powerful salmon-rod. One of the most successful flies in Ireland is made of the end of a brown calf's tail, and is not a bad imitation of a water rat, for which, no doubt, the pike take it.

So much for the methods of catching pike. When they are caught, no attempt should be made to take out the hook until they have been knocked on the head. Not long ago I invented an improved form of "Priest," which contains in the tube forming the handle a capital pike gag to keep the fish's mouth open, and a powerful disgorger to remove the hooks. The gag also acts as a measure to take not only the length, but the thickness of the fish. Out of some waters pike are excellent eating when in their best season, which is from October to the middle of January. If stuffed and baked with a rich gravy flavoured with port wine, many people esteem them for the sake of the gravy and stuffing. They require a liberal basting. Personally, I prefer cutlets of pike, egged, sprinkled with bread-crumbs, and fried in *butter*. The fish should be cut into cutlets before being cleaned, the cleaning done after the fish is in pieces.

Pike-fishing in public waters, and the sale of pike, is prohibited between March 15th and June 15th following, both dates inclusive. The Act does not apply to the Norfolk Broads.

John Bickerdyke.

Bibliography—*The Book of the Pike* (1865), by C. Pennell; *Angling for Pike* (2nd ed., 1897), by John Bickerdyke; *Pike and Perch* (1897), by Alfred Jardine.

PIKE—Measurements, etc.—Length of head 3½ to 4, of caudal fin 6, height of body 6½ to 7 in the total length. Nostrils large, and nearer the orbit than the end of the snout. Numerous glandular orifices on the head. *Teeth*—none on the maxillary; large ones and of unequal sizes on the mandibles; present on the vomer and palatines, the inner row of which are the larger, more or less strong and depressible; also fine ones on the tongue. *Fins*—the dorsal is situated in the last fourth of the total length (excluding the caudal fin), and slightly in advance of the origin of the anal. Pectoral placed low down and below the subopercle. The ventral slightly behind the middle of the total length (excluding the caudal fin). Caudal emarginate or slightly forked. *Scales*—small, present on the cheeks, upper portion of the opercle, and over the body. *Lateral-line*—nearly straight. *Colours*—when in the greatest perfection, of a green colour, becoming lighter on the sides and beneath; numerous

yellow blotches, spots, or lines along the head and body; dorsal, anal and caudal fins of a light ground colour with irregular blotches, spots and bands of dark. When out of season, the green becomes of a grey hue, and the yellow markings pale or white.

Day, *Fishes of Great Britain and Ireland*, vol. ii. p. 140.

PISCICULTURE—This art was well-known to the Ancients, but their knowledge of the subject seems to have been entirely lost. It is now a little more than a century since the artificial propagation of fishes was rediscovered. During the last two or three decades of that period the discovery has been turned to good practical account, and the work and knowledge of fish culture has made rapid strides. In connection with British water it has been chiefly applied to the cultivation of various members of the salmon family (*Salmonidæ*), although so-called coarse fish have also been dealt with, as well as many of our marine forms. The *modus operandi* varies somewhat according to the class of fishes that is being dealt with, but at least two requirements are common to all: these are suitable water and protection from enemies. Salmon and trout naturally push up to the head waters of streams for the purpose of depositing their ova, and here they are most likely to meet with good water, which may be said to be their first requirement. So it is the first requirement of the pisciculturist. He must have a good supply of clear sparkling water as supplied by nature, and this being at hand it may be diverted into hatching tanks, in which the ova can be deposited for safety, instead of being left in the gravelly bed of a stream. It is usually found desirable to pass it through a filter. One which I have used successfully for upwards of thirty years is shown in Fig. 1, which explains itself, half a dozen frames being fitted into a box through which the water passes. The frames have flannel or other fabric stretched upon them, and can be taken out and cleaned by washing daily or when required.

From the filter the water should pass into a distributing tank, which in a hatchery of any dimensions consists of a long box placed across the ends of the hatching boxes. Into one side of this a number of spouts are fixed, which carry the water to the others, and the supply to each must be regulated by a tap or some other appliance. The same plan is usually adopted for both salmon and trout, the ova of both fish requiring similar treatment. The arrangements shown in Fig. 2 will explain the system generally adopted, being a set of accessory outdoor hatching apparatus with distributing tank, &c. A very convenient size for the latter is about nine inches depth, and any length to suit the number of hatching boxes.

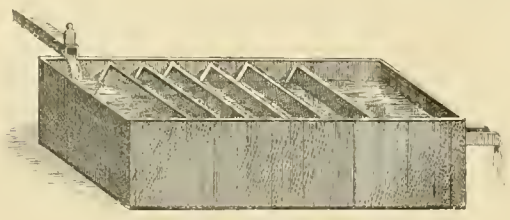


Fig. 1.

These may be about twelve feet long by eighteen inches wide inside, and six inches in depth, and each of such boxes will incubate twenty-five thousand salmon ova or thirty thousand full size trout ova.

The water should be about three or four inches deep and the eggs placed in it on trays about midway. The most satisfactory trays have proved to be those known as glass grilles, and there can be no doubt that they supersede all other methods yet known, inasmuch as they give better results. In some waters, it is true, metallic trays have been used with success, but many cases have occurred in which their use has proved disastrous.

All submerged woodwork in connection with fish hatching apparatus should be first charred and afterwards coated with a specially prepared waterproof varnish. The deadly fungus, so well known as "salmon disease" (*Saprolegnia*), will grow on wood but not on carbon, hence the advantage of carbonising the apparatus. The carbon in time wears off, but a coat of varnish will preserve it, and is a sure preventive of the fungus, so far as anything coated with it is concerned. At first, ten

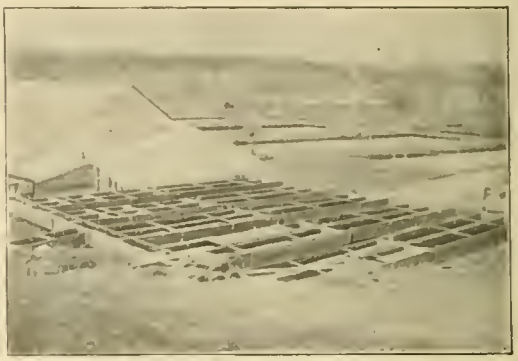


Fig. 2.—An Accessory Outdoor Hatching Apparatus, as used at the Solway Fishery.

gallons of water per minute should be run through such hatching boxes as I have alluded to, and the supply may be increased to twenty gallons before the eggs hatch, and afterwards thirty gallons per minute will not be too much. I have seen apparently good work done with a smaller run of water, but in order to keep the eggs in a really healthy condition it is much safer to have a good supply. Much depends too upon its quality and temperature.

The eggs are procured by a process which is termed "stripping" the fish. The males and females are first sorted and placed in different tubs or tanks. Then a female fish is taken in hand, and, if ripe, the eggs will flow from it on gentle pressure being applied to the abdomen. These ripe eggs are expelled into a bowl or dish, and when several females have been stripped, the milt of a good ripe male is expressed upon them, and should there be any doubt as to its quality two fish are used instead of one. Eggs and milt are then gently mixed together by the hand, a little water is added, and they are allowed to stand until they separate, for at first they will adhere to each other and to the dish. The time of their separation varies according to temperature, sometimes occurring in a few minutes, whereas on a frosty day they will often remain for an hour or more before becoming free.

The next process is to wash them and lay them on the grilles in the hatching boxes. Here they remain about ninety days, should the water be of an average temperature of about 40° F. The colder the water, the longer they will be in hatching; on the other hand, should it be warmer, they will hatch much more rapidly. Salmon ova have been hatched in thirty days, and where the water was very cold the time has been prolonged to 160 days. A good while before hatching, the eye spots can be distinctly seen, and at this period of their existence the eggs can be packed and sent long journeys with comparative safety.

On first emerging from the eggs the little creatures are called "alevins" and do not bear much resemblance to fish. The word is derived from the French.

The accompanying figure (3) represents an alevin trout magnified.

(1) The cranial cavity containing the brain; (2) the gills or breathing apparatus; (3) the heart; (4) one of the pectoral fins, used at this stage for assisting respiration by causing currents, and acting like a fan to

the gills; (5) an oil globule; (6) the vertebral column; (7) the anus. The rudiments of the dorsal fin are quite apparent, and the rays of the caudal fin or tail may also be traced. The sketch is taken very soon after hatching, and the daily development of the fish from this point is a most fascinating study, and well worth the attention of any one interested in such matters.

Any one may keep a few alevins for a week or two in an ordinary basin, by changing the water daily, and very interesting little creatures they are. There is, attached to each individual at this stage, a large transparent bag, known as the umbilical sac, and this contains the nourishment necessary for the next thirty or forty days, during which period of their lives they are very easily managed. When the sac is nearly absorbed, the alevins begin to look like fish, and are soon in the fry stage.

One of the greatest difficulties pisciculturists have had to contend with is the rearing of the fry. In the case of salmon and trout these difficulties have been largely bridged over. Study, research and experiment have done a great deal, and now, when much practical skill is combined with the knowledge which has been gained, a fair percentage of fry may be reared to the yearling stage. It will be apparent to any one that delicate little creatures like trout fry require delicate treatment. A very little disorganisation, be it external or internal, is sufficient to kill them, and the constant and unflagging care of an attendant is absolutely necessary. When they begin to take food by means of their mouths, which is usually a little while before the complete absorption of the umbilical sac, they must be carefully and regularly fed. The natural food at this period of their existence has been found to consist of minute crustaceans, and the artificial food most nearly corresponding to this consists of pulverised shrimps. These may be boiled and then put through a meat chopping machine, fitted with a very finely-perforated plate, or, if used on a small scale, pounded in a mortar and rubbed or forced through very finely perforated zinc. Other food should also be given, such as chopped worms, egg, curd, liver, &c. One of the most economical methods of maintaining or replenishing the stock of trout or salmon in any water is by planting the eggs, when almost ready for hatching, in artificial ova beds. The heavy losses which occur in nature at spawning time and during the period of incubation are by this means saved, as the ova can be purchased for comparatively little, all ready for laying down, every egg containing a living fish. The loss on such eggs should be very trifling, other things being equal; indeed it has

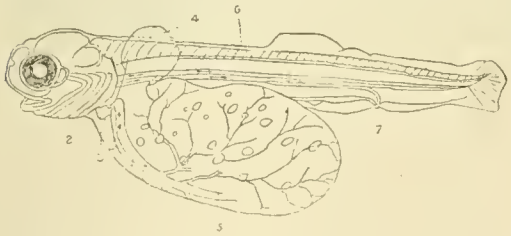


FIG. 3.—ALEVIN TROUT.

been found in practice to be usually something under three per cent. A great advantage possessed by these artificial beds is that they can be fixed in any convenient situation. They may be away from the stream or near it, as desired, so long as they are in such a position that a supply of water can be led to them, and this may be done either by means of a pipe or by an open spout. An ordinary two-inch drain tile answers very well, and, being carried under ground, has the double advantage of keeping out the frost. Of course the beds should be out of the reach of the highest floods.

In addition to a suitable supply of water, it is necessary to provide for its proper exit, and the arrangement must be one that will suit the little fish when they incline to drop down stream, for herein lies one of the great secrets of the ultimate success of the system. The bed itself may be simply dug out, or an ordinary ditch may sometimes be made use of, the bottom and sides being lined with brickwork or concrete. The width may be from one to two feet, and the bottom should be covered with a good coating of fine gravel about the size of a pea. The eggs are laid upon this, and a nice ripple run over them. When they hatch, the "alevins" remain in the bed just as long as they like and no longer. They can be kept in it for a while by keeping it dark, and this should be done, but if any attempt be made to confine them by means of screens or gratings, the whole object of the apparatus is nullified.

The best and most practical ova beds are constructed of wood, and as they can be made perfectly tight and a false bottom of perforated metal easily fitted, the gravel can be laid upon this and the water conducted underneath, so that it rises up through the gravel, upon or amongst which the eggs should be placed. Below the hatching-bed suitable provision should be made for the welfare of the nurslings. A tiny streamlet, widened out into narrow ponds, nicely gravelled and planted with aquatic vegetation, forms an excellent nursery in which they are absolutely in a state of nature. The growth of natural food can here be encouraged, and all surroundings kept in favourable condition for the welfare of the little creatures. They can be protected by wire netting from the onslaughts of birds or other animals, and they finally drop down at will into the stream or the lake which is to be their future home. Such a sanctuary will be the means of saving a large number of them, and herein lies the great advantage of the whole system. Sometimes it is most convenient to place the ova bed alongside a stream into which the fish can escape as soon as they like, and even without the provision of any nursery ponds good will result, but a system such as I have described will, if properly carried out, do much more towards replenishing the stock in any water.

In Britain it is most desirable that the ova of *Salmonidæ* should be incubated in a building, and this building should be as nearly frost-proof as may be. I have seen good work done, and have done it myself, in the open air, but owing to the vicissitudes of our climate the operation is always fraught with danger. When the embryos are so far developed that the eggs are almost on the point of hatching, they may be transferred to artificial ova beds and safely left there, as they can be covered up during frost. On the other hand they may, if desired, be retained in the hatching boxes until the fry are nicely on the feed.

When deposited in our waters, the destruction of ova is enormous: hence the great advantage of caring for it. It is quite easy to save 95 per cent. in most cases. Then the delicate little "alevins" are often destroyed wholesale, so that by protecting them from their many enemies another great advantage is gained, and even if we do no more than this, our fisheries might benefi enormously. There are a great many neglected streams in this country, which might be made to do excellent work and to support a large number of fish, where at present there are hardly any worth mentioning. Artificial ova beds are invaluable aids to stocking such waters, and combined with a little engineering skill would soon give results. I have seen many cases in which small streamlets holding nothing but diminutive trout have been made to produce a fine crop of large fish. The cultivation of such waters is a matter of great importance, and when we bear in mind that an acre of water is worth more than an acre of average land, there can be no question as to whether or not it is worth while to turn attention to it.

In the past we have treated our waters as waste—when on land something to be got rid of,—when in river something into which to turn every sort of pollution that man could produce, and this is still going on. We have, however, at last found the water to be an exceedingly valuable commodity from which a considerable revenue may be derived. Its cultivation is now no mere theory, but is a realised fact; but in order to carry out the work

to any appreciable extent much study is needed, or the result will be failure, as is so often the case in agriculture where the worker does not understand his business.

The cultivation of water for the purpose of increasing or improving stocks of fish is a matter which has hitherto largely escaped notice. Fish cannot live in unsuitable water any more than wheat or any other crop will succeed on unfavourable land. Close attention must be given to the *flora* and *fauna* of any piece of water, be it natural or artificial. First of all, the plants must be considered, and desirable species should be carefully cultivated, whilst noxious forms should be kept down or, if possible, eradicated at once. In addition to a good supply of water, trout are dependent upon liberal contributions of food, and this food nature produces in limited quantities, but by means of cultivation the quantity can be increased enormously. In a lake the natural stock may thus be largely augmented; in a pond the fish may be given daily rations of artificial food to supplement the limited supply provided by nature. In such a case a much larger number of fish may be kept, and a supply be always at hand—a consideration of no mean kind.

In dealing with these and kindred matters it is well worth while to have skilled advice, as otherwise much benefit may be lost by inattention to some apparently trifling point, or the work may be completely spoiled. I have seen thousands of pounds sunk where hundreds with a little engineering skill would have produced better results. The system of ova beds which I have described leaves the trout or salmon fry to take care of themselves. Should it be desired to retain them in rearing ponds they must be turned in soon after beginning to feed, and they then require constant care. The outlets should be protected by finely perforated zinc so that the little fish cannot escape. A good flow of water, varying according to circumstances, should be kept up, and the fish should be fed four times a day.

An excellent plan for feeding fry, and one that is now generally adopted, employs a wooden box with a perforated zinc bottom. The box is fixed on to a long handle of convenient dimensions, and when charged with food is dipped into the water. The latter enters through the perforated zinc bottom, and on withdrawal of the box rushes out again, carrying with it a quantity of the food. The fish soon get to know the feeding-box, and come up to partake of its contents. After they have been in the rearing ponds, or nurseries as they are often called, for about eight or ten weeks, they require thinning out, and sometimes this has to be done at a much earlier period of their existence. Of course much depends upon the success of the undertaking, as they sometimes thin out their own numbers by dying from one cause or another, and this has to be taken into account.

Fig. 4.—Scene at Spawning Time.

It will be at once apparent that a pond which is fully stocked with fry will not sustain those fry when they have doubled, and some of them nearly trebled their size. If half of them have died, that has partly compensated the matter, but if a large proportion of them live, then they must be dealt with in one of two ways,—either by increasing the water supply or thinning out the fish. The latter course is the best. This usually takes place towards the end of July, or during August, and by the end of the latter month the fish have got over the difficulties of infancy. They are then known in commerce as "yearlings." It is true they are not a year old, but they have passed a very marked stage in their lives, and may be sent to different parts of the country. This during July has hitherto been practically an unknown occurrence. The size of the particles of food given to them should be increased, and they need only be fed twice daily. The change should be made by feeding them only three times daily for a week or ten days before the final reduction is made.

At some convenient season during the autumn months,

they should be transferred to much larger ponds, and in making the transfer they should be sorted. The larger ones then go into one pond, and the smaller ones into another. If this be not done, many of the smaller will be devoured by the others, involving not only a loss of fish, but at the same time giving to the larger ones an increased desire to eat their fellows, which is not a good beginning for them. Many of the small ones will grow rapidly when separated from their larger brethren, and by the following spring will make good fish. A pond about sixty feet by fifteen and six feet deep is a good size for rearing yearling trout to two year olds, and after that they may be dealt with according to the fancy of their owner, being either turned out into a lake or river, or retained in ponds near the house as may be desired.

Salmon must of course be turned out into some suitable river, as they have to go to sea, and if retained in ponds against their will they do not thrive. Many of them will jump out, if it be possible to do it, others will die, and the survivors will be found to have lank, thin bodies, and even though they may develop, as they have done in some places, until they yield ova, yet they will never make good fish. Their progeny are weak, and nothing like so good as their parents. In New Zealand salmon have been kept and bred in fresh water, but the experiment was not a great success, though much credit is due to the New Zealanders for having left no stone unturned to introduce the fish into their rivers. Their success in trout culture, on the other hand, has been unprecedented, the fish having multiplied and grown to what are looked upon in this country as enormous weights. The same success, though not in such a marked degree, is attending the cultivation of trout in the Cape Colony. In Germany and in many other parts of the Continent great success has attended piscicultural efforts, and there are fish farms there which run to several thousand acres in extent. The difference between trout and salmon culture lies not so much in the manipulation of the ova and young fish, as in dealing with the adult salmon, with the fish after they have been turned into the rivers, and in the manipulation of the rivers themselves. The last consideration is one of immense importance, and yet, owing to the difficulties which lie in the way, little comparatively is being done to repair the damage which has accrued to them. Pisciculture undoubtedly has its work to do for the salmon, and it is a most important one. Carried out in the right way and on a sufficiently large scale, there can be no doubt as to the benefit that will result, but the work must not be played with. Professional pisciculturists have had a great deal to learn, and experience has often been very dearly bought, but a mass of knowledge has been gained upon which we can now build with safety, and we are too sure of our ground to hesitate even for a moment in going forward.

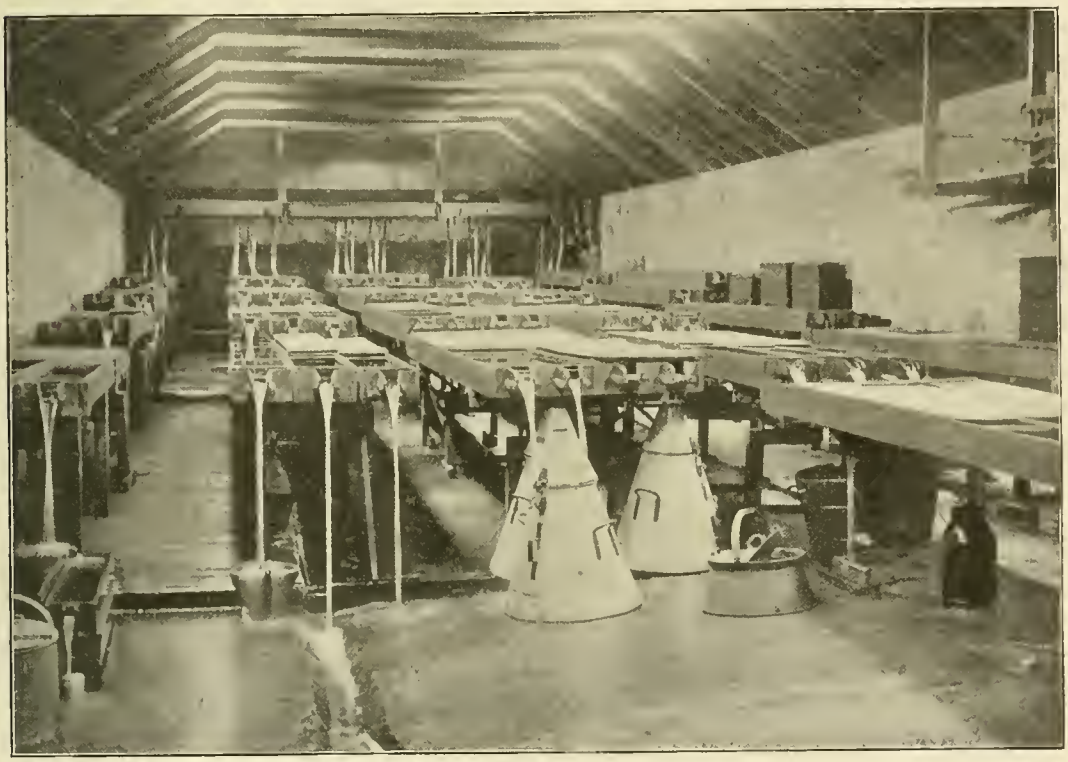


FIG. 5.—VIEW INSIDE ONE OF THE HATCHERIES.

In conclusion, I would briefly refer to the accompanying illustrations of a portion of the work of cultivation carried on at the Solway Fishery, near Dumfries. Fig. 4 represents a scene at spawning time, and in Fig. 5 we have a view inside one of the hatcheries. There are two distributing tanks overhead at the far end of the building, with fall pipes for conveying the water to the hatching boxes, through which it is running. Fig. 6 shows a few of the nursery ponds for rearing fry, with the preparation house on the left and and the keeper's house on the right.

Fig. 7 represents the preparation of yearlings, which are confined in the series of tanks prior to a journey. A few fish carriers occupy the middle of the picture.

Coarse Fish Culture has not been followed up so enthusiastically as the cultivation of the *Salmonidæ*, probably because the fish are not so valuable, and therefore do not pay for cultivation in the same ratio. There are, however, so many waters that are peculiarly adapted to the requirements of coarse fish, that their cultivation is well worth attention, and many of them are quite easily managed. In contradistinction to the members of the *Salmonidæ*, they are known as "summer spawning" fish,

although this is not strictly correct, as many of them spawn in spring.

Instead of keeping the ova in cold water, as in the case of salmon, that which has been warmed by the rays of the sun to a temperature exceeding 60° F. is necessary; instead of being incubated in a hatching house, they do better out of doors; instead of being kept in the dark, light is good for many of them, and instead of being fecundated by artificial means, it is often best to allow the fish to spawn naturally, in a nest which the pisciculturist has built, and which he can afterwards remove along with its contents. It is true that they can be taken and stripped by hand like trout, but as the natural impregnation of the ova is usually almost perfect, and the fish are much more delicate and do not bear handling so well, it is often much better to allow them to do for themselves than to attempt to strip them by hand. Many coarse fish eggs are adhesive, and therefore, if we take them artificially, we must use some sort of apparatus and strip the eggs into it direct. This can be done, and the eggs milted successfully, but there is no need for it.

If, however, we wish to do it, we must provide a hatching box containing some frames and resembling Fig. 1, but instead of covering them with flannel they should be made with a cross-bar in the middle, to facilitate the intertwining of some twigs, or they should be covered with galvanized wire netting, into the meshes of which suitable water plants may be twined for the purpose of receiving the ova. The fish may then be spawned by hand in the usual way. Care should be taken to run a current through the tank in order to get rid of the milt.

batches, but singly. These eggs can be dealt with in such an apparatus as I have described. Other fish again spawn among the gravel in streams. Pike deposit their spawn chiefly in bays and ditches amongst the aquatic vegetation found there, and the spawn may be hatched in the apparatus to which I have alluded. The eggs of the *Percidæ* (Perch) are only adhesive for a while, when first they come from the parent fish, but they are shed in batches and not singly. These batches, if examined, are found to be in the shape of hollow ribbons, and in nature they are to be found deposited on water plants, masses of sticks or twigs, heaps of stones, and submerged branches of trees.

I have cultivated perch successfully for many years, and have long since given up the plan of artificially spawning them, or of using anything in the shape of hatching apparatus. A pond twenty feet square and three feet deep should be prepared and stocked with water plants, and in this pond breeding perch should be placed, say in February or March. The sides of the pond should be perpendicular, or nearly so. These fish will deposit their eggs on the water plants when the time comes, usually in April, when they may be collected and removed to another pond called the hatching pond. It should be constructed like the one used for spawning.

Obtain a number of dead spruce branches, cut the stump or butt-end of each to a point, and insert them into the bank of the pond in a horizontal position, about six inches or a foot below the surface of the water. Owing to their fan-like shape, it will be apparent at once that these are very handy contrivances for receiving the ova.

Fig. 6.—A few Trout Nurseries, Keeper's House, and Yearling Preparation House.

and a slight trickle should be kept going all through the period of incubation. The eggs of most coarse fish hatch in as many weeks as trout take months, and this at once makes a great difference in the mode of procedure.

Many of the *Cyprinidæ* deposit their ova on the stems and leaves of water plants, to which they adhere, not in

What is more, the ova do very well upon them. A batch of perch spawn being adroitly spread over them by a gentle but dexterous movement of the hand, it settles down on the twigs, which present a very irregular surface, whilst offering the least obstruction to the motion of the water. Some of the spawn is borne up by the projecting

twigs, whilst another portion settles down between them; so it hangs suspended from twig to twig and every egg has an equal chance. When huddled together in a heap many of them will die from suffocation.

Perch ova can be hatched most successfully in the manner described. The period of incubation varies from fourteen to about twenty-one days, according to temperature. Some warm day, on inspecting the hatching twigs, the eggs will be found to be empty, the embryos having emerged and left nothing but the empty shells and the tougher portions of the gelatinous substance with which the eggs were enveloped, and which held them together. On closer inspection the water in the immediate neighbourhood of the twigs is found to be crowded with young perch, which may be seen swimming in all directions. They are helpless little creatures, and an enemy coming among them would have a fine time of it. Here, however, they can be protected from many depredators, and it is evident that a great advantage is to be gained by caring for and hatching them in this way. From the hatching pond the fish may be allowed to drop down to a larger one in which they can grow, all other fish being carefully excluded. Most of the coarse fish will eat their own progeny, so that one essential is to separate the spawning fish from their eggs. Either the fish must be removed from the pond as soon as they have spawned, or the ova must be transferred to another pond. In the case of those which spawn amongst gravel, the fish will enter a raceway at the head of the spawning pond, and here their operations should be carefully watched, and, as soon as the eggs are safely deposited, a sluice should be inserted at the mouth of this raceway, so as to prevent it running dry, and the pond should be let off and every fish taken out. If done properly, a good stock of fish may be raised in this way, as I have proved by experiment. In dealing with carp, a small pond should be constructed from which the fish can easily be withdrawn after spawning, or the alternative plan may be adopted of removing the ova to another pond as in the case of perch. It is done in this way:—make a few wooden frames and stretch wire netting over them. Upon the netting place some thinly cut sods, grass downwards. Then dig from the bottom of a pond or stream a quantity of healthy growing water plants; these should be carefully washed and examined to see that no enemies are lurking among them. Lower the apparatus into the pond with the plants attached. The carp will deposit their eggs upon these, and the frames should then be lifted out and transferred to another pond, from which all enemies have been excluded. The spawning pond should contain no plants but those on the frames. Carp ova usually hatch in about fourteen days, and the spawning season lasts some time, the fish shedding only a portion of their eggs at once. When the plants bearing the ova are removed, therefore, others should be introduced to take their places. By these methods many of our coarse fish may be easily cultivated, larger ponds being required as they grow older.

FIG. 7.—PREPARATION OF YEARLINGS.

J. J. ARMISTEAD.

[*See also* CONSERVANCY OF RIVERS.]

PISCICULTURE (BY AN AMERICAN CONTRIBUTOR)—A complete history of pisciculture in all its details is, I believe, yet to be written. Much concerning it can be gathered by searching here and there, but no one has seen fit to gather these fragments together in a continuous story of what has come to be an important factor in furnishing food for the people of a good portion of the world. Some encyclopædias will say that pisciculture was practised by the ancient Egyptians, and that it was in use by the Chinese, and that is all. How it was practised in Egypt or what

use was made of it in China in the dim past is of little moment now, for in all probability the people of those countries at that time knew nothing of pisciculture as practised to-day. The people of this century are given to demanding facts based upon figures, when history is offered to them; and, leaving speculation out of the question, I will recite briefly some of the beginnings of pisciculture. It has been claimed that a French monk, Dom Pinchon, in the Abbey of Reome, discovered the process of hatching fish eggs in 1420, but it is believed by those best informed that he simply collected and transplanted eggs that had been naturally impregnated.

The real "Father of Fishculture," who first fecundated fish eggs artificially, was Stephen Ludwig Jacobi, a German, born April 28th, 1709, at Hohenhausen in the Province of Varenholz. In 1741 he took eggs and milt from trout by hand and fertilised them artificially, and that was the genesis of modern pisciculture. For hatching trout ova, Jacobi used wooden troughs, the bottoms covered with gravel, to represent the natural spawning beds of the fish, a process abandoned by most fish breeders, but in vogue to-day at one of the largest hatching stations of the United States Fish Commission. Jacobi did not make his discovery known until 1763, when his methods were published in a Hanoverian Magazine. The next year his discovery was endorsed by German naturalists; his memoir was published in Paris in 1770; he was recognised by George III. of England in 1771, who granted him a life pension for his discovery; his memoir was translated into English in London in 1788, and there can be no doubt regarding the title that has been given him as the first to discover and carry into practical usefulness the art.

John Shaw was the first artificially to fecundate the eggs of salmon in Great Britain, in the year 1837, and Dr. Theodatus Garlick was the father of pisciculture in America. Garlick read of the experiments of Gehin and Remy in France in 1842, which were simply modelled on Jacobi's methods, and in 1853 he impregnated the eggs of trout and hatched them in January 1854. Public fish culture in the United States did not follow until 1856, when the General Court of Massachusetts appointed three Commissioners "to ascertain such facts respecting the artificial propagation of fish as may tend to show the practicability and expediency of introducing the same into the Commonwealth under the protection of law." The same year Mr. V. P. Vrasski, a Russian pisciculturist, discovered the method of dry impregnation, a method which nearly doubled the impregnation of eggs taken artificially. Before this time the eggs and milt of trout had been taken in a vessel of water with the idea of adhering as nearly as possible to natural processes.

Down to 1854, all piscicultural experiments had been conducted with eggs of the Salmon family, chiefly trout, *Salmo fario* in Europe, and *Salvelinus fontinalis* in America. Vrasski attempted to propagate the eel artificially, as well as the trout, in the year 1854. In 1857 the eggs of the whitefish from Lake Ontario, *Coregonus clupiformis*, were impregnated, and an attempt was made the same year to propagate the pike-perch, *Stizostedion vitreum*, by the same pioneers, Carl Müller of New York and Henry Brown of New Haven, Connecticut. All the salmon family experimented with up to this date were fall spawning fishes, which spawn on a falling temperature, but the pike-perch is a spring spawner and spawns on a rising temperature. Consequently the pike-perch was the first of the spring spawning fishes to be hatched by artificial means, but it could not have been very successful, as will be shown later in this article.

The first attempt to introduce salmon into Australia was made in 1862 by Mr. H. R. Francis of England. The eggs sent from England to Tasmania were a failure; not so with those sent in 1864 and afterward. The first attempt to breed salmon in America was made in 1864. The eggs were obtained in Europe and hatched in a studio in New York city by Mr. James B. Johnson. In 1865 the first successful attempt to hatch codfish eggs was made in Norway, and two years later the Seth Green shad hatching box was invented; and thus the list of fishes with different breeding seasons and with eggs of a different character hatched artificially continued to grow. The trout (except some species in Western United States that are spring spawners) and salmon are fall spawning fishes, with heavy non-adhesive eggs; the pike-perch is a spring spawning fish with heavy adhesive eggs; the codfish a winter spawning seafish with floating eggs; and the shad a spring spawning fish with semi-buoyant, non-adhesive eggs. As the eggs of these fishes required each a different treatment to hatch them successfully, great progress was made in the science of fish culture in a few years.

In 1870 the Deutscher Fischerei Verein was established, an organisation which has had a powerful influence in piscicultural matters in Europe. Different states in the United States, and other countries in Europe beside those referred to, had not been idle during the years already mentioned. Italy, Bohemia, Austria, Switzerland, Finland, Belgium, Holland, Russia and Canada had been making progress in fish culture and had established fish-breeding establishments, and the States of Massachusetts, Vermont, New Hampshire, Connecticut, Pennyslvania, Maine, California, New Jersey, Rhode Island, Alabama, and New York had organised Fish Commissions and constructed fish hatching stations that were hatching fish and planting them in the public waters of the respective States. In 1870 an important organisation was formed that was destined to give a very great impetus to fish breeding in the United States. This was the American Fish Cultural Association, now called the American Fisheries Society. This organisation was practically founded by Livingston Stone, author of the standard work, *Domesticated Trout*, and a pioneer of the art, as he erected a trout hatchery in 1866 near Charlestown, New Hampshire. Mr. Stone signed the call for the first meeting of a few pisciculturists, and was the first secretary, and drew up the constitution practically as it remains to this day, and at the outset he was in effect the Association. The Fish Cultural Association was the godfather of the United States Fish Commission, for one of its first official acts was to send a Committee to Washington to urge the creation of a National Fish Commission, which was provided for by joint resolution of Congress on Feb. 9th, 1871, and the Commission organised the following year. The same year shad were hatched, transported across the Continent from the Atlantic to the Pacific, and established in the waters of the western coast. Shad from this planting have become so numerous on the Pacific coast that they have been sold at a less price than on the Atlantic sea-board, and they have spread along the coast until it is expected that they will ultimately reach the Sea of Japan. In 1872 Mr. Stone went to California to inaugurate the propagation of Pacific salmon, a work which has grown to gigantic proportions. At one station during the season of 1896, 25,852,880 eggs of the Pacific salmon were taken. Striped bass, *Roccus lineatus*, were artificially propagated in 1873, and sea bass, *Centropristes striatus*, in 1874. White-fish were sent to New Zealand from the United States in 1876, the experiment being successful, so far as the arrival of the eggs in good condition is concerned. In 1877 experiments were successfully conducted for retarding the development of fish eggs by cold; herring were propagated artificially; German carp were introduced into the United States; California salmon were introduced into Europe, and the plunging bucket for hatching shad was invented. For the next few years reports of the capture of planted fish were received from many waters; haddock, *Melanogrammus æglifinus*, and Spanish mackerel, *Scomberomorus maculatus*, were successfully propagated, and the establishment of fish commissions in the various states of the Union continued until nearly every state was at work increasing its food supply by cultivating fishes.

The operation of hatching fish ova differs with different

species of fish (after the eggs are impregnated), depending upon the character of the eggs. The fertilisation of the eggs is always the same with all species. The fishes cultivated artificially in Europe are the so-called game fishes or hook and line fishes chiefly. In America, not only are hook and line fishes propagated but a large number of commercial fishes also. The Atlantic salmon, *Salmo salar*; Pacific or Quinnat salmon, *Oncorhynchus tschawytscha*; Land locked salmon, *Salmo salar sebago*; Red salmon, *O. nerka*; Silver salmon, *O. kisutch*; Brook trout, *Salvelinus fontinalis*, Rainbow trout, *Salmo irrideus*; Steelhead trout, *Salmo gairdneri*; Black spotted or Rocky Mountain trout, *Salmo mykiss*; Golden trout, *Salvelinus alpinus aureolus*; Lake trout, *Cristivomer namaycush*; Loch Leven trout, *Salmo levenensis*; Brown trout, *Salmo fario*; Yellow finned trout, *Salmo mykiss macdonaldi*; Whitefish, *Coregonus clupiformis*; Striped bass, *Roccus lineatus*; Shad, *Alosa sapidessima*; Pike-Perch, *Stizostedion vitreum*; Sea bass, *Centropristes striatus*; Adirondack frostfish or round whitefish, *Coregonus quadrilateralis*; Codfish, *Gadus callarias*; Alewives, *Pomolobus æstivalis*; Flat-fish, *Pseudopleuronectes americanus*; Crappies, *Pomoxis sparoides*, and *P. annularis*; Flounder, *Paralichthys oblongus*; Haddock, *Melanogrammus æglifinus*; Lake Herring, *Argyrosomus artidi*; Lake Sturgeon, *Ancipenser rubicundus*; Mackerel, *Scomber scombrus*; Muscalonge, *Lucius maskinonge*; Sea herring, *Clupea harengus*; Squeteague, *Cynoscion regalis*; Tautog or Black fish, *Tautoga onitus*; Tomcod, *Microgadus tomcod*; Smelt, *Osmerus mordax*, are some of the fishes, and it is not a complete list, that are propagated in America. It will be observed that several of the so-called trout in the foregoing list are chars, *salvelinus*, but the word char is never used in America, as it is in England. All the members of the salmon family are commonly called either salmon or trout, except the golden trout found in Sunapee Lake in the State of New Hampshire; this fish is frequently called the American or Sunapee saibling.

The first step in hatching fish eggs is to obtain ripe fish of both sexes, that is, fish that are ready to deposit their ova naturally. Where stock-fish are maintained, as at a hatching station, all the fish are under observation and control, and it is a simple matter to pick out the fish ready to cast their ova, and wait for others to become ripe. In wild waters, where fish are netted to obtain their spawn, some species are placed in breeding pens until they mature, but most commercial fishes are simply netted and the ripe fish selected and all others returned to the water, and are perhaps netted again before the season is over.

Does it hurt the fish to take the spawn artificially? No; if the operator is a skilful man in handling breeding fish; and none but skilful men are employed in the business at the National and State Hatcheries. Stock fish are handled year after year at the spawning stations, without injury, until in fact they cease to breed, or make way for younger fish in the stock ponds.

When, for instance, trout are ready to spawn at a hatching station, the male and female fish are taken from the stock ponds with a dip net, and placed in tubs, the sexes being separated. A pan, earthen or tin, generally the latter, is filled with water, and at once the water is poured from it, leaving only such moisture as may adhere to the sides and bottom of the pan. A female fish is taken in hand by the operator. One hand, covered with a wet woollen mitten, grasps the fish above the tail after it has ceased to struggle, and with the thumb of the other hand the operator presses the abdomen gently, with a downward motion along the ovaries, holding the vent over the spawning pan; if the fish is ripe, the eggs will run freely. Very little force should be used in the operation and the fish should be held close to the pan. Practice teaches the operator to distinguish a ripe fish as soon as it is in his hands. The male fish is treated in exactly the same manner, and the milt flows into the spawning pan with the eggs, and milt and eggs are stirred together with a feather, with the tail of the fish if it is small, with the operator's hand, or by gently tilting the pan from side to side. This is called the dry method of impregnation, because the eggs and milt are taken in a dry spawning pan, instead of one partly filled with water; and by the dry process 100 per cent. of good salmon and trout eggs may be impregnated, while by the wet process (an inch or two of water in the spawning pan) only from 60 to 70 per cent. are impregnated. The eggs are quickly impregnated, within a quarter of an hour after they come in contact with the milt, no matter what the temperature of the water may be, and it is usually accomplished in two or three minutes. A little water is then added to the pan and the eggs are left until they separate. Eggs when they come from the fish are not round, but slightly shrivelled; when fertilisation takes place, the eggs absorb not only zoosperms, minute organisms of which the milt is composed, but water as well, and during the process of absorption the eggs adhere to the pan and to one another. When absorption is completed, the eggs are round and plump, and they separate and are ready, after a thorough washing, to be placed on the hatching trays or glass grilles. In America trays are used, sides and ends of wood and bottom of wire that is tarred. These trays are placed in wooden troughs containing running water and are left to hatch. Trout eggs are heavy and non-adhesive, and about one sixth of an inch in diameter. The average production of eggs is from 350 to 1,500, depending upon the age of the fish. With water at 50° Fahr. the eggs hatch in about 50 days, but with water at about 34° Fahr. they will require over 150 days, 157 days being the record in one of the New York state hatcheries. Impregnated eggs are amber coloured, and dead eggs are white as chalk, and must be picked out from the good eggs to prevent the spread of disease. Shad eggs are semi-buoyant, non-adhesive, and smaller than trout eggs, being about one-eighth of an inch in diameter. Shad average 30,000 eggs, but a single fish has been known to produce as high as 156,000. Shad being a spring spawning fish, the eggs hatch in from three to nine days, and the treatment is different from that of trout and other heavy, non-adhesive eggs. Shad eggs are placed in a hatching jar of glass which admits water from the bottom and the pressure or flow is regulated to hold the eggs in suspension, as it were. Trout fry are born with a large umbilical sac on which the fish feeds by absorption for from 20 to 40 days, and which to all intents and purposes anchors the trout fry to the bottom until the sac is absorbed. Shad are born with a very small umbilical sac and swim away with it as soon as the fish is hatched. Cod-fish eggs, one-eighteenth of an inch in diameter, are buoyant, non-adhesive, and are hatched in a "tidal hatcher" supposed to represent, in the action of water in the troughs, the action of the tides. A cod-fish produces as many as 9,000,000 eggs at one time. The eggs float during nearly the whole time of incubation, 14 to 21 days, with the water from 38° to 43° Fahr. Pike-perch eggs are heavy and adhesive, and one-thirteenth of an inch in diameter. The eggs are hatched in a McDonald or Chase hatching jar, the same that is used in shad work; but after impregnation they are treated to a bath of water and powdered loam, the water so thick with the loam that it is muddy. The eggs being covered with mucus, they are soon coated with the fine particles of loam in the water, but to separate the eggs so that each particular egg may become coated, they are placed in a metal cylinder with an intake at the bottom; the water is cut off at the intake and air is blown through the water, which separates the bunches of eggs, and the loam in the water prevents them from adhering again; after they are thoroughly "blown" they are placed in the hatching jar, where they hatch in from 12 to 16 days, and the fry absorb the sac in from 6 to 12 days after they are born, with the water about 45° Fahr. Muscalonge have eggs that are semi-buoyant and slightly adhesive. They produce as many as 300,000 eggs or more, and the average is about 100,000, the eggs being one-eleventh of

an inch in diameter. The ova are hatched in double wire covered boxes, sunk in the lake where the parent fish are found. The wire is doubled at top and bottom of the boxes, with space between to protect the eggs from predatory fishes and other enemies, and they hatch in about 15 days with water at 55° Fahr., and it requires the same length of time for the sac to absorb.

In the annual reports of the National and State Fish Commissions in America, there are given figures to show how many fish have been hatched and planted during the year. How can little fish be counted by hundreds of millions? The fish are not counted, but the eggs from which the fish are hatched are measured into the hatching trays, jars or boxes, the loss in dead eggs during the process of hatching is deducted, and the result is over rather than under the number which the reports show to have been planted. The measure used is the standard fluid quart of 57·75 cubic inches. Eggs of the same species of fish may differ in size in fishes of different ages. Brook trout (*fontinalis*) vary from 13,998 to 12,063 to the quart. The figures are from actual counts made; the first was made in Washington at the Central station of the U.S. Fish Commission, the last was made in the state of Connecticut. Brown trout (*fario*) vary from 8,301 to 9,935 to the quart. Perhaps the greatest variation is in rainbow trout eggs (*irrideus*). In California but 6,875 were counted in a quart, while in Michigan, where the fish was introduced, 12,800 were counted from a quart. The following are the average number of eggs in a quart from the fishes named:— Atlantic salmon, 4,272; land-locked salmon, the largest eggs of any fresh water fish that is propagated, 3,300; Pacific salmon, 3,696; Spanish mackerel, 1,267,728; cod-fish, 335,000; striped bass, 24,363; shad, 28,239; pike-perch, 152,294; muscalonge, 73,938; white-fish, 36,800; lake trout, 5,525; tomcod, 233,280; smelt, 496,000; Adirondack frost fish (round white-fish) 33,000.

The Fisheries, Game and Forest Commission of the State of New York hatched and planted in the public waters of the state during the year 1897, 213,922,694 fish of various kinds and ages. Of this number nearly 8,000,000 were trout, 50,000,000 pike-perch, 10,000,000 shad, 7,000,000 lobsters, 21,000,000 whitefish, 44,000,000 tomcod, 3,000,000 muscalonge, 80,000 sea salmon, 39,000 black bass. The State maintains nine hatching stations in different parts of the State and a State fish car for transporting fish over the railroads.

A. Nelson Cheney.

PISCICULTURE IN INDIA—Pisciculture in India is dependent for success on circumstances altogether different from those attendant in England, circumstances so extreme as to seem hardly credible. Subject to the influences of the early and the latter rain (the north-east and south-west monsoons), and to long continued tropical heat, a river that is at one time a roaring flood of two miles in breadth and twenty feet in depth, can at another time be crossed so dry that the bare foot is pained by the heat of the scorching sand. And these extremes occur annually, and yet the river teems with fish of all dimensions, many of them far surpassing in size anything ever attained in England. To accommodate themselves to such extremes the fish have to be anadromous (having an upward course), ascending the rivers, not as the salmon do from the sea up the river, but from the lower reaches of the river to the perennial parts nearer to their mountain sources, the fry subsequently descending to the localities from which their parents had ascended. And different fish have different limits within which their migrations are confined, and differing seasons of the year at which they recur.

These must all be noted by the pisciculturist. Generally speaking, the ascending tendency is to be accounted for by the instinct of propagation, which induces the parent fish to lay their eggs in tributaries and at altitudes to which they can resort only when the swollen waters of the annually recurring flood season allow of their access thereto. These, from the shrinking volume of the stream, they soon after have to quit, so that the fry, when hatched, have all to themselves, free from the presence of larger predacious fish, waters that have dwindled to proportions suitable to their puny strength. But they soon find them quite inadequate to supply their growing want for additional food, and then there comes over the fry a hunger that impels them to seek food in larger waters with the first floods; and so they migrate downwards in numbers that are incalculable, and with an eagerness that is surprising.

The position is further complicated by the presence of numerous irrigational works drawing off the water from the river in channels for the irrigation of crops, which channels are set with countless fixed engines or *cruives*, as soon as the force and volume of the water in the channels have sufficiently abated to allow of their erection. These engines are constructed of basket-work, so fine as not to allow fry of a single drachm in weight to pass uncaptured. The fry caught therein are sold for food when averaging from 2 to 4½ drachms each in weight, at the rate of three double handfuls for a farthing. The destruction of fry thus worked is wholesale, and includes all sorts, including the mahseer, that runs to 150 lbs. weight, others that grow to 6 feet in length, and numbers that attain 20 lbs. in maturity. Some idea of the waste of fish life thus caused may be gained from a calculation based on actual captures at a place and at a season unfavourable to high totals, and embracing only five sorts of identified fry. Allowing no more than 2 lbs. for the average weight of sorts known to attain as much as 20 lbs., and with every precaution in other respects against exaggeration, the result was that 68,000 tons weight of fish were shown to be sacrificed annually in one river alone, at an age when they weighed only from 2 to 4½ drachms each.

These seemingly unpropitious circumstances, rightly utilised, place it in the power of the pisciculturist, without any artificial process, and with no expensive plant, to conduct stocking operations at a rate far below anything yet attained in Europe or America. A very slight advance on the above quoted market price of a farthing for three double handfuls of fry, weighing on an average 2 drachms each, will suffice to induce the *cruive* owner to select from his captures any specified fry. This is ordinarily done on a large scale by certain classes, who keep stews in which the two drachm fry soon attain 10, 20, and 50 lbs. each for the table: and one Angling Association has recently turned into its reservoirs 25,000 fry, from 4 to 6 inches long, of Catla, Rohu, and Mirgha fish, that attain respectively 100, 50, and 20 lbs. weight or more, at a cost of seven shillings a thousand.

H. S. Thomas.

PLOVER—**Classification**—The name plover, as accepted by writers on systematic ornithology, is of wide signification, since it includes not only the short-billed, three-toed species, with long narrow and pointed wings, which are comprised in the genera *Charadrius*, *Eudromias* and *Ægialites*, and the four-toed, rounded winged birds of the peewit type, belonging to the genera *Vanellus*, *Chetusia*, *Hoplopterus* and *Lobivanellus*, but also such aberrant, though undoubtedly related, forms as the thick-knees or stone-curlews (*Œdicnemus*), Oyster-catchers (*Hæmatopus*), Turnstones (*Strepsilas*), Coursers (*Cursorius*) and Pratincoles (*Glareola*). All these, and some others that might be named, belong to the great family of Plovers (*Charadriidæ*), which are related on the one hand to

the Snipes and Sandpipers (*Scolopacidæ*), and on the other hand to the gulls (*Laridæ*).

Distribution — Geographically speaking, they are of wide distribution, having representatives in every part of the world, for the most part migratory in their habits, and all of them to some extent the object of pursuit by sportsmen. The reason for this is two-fold. In the first place, with a few exceptions (as, for example, the Oystercatchers), they are not only edible, but some of them, like the Golden Plover and Dotterel, are of renowned excellence for the table : in the second place, the wildness of their haunts, the wariness of their habits, and their strong rapid flight cause them to be at all times and in all countries much sought after by lovers of shooting.

To give an account of all of them, however brief, would necessitate a review of more than one hundred different species, and would occupy an amount of space which cannot here be accorded. It will suffice to notice only some of the more typical genera, and in so doing to confine attention to those species which are most sought after by sportsmen.

Golden Plover.

Without much risk of provoking dissent we may place at the head of the list the **Golden Plover** (*Charadrius pluvialis*), in every respect a typical plover and one well known to wildfowlers, not only in the British Islands, but throughout the greater part of Europe and Africa, from Iceland and Scandinavia to the Cape Colony, and from the West of Ireland to the tundras of Siberia, as far east as the river Lena. Eastward of the Yenesei, and throughout Asia generally to Behring Sea, its place is taken by a smaller species, the Asiatic Golden Plover (*Charadrius fulvus* or *orientalis*), with gray instead of white axillary plumes, which in winter migrates southwards to China, Japan, India, the Malay Archipelago, Australia, New Zealand and Polynesia. This smaller race is found also on the Prybilov Islands and the coast of Alaska, where it approaches the American form *Charadrius virginicus* (or *dominicus*), which also has the axillary feathers gray, but is said to be distinguishable by its somewhat larger size, relatively shorter secondaries, and less brilliant yellow spots. The comparative measurements of the three species, as taken by the present writer from a series, will be found stated in *Proc. Zool. Soc.*, 1871, p. 116.

The **American Golden Plover** (*Charadrius virginicus*), according to the concise statement of Mr. Howard Saunders (*Manual*, p. 533), nests in the barren grounds from Alaska to Davis Strait, as well as in the northern part of Greenland ; while on passage it traverses Canada and the United States, seldom occurring in the west of California, but rather inclining to the east of the Rocky Mountains. In September and October large flocks arrive in the Bermudas, while on Antigua, Martinique, Barbadoes and other West Indian Islands they are sometimes so tame or exhausted after their long flight that they can be knocked down with sticks and stones. The migrations of this bird extend through tropical America to Buenos Ayres on the east side and Chili on the west.

All three species of Golden Plover, as well as the **Grey Plover** (*Squatarola helvetica*) undergo a singular change of plumage during the nuptial season. The underparts, so white in winter, become more or less black, and the dorsal plumage, which in winter is so closely spotted with yellow as to suggest the name "golden," becomes in summer considerably suffused with black or dark brown. It is remarkable that the young of the Grey Plover is golden for many months after it has left the nest, and birds of the year which are able to fly as well as their parents may be easily mistaken for Golden Plover by those who are not familiar with the distinguishing characters. As above stated, the feathers under the wing known as the axillary plumes are in the Golden Plover *white*, in the Grey Plover *black*, and while the former bird has only three toes anteriorly directed, the latter, like the Peewit, has a small hind toe which serves to identify it at all ages.

It is the habit of the Golden Plovers, as it is also of the Dotterel, in all countries where these birds are known to breed, to resort in the nesting season to the wild desolate moorlands, often at some elevation above and away from the sea. As soon as the young are able to fly well, they descend to the low grounds and spread over the uncultivated marshes near the sea, and wide, open fields inland where the latter are sufficiently large to induce the flocks to alight : for they seem to fear danger from the proximity of fences that might mask the approach of gunners.

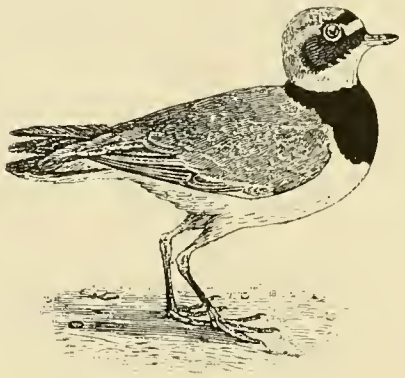
On the mud flats at the mouths of rivers, and in tidal harbours, large flocks of these birds may

be seen in autumn, as well as in winter during frost, when the soil further inland is too hardened to admit of their getting their usual food. In such situations at that season, and in some numbers, the **Peewit** or **Lapwing** (*Vanellus cristatus*) is to be found, the two species being not unfrequently in company when on their common feeding ground, although they separate on rising and fly in different formation.

At other times of the year the Peewits come inland and spread over the cultivated fields and fallows, waste marsh-land, and unfrequented bog. The flocks break up into pairs, and lay their dusky eggs of stone-colour blotched with black—the dainty "plovers' eggs" of fashion—with scarce any nest, upon the bare ground, with which their colour harmonises. (See also PEEWIT.)

Companions of the Peewit and Golden Plover on the dreary mud-flats and along the edges of the channels, we find the Ringed Plovers, Ringed Dotterel or Sand Plovers, as they are termed abroad, of which three species only, out of five and twenty or thirty different kinds, are to be met with in the British Islands.

These are the common **Ringed Plover** (*Ægialitis hiaticula*), to be met with on all



RINGED PLOVER.

parts of the coast, where, on the great stretches of shingle beach, and amidst the marram grass of the undulating sand-hills, it deposits its four spotted eggs, which curiously resemble the speckled stones by which they are surrounded; the **Kentish Plover** (*Æ. cantiana*), a local and much less numerous species to be found breeding on the coasts of Kent and Sussex, and the **Little Ringed Plover** (*Æ. curonica*) which, as an irregular visitor from Europe, has been occasionally met with in England.

The **Ringed Dotterel** of the sea-shore is not to be confounded with the **Dotterel** of the hills (*Eudromias morinellus*), a very different bird in appearance, as may be seen on comparing the portraits of both in Yarrell's *British Birds*, in which work a full account of their different habits is given.

These may be said to be the typical forms of Plover which have their representatives all over the world, and we have now to consider their particular status in relation to sport. Those which have a market value are the Golden Plover, Peewit (known also as the Lapwing and Green Plover) and the Dotterel, the last named finding such favour as a delicacy in the London season as to command with West End poulterers as much as nine shillings a couple; the price of Woodcocks being from seven to eight shillings a couple. The smaller Sand Plovers have no commercial value and are objects of attraction only to the naturalist and shore shooter.

Plover Netting Large numbers of Golden Plover and Peewits are received every winter from Holland, and a great many also reach London from Ireland, where they are captured by professionals in "plover-nets" with the aid of decoys. This method of capturing them has been well described with illustrations by Sir R. Payne Gallwey in his *Fowler in Ireland*, in which volume full directions are given for making and working the nets. This author states:—"Golden and Green Plover are netted in Ireland in thousands, if the winter be mild, by men who make a living thus. I have known one man, an adept at this work, take twenty pounds' worth of Plovers in a week, which at a low estimate of value would represent at least a thousand birds."

On some parts of the east coast, as in Norfolk and Lincolnshire, a different mode of netting is pursued with what are termed "flight nets." These are long nets stretched upon poles, and set at right angles to the sea, designed to intercept the birds as they fly low in flocks along the shore. By means of such nets, which are described and figured in Rowley's *Ornithological Miscellany*, different kinds of shore birds have been captured, and forwarded alive to the London Zoological Gardens, amongst them Golden Plover, but these birds are less frequently taken in this way than by the "plover-nets" above mentioned.

The various methods adopted by French fowlers have been described in a chapter on "Plover Catching in France" by the present writer (*Essays on Sport and Natural History*, pp. 201–205), and include the use of nets, bird calls, "stales" or decoys, and lanterns at night, when the birds, attracted by the bright light, are shot as they fly towards or past it.

The mode adopted in Holland and North Germany has been described by Baron von Droste in the *Journal für Ornithologie*, 1869. A translation of his description is given in Mr. Macpherson's recently published *History of Fowling* (Edinb., Douglas, 1897), in which volume will also be found some additional remarks by Mr. Blaauw on plover catching in Holland, and by Professor Giglioli on the methods of netting employed in Italy. It is

obvious that these devices are practised by professional fowlers for profit, rather than by amateurs for sport, and that, in this country at least, plovers are generally said to show sport when they afford shooters the opportunity of approaching them with the gun.

Plover shooting may be said to be of two kinds, according as the birds are (1) inland, and have to be outwitted by stalking or driving, or (2) on mud flats or sand banks, where they are only to be approached in a punt. In either case they are usually so wary as to require all the skill and patience of which a wildfowler is capable in order to get near them. In nine cases out of ten, probably, a good bag of plover is made more by good luck than anything else; for usually the flocks are met with by chance when the shooter is after snipe or grouse; the time of their arrival is more or less uncertain, depending on the weather; and at the period of migration they seldom remain long in the same place.

All plover will be found hard of approach when congregated in an open field, should the shooter try to steal directly towards them. He should boldly skirt the "stand" (as advised by Sir R. Payne Gallwey) without looking anxiously at them, gradually narrowing the circle with each round he takes, and finally with a rush take his chance of a shot. Some excellent remarks by J. A. Harvie Brown on the best mode of shooting plover on the coast of Stirlingshire will be found in the *Zoologist* for 1878, pp. 210–212.

If several guns are available, "driving" may be resorted to, the guns being posted as for a grouse drive, down wind of the flock, and the drivers being sent well round the birds with orders to approach them very slowly and noiselessly.

"Another method," says *The Fowler in Ireland*, "of getting within range of plover congregated in a field, is to tie a dog to a short stick and peg it down into the ground, leaving the animal a tether of five or six yards. Secure him a couple of hundred yards away from the 'stand' to windward, and every bird's eye will be turned in his direction as he moves or struggles. You may then steal up to them on their other flank against the wind, and will always get within fair, often easy shot."

If plover are passing overhead out of shot, and powder is to spare, it is a common custom to fire in their direction, well ahead of them. The sudden alarm will often cause them to drop quickly downwards and sweep within range, thus affording a good chance of a shot. Why they do this, and so run into danger, one cannot say. Perhaps, when alarmed, they are not conscious of more than an effort to change their direction, ignorant from whence the startling noise proceeds; and it is naturally easier for them suddenly to lower their flight than to ascend.

"In shooting plover from a punt," says the author just quoted, "or with a heavy shoulder gun, however close their ranks, it is seldom that a good shot can be made on the ground; that is to say, a shot that does execution in proportion to the number of birds fired at. Indeed, no shot is a successful one to a fowler that does not attain this end."

Golden Plover sit so low and small that it is well-nigh impossible to send the weight of a charge among them; if it were feasible to raise them by making a noise, all the better, but this with plover is very risky. They are apt to straggle up too far apart to fire at, and yet afford a scantier shot on the ground. If they do happen to rise well together, and you send the charge straight when their wings are just extended, you will bring down three times as many as if you had taken them sitting.

They must not, however, be allowed to rise too high before firing—four or five feet from the ground at most. The circle of shot will then take those on the wing, those in the act of rising, and any standing as well. Large numbers of birds that have been closely huddled on the ground soon open out when sprung, for mutual freedom of flight. They then, perhaps, still offer a good shot for some distance, though not the best, which is what one should strive for—a lesson only learnt by repeated failure.

Golden Plover and Peewits are often met with on the coast in large numbers, sometimes several hundreds in a flock. The Grey Plover, on the contrary, so far as the writer's experience goes, is seldom seen in flocks; ten or a dozen together is about the usual number. They are not often met with inland, keeping more to the coast and to the mud flats or sand banks at the mouths of rivers, and in tidal harbours. The reason for this may be that, unlike the Golden Plover, the Grey Plover does not breed in the British Islands, and is only to be met with at the period of its migrations in spring and autumn. About the first week in May small parties arrive, chiefly on the south and east coasts of England, on their way northward towards their breeding haunts. By the end of that month they have disappeared, not to return until the end of September or beginning of October, when the old birds are accompanied by their young, which by that time are strong on the wing and are so speckled with yellow that, but for the black axillary feathers and the presence of a small hind toe, they might be easily mistaken for Golden Plovers.

In point of size there is not much difference between the two species, the Grey Plover being slightly larger and more robust and having a somewhat stouter bill.

In regard to weight, the Golden Plover, Grey Plover and Peewit each average from 8 oz. to 10 oz., their condition depending upon the mildness or severity of the weather, and their

consequent ability to procure a good supply or otherwise of their natural food.

No more characteristic illustrations of these birds can be obtained than Bewick's woodcuts, and these have therefore been reproduced.

J. E. Harting.

POACHERS AND POACHING—In an ideal state of society we shall have no poachers, the rights of property in game will be universally recognised, the law will be respected, and keepers will only have to guard against winged enemies and ground-vermin. As it is, we fear we shall have the poacher always with us, and it must be admitted that the temptations are strong.

Poachers are of various classes and very different types. Not a few are constrained by a genuine passion for sport, but the very great majority of the poaching confraternity betake themselves to the occupation as a lucrative business, dispensing them from the necessity of regular work and supplying the means of low dissipation. They are encouraged by receivers of the stolen goods, who, occupying comparatively respectable positions, play hide and seek with the magistrates and the rural police. Convictions and repeated fines are accepted as the inevitable drawbacks in their trade, and after a time of seclusion in the county gaol, they return to their pursuits with renewed zest.

We need say nothing of the armed gangs in the mining districts or Black Country, who break into well-stocked preserves, prepared to repel force with force. The only way of dealing with them is by superior strength; rather than be caught and identified, they seldom hesitate at murder, and theirs is simply a desultory warfare in which quarter is neither given nor expected. The standing nuisance to the ordinary keeper is the local trespasser whose character is notorious, but who has all the wiles of the Red Indian or the venerable dog-fox, who is fairly well versed in the law of trespass, and who, notwithstanding his sporting proclivities, is on tolerably good terms with his neighbours. Though he will seldom accept a regular engagement, he is far from averse to an occasional day's work. On the contrary, he eagerly welcomes a job in wood-cutting or hedge-trimming, and nothing gives him more satisfaction than doing some bush-harrowing or taking a scythe in the hayfield. That is all in the way of business. It gives him free entry to the woods and the fields, and enables him to make the minute observations which guide his researches in the dark. The game he snares or nets is lightly come by, and, if he is wise, he is liberal in local commissions and hush-booty. The labourer, who is gratified with rabbits, closes his eyes to the proceedings and is sullen or silent when questioned by the keeper. The farmer asks no awkward questions when he often finds a hare of a morning in the rick yard; even now that he has the right of shooting himself, he does not dislike a certain check on the depredations of ground game, and, moreover, the trespasser takes special care to fasten his gates after work, and does no harm to his fences. Frequently the village poacher illustrates the doctrines of heredity. He was brought up to the trade, like his father and grandfather, among nets, wires and lurchers. He has a manly bearing and an easy walk, but his step is soft as that of the gipsy, and the shifty glance of the suspicious eye, with the slight bend of the shoulders contracted by stooping and peering, would of themselves be enough to condemn him. Were further evidence wanting, it would be found in the compromising dogs which are his invariable companions. His inseparable shadow and counterpart is the lurcher, with the sidelong look and the slouching gait. The best of these are crosses between greyhound and collie, with the swiftness of the one and the scent of the other. They do their hunting in silence, however excited; they can quickly retrieve a cripple by nose and lightness of foot; and, like Bill Sikes's dog, if shut up in a witness box without victuals, they would never bark for fear of committing themselves. When dogs and man go out together of a night, they are very difficult to deal with. The man has made a study of the habits of the watchers, and is probably far better informed as to the wind and the weather. Indeed, he can read the weather-warnings almost by instinct, and arranges his strategy accordingly. Finding his way through intimate knowledge of the ground, he sends the dogs ahead on patrol duty, and they have the almost human sagacity of the sheep dog. Listening intently, should he hear a footfall, man and dogs disappear beneath the cover of a ditch, where they wait till the enemy has gone by, assuring them of temporary impunity. The most effective way of dealing with these men is to carry the war into their camp. Checkmate their dogs with well-bred retrievers that, sniffing suspiciously about, will smell them out in their hiding places. But, above all, let them understand that there is an incessant watch on their movements, and terrorise them into the fear of being sold. Nothing demoralises the skulker so much as the sense that some watcher may be shadowing his movements; and the indispensable qualities for habitual poaching are fine nerve and cool self-command.

But poaching, like other scientific professions, has made rapid strides with the increase of preserving, and the most successful practitioners are specialists. One expert devotes himself to rabbits or hares, another gets his livelihood by bagging winged game. Pheasant coverts are tempting, but eminently perilous to the poachers who go out singly or in couples. If they shoot at roosters in the moonlight, even with reduced charges of powder, the report is likely to bring a swarm of hornets about their ears. They may be shabbily taken in by dummy presentments, or they may stumble over wires in the undergrowth attached to a peal of bells. Their best chance comes in on the outskirts of some great estate, in a woodland country, intersected by hedgerows. The pheasants will wander along the hedges to the outlying spinneys, and their crow, when they fly up to roost in the trees, always gives warning of their whereabouts. Moreover, the lounging moucher will lure them to their destruction by strewing grain day after day in some tempting spot and then surrounding it with snares. There are other and more diabolical methods devised by perverse ingenuity. One of the most innocent is steeping the grain in intoxicants, certainly the most cruel is introducing bristles in boiled maize, when the victims of indiscreet voracity succumb to tortures of indigestion.

Hares have greatly decreased in most districts since Sir William Harcourt passed the edict of 1880. Nevertheless, they are still numerous where landlord and tenant continue in the old friendly relations. Were it not for one little circumstance, no species of game could be more safely stolen or would be more remunerative, especially where fields are enclosed by turf-banks or stone walls. Fields of young grass or shooting grain are irresistibly inviting; the hares select them for their feeding and play-grounds, and, when alarmed, they invariably make for the gate. Even with more open fencing, they have their favourite runs; arched, covered ways carried under the weeds in the ditches. The poacher nets the gate, or sets his snares *from the outside* of the run, for no creature is more keen of scent than the hare, and not even the Canadian wolverine is more mistrustful of anything touched with human taint. The poacher sends in his lurchers to quarter the field; the hares, with small leisure to indulge suspicions, scurry for the gates or runs. But then comes in the drawback to which we alluded, for, when netted, they will shriek like a child in agony.

Now the rabbit, though scared out of his senses by the ferret, when enmeshed at the bolt-hole, as a rule resigns itself with silent decorum. And the rabbit has been fetching good prices of late years, from the growing demand in the great manufacturing towns; moreover, the penalties for trespassing after rabbits are more

lenient. Consequently systematic coney catching has been becoming more popular, and there is a great deal of quiet excitement in it of a moonlight night. We are glad to say that little is done by way of iron traps now, for at best they are abominably cruel. They may be set in the dusk, but cannot be examined till the dawn, and the risks of detection are always considerable. Rabbits are taken for the most part either by ferreting or field netting, and of ferreting nothing need be said. As for the netting, when well arranged, it is very deadly, though it is speculative, and requires capital as well as caution, for the capture of the appliances is a serious loss. A field is selected, skirting a favourite bit of cover or a furze bank honeycombed with burrows. Two parallel nets, a very few feet apart, are pegged up along the side of the cover. One man works the dogs and scares the feeding rabbits. They scuttle for home and dash headlong into the first net, which is carried by force of impact through the larger meshes of the second one. The fugitives are very effectively snared, and they find a second gentleman in waiting to knock them on the head, or to dislocate the neck with that dexterous twist only learnt by long practice, which sometimes results in a badly sprained thumb.

As for partridges, the old poacher knows as well as the old pointer precisely where they may be found at different times and seasons. Moreover, he can correct his general knowledge by particular observations, for no birds are more regular in their habits, and the coveys are as home-loving in their likings as the cats. Noon after noon they will dust themselves and take their siesta on the same sandy bank or sunny potato patch: night after night they will huddle together in the middle of the same field, for partridges invariably keep to the open. The net is dragged along, and, when the sign is given by the whirr of the scuttling wings, it is dropped, and the whole covey may be secured. The most effective protection is in the rough branches or thorns with which stubbles or grass fields are "bushed." On broken ground, or in the furrows of the root crops, netting is naturally more difficult, though poaching ingenuity often borders the nets with a strip of some smooth material. But these delicate operations are laborious, and require care and leisure, when the keepers are supposed to be occupied elsewhere. Were there no fear of keepers, or were the keepers blind, netting might be done in the dark as fatally as in the moonshine. The dodge is to fasten a lantern to the collar of a steady dog: when the light comes to a dead stop, the ground is dexterously swept in advance of it. But necessarily the lantern attracts attention, for wills-of-the-wisp do not go flitting about over dry places.

Perhaps nothing is more profitable than grouse-poaching at the eve of the season, and evidently it must be carried on to a great extent. The southern poulterers' shops are always well supplied on the 12th with birds that can be recommended as fit for the table. Of course they are sold as Scandinavian or Russian. The fact is that it is next to impossible to guard a wide extent of rolling heather hills and impracticable morass against men who have made themselves familiar with every acre. The moors are seldom so thoroughly patrolled as the deer forests; the poacher sets spies on the movements of the gillies, he studies the weather and especially the wind, keeps carefully to leeward of the ground where he mistrusts the fitful currents of air and loads with half charges, sticking as much as possible to the hollows. It is there that the young coveys will lie like stones, and there is no necessity for long shots. Probably, from personal observation, or by sure information from the shepherds, he knows precisely where to look for the brood, and need waste little time in hunting. The enmity of the shepherds is always disastrous, and the first object of a keeper should be to make friends with them. If malevolently disposed, when they come upon the nests they break the eggs, and the collies always ranging about the hills may do infinite harm among the fledglings. In any case, as we said, the shepherds can act as scouts and markers to the poacher, either out of sheer spite to the keeper or shooting tenant, or looking for payment for their help in one shape or another. Then, when the birds have been packing, after three weeks or a month, the best stocked moors are often deserted. Yet, with the keen black frosts, the birds break and sit again, and then the poacher has a second chance. The deadliest opportunities for the pot-hunter catering for the market are where the wide wastes of the moor are skirted by corn-land. Then the flights come from all quarters at daybreak and towards dusk in the harvest time, like the birds of the Soudan to the springs and the river-pools, to fatten on the stouks, which are sometimes left out for weeks, and cannot be stacked till the weather settles. They are either caught in snares and in high condition, or a single shot may "brown" a cluster from the convenient ambush beneath the sheaves. Nor is there any way of dealing effectively with that form of pot-hunting, for the keeper will be the trespasser if he follows up his birds. As for the black game, at the beginning of the season they are even more easily disposed of than their red cousins. The old birds know how to look after themselves, but their nurselings squat, and will wait passively to be trodden upon. They roost upon the ground; they frequent the bed of thick bracken near the well-head or the heathery turf in the bend of the burn; and when the old pointer that understands all about it comes to a dead stand, the net can be drawn across them as over a covey of partridges.

Had we written on this subject thirty years ago, much might have been said of the Highland free shot, who was a special and rather chivalrous type. He held hereditarily to the maxims of Evan Dhu in *Waverley*, that no Highlander need think shame of taking a deer from the hill, a salmon from the stream, or a cow from the lowland strath. He went stalking as much from passion for the wild sport as from the prosaic consideration of selling the venison. He shunned the keepers because he shrunk from unnecessary violence in an indifferent cause, but when cornered he was always ready for a fair fight. Those stalwart fellows generally gathered in parties of three or four, and their hardihood was extreme. In bitter winter they would sleep out in their plaids, on beds and under blankets of heather shoots. That was always supposing they did not find snugger quarters in one of the bothies and illicit stills which were frequent in the hills. Genuine sportsmen, as they often were, they were by no means over particular. They would lie in ambush for the deer who come to raid upon the crofters' miserable corn patch, potting them point-blank with musket or fowling-piece. But on the other hand, in their love of sport and local ambition they would spare neither pains nor fatigue to circumvent some famous roving stag as well known in far Lochaber or Badenoch as in Athol. What with stricter preserving, high renting, and the multiplication of watchful sentinels and night patrols, that older generation has left few successors. Now the Scottish poacher, especially in the Lowlands, is closely assimilated to his skulking English *confrère*.

Fortunately we have not, and we never had, such reckless *freischutze* and such a bloody code of wild chivalry as in Southern Germany, even extending in some degree to the more civilised Bohemian woodlands. Especially in the chamois preserves of Bavaria and the Sultz Kammergut, the *Wilderer* by descent takes his life in his hand and stalks the wary game at his bodily peril. Surprised at some sharp turn on the precipices by a keeper, he is challenged and told to throw up his hands. If he shows fight and is shot down, his friends make no complaint and seek no revenge. If the poacher has first call and kills the forester under similar circumstances, all passes off equally quietly. He is free to pursue his avocations with no greater risk than before. But if there be suspicion of treachery or ambushing, then the comrades of the fallen man are sworn to sanguinary revenge, nor do they scruple to take every advantage.

A. Innes Shand.

[For the law with regard to poachers, see Game Laws.]

POCHARD—(*Fuligula ferina*)—In classifying the various species belonging to the duck family (*Anatidæ*), from a consideration of their habits correlated with structure, naturalists are wont to distinguish the surface-feeding ducks from the diving ducks, and to place the latter apart in a genus (*Fuligula*) which includes the pochard, white-eyed pochard, canvas-back, red-crested duck, scaup, tufted duck, and others. In the former group are included the common mallard, gadwall, shoveller, pintail, wigeon, and many others which at one time were all placed in the genus *Anas*, but which, from more detailed examination of their anatomy, and recognition of important differences of structure, have come to be regarded as generically distinct, and are now placed in such genera as *Spatula*, *Dafila*, *Mareca*, &c.

The pochard (pronounced indifferently *poachard*, *poakard*, and *pockard*) may be taken as a typical diving duck of the sub-family *Fuligulinæ*—for we must here omit from consideration such

POCHARD.

aberrant forms of diving ducks as the Mergansers and Scoters. It is a sufficiently common and well marked species to be easily identified; its red head, black breast, and silvery gray back, delicately pencilled with fine, wavy lines, serving to distinguish it at a glance from all the above-named species, except perhaps its larger relative the canvas-back duck of North America (*Fuligula vallisneriana*), which it somewhat resembles. Like other diving ducks, which are generally of stout build with comparatively short wings, it has a much larger lobe, or webbing, on the hind toe than any of the surface feeders—a characteristic mark of distinction.

The females, and young males before they have moulted, are known to fowlers as "Dun-birds," from their general colour, and in some parts of the coast as "Dun-curres"; "cur" or "curre" being a general term amongst wild fowlers for diving ducks, although by some (*e.g.* Colonel Hawker) restricted to the scaup, *Fuligula marila*.

Formerly the pochard was considered to be only a winter visitor to the British Islands, arriving in October and departing in March; and instances of its remaining to breed were extremely rare. But of late years the protection afforded to this and other freshwater ducks in spring, not only by statute, but also by private enterprise, has resulted in many pairs remaining here for the nesting season, and successfully bringing off their broods. Nevertheless the majority of the pochards which are to be seen in flocks here during the winter months, come to us from abroad, the species being a widely distributed one, and found nesting in Denmark, Germany, Poland, and Russia, though strangely enough not in Scandinavia.

On arrival in autumn, the flocks make straight for inland waters, where they may be found until March or April, sometimes in considerable numbers, in company with tufted ducks, or duck and mallard, and occasionally golden-eyes. In this respect they differ from wigeon, scaups and scoters, which prefer salt water, and from the mergansers, which love tidal waters, where they can secure a better supply of fish, their staple diet.

The pochard being one of the best of ducks for the table, rivalling in this respect the far-famed "canvas-back" of North America, is much sought after by wild fowlers, and is generally killed by punt-shooters, although in favourable localities it falls a prey at flight time to the long-shore gunners. The best accounts of this bird, from the shooter's point of view, will be found in Folkard's *Wild Fowler* (1864), and Sir R. Payne Gallwey's *Fowler in Ireland* (1882). Writing from personal experience, both these authors agree in stating that the pochard is by nature one of the most wary of wild-fowl, and though extremely numerous in some winters, when the flocks cover acres of water, on being approached they break up into smaller companies, and, after swimming away very low in the water, contrive either to keep out of gun-shot, or by direct flight to evade all attempts to make a heavy shot at them with the punt-gun.

Seeing the difficulty of shooting them, the "flight pond" with its artfully contrived nets was specially designed for the purpose of capturing these birds, their cunning being such that they elude the vigilance of the most skilful decoyman. It is true they will visit the decoys sometimes in large numbers, and may be even enticed into the pipes (*see* DECOYS), but they have a vexatious habit when pressed, of diving back to the mouth of the pipe instead of rising on the wing and flying to the other end of it, and in this way they contrive to make good their escape.

The method of capturing them at the "flight pond" is well described, with an illustration, by Folkard, in the work above mentioned, to which the reader may be referred, since it is too long to be quoted here *in extenso*. Briefly stated, a net is so fixed with poles, cords and pulleys, that when the birds are flushed and fly towards

it, it is suddenly hoisted so as to intercept their flight, and numbers fall into its meshes. To give an idea of the immense flights which used to be taken in the nets at Mersea and Goldhanger in Essex, Folkard states that the bulk of birds has there been known to be so great, that when their flight has been intercepted, their mass has actually been heavier than the ponderous boxes of weights placed at the lower ends of the poles for hoisting the net, and the consequence has been that the birds have borne down the net and partly spoiled the fowler's sport. At these same decoys (Mersea and Goldhanger) the capture of "dun-birds," as they are there termed, has been so great that a wagon and four horses were required to remove them from the pond; and they have fallen in such heaps on striking the net, that many of those at the bottom of the pens were taken up dead, apparently crushed or stifled by the pressure of those above. From five to six hundred "dun-birds" at one pull of the net was formerly considered but a moderate capture, and to break the neck of every bird in that number would occupy three experienced men twenty minutes.

Mr. Page, the owner of one of the oldest decoys in Essex, "the Marsh House Decoy," on Bradwell Marsh, has furnished some interesting statistics concerning the visits of the pochard, which will be found in Sir R. Payne Gallwey's *Book of Decoys* (1886), and for details as to the shooting of these birds by puntsmen and coast-gunners, the reader may be referred to Mr. Henry Sharp's *Practical Wildfowling* (1895); Mr. Abel Chapman's *First Lessons in the Art of Wildfowling* (1896), and to the *Diary of Colonel Peter Hawker* (2 vols., 1893), whose *Instructions to Young Sportsmen* has passed through several editions, and has proved an invaluable text-book to all who delight in the sport of wildfowling.

J. E. Harting.

POLO—**Antiquity of the Game**—The earliest reliable records that have hitherto been discovered speak of the game of *chaugan* as being played by the Persian kings of the Median period, 600 B.C. Firdousi, who wrote *The Book of Kings*, although living in the beginning of the eleventh century, gives many traditions of the habits and customs of the Persians of the fifth century B.C., and for the present we must be satisfied with this date. I am of the opinion of M. Dehlavi, that the game spread from Persia to the East, and that the Tartars learnt the game from the Persians.

The British Museum contains many interesting drawings which can leave no doubt that the ancient game of *chaugan* is identical with the modern game of polo. Among these is one illustrating a game of *chaugan* being played by ladies about the time of Akbar. This depicts four ladies richly dressed, riding astride, and seeming perfectly at home and masters of the art. The details are so well drawn that the bandages or coverings to the horses' legs are seen to be practically the same as those in use at the present day.

When Persia was conquered by the Mohamedans, the latter took up the game with as much zest as their predecessors, and it is in all probability the Mohamedan conquest, which spread through Afghanistan and throughout India, that carried the game to the East. It also appears that the Byzantine princes of the twelfth century played polo. From Persia the game must be followed to India, where a hardy race of Indians, who inhabited the country spreading from the Punjab on the west to Manipur in the east, took up the game. To the Manipuris and their neighbours we owe a deep debt of gratitude for having preserved the game from extinction when it disappeared from Southern India with the decline of the Mogul power. It is a curious problem, why a game that was once so popular throughout the whole of India should have so utterly disappeared, and remained extinct until reintroduced by our native frontier forces during the present century.

Introduction into England—The game was first played in England by the 10th Hussars in 1870, Captain Hartopp of that regiment being the chief mover in introducing it. The 9th Lancers then took it up when quartered at Aldershot, and the game took such a hold that in 1871 it became very popular. At first no fixed ground was used, but any level piece of turf available, a favourite spot in those days being a small hollow under "Cæsar's Camp." After a short time a match was arranged between the two regiments, and as this game is now of some historical interest, I give a full account of it, as written down at the time. In those days it was called "Hockey on Horseback."

"Nearly all fashionable London journeyed from town to Hounslow on Tuesday, to witness a new game called 'hockey on horseback,' between the officers of the 10th Prince of Wales' Hussars, from Hounslow Barracks, and the officers of the 9th Queen's Royal Lancers, who had come over from Aldershot.

"The game took place on Hounslow Heath, and the various equipages quite surrounded the space allotted to the players. Four upright posts, some twenty feet apart, marked the goals, through which the ball (a small sphere of white bone) had to be driven by the players before either side could claim any advantage. The sticks used were in form like those used for hockey, of ash, and crooked at the end, and with these the ball was often struck a considerable distance. The distance between the goal posts was a little under 200 yards, and, the players having taken up positions in front of their

respective goals, the ball was thrown up in the centre of the ground by a sergeant major of the 10th Hussars, who then galloped off—when each side immediately galloped for the ball at best pace of their ponies. The 10th appeared in blue and yellow jerseys, and the 9th in parti-coloured shirts of blue and red, and both sides wore mob caps with different coloured tassels attached. The game, which has been imported from India, and which has been for a long time in vogue among the Munipoories, one of the frontier tribes, was watched with the keenest interest by the numerous and aristocratic company present. The game lasted for an hour and a half, with an interval of ten minutes, when half time had been played. The players, who number eight on each side, and who were mounted on active wiry little ponies, about 12½ hands high, were as follows :—

10th Royal Hussars.	*9th Royal Lancers.*
Captain Barthorp	Captain Clayton
Captain Bulkeley	Captain Grissell
Captain St. Quinton	Captain Palairet
Captain Okeden	Lieut. P. Green
Lieut. Viscount Valentia	Lieut. R. Moore
Lieut. Smith Dorrien	Lieut. F. Herbert
Lieut. John J. L. Woods	Lieut. Lord W. Beresford
Lieut. E. Hartopp	Lieut. W. F. Fife

"At the end of the prescribed time the Hussars had gained three goals, to two gained by the Lancers, and though the general remarks made it evident that the new game is one most fitted for cavalry soldiers, it was admitted by all who were looking on that it was more remarkable for the strength of the language used by the players than for anything else. Mr. Hartopp on the side of the 10th Hussars, and Mr. Moore on that of the Lancers, were much applauded for their activity throughout the game and the speed of their ponies."

The ponies used in those days were a mixed lot, from 13 to 14 hands, and as cantering was the fastest pace ever indulged in, small ponies were preferred, as from them it was easier to dribble the ball along. India-rubber and tennis balls were first used, but it was not long before the wooden ball was introduced.

For many years after polo was started, the custom was to begin each game by galloping for the ball—that is to say, each side started at a signal from behind their goal line, the ball being placed in the centre of the ground. Very amusing indeed were the incidents that arose through this rule. As the game got faster, this dangerous practice was abolished, and the crossing of sticks, while standing over the ball, became the fashion. This eventually gave way to the present system, in which the ball is thrown in between the two sides lined out in centre of ground.

For some years after this, polo in England made but slow progress. The game was entirely confined to certain cavalry regiments, the Royal Horse Guards being one of its greatest supporters, and it was principally through their exertions that the first real Polo Club was formed at "Lillie Bridge." This gave a certain impetus to the game, and some rules and regulations were framed. The club was then under the management of soldier Hawkesley. In those days eight a side was still the rule.

For some few years polo flourished at Lillie Bridge, and then the Hurlingham Club formed a ground (the present one) and catered for polo players. This was the deathblow to Lillie Bridge, which soon after collapsed.

The first provincial club formed in England was the Monmouthshire, in 1872, by Captain F. Herbert on his retirement from the 9th Lancers, and this example was taken up by several other counties and towns. It was not until 1880, however, that polo began to assume its present form. The number of players on each side was reduced to five, and the formidable Sussex Club, which included the three brothers Peat, carried everything before them. It was shortly after this that back-handers came into fashion, and the number of players was reduced to four a side.

The game had now spread to many of our Colonies, and in 1886 an English team went over to New York to play an International Match against the United States. The respective teams were composed of the following players :—

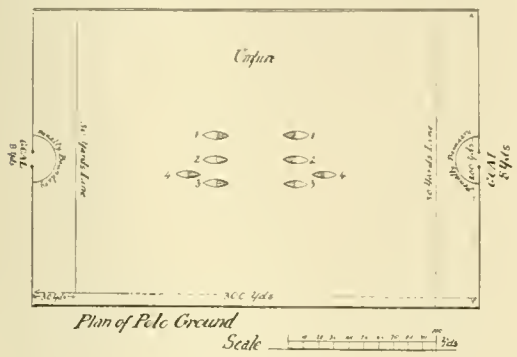
Hurlingham.	*America.*
Hon. R. Lawley (7th Hussars)	Mr. R. Belmont
Captain T. Hone (7th Hussars)	Mr. F. Keen
Captain Malcolm Little (9th Lancers)	Mr. W. K. Thorn
Mr. John Watson (Captain)	Mr. J. Hitchcocks (Captain)
Captain the Hon. C. Lambton (Umpire)	Mr. E. Winthrope (Umpire)

The English team won very easily, and brought back the handsome Challenge Cup, which has remained at Hurlingham ever since.

There is little more to relate with regard to the advance of polo from that date to the present time, but during the last six years enormous strides have been made in the science of the game. In 1896 the vexed question as to the height of ponies was decided, and the limit raised from 14 hands to 14 hands 2 inches. The positions of the players are defined by numbers, and each has his duty to perform. The best drilled combination is now sure to win. It is, however, a very grave question whether the individual play in games has made any progress during the last six or seven years. There are many brilliant players in the front rank now, but those who can recall the part taken in past contests by Mr. Arthur Peat, Mr. John Peat, and Mr. A. E. Peat, together with Mr. John Watson or Mr. Mildmay when in the zenith of

their glory, will hardly say they were inferior to the best players of the present day.

The Ground—A full-sized ground is 300 yards long by 200 yards wide. There are, however, not very many such grounds in England, and a good game can be played in a much smaller ground. A rectangular shape should be adopted where possible, but many prefer to have the corners rounded off. It should be perfectly level,



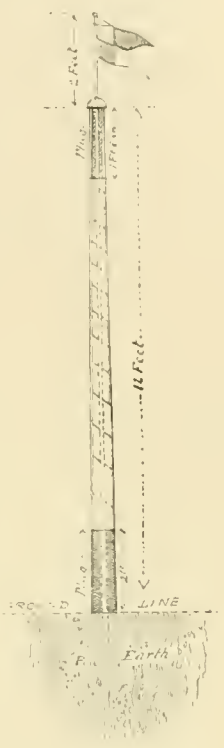
PLAN OF GROUND.

but a slight rise from each goal end to the centre is no detriment, but there must be no slope from the centre of the ground to the sides. It is impossible to lay down any rule as to the turf, because the grasses that suit some soils would perish on others. Take the advice of some expert on soils and grasses and follow it. Remember that as much care should be taken of a polo ground as of a cricket ground, and the grass kept nice and short like a lawn. On this largely depends the travelling of the ball. There is nothing more tiring and wearying than to play on a badly kept ground with rather long grass.

As soon as play has ceased on a ground, get together as many men as possible, and let these walk in a line up and down, treading in with their feet the turf that is torn up from the galloping of the ponies. This is one of the most essential things to be done if you wish the ground not to get bumpy, and thereby prevent accurate or fast play. A heavy roller should then be used, which will solidify the loose pieces of turf. On well-kept grounds, such as Hurlingham and Ranelagh, watering is adopted in dry weather. This, however, is a luxury that most clubs cannot run to, as the expense is very great.

SECTION OF SIDE BOARDS.

Boundaries—These can be marked with a white line similar to those of lawn tennis courts. Where side boards are not adopted, a narrow strip may be cut out of the turf, but boards are now generally used in England. The diagram shows the proper arrangement of the boards and the slope of turf on the inside which prevents the ball lodging against them. The boards, which should be about 10 inches high, are nailed to wooden pegs, placed at intervals, and firmly fixed in the ground: these boards run on the sides of the ground only. It is now the custom at Hurlingham to mark the 15 yard boundary for the enforcing of Rule 14. A line is also drawn across the ground, marking the 30 yard boundary. It is advisable to have a white spot to mark the centre of the ground when the ball is thrown in.



SECTION OF GOAL POST.

Goals—These are placed at each end of the ground in the centre of the back line. The goal posts are 8 yards apart. Goal posts can be made of any material, and they vary according to locality, but the most approved are those made of Willesden paper, which have a substantial look and yet are not dangerous in the event of a player coming into collision with them. Very thin posts are objectionable, for they do not catch the eye sufficiently when trying to hit a goal. The sketch and section

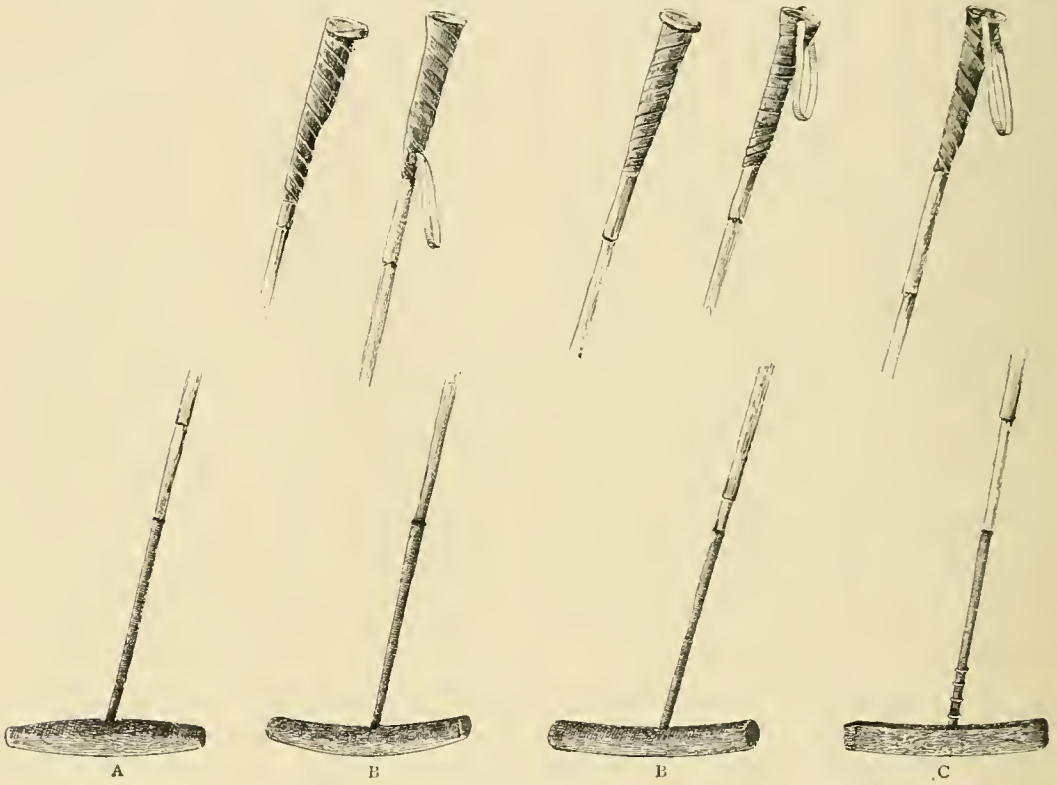
THE GOAL POSTS IN POSITION.

will show their construction. It is advisable to have a plug at the top in which a flag can be inserted; this protects the posts in bad weather. The height of posts should be 10 feet.

Polo Sticks—The selection of sticks is a very important item with a player, and it is wonderful how careless most are on this point, and also how ignorant. The length of a stick varies

according to the fancy of a player, but the usual length is from 4 feet 2 inches to 4 feet 6 inches. I have, however, known them made as long as 4 feet 10 inches The heads are made of various shapes; Indian players favour a good deal the broom handle or cigar-shaped head, A; others the round head, B. The ordinary head is shaped like C, and is made of sycamore generally, being from $1\frac{7}{8}$ to $2\frac{1}{4}$ inches in width, $7\frac{1}{2}$ to $8\frac{1}{4}$ inches long, and $1\frac{1}{8}$ to $1\frac{3}{8}$ and 2 inches deep. The edges should not be sharp, but bevelled off. When the present style of stick came into vogue, the heads were made of all sorts of wood, hickory, ash, beech, wych elm, bamboo root, willow, and sycamore, but the last-named has been found after years of trial to comprise the greatest advantages. The canes used are rattans or malaccas. The Singapore ground rattan can be distinguished from others by its having the joints further apart. In selecting a cane, be sure to see that the play or spring is near the head of the cane, about a foot above it; always avoid a cane with the spring near the handle. Another very important point is to take care that the angle at which the stick is fixed in the head suits you. This can only be found out in practice.

The handle, of which I give several sketches, should be flat, and suit the grasp of the player, with a taper to prevent the stick from slipping through the hand. They are generally covered with white or brown basil, made from sheepskin. There are a number of rubber handles in the market, but nothing beats the adhesive tape, an inch wide, which can be bound round by the player himself. It sticks firmly and yet can be easily taken off and fresh tape substituted. Some players have wrist straps fastened to the handle to prevent them from dropping the stick, but these, when made of too strong leather, may prove dangerous and cause the player to be dragged off his pony. A far better plan is to use a piece of common tape. This should be tied round the handle, and a loop made to go round the wrist; if any entanglement then takes place, the tape breaks.



POLO STICKS AND HANDLES.

Balls—The regulation size of a polo ball is 3 inches diameter. All sorts of inventions have been tried, but nothing beats the willow or alder. Bamboo root balls have been tried but found wanting, also cork balls covered with leather. The only drawback of the willow balls is their liability to break and chip. They are always painted white.

Dress—This of course must vary according to climates and circumstances. The regulation dress in England is brown leather butcher boots, now known as polo boots, white twill breeches, or some similar material, flannel or silk shirts, with cap to match.

With regard to the head-dress, as this has often been the means of saving the player from serious injury, always use the New Cork Cap, patented, I believe, by M. Barnard. Sometimes the pith helmet is used, as in India, but this is rather apt to get displaced on the head. The sides in a game are distinguished by the players wearing different coloured shirts or sashes. A modern improvement is a coloured waistcoat put on over the shirt. Every club should possess sets of these waistcoats.

The Game—So much science has been introduced into the game, that a short notice of how it is played becomes necessary beyond the bare rules.

POLO.

Each side has four players, who are distinguished by different coloured shirts or jerseys. The players on each side are told off as Numbers 1, 2, 3, and 4, or back player. The duties of each man are as follows :—

No. 1—His duties are to devote himself entirely to the back player of the opposing side. He should keep as close to him as possible, and endeavour to ride him off the ball, and thus allow No. 2 or 3 of his own side to get possession. The position of No. 1 is the most difficult in the game. It requires a very quick man, and he must be mounted on an extremely handy and fast pony, to be of any use. It is not necessary that he should be a fine hitter; indeed, it has sometimes been tried to play No. 1 without any polo stick at all. So much depends on a good defence by a back player that it must be seen at a glance that if the back is prevented from reaching the ball, the chances are that the goal is taken.

No. 2—The easiest and most independent, as well as pleasantest place. The best hitter is the man to select for this post, and he should be mounted on a fast pony. His place is right forward, so that when the ball is hit to him he can carry it on, No. 1 in the meanwhile clearing the way for him by riding off the opposing back.

No. 3—Must be always ready to assist his back player when in difficulties, and also to drop back and take his place when the back gets an opening and makes a run. The position does not require such a fast pony as the others.

No. 4 (*Back*)—This, the most important of all the positions, is generally occupied by the captain of the team, as he can see how the game progresses and direct the players in front. He must be a good and strong and sure hitter of backhanders, so that the ball can be sent back right through the game. The back, having the most responsible position, should be mounted on the best pony procurable, with regard to handiness, speed, and riding off power. It is the duty of No. 4 to hit off from the back line when the ball has gone behind.

The game begins by each side lining up and facing its opponents in the centre of the ground, as marked on the plan (p. 123); No. 1 is nearest to the thrower in of the ball, 2 and 3 next, while No. 4 takes up a position slightly in the rear of his side. The two umpires take up their positions on each

side of the ground. The secretary, or polo manager, or some one deputed by him, then throws the ball in between the line of players, and the game begins. The rules given will supply all the further information required.

Polo Ponies—There are so many different sorts of ponies used in the game, that it is difficult to lay down any fixed rule as to the best, but the accepted type is "a miniature thoroughbred weight-carrying hunter."

The points to observe in selecting a pony are speed, handiness, a light mouth, and quickness in starting. The points to avoid are high and round action, such as trotting harness horses have, sluggishness, and a hard mouth. There is no value whatever in a slow and pulling pony.

The raising of the height of polo ponies from 14 hands to 14.2 must have the result of introducing the thoroughbred element very considerably into the ranks of polo ponies, and I much fear it will tend to encourage weeds, for speed is of greater value in a game than substance.

We can divide polo ponies into four classes, viz. :—

1. The English-bred pony.
2. The Arab pony.
3. The Barb pony.
4. The Argentine or Criollo.

There are many other breeds in the various countries where polo is played, such as the Australian or Waler, the Indian country-bred, the Texan, the Russian, &c., &c. These have all got their good and bad points. It will be sufficient for us to note the four first named breeds.

The English Pony—This is a chance production, and cannot as yet be claimed as an absolutely definite type. The changing ex-

CHARLTON.

igencies of the game may alter the required points at any moment. There can be no doubt that, for high class games, the really best English ponies are far better than any other breed: but it is very doubtful, after one has sifted out the best score or so, whether the remainder are superior to Arabs or Argentines. The amount of rubbish that is brought to the hammer at the various horse repositories under the name of polo ponies is extraordinary.

The breeding of most of our best ponies is unknown, or at least very doubtful. The pony strains in England come from the New Forest, Exmoor, Dartmoor, and Wales. These breeds are only 12.2 in height, and there are few ponies indeed playing that are bred direct from a 12.2 pony.

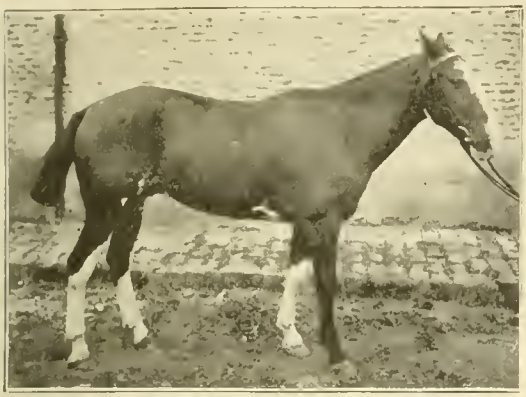
It would take up too much space to enumerate all the flyers that have passed through the ordeal at Hurlingham during the last decades. I, however, give an illustration of what may be considered one of the best, and perhaps the best, English bred ponies now playing—Charlton. This pony is by Discount, out of a mare by Pontiff, out of a Welsh pony. The breeder of both Charlton and her dam was a Mr. Harper, of King's Sutton, Banbury, and Charlton is now owned by Mr. W. J. Drybrough.

The Arab Pony—Animals of this breed, together with the "Barb," may be looked upon as naturally bred polo ponies. It is rare, indeed, that an Arab can be found that will not play the game, and a few years ago they were all the rage and commanded big prices. The result was that many inferior Arabs were imported which lacked speed, and at the present day they are not in demand. Another point that tells against them is the increase of the height limit. Most of the Arabs that are now playing were imported during the period when the height was 14 hands, and it will be some years before a good selection of bigger ones will be available. There is no pleasanter pony to ride than an Arab. Their gallop is smooth and even; they bend and turn beautifully, and have excellent mouths. They last well and are very sound, but they are not so speedy nor so resolute as an English pony. There are several different strains of Arabs imported into England, under the name of Syrians, Egyptians, and Persians or Gulf Arabs. All these varieties have supplied good ponies at different times. The breed of Arabs has already been described in this work by Mr. Wilfrid Blunt [*See* HORSE, ARABIAN], and it is to be hoped that he may be induced to turn his attention somewhat more to the breeding of Arabs for polo than he has hitherto done.

The Barb—Although the Barb is a breed of itself, and a very distinctive one, yet it seems to have something mongrel about it in comparison with the Arab. The breed extends along the northern shores of Africa, and it would be interesting to know from what source they derive their sloping quarters, and common

heads and necks. They have few good points beyond their extreme handiness, good mouths, and good legs. They are decidedly wanting in courage, slow, and sullen. In all probability the best Barb ever imported into England was Awfully Jolly, the property of the Earl of Harrington. This pony turned out to be a most valuable sire and bred some first class ponies, as well as hunters.

The Argentine—This native breed, known as the Criollo, comes from the River Plate or



ARGENTINE PONY.

Argentine Republic. It is bred extensively on some of the estancias, but little trouble seems to have been given to its improvement, chiefly owing to its small value out there. With the establishment of polo clubs in the different provinces, it is to be hoped owners will not be blind to their own interest, and will take some trouble to provide what should be a most profitable and marketable article. I give an illustration of what may be considered a good type of an Argentine pony. Orsino is a pure bred Criollo, and was bred by Baron Peers in the Buenos Ayres district. The Criollo type is not handsome, but they have supplied some of our best ponies at Hurlingham, such as Aluminium, the property of Captain R. Hoare, of the 4th Hussars, and one owned last season by Mr. Scott Robson. They are very hardy ponies and difficult to ride off; rather slow, perhaps, but I have known several with a good turn of speed. Their chief fault is slowness at getting off.

Breeding Polo Ponies—Every breeder has his own ideas on this subject, and they all differ. To take the leading breeders' opinions (they can be numbered on the fingers), there is first the Earl of Harrington, who has had a longer experience than any in breeding polo ponies. His opinion is that if thoroughbred ponies of the right height can be bred with sufficient substance and good temper, it would be impossible to breed on better lines, but as he evidently considers this unattainable, he has for many years bred from the Barb Awfully Jolly, and with the greatest success. In looking over, however, some of the results, I notice in the table before me that all his stock seem to be on the small side. In only one instance was the offspring higher than the sire, and that was when the mare was a 15.3 thoroughbred. The result was Cyclops, a 14.2 pony, Awfully Jolly himself being 14.1.

Sir Humphrey de Trafford can be put down as an equally successful breeder of polo ponies, and the dispersal of his breeding stud, just when he was beginning to reap the fruits of his labour, was a sore loss to the polo world. Sir Humphrey believed in breeding from a thoroughbred sire and from selected pony mares, also in in-breeding. He owned the famous thoroughbred pony *Rosewater*, by Rosicrucian, out of Lady Day II, of which an illustration is given; this pony is perhaps the most perfect miniature thoroughbred extant at present, and with such blood in his veins, there can be little wonder at his stock winning at all the shows.

Mr. John Hill, to whose efforts we are indebted for the present existence of the polo pony stud books, unhesitatingly states that the foundation stock should come from one of the pure breeds of Welsh or Exmoor ponies, and he favours an Arab sire.

Mr. E. L. Miller, in his book, *Modern Polo*, gives a very excellent article on breeding, which is much to the point. His arguments, however, are somewhat contradictory, as, although agreeing that there is no hunter or polo pony like a thoroughbred, on the next page he says that the right sire, to his mind, is a high caste Arab.

ROSEWATER; THOROUGHBRED.

To these authorities I add my own ideas, gained partly by practical experience and partly by observation of the failures of others. Much as I should like to speak in favour of breeding

and its possibilities, honesty compels me to say that as a paying and *profitable* business, it will never succeed. There are too many obstacles in the way. The polo pony always has been, and will continue to be, a chance animal. A polo pony must be the right height to within about an inch; he must be speedy; he must have substance; he must have a light mouth, and be as active as a cat, and also have a good temper and be free of any vice; also, a pony is five years of age before he is fit to play. Can such an animal be bred at a paying price? I for one doubt it. Then there are the rules of the game, which may change, as when the height was raised from 14 hands to 14.2. A breeder may, after years of toil to breed to a certain height, find all his stock valueless. Nevertheless, there are plenty of good sportsmen left who are willing to risk much on the chance of breeding a good one or two, and to these my advice would be, use a thoroughbred sire such as Rosewater, and for a dam select a 13.3 or 14 hands mare, that has been a first-class player,

ENGLISH BRED.

and whose dam also has been a good player. The mare must of course combine all the qualifications of speed, light mouth, and so forth. If with this you can combine pure pony blood, so much the better.

Not half enough attention is paid to the character and temper of the parents, and this has been the cause of many failures. I am very strongly against the first cross with an Arab sire. One has only to look round and see how many of this cross have ever risen into notoriety. I consider a Barb a far better cross for our English ponies. This has been proved by Lord Harrington's success with Awfully Jolly.

In conclusion, let me advise the would-be breeder of polo ponies not to put his mare to a stallion because he is near at hand, as so many do, but to spare no expense and send to the most suitable sire. Then success may reward him.

F. HERBERT.

Bibliography—The following books and periodicals constitute the chief modern works on polo, outside of the information to be obtained at the British Museum:—*Polo* (*Badminton Library*), J. Moray Brown; *Polo*, J. Moray Brown (Vinton and Co.); *Polo in India*, G. J. Younghusband; *The Polo Magazine* (monthly), Captain F. Herbert; *The Hurlingham Polo Calendar*, Captain F. Herbert; *Modern Polo*, E. L. Miller; *Station Polo*, "Lucifer"; *Hints to Polo Players in India*, Captain H. de B. De Lisle; *The Game of Polo*, T. F. Dale.

HURLINGHAM CLUB.

POLO RULES AND REGULATIONS.

1. *Height.*—The height of ponies shall not exceed 14 hands 2 inches, and no pony shall be played either in practice games or matches, unless it has been registered in accordance with the bye-laws.

No pony showing vice shall be allowed in the game.

2. *Ground.*—The goals to be not less than 250 yards apart, and each goal to be 8 yards wide.

A full-sized ground should be 300 yards long, by 200 yards wide.

3. *Size of Balls.*—The size of the balls to be 3 inches in diameter.

4. *Umpire, Referee.*—Each side shall nominate an umpire, unless it be mutually agreed to play with one instead of two: and his or their decisions shall be final. In important matches, in addition to the umpires, a Referee may be appointed, whose decision shall be final.

5. *Number of players.*—In all matches for cups or prizes the number of players contending to be limited to four a side.

6. *How game commences.*—The game commences by both sides taking up their position in the middle of the ground, and the manager throwing the ball in the centre of the ground.

7. *Duration of play.*—The duration of play in a match shall be one hour, divided into three periods of twenty minutes, with an interval of five minutes between each period.

The two first periods of play shall terminate as soon as the ball goes out of play after the expiration of the prescribed time; any excess of time in either of the first two periods, due to the ball remaining in play, being deducted from the succeeding periods. The last period shall terminate immediately on the expiration of the hour's play, although the ball is still in play.

Exception.—In case of a tie, the last period shall be prolonged till the ball goes out of play, and if still a tie, after an interval of five minutes, the ball shall be started from where it went out of play, and the game continued as before, until one side obtain a goal, which shall determine the match.

8. *Changing ponies.*—As soon as the ball goes out of play, after the expiration of the first ten minutes of each period of play, the game shall be suspended for sufficient time, not exceeding two minutes, to enable players to change ponies. With the above exception, play shall be continuous, and it shall be the duty of the umpire to throw in the ball punctually, and in the event of unnecessary delay in hitting out the ball, to call upon the offending side to proceed at once. Any change of ponies, except according to the above provision, shall be at the risk of the player.

9. *Bell.*—A bell shall be rung to signify the time for changing ponies, and at the termination of each period of play.

10.—An official time-keeper shall be employed in all important matches.

11. *Goals.*—A goal is gained when a ball is driven between the goal posts, and clear of the goal line, by any of the players or their ponies.

12. *Over top of goal posts.*—If a ball is hit above the top of the goal posts, but in the opinion of the umpire, through, it shall be deemed a goal.

13. *To win game.*—The side that makes most goals wins the game.

14. *Where ball to be hit from; position of players.*—If the ball be hit behind the back line by one of the opposite side, it shall be hit off by one of the side whose line it is, from a spot as near as possible to where it crossed the line. None of the attacking side shall be within 30 yards of the back line until the ball is hit off. If, however, the ball be hit behind the back line by one of the players whose line it is, they shall hit it off from the centre of the goal line between the posts, and all the defending side shall remain behind the line until the ball is hit off, the attacking side being free to place themselves where they choose, but not within 15 yards of the ball.

15. *Ball thrown in by umpire. No delay allowed.*—When the ball is hit out of bounds, it must be thrown into the ground by the umpire from the exact spot where it went out of play, in a direction parallel to the two goal lines, and between the opposing ranks of players. There must be no delay whatsoever nor any consideration for absent players.

16. *Riding out an antagonist. Crossing.*—A player may ride out an antagonist, or interpose his pony before his antagonist, so as to prevent the latter reaching the ball, but he may not cross another player in possession of the ball, except at such a distance that the said player shall not be compelled to check his pony to avoid a collision.

Definition of crossing.—If two players are riding from different directions to hit the ball, and a collision appears probable, then the player in possession of the ball (that is, who last hit the ball, or, if neither have hit the ball, the player who is coming from the direction from which the ball was last hit) must be given way to. Provided that no player shall be deemed to be in possession of the ball by reason of his being the last striker if he shall have deviated from pursuing the exact course of the ball.

17. *Crooking stick.*—No player shall crook his adversary's stick, unless he is on the same side of the adversary's pony as the ball, or in a direct line behind.

18. *Off side.*—No player who is off side shall hit the ball, or shall in any way prevent the opposite side from reaching or hitting the ball.

Definition of off side.—A player is off side when, at the time of the ball being hit, he has no one of the opposite side nearer the adversaries' goal line, or that line produced, or behind that line, and he is neither in possession of the ball nor behind one of his own side who is in possession of the ball. The goal line means the eight yard line between the goal posts. A player, if off side, remains off side, until the ball is hit or hit at again.

19. *Rough play.*—No player shall seize with the hand, strike, or push with the head, hand, arm, or elbow, but a player may push with his arm, above the elbow, provided the elbow be kept close to his side.

20. *Carrying ball.*—A player may not carry the ball. In the event of the ball lodging upon or against a player or pony, it must be immediately dropped on the ground by the player or the rider of the pony.

21. No player shall intentionally strike his pony with the head of his polo stick.

22. *Penalty for foul.*—Any infringement of the rules constitutes a foul. In case of an infringement of Rules 16, 17, 19, 20, and 21, the umpire shall stop the game; and in case of an infringement of Rule 18, the umpire shall stop the game on an appeal by any one of the side which has been fouled. On the game being stopped as above, the side which has been fouled may claim either of the following penalties.

(*a*) A free hit from where the ball was when the foul took place, none of the opposing side to be within 10 yards of the ball.

(*b*) That the side which caused the foul, take the ball back and hit it off from behind their own goal line.

23. *Penalty for disabling a player.*—In the case of a player being disabled by a foul, the side who has been fouled shall have a right to designate any one of the players on the opposite side who shall retire from the game. The game shall be continued with three players a-side, and if the side that causes the foul refuse to continue the game, it shall thereby lose the match. This penalty shall be in addition to that provided by Rule 22.

24. *Changing ends.*—Ends shall be changed after every goal, or if no goal have been obtained, after half-time.

25. *Ball out.*—The ball must go over and clear of the line to be out.

26. *Throwing in ball.*—If the ball be damaged, the umpire must at once stop the game, and throw in a new ball at the place where it was broken, towards the nearest side of the ground, in a direction parallel to the two goal lines and between the opposing ranks of players.

27. *Broken sticks.*—Should a player's stick be broken, he must ride to the place where sticks are kept and take one. On no account is a stick to be brought to him.

28. *Dropped stick.*—In the event of a stick being dropped, the player must pick it up himself. No dismounted player is allowed to hit the ball.

29. *Ground kept clear.*—No person allowed within the arena—players, umpires, and manager excepted.

30. *Accidents.*—If any player or pony fall or be injured by an accident, the umpire may stop the game, and may allow time for the injured man or pony to be replaced, but the game need not be stopped should any player fall through his own fault.

31. *Where ball is to be thrown in.*—On play being resumed, the ball shall be thrown in, where it was when the game was stopped, and in the manner provided for in Rule 26.

32. *Disregarding umpire's decision.*—Any deliberate disregard of the injunctions of the umpire shall involve the disqualification of the team so offending.

33. *Umpire's power to decide all disputes.*—Should any incident or question arise that is not provided for in these rules, such incident or question to be decided by the umpire.

Conditions for Cup Tournaments.

Champion Cup Conditions.

1. *Open.*—Open to any polo teams.

2. *Entry form.*—The entries, naming colours, to be made on or before 5 p.m., on the Saturday prior to the week of competition.

3. *Draw.*—The respective teams to be drawn, and the said draw to take place on Saturday, at 5 p.m., prior to the week of competition.

4. *Name players.*—The captain of each team to name his four players at time of entry.

5. *Substitutes.*—In the event of one of the players being prevented from playing from some *bona fide* good reason, the Polo Committee may, if they think fit, allow another man to be nominated in his place; such substitute must not, however, be taken from among the players selected in any other team.

6. *Three teams.*—Unless three teams contend, the cup will not be given.

7. *Tie.*—In case of a tie between two teams, it must be played off the same day till one team obtain a goal, always excepting both teams electing to postpone.

Revised Rules for County Club Cup.

Open to all registered County Clubs.

1. All polo Clubs must be registered with the manager on May 15 in each year. A book of rules and members of such club must be forwarded at time of registration, and no player is eligible to play for his club in the county cup unless his name appears on such list of members.

2. Any member playing for his club must be a resident in the county where such club has its ground, or reside within 50 miles of the club ground.

No player is eligible to play for his club unless he has played on at least six different days on the club ground during the past season, or on six different days during the present season, in club games or matches.

3. The team which has played for the Open Cup,

and won the same during the last three years is not eligible to contend, and not more than one player of such a team may play in the same team for his club.

4. Any players eligible to play for their universities in the inter-university match may play for Oxford and Cambridge university clubs, provided that they fulfil the necessary qualifications in other respects.

5. A residence within the Metropolitan area of London cannot act as a qualification for any club.

6. Ranelagh and Hurlingham are not eligible to contend.

7. The fact of an officer being quartered in the neighbourhood does not constitute a residential qualification; with the exception that an officer with a militia, volunteer, yeomanry, or staff appointment for not less than three years, and who has not played for his regiment in the regimental tournament of the same year, is eligible to play for his club.

8. Entries to be made in writing to the manager at least ten days previous to the date fixed for the first game, giving the names and addresses of each player. And a certificate must be furnished by the captain or secretary of the club at the same time that the necessary conditions as to qualification have been fulfilled by all the players entered. The manager shall not accept an entry from any club, unless it is registered according to Rule 1.

9. The captain of each team on entering to deposit five pounds with the manager, which shall be returned on the tournament concluding. Should the team be scratched, the five pounds shall be forfeited and go to the team which is second.

10. In the event of one of the players being prevented from playing for some reason that the polo committee may consider *bona fide*, they may allow another man, a member of the same club and properly qualified, to be nominated in his place; such substitute cannot be taken from a team entered for County Cup unless the same is scratched.

11. The ponies played must be *bona fide* the property of a member of the club.

12. The decision of the Hurlingham committee on any point is final.

Rules of Measurement.

1. *Official measurer.*—The measurement shall be made by an official measurer under the supervision of the polo committee. Such official measurer shall be appointed by the committee and shall be a duly qualified veterinary surgeon.

2. *Time of measurement.*—The official measurer shall attend for the purpose of measuring ponies on the first day in the season on which the ground is open for play, and on certain subsequent days which shall be advertised in due course.

3. *Description of pony to be signed, and fee paid.*—The person presenting a pony for measurement shall fill up and sign a form, supplied by the club, containing particulars and a description of the pony, and shall pay to the manager a fee to be fixed by the committee before the pony can be measured.

4. *Age of pony.*—Ponies aged 5 years and upwards may be measured and registered for life; ponies under 5 years can be registered for the current season only. The official measurer shall determine the age of the pony.

5. *Condition of pony.*—A pony shall not be measured if he appears to have been subjected to any improper treatment with a view to reduce his height, or if he is in an unfit state to be measured. If a pony is rejected under this rule, he shall not be presented again for measurement until the following season.

6. *Standard and place of measurement.*—The measurement shall be made with a standard approved by the club, and in a box with a level floor specially erected for the purpose.

7. *Access to measuring.*—Neither the owner of the pony nor his servant shall on any account enter the box during the measurement, nor shall any other person be admitted unless specially authorised by the official measurer, but members of the polo committee shall have a right to attend the measurement when their own ponies are not being measured.

8. *Position of pony and standard.*—The pony shall stand stripped on the level floor, and the measurement shall be made at the highest point of the withers.

9. *Holding pony.*—The pony shall be held by a person deputed by the official measurer.

10. *Position of head.*—The head shall be so held that a line from the poll to the withers would be parallel to the floor.

11. *Legs.*—The forelegs from the point of the shoulder, and the hind legs from the back downwards, shall be as perpendicular to the floor and as parallel to each other as the conformation of the horse allows.

12. *Hair and skin.*—The wither may be shaved, but the mane must not be pulled down, nor the skin of the neck or wither in any way interfered with.

13. *Shoes.*—Ponies may be measured with or without shoes, but no allowance shall be made.

14. *Appeal.*—Any person who is dissatisfied with the determination arrived at may by a written application, presented to the manager within seven days from the time of measurement, apply for a re-measurement. Such re-measurement shall take place in the presence of two members of the polo committee, and on the first convenient day which may be appointed, and their decision shall be final.

Hurlingham Club.

Form for Description of Pony presented for Measurement.

Owner's Name.	Pony's Name.	Colour.	Sex.	Age.	Distinctive Marks.

Date Signature of owner.

PORCUPINE—Various species of these rodents are to be met with in different parts of the world, and of these the common porcupine, *Hystrix cristata*, found in Africa, the hot regions of Asia, and part of Europe, is the best known. This animal is essentially nocturnal in its habits, and lives by day in deep burrows excavated by itself in the soil. It is very seldom encountered in daylight, and in South Africa is hunted with the aid of dogs on moonlight nights, or more commonly on dark nights with lanterns. Mettlesome dogs, not previously entered to porcupine hunting, suffer very severely from over-rashness in tackling so thorny a subject; but any mongrels or odd dogs that are accustomed to the sport will be found useful in making known the whereabouts of the bristling quarry and keeping it from its burrows. Like the hedgehog, the porcupine can roll itself up in a ball, and thus bids defiance to dogs and four-footed foes. It is extremely tender about the nose, and a blow or two with a stout club will quickly put one of these animals *hors de combat*. Porcupines live mainly on roots, herbs, wild fruits, and plants,

and often perpetrate a good deal of havoc among the fields and gardens of the colonists and natives. For this reason, as well as for their handsome quills, and the sake of the flesh, which is in flavour somewhat like delicate pork, they are a good deal hunted. The Dutch colonists at

PORCUPINE.

the Cape used formerly to smoke and dry the flesh of these animals, and here and there the practice may still be met with. Although armed with sharp and strong incisors, the porcupine seldom or never uses its teeth when attacked, but trusts entirely to its quills for its defence. Old and worn-out lions, leopards, and other carnivora, unable to procure their natural food, sometimes, when famine-stricken, attempt to make a meal of a porcupine. These worn-out brutes have been found or shot in the last stages of misery, with the tongue, palate, lips, and paws frightfully wounded by quills, of which the animal has found it impossible to rid itself. A wounded dog ought to be carefully looked to, as the shorter spines, which do most of the mischief, work deep into the flesh and set up suppuration. The rustling noise made by the porcupine as it moves is caused chiefly by the hollow spines of the tail. This rattling sound is sufficient to startle a horse very considerably, especially at night. Other kinds of porcupine are found in America, the Malay Archipelago, West Africa, and Borneo. In the forests of tropical America various species of tree porcupines are to be met with. These animals are easily distinguished by their arboreal habits, shorter quills, and long prehensile tails.

H. A. BRYDEN.

PRAIRIE CHICKEN—Of all American grouse, the species of ground grouse, found as a rule away from woodland, and commonly called "prairie chicken," yield most sport; though the ruffed-grouse, a dweller in the woods, is a well-known and highly appreciated game bird whenever it is found. The big sage fowl, also a grouse of the open country, the largest of all, exists so far from water that it is ordinarily not much sought after by the men who use setters and pointers. The blue-grouse, spruce-grouse, and ptarmigan are as yet chiefly killed for the pot by men who are on trips after big game. The ptarmigan, except in the extreme north, is only found high up on the mountains, and the blue-grouse and spruce-grouse in thick timber, where they are frequently killed with the rifle, their heads being shot off as they sit on trees.

There are two entirely distinct birds known as prairie chickens. The true prairie chicken, or pinnated-grouse (*Cupidonia cupido*; there are several geographical varieties or sub-species), which was formerly, in one of its forms, a common bird east to the Atlantic coast, has now vanished from practically all the eastern part of its range, and has been sadly thinned out even in Illinois and Wisconsin. In Iowa and Minnesota it is still abundant, and it works its way westward with the cultivation of the land. The ordinary way to shoot the birds is to take two or three dogs for each sportsman, and a wagon to carry the entire party. The distances are so great that the dogs must travel well and range far. Men on foot could hardly cover enough ground, as it will often be necessary to pass over a mile or two of country which is not worth beating. In all likely spots the

PRAIRIE CHICKEN.

wagon is left, and the sportsmen follow their dogs, just as was done in England before the days of "battues." The birds are sometimes found in the stubble fields, and sometimes out on the prairie. Early in the season they are

easy to kill. By October they are very strong and wild, and then need straight powder. They are most delicious eating.

The other kind of prairie fowl is the sharp-tailed grouse (*Pediœcetes phasianellus*; likewise with several geographical sub-species), a more northern and western bird. The limits of the two species overlap; and in the Dakotas the pinnated grouse has been extending its range westwards, the sharp-tail seeming to recede before it. As the sharp-tail is especially the grouse of the cattle country, it is much followed by all sport-loving ranchmen; but as it inhabits a drier country than the pinnated grouse, it offers a rather more difficult problem for dogs. Early in the season, sharp-tails are shot precisely as ordinary prairie chickens are shot. As cold weather comes on, they assemble on the river bottoms and take to perching on the trees. They then become very wild and shy, and do not offer much sport.

The first sparse settlement of the land does not in any way interfere with the increase of these grouse. On the contrary, the ranchmen, by the war they wage on the wolves and coyotes, help the grouse in their struggle for existence. In the purely pastoral parts of Montana and the Dakotas, these birds are probably more plentiful now than they were fifty years ago. But they disappear as the settlements become dense. This seems to be true of all the game of the plains, whether furred or feathered. The beasts and birds of the deep woods hold their own, as those of the plains cannot. There is no likelihood of the extinction of the ruffed-grouse; it is still found in places from which the pinnated-grouse has absolutely disappeared, though once the latter outnumbered it fifty to one. But both species of prairie chicken are steadily diminishing in numbers. The efforts of the game associations and sportsmen's clubs to have the game laws properly enforced have done much to arrest this diminution, and here and there to stop it; but the communities as a whole will have to see more clearly than they now do the effects of wasteful slaughter of game birds and game beasts before these birds and beasts can be effectually preserved.

THEODORE ROOSEVELT.

PRESERVATION OF GAME — The word "game" is an indefinite word and seems at various times to have had various meanings. There is no general definition which holds good in the consideration of the various statutes passed to protect it, since each statute contains its own definition (*vide* Warry's *Game Laws of England* 1896, p. 4).

The following are legally regarded as game throughout the United Kingdom and Ireland; a few species not included herein, as ptarmigan, quail, wigeon, wild-duck, landrail, and deer, are not, legally speaking, game throughout *all* the British Isles:—

Hares	Game Act, 1831, Sec. 2.	Woodcock	Poaching Prevention Act, 1862.
Pheasants		Snipe	
Partridges		Rabbits	
Grouse		Eggs of Pheasants	
Heath or Moor Game		,, Partridges	
Black Game		,, Grouse	
		,, Black or Moor Game	

Since the passing of the Ground Game Act 1880, the entire rights as regards hares and rabbits are no longer vested in the owner of the land as such. In the game preserver's sense the list may be stated thus: Hare, pheasant, partridge, grouse, black game; ptarmigan and capercailzie: of these the first five form the chief game of the country; ptarmigan and capercailzie are confined to particular districts.

The first and essential requisite for the preservation of any sort of game is to secure the services of a competent keeper. A good keeper must not only be able to breed and rear pheasants, but should be able to beat his coverts in workmanlike style, and should also understand the art of partridge driving. The ordinary qualifications of a keeper need not detain us, but there are two indispensable ones: he must be a sober man, and he must have the tact to conciliate the tenant farmer. The necessity of the latter becomes increasingly apparent each successive year.[1] The head of game on any manor will depend to a large extent upon the suppression of two nuisances—poachers and vermin. Poachers, broadly speaking, are divided into two classes—night poachers, who follow their calling in gangs and are frequently desperate fellows, and day poachers, a far more numerous class, of whom every court of Petty Sessions supplies examples. There are many modes by which pheasants are taken at night. At an early stage, when they have been moved into the coverts, and are still under the hen, they are most easily taken by placing a board in front of the coop, when they can be withdrawn without a sound being heard. Later on, when the young birds begin to roost on the bushes, a bull's eye lantern held at them dazzles the birds, and they can be picked off at will. Full-grown birds can be shot any light night either by swan shot discharged from a catapult, or by an air gun. Low roosting birds of any age can be taken without any noise by a running noose of wire at the end of a stick. These tactics can only be defeated by ceaseless vigilance on the part of the keeper and watchers, whose efforts may be supplemented by alarm guns and dogs. It is a common and effectual practice to surround the coops with a stout wire

[1] Every keeper ought to know something of the Game Laws, in order to keep well within his legal rights. To obtain this information we cannot give him better advice than to secure a copy of Warry's *Game Laws of England*, where the subject is carefully treated in chapter 13.

and to attach to it one or more dogs, so that each dog has free range over a considerable length. Another device is to stretch a wire about 9 inches from the ground across all the approaches leading to the rearing ground; these wires are made fast, and, being invisible at night, trip up the poachers.

The plan adopted formerly in taking partridges at night was tunnel netting. This net was shaped in a half circle, with a tunnel in the centre, and was fixed in the ground with stakes, at or near the spot where the birds had been heard to jug. They were then gently edged towards it by using a quiet horse. Daniel, writing in 1807, mentions an ingenious device by which the tunnel netters were checkmated (*vide Rural Sports*, vol. iii. p. 64). The principle of the tunnel net was that of driving the birds towards the net; the principle of the "long net," which has superseded it, is that of drawing the net towards the birds. A long net is usually made of silk, and is 25 yards long, 12 feet deep, with $1\frac{1}{2}$ inch mesh. The bottom is weighted; three men work it, one at each end and one in the middle, whose business it is to clear it of all obstacles. Having noted the exact spots where the coveys are roosting, the poachers draw the net towards the place, and the instant the birds rise, drop it over them. When the poacher is not sure of the roosting places, he uses a pointer. The dog carries a bell or a small lantern, and, either by the bell ceasing to sound, or by the light becoming stationary, the poacher is made aware that the dog has come to a point. The ordinary means of prevention is bushing the fields. Thorns or crooked sticks are fixed at intervals, and pieces of furze or bean haulm are scattered about; these become entangled in the meshes. In dealing with night poachers, the keeper should endeavour to have the odds, as regards numbers, invariably on his side. This is not merely for motives of self-preservation, but because the exhibition of superior force will frequently prevent a serious collision. When gangs of night poachers are in the habit of visiting a neighbourhood, keepers on different estates should lay their heads together and concert a system of signals by which all their available force may be concentrated at short notice on any given spot. It has been suggested that the summons should be conveyed by firing a rocket, and, if different coloured rockets were distributed to the various keepers, a code might easily be established indicating the point of attack. The discharge of a rocket would in itself be a sufficiently alarming incident to discourage many poaching expeditions. It is very desirable that keepers should obtain the co-operation of the police; the presence of a man in uniform has a deterrent effect, in addition to which the police on their night beats have the best opportunity of remarking the movements of poaching gangs.

The hours of night are legally defined by sect. 12 of 9 Geo. IV., c. 69 as commencing at the first hour after sunset and ending at the beginning of the last hour before sunrise.

The much more numerous class of poachers who work by day includes many varieties, ranging from the professional who drives round the country in his cart with a couple of concealed lurchers, to the loafer who sneaks a rabbit out of the hedge. Perhaps the most troublesome of all is the village poacher, who, being a resident, is well acquainted with all the keeper's movements, and takes advantage of every occasion when his back is turned. Again, there is the ex-keeper, perhaps discharged for drunkenness, who has settled in some outlying cottage not belonging to the property, but within easy reach of the preserves. Such an one came under our notice recently, who, amongst other poaching properties, possessed a retriever of unusual intelligence. This dog had been trained to carry eggs in his mouth, and we have known him carry off to his master, one by one, every egg from a pheasant's nest half a mile from his cottage. An experienced keeper will regard with suspicion every stranger found on those parts of an estate where eggs or game exist. Two of the most accomplished poachers we have ever known were, the one a pianoforte tuner, and the other the wife of an ex-gamekeeper. He was such an adept at netting that in one season he swept off the partridges from a considerable extent of country, and she was equally clever at catching rabbits with the long net.

The rambling habits of **pheasants** when blackberries tempt them along the hedgerows, or when acorns draw them from the coverts, render them easy objects of capture. There is no doubt that every season many pheasants fall victims to sticks, stones, and the carter's whip. To check this, the keeper should always be provided with a team of spaniels to scour the hedgerows and drive in straying birds. Orchards near coverts, but not belonging to the estate, must be carefully watched when the fruit is ripe, for pheasants cannot resist fallen apples. On manors near a sea-coast, where there is a public fore-shore, saltings and marshes should be driven, as pheasants are fond of salt and frequent such places. It is no uncommon experience to find that coverts where no stock of game exists, but which are near good preserves, are taken for the season by so-called sportsmen. The reason is obvious: the lessee hopes to get his game without the trouble and expense of rearing it. In order to attract pheasants, he will put himself to no little expense in procuring damaged raisins, figs and maize. In such cases hedgerows must be carefully scrutinised, and especially the bottom of any ditches which lie

between the two properties. Poachers sometimes select a neck of covert where pheasants are numerous, and, by tapping, contrive to drive them across a path on which they have previously disposed horse-hair nooses; or they catch single birds on hedgerows on fish hooks baited with raisins. A more deadly method than either of these is that of steeping corn in rum, or methylated spirits, which intoxicates the birds. *Nux vomica* also is mixed with meal, causing faintness, and the birds are easily picked up.

The beginning of the laying season is an anxious time, for, owing to the demand for eggs, poachers are very active. When birds are sitting, the egg-stealers' operations are simplified, for it needs no great sagacity to discover a pheasant's nest. It is a curious fact that where places of security abound, the hen pheasant will sometimes select a spot which is comparatively public,—such as a hedgerow on a main road, or a felled tree alongside of a footpath.

There still remains to be noticed that terror of keepers, that thorn in the side of the landowner,—the proprietor of some isolated piece of land in the midst of the preserves. This land may not exceed a few perches, or may extend to three or four acres, but whatever be its size, two things are certain—that the owner will plant a considerable breadth with buck-wheat, and that he will possess a game licence. This man *must* be squared! One other obnoxious individual, the product of modern legislation, is the allotment-poacher. His plot is situated, say, a mile from his house, and his nearest cut lies along a public footpath through a game covert. He has a licence to carry a gun, and as he is *en route* to his potato-patch, he carries it through the wood. We have known more than one of these gentlemen improve the opportunity thus afforded him.

The above instances by no means exhaust the category of poachers. The keeper will have to keep a jealous eye on casual water-cress gatherers, who are generally on the look-out for eggs; also on mushroomers, who frequently conceal the heart of the poacher under the modest garb of the market-gardener; and on gipsies, to whom nothing comes amiss.

A long spell of snow is perhaps the most trying time of all, for then not only is every object visible, but game may be tracked through the snow by their footprints. Hay ricks and straw stacks should at such times be specially watched. All game becomes very tame during the snow and falls an easy prey to ill-disposed persons.

Some of the methods of poaching pheasants which we have described are applicable also to **partridges**. Partridge eggs are always readily saleable, and it is to be regretted that many preservers are indifferent where the eggs come from, so long as they obtain a change of blood. In this way A.'s manor is despoiled of its eggs in order to supply his neighbour B. with stock. In some cases the owner of a manor unconsciously buys his own eggs. Partridges, unlike pheasants, are seldom confined in aviaries, and the nests of the wild birds are frequently neglected by the keeper, who at that season is busy with his pheasants. A keeper ought to know all the partridge nests on his beat, and assure himself constantly that they are not molested. To secure the preservation of partridge eggs on an estate, the best plan is to enlist the sympathy of the farmer and the labourer. Farmers as a rule are very tolerant of winged game, and labourers may be won by the offer of a reward for every nest found by them which is hatched off. When the mowing machine is at work the keeper must be on the alert. Grass-cutting, in many parts of England, takes place just before the eggs hatch, and the machine destroys both the sitting bird and the eggs. When a partridge is driven from her nest, a patch of grass or corn should be left standing, and, if she does not return to it, the eggs should be withdrawn at once and placed under a broody hen. The keeper who has a beat on high ground, where there is little corn grown, is liable in hard weather to find himself confronted by an insurmountable difficulty. His entire stock may betake themselves to the valleys never to return.

Grouse run most risk from shepherd dogs in the egging time, from poachers in winter, when the snow is heavy on the ground and the birds seek the cultivated lowlands, and at harvest, when they gather in numbers on the stubble fields and stooks. They are also netted at night. The maintenance of a good stock of grouse depends mainly upon immunity from disease. The subject of grouse disease is an obscure one, and is fully discussed elsewhere [*See* GROUSE, DISEASES OF]. Most practical authorities, however, agree that the chief means of preserving the health of the grouse is the periodic burning of the heather. The heath should be fired between November and March 26th; firing is illegal between April 11th and November 1st. It should be burnt in strips. Grouse feed upon the young growth.

Black Game have become very scarce in most parts south of the Tweed. Some still exist in the New Forest, Dorset, Wilts. West Somersetshire, Cornwall and South Devon. On the sides of Dunkery, on Winsford Hill, and on many of the drier slopes of Exmoor, where the heather is sweet and the whortleberry plant abundant, black game are found. They are generally shot over pointers, and in favourable seasons bags of from twenty to twenty-five brace are frequently made. The conditions chiefly conducive to their preservation are absence of foxes, the neighbourhood of corn and turnip crops, and the judicious burning of furze and old heath in

the spring before nesting commences. The old cocks are seldom kept down as close as they should be: they may be seen drumming on a fine spring morning in all the magnificence of their courting plumage, but no doubt this interferes with nesting operations. There are comparatively few black game on the Quantocks, where the heath is inferior and foxes somewhat plentiful. In the Midlands, black game are found in Sherwood Forest and Cannock Chase.

The **Capercailzie**, or cock of the wood, after becoming an extinct species of game in Scotland, has now been partially restored. Perthshire is the home of the bird: it feeds on their worst enemies is the mowing machine, which destroys annually great numbers of leverets.

Vermin, in the game preserver's sense, is either four-footed or winged. Amongst the former must be included cats, polecats, foxes, stoats, weasels, pine-martens, hedgehogs, and rats; amongst the latter, crows, rooks, jackdaws, magpies, jays, sparrow hawks, brown owls, peregrine falcon, buzzard, merlin, and hen harrier. Individual kestrels must also be included. First and most formidable of all four-footed vermin, we place the house cat grown wild. Every village and every cottage contri-

Sparrowhawk and Partridges

the young tops and the cones of the fir trees and on berries of the juniper, and may be sometimes found on the stooks. The flight of a capercailzie, big bird as he is, is absolutely noiseless and very fast. The female lays from six to eighteen eggs, and deposits them on the ground. Vermin must be vigilantly kept down, or the eggs will go.

Hares—Since the passing of the Ground Game Act, hares are rapidly disappearing from districts in which formerly they were plentiful; but so long as coursing and hare-hunting remain popular branches of sport, there is no danger of their becoming entirely extinct. Hares are easily snared, shot, and gate-netted; the lurcher also snaps up a great many; but one of

butes to the number, and a cat that has once formed a taste for the woods will seldom return to the domestic hearth. Cats take almost every sort of game in every stage of its growth, and but for the fact that they are easily trapped, would render game preserving in populous neighbourhoods impossible. The trap should be baited with flesh sprinkled with valerian, or with a herring. It should be well set back against a tree, and the approach to it enclosed with brushwood; the trap itself should be neatly brushed over.

Polecats are becoming very rare (especially in districts where rabbits are systematically trapped), and are seldom heard of out of Wales and Scotland. They are very destructive to young

birds as well as eggs. They are generally caught in box traps set in ditches or under walls.

The **Fox** has his prescriptive rights, which of course every sportsman must recognise. Nevertheless, the fact must be confronted that he is a crafty and successful poacher. He kills old birds on their nests and sucks their eggs; he takes the birds from the dainty age of eight weeks upwards; he chops old hares in their forms, and catches leverets in the open; he digs out rabbits quicker than a spade labourer, and is especially active in coverts on the night succeeding a big shoot. His nocturnal visits to the coops are best prevented by the use of chained dogs and hurricane lamps. Rags steeped in animal oil will also be found useful. Where rabbits abound, pheasants and partridges will be less molested by the fox.

Stoats and **Weasels** have one merit, viz., that they are the natural enemy of the rats, mice, and field voles, although from the ordinary keeper's point of view they are pests to be exterminated. They will attack equally readily young pheasants and partridges, leverets and rabbits; they also destroy eggs. As an instance of the rapacity of the stoat, one of the most experienced keepers in the west of England tells us, that he has known thirty-five pheasants, six weeks old, to be taken out of a hole where they had been deposited by a stoat, as a result of one hour's hunting in a field into which the said pheasants had only been removed that morning. Stoats and weasels, owing to their methodical habits when on the war-path, are not difficult to trap. Any aperture in a wall or fence is pretty sure to attract them. Thus a steel trap set in a burrow which traverses a bank, or at the corner of a wall, or in a hole through a wall, will almost inevitably take them. The traps used are small steel traps with peg and chain, and are, as a rule, unbaited. The best time to get rid of stoats and weasels is in the months of May and June. In these months the parents hunt with their young in "trips" or families. By securing the old female, the whole family may be destroyed. The keeper takes the body and suspends it by two small forked sticks over the trap, resetting it in the same place. All he then has to do is to station himself at hand out of sight and take the animals out as fast as they get in. Stoats and weasels seize their prey near the head, and no hare or rabbit bitten in this way ever recovers.

The **Pine Marten** is not, as many suppose, confined to Scotland, but is found also in Cumberland, Westmorland, and in many parts of Wales. Its food is game and small birds. It attacks pheasants when at roost and can be taken in steel traps baited with birds' flesh.

Hedgehogs are great egg stealers. They will take four or five each night from under the hen as long as the eggs last. They are easily trapped in a gin baited with an egg, and are frequently caught in traps set for other vermin.

Rats—The mischief wrought by rats on a manor is not sufficiently recognised. They are very destructive to eggs and young birds, besides consuming a great amount of food at feeding places. In illustration of this fact we may mention a case which recently came under our notice. The preservation of game upon a certain manor having been given up, the tenants immediately complained of a huge incursion of rats which flocked to the farm buildings from the coverts. The methods of destroying rats are too well-known to require more than a passing notice. The best plan is to entice them by food into some enclosed space, such as a stone-paved yard, and feed them for awhile with barley. Then let the grain be poisoned. A quick irritant poison must be used and water must be provided.

The **Badger** cannot fairly be included in any list of noxious vermin; the charges made against him of destroying rabbits and of sucking eggs, rest upon evidence which we do not consider conclusive.[1]

Winged Vermin—Every game preserver has, or ought to have, some of the instincts of a naturalist, and should caution his keepers against the wanton destruction of rare birds. We do not advocate that every one should follow the example of a certain well-known sportsman, who recently turned down several pairs of owls in his coverts: but even this is better than indifference to the wholesale destruction of such harmless and beautiful birds as barn owls, and the majority of kestrel hawks. The worst enemies to eggs are crows, magpies, jays, and, in dry seasons, rooks and jackdaws. Crows and jackdaws also destroy young birds. They may all be trapped with eggs set on or about the traps, or otherwise poisoned with strychnine; but the latter is a very risky procedure, and must never be attempted in a hunting country. Much better than the trapping of individual birds is the destruction of the nests with the young ones. This remark, however, does not apply to the rook, whose many services to the farmer ought to secure his exemption. Magpies and jays are both egg-suckers, yet the warning note of the jay (which is the watch-dog of the wood) often informs the keeper of the presence of an intruder. Individual birds of the kestrel species, when providing for their young, occasionally turn poacher and carry off young birds from the coops. Such offenders must pay forfeit, but any sportsman who has ever watched a pair of kestrels hunting field mice and alternately soaring and stooping, will be loth to have them destroyed. The brown owl will take young birds

[1] Amongst the enemies to game which are not vermin the most common and destructive are shepherds' dogs; they snap up ground game, and sometimes do great damage among young pheasants and grouse.

from the coops. We have known a couple of brown owls kill a brace of pheasants night after night. The sparrow-hawk's case cannot be defended; he takes young pheasants and partridges whenever he has the chance, and when he is nesting, is a deadly neighbour. The nest should be trapped all the year round, as both birds will often return to it out of the nesting season. The goshawk is a dangerous enemy to the partridges, but is a very rare species. The peregrine falcon, harrier, and raven are fast disappearing, and such districts as can still boast of isolated pairs should surely be regarded as havens for these birds. Merlins, which are the smallest of the hawk kind, have for their natural food small birds, and we doubt whether they do much harm to game.

CHARLES C. TUDWAY,
JOHN F. HALL.

PRONGHORN—The prongbuck (*Antilocapra americana*) is almost universally known in America as "antelope"; yet it is, in reality, not an antelope at all, but a very peculiar beast which zoologically stands in a position as unique as that of the giraffe, being the only hollow-horned ruminant which annually sheds its horns.

Pronghorns were formerly found all over the great plains of western North America from the Mississippi to the Pacific, and from Northern Mexico to the Saskatchewan. Like all other big game, their numbers have been very much reduced. They hold their own, of course, far better than great beasts like the bison and wapiti, where the conditions are similar: in many places where all three were formerly abundant the pronghorn is now the only survivor, though sadly thinned in numbers. But he is, when left to himself, purely a beast of the prairie and the open plains, and like all such beasts he vanishes far more quickly than those that dwell in the shelter of the tangled forests; the white-tail deer always outlasts him.

When much persecuted, pronghorns are driven into rough and even into wooded country, but their chosen ground is the open grass land. In power of eyesight they far surpass deer, and their noses are good. In consequence, they are very difficult to stalk; for they are always found far from cover. Their tactics are just the reverse of those of white-tail deer. The white-tail's one object is to avoid observation; he trusts to sheltering himself so that the hunter will not see him. The pronghorn doesn't care in the least whether he is seen or not, and indeed is usually found in some conspicuous position where he challenges attention: for all that he wishes is to be sure that he sees everything within half a mile or more. Formerly it was possible to take advantage of the curiosity of the prongbuck and lure him toward the hunter by means of a red handkerchief, or something similar; but there are very few regions nowadays where the game is so unsophisticated. At present pronghorns are usually killed by fair stalking. They are also sometimes followed on horseback with the rifle, and they afford the best sport of all when regularly coursed with greyhounds.

Stalking antelope is very different work from still-hunting deer, wapiti, and moose, or climbing after mountain sheep and goats. More than any of these sports it necessitates skill in the use of the long-range rifle, the shots being customarily taken at standing objects, a rather long distance off. There is no need for the noiseless stealth of the hunter who follows his quarry through thick woods, and though long walks over the rough prairie grass give plenty of exercise, they are, of course, wholly free from the

PRONGHORN.
Av. height at shoulder, 36 *in.* *Av. horn meas.*, 13 *in.*
Max. horn meas., 17 *in.*

difficulty and fatigue of mountaineering. But there is much need to show the stalker's skill in the actual approach to the game. If the pronghorn once sees the hunter, the latter's chances are gone, unless the quarry suffers from one of those queer, freakish fits which occasionally attack it. The hunter must spy out the land with such care as surely to get the first glimpse of the animals he is after. He may see them either feeding or lying down, for they graze and rest at all hours of the day. Once seen, I think the lying down animal is easier to approach, because it cannot see so far, and, moreover, it is not continually shifting its position and thereby increasing its chance of destroying the benefit

of the very little shelter the hunter has. At first sight, it seems impossible to stalk anything on the plains, for to all appearance there is no cover whatever. Nevertheless, in most places the ground is not really perfectly flat. There are slight rolls, making very gentle hillocks and valleys; and there are small watercourses which here and there make cut banks, though only a few inches in height. Often a band of pronghorns will be in an entirely impossible position—indeed, I think I may say that this is generally the case; but if carefully watched and followed they are apt, sooner or later, to get into some position where it is possible to approach within long rifle range. A good part of the stalk must be made on hands and knees, and the remainder flat on one's stomach, hitching along by means of the elbows. Occasionally, of course, the animals are found in places where the hunter can get a close shot, but ordinarily they must be killed at long range. In consequence, they are usually shot at a much greater distance than any other American game, and from this it follows as a corollary that more cartridges are expended for every head bagged than in any other kind of hunting.

Pronghorns can run away from any ordinary horse: but when once they have taken their line of flight they hate to swerve from it, and advantage can often be taken of this peculiarity, by riding at an angle to their course, to get a shot at them.

When I did my first shooting on the plains, fifteen years ago, there was plenty of other game, and I rather looked down on pronghorns; but for the last five or six years I have followed them to the exclusion of everything, except an occasional deer or sheep, on the few occasions when I have been able to get out to my ranche.

For a fuller account of their habits and chase I would refer to my books, *The Wilderness Hunter*, *Hunting Trips of a Ranchman*, and *Ranche Life and the Hunting Trail*, and also to the chapters I have written on the subject in the three volumes of the Boone and Crockett Club.

THEODORE ROOSEVELT.

PTARMIGAN (*Lagopus mutus*)—**Distribution**—Unlike the red grouse, which we can claim as belonging solely to the British Isles, the ptarmigan is found in various types—all very closely allied—throughout the Arctic and Sub-arctic regions of the northern hemisphere.

Scotland, Norway, Russia, Siberia, North America, Canada, Greenland and the islands of Iceland, Nova Zembla and Spitzbergen, can all boast their ptarmigan, and but for their welcome presence many a traveller in these northern lands would have to subsist on very hard fare indeed.

In the countries frequented by the ptarmigan in its more southern range, the bird is found in the picturesque solitudes of the highest mountains, for there only can it obtain its food, which consists of arctic berries, &c. As we move to more northern latitudes the birds are found on ground of the same character, but at lower levels, for in northern Iceland and Spitzbergen they are found right down amongst the rocks by the sea.

In severe winters, too, immense numbers of the fjal-ripa, which are almost identical with our ptarmigan, have been known to leave the high grounds of Norway and migrate across the strip of water to the flat shores of the Lofoden Islands, where they have been killed in thousands on the sea shores.

We must turn, however, to our own type, which is the most interesting to British sportsmen.

Natural History—Most sportsmen and naturalists are already familiar with the general appearance of the ptarmigan, and have been struck by the marvellous provision of Nature which enables this beautiful creature to assimilate itself to its surroundings, in accordance with the seasonal changes of landscape. Every month sees some alteration in the plumage which, apparently at the will of the bird, becomes white, gray, red or brown, as its surroundings alter, although parts of the wings, stomach and legs remain white at all seasons.

Ptarmigan frequent nearly all the summits of the hills over 1,500 feet, in the deer forests of Ross, Sutherland, Inverness, Aberdeen, Argyle and Perth. They also exist in the Western Isles, and, till recently, they were found in the Hoy Hills in the Orkneys, but they have long been extinct in Cumberland and Wales. Ptarmigan are monogamous, like grouse, but they do not split up into pairs at once, after the males have had loose fights with others, but the whole covey holds a sort of day-break tournament, in which the males fight somewhat after the manner of the blackcocks. The same spot is resorted to every morning at daybreak, but it is not maintained from year to year like the blackcocks' playing ground. The call of the male is a prolonged croak like the syllable "a-r-r-r-r," and that of the female "ee-ac."

The ptarmigan makes its nest about the first week in June, amongst the moss and stones, and it is one of the most difficult to find in the British list, as I can attest from personal experience. The female bird will scarcely move unless touched, and also seems to give out no scent when sitting, so that a dog will not find her. Whilst in Iceland, in 1889, I found the male ptarmigan a most brave and daring bird in defence of his young ones, if one accidentally disturbed a female with chicks. The mother would give a call, and immediately the cock would come flying at great speed towards the intruder, as if to attack him, only just swerving off when within a few feet. He showed far

greater concern and excitement about his family than any cock grouse would do.

Males are generally shy when found by themselves, but if the weather is fine and still, and a whole covey is met with, there are no birds more easily approached. Ptarmigan are very much affected by the weather, and are as unapproachable in rain and storms as they are tame on a still sunny day. They possess the power of ventriloquising to quite as great an extent as the corncrakes, and sometimes, if you are lost in the mist, and the ptarmigan are croaking all around, you may walk for a long time without seeing one, although you think you could locate exactly the position of the birds from their call.

Though the ptarmigan and the grouse occupy at certain seasons the same ground, there is no authenticated instance of their interbreeding.

Shooting—Though exposed to the attacks of foxes and eagles, the ptarmigan leads a life of safety as compared with that of other species of game birds. But a day on the tops, amidst the scenes of alternate gloom and splendour, such as only Scotland can present, is often more delightful than moor shooting on tamer ground. It is only once or twice, after the stalking is over, that a stray gunner may perchance climb to their magnificent solitudes and shoot a few brace.

There is a fascination about the panoramic view, the exhilarating air and "the towers of eternal silence," that gives this sport a quality all its own.

The novice will find it difficult to see ptarmigan, and, though so tame, when once on the wing they get away very smartly, and one has to be sharp with the second barrel to kill a brace neatly, for the birds are round a corner in a moment.

They nearly always rise all at once, keeping close together, and straight shooting is essential to make any sort of a bag, for the game in a few seconds will cross chasms and disappear into rocks that would take you hours to reach. Dogs are of little use in this kind of shooting, for the ground is often too difficult to work, and so full of blue hares as to upset the steadiness of any but an old and tried animal. A good old pointer may be very useful in finding wounded birds, &c.: but the chances are that you will see as many yourself as the dog does, from the habit of the old cock, and sometimes of the whole brood, of standing up on the rocks and croaking.

PTARMIGAN.

The best ptarmigan ground in Scotland is to be found in the mountains of Ross-shire near Loch Maree, and on Auchnashellach sixty brace have been killed in one day by a single gun. Driving is occasionally practised, but it is hardly worth the trouble of organising beats on ground where things may go wrong in a moment, unless the game is very numerous. In Gaick Forest they generally have a drive at the end of the season, which results in from about twenty-five to thirty brace being killed.

J. G. MILLAIS.

PUBLIC SCHOOL GAMES—The following article has been compiled from the results of inquiries addressed either to boys or masters at the different public schools. The information supplied considerably overran the space available, but it is hoped that it will be found clear and complete, in spite of the abbreviated form in which it appears. Under each school the first paragraph gives the chief games played. The second paragraph gives the name of the schools played, and the games at which they are met. Then follows some information as to house matches, or their equivalents, and, in a a few cases, a longer description of peculiar games.

The following abbreviations are used:—C =

Cricket: F = Football: A = Association: R = Rugby (Football or Fives): and E = Eton Fives.

BEDFORD GRAMMAR SCHOOL—(1) Cricket, football (R), rowing, fives (R).

(2) St. Paul's, Dulwich, Merchant Taylors' (C), Haileybury, St. Paul's, Dulwich, Merchant Taylors' (F).

Shrewsbury is met on the river and St. Paul's at fives.

At football the houses meet on the League system, at cricket and rowing they are drawn in heats. As there are only 200 boarders out of 800 boys, the town is divided into six divisions, and the boarding houses are divided among the divisions or school houses irrespective of their situation. Not only is there a cockhouse at each game, but a cup is held by the house best at all games.

BLAIR LODGE—(1) Cricket, football (R), fives.

(2) Fettes, Loretto, Merchiston, Edinburgh Academy, Glenalmond, the last at cricket only.

There are House and Form matches at all games, and also Modern *v.* Classical, and Scotland *v.* The World.

BLUNDELL'S SCHOOL, TIVERTON—(1) Cricket, football (R), fives (R).

(2) Weymouth, Newton College, All Hallow's School, Honiton (C), U.S.C. Westward Ho! Exeter Grammar School, Newton College, All Hallow's School (F).

BRADFIELD COLLEGE—(1) Cricket, football (A), fives (E).

(2) Sherborne, Radley (C); Lancing, Radley (F). Radley is also met at fives.

Form matches are played in heats in two divisions, Upper and Lower VI., Modern Side I., Remove Upper V. and Army Class I. meeting in the Senior Cup, Middle and Lower V., Modern Side II. and III., and Army Class II. in the Junior Cup.

CHARTERHOUSE—(1) Cricket, football (A), fives (E), rackets, swimming, and rifle-shooting.

(2) Westminster (C and F), Wellington (C), Eton (fives), Winchester (rackets), Harrow (swimming).

There are House Matches at football, cricket, fives, rackets, swimming, and shooting, the ties for which are drawn on the ordinary Cup system. In football, for boys outside of the first and second games of the four clubs into which the eleven houses are divided, there is an "Unders'" Football League, consisting of twenty-four teams, which play each other once only, the winning team securing a Cup which is held for the season. In cricket, those outside the twenty-two and the first and second games of the four clubs are divided into "yearlings," or new boys, and "etceteras."

CHELTENHAM—(1) Cricket, football (R), rowing, rackets, fives (R and E).

(2) Marlborough, Clifton, Haileybury (C), Rugby, and Haileybury (F); St. Paul's is met on the river.

The Haileybury match is played at Lord's.

For cricket the arrangements are: (1) house challenge cups for first and second eleven; (2) house League matches on the three half-holidays, teams composed of boys not included in college pick-ups.

For football (1) full team games twice a week; (2) college pick-ups or match three times a week; (3) house challenge cup for first and second fifteens.

CHRIST COLLEGE, BRECON—(1) Cricket, football (R), fives.

(2) Llandovery, Monmouth, Hereford County School (C), Llandovery, Monmouth (F).

As the school house greatly outnumbers the others, the only match at football is School House *v.* Rest, known as Ins *v.* Outs, but at fives there is a house cup for pairs.

CHRIST'S HOSPITAL—(1) Cricket, football (R), fives, hockey, rowing.

(2) Merchant Taylors, Epsom, Royal Naval School. St. Edward's School, Oxford, is met on the river.

The position of the school interferes greatly with all the games. The field is at Penge and the boathouse at Putney.

The "Ward" or Dormitory matches at cricket are played at Penge, but the football matches are played in the City and consequently on asphalt. No boy above 12½ is allowed to play. Until lately, Ward matches were played at 7.15 a.m., but the hour has now been altered to 4.15 p.m., and accordingly they have to be played early in the season. The effect of playing on asphalt is that in out-matches boys are at first afraid to collar low, and the only practice the XV can get is in out-matches. In ordinary games, "Housey Rugger" is played. "Housey" is the school name for Christ's Hospital. This game is a form of Rugby. There are no scrimmages. A player, when collared can try to throw the ball so as to hit an opponent. If he succeeds the ball is in play again; if he fails, all his side are offside until an opposing player has touched the ball, unless the thrower can regain it before it has been touched.

At fives, no out-matches are played owing to the peculiar courts, which are a mixture of every possible variety of fives courts.

Until twenty years ago, most of the games were peculiar to the school or played under special rules. "Feeder Cricket" was a mixture of baseball and cricket. Marbles, skipping, tops, etc., all had their season.

Hockey is played with a stick in both hands and a soft ball.

"Ends" is played with a football. The sides take drop kicks in turn and endeavour to force their opponents back until they are near enough to drop a goal. If a player catches the ball before it reaches the ground, he runs forward and by passing gains ground until the ball is dropped or the holder is touched by an opponent. Then the ball is kicked on again.

CITY OF LONDON SCHOOL—(1) Cricket, football (A), fives (E), rowing.

(2) Whitgift Grammar School, Cranleigh School (C). University College School is met at fives.

CLIFTON—(1) Cricket, football (R), fives, rackets.

(2) Cheltenham (F), Marlborough (C).

Football is only played in the Christmas term. In the Easter term cross country runs are compulsory for all except those exempt by doctor's leave.

At football house matches are played on the League system, but the system has not been found entirely satisfactory in bringing out a definite order, and at cricket the other system is preferred.

DULWICH COLLEGE—(1) Cricket, football (R), fives (R).

(2) Haileybury, Bedford, St. Paul's, Tonbridge, Merchant Taylors' (F), Bedford, St. Paul's, and Tonbridge (C). St. Paul's is also met at fives.

There are house matches for the boarders but the chief contest is between "Sides" or "Forms." The science, engineering, modern and classical sides play one another, and there are cups for the senior and junior schools, competed for by the various forms.

EDINBURGH ACADEMY—(1) Cricket, football, (R) fives.

(2) Fettes, Loretto, Merchiston, Glenalmond, Blair Lodge, George Watson's College (C and F).

Each of these schools is met at football once before and once after Christmas, so that there is not found to be any necessity for house or form matches, and the district matches which formerly took place have been discontinued. Three "Fifteens" play against Loretto and Fettes, ten against George Watson's, and seven against Merchiston.

The Game of Hailes as played at the Edinburgh Academy—The game of hailes has been played at the Academy since the early years of the present century, when the school came into existence. Formerly a similar game was played at the Royal High School of Edinburgh, but there the game is believed to have died out shortly after it came to be played at the Academy.

The game is played by the boys in the "yards," or open spaces surrounding the school during the play-hour and the intervals between the classes.

In many respects the game is similar to that of football, under "Rugby" rules: instead, however, of playing between, and scoring by "goals," the game takes place between "hailes." The "hailes" consist of the walls forming the boundaries at either end of the "yards," and the side which drives the ball against its opponents' boundary in the manner required by the rules of the game is said to gain a "haile."

The outstanding peculiarity of the game is that each player carries a "clacken"[1] or wooden bat; the clacken is used for carrying the ball, and also for raising it from the ground, and to a greater or less extent in dribbling. It consists of a piece of wood about 18 inches long, and has a head about 4 inches wide and $\frac{1}{2}$ inch thick: just short of the head, the bat is thinned down to about $\frac{1}{4}$ inch from back to front, and again the head is thinned off towards the tip to make it easier to raise the ball from the ground. The thinned neck of the clacken is known as the "spring," and a good spring is essential to success in carrying the ball poised on the clacken. The ball is somewhat larger than a lawn-tennis ball, made of india-rubber, and collapsible, to prevent it bursting if trodden upon.

The game can be played with any numbers; we have seen as many as twenty to twenty-five boys a side, and have also seen excellent games with eight or twelve a side; the smaller the numbers, the faster of course is the game.

Captains of teams are selected, who pick sides and arrange their "forwards" and "backs" to the best advantage, and, the game being started, the great endeavour of each side is to carry or dribble the ball through their opponents towards the "haile," against which the ball must be dashed in order to score a "haile."

No attempt, so far as we know, was made to codify the rules of the game until the year 1891, when certain former pupils of the school presented a silver clacken as a trophy to be played for annually by the schoolboys, and at the same time drew up a set of rules to regulate the play in the competitions for this trophy. These rules

[1] In general appearance the "clacken" is very like the shorter rounder-headed form of "fives-bat"—not the "Rugby" form—but differs from it in being thinned away at the tip to assist in lifting the ball from the ground, as explained above.

made certain unimportant modifications in the game, but the main object in view while formulating them was to preserve the game as nearly as possible in the same condition as it had been in since it was first played: it must, however, be borne in mind that many formalities had to be enforced which were unnecessary—and as a matter of fact, were never observed—in the ordinary play in the "yards."

Amongst these rules the following are the most important:

The game shall be started by the teams lining up ten *yards* apart, and the ball being thrown between them in the centre of the "yards." The game shall be re-started in the same way after a "haile" has been scored.

A haile can only be scored from within 5 yards of the hailes wall, and the ball must either be kicked, thrown from the clacken, or rebound direct from one of the attacking side against it.

The ball shall be considered in touch when it passes beyond or over any of the boundaries of the "yards," and shall then be thrown out at right angles to the touch-line.

If the ball be not thrown out straight, a maul shall be formed at 10 yards from where the ball entered touch, parallel with the "hailes" line.

A maul shall be formed by the players on each side, lining up 5 yards apart, when the ball shall be thrown between them.

If any player touch the ball when offside, a maul shall be formed where the ball was last played. A player shall be offside when the ball has been last kicked or touched by one of his own side between himself and his own "hailes" line.

A player may not lift the ball off the ground with his hand, but he may catch it before it "spots" or on the bound, or he may lift it with his clacken. Having thus obtained the ball, he must, if it was caught in the hand, at once put it on his clacken.

A player may at any time pass the ball with his hand.

A player may not hold the ball on his clacken with his hand, nor take it into his hand to pass an opponent.

A player running with the ball on his clacken may throw it off his clacken over or past an opponent and then catch it in his hand, but he must immediately replace it on his clacken.

Upon a player deliberately holding or tripping an opponent, whether running with the ball or not, a free hit shall be given to his opponents.

A free hit is taken by one of the players throwing the ball in the air, and, as it descends, striking it with the *edge* of his clacken towards the opponents' "hailes" line.

With the above exception there shall be no "slogging" or hard-hitting.

ETON—(1) Cricket, football (Wall, Field, Association), fives (E), rowing, rackets, beagles.

(2) Harrow at Lord's, Winchester at Eton and Winchester in alternate years.

The games are controlled by two "Keepers," viz.: "senior and junior." Thus there are Keepers of the "field," "wall," fives courts, racket courts, and of the several cricket clubs, namely: "Upper Club," "Second Upper Club," "Lower Club," "Upper Sixpenny," "Sixpenny."

Boating, "wet bobbing," is under the first and second Captains of the Boats.

Boating begins on March 1st, and is permitted only to swimmers (Nants).

The "boats" are ten in number, three upper and seven lower. The head boat is the ten oar "Monarch," the rest are eight oars. The following catalogue shows roughly in order of importance the principal features of "wet bobbing." Lower boy and novice "pulling" and sculling, novice eights, lower boats, junior "pulling" and sculling, upper boats, trial eights, school "pulling" and sculling, the eight ("pulling"=pair oar rowing).

The vacancies in lower and upper boats are filled on March 1st and June 4th by the selection of those who have previously shown promise. The senior men are captains, and necessarily strokes of the boats.

Boating is for the most part a "school" and not a "house" institution; but there is a cup for "house fours," which is rowed for towards the end of the summer half by such houses as have four oars sufficiently good to make it worth while to enter. The race is rowed in light fours with fixed seats and a coxswain.

Cricket—School is divided into clubs according to school order.

There are no house cricket colours, but a challenge cup is held by winners of the house ties (senior and junior).

Rackets—As there are only two courts and no squash courts, this game is confined to a small number.

Football—**Field game**—The houses play in groups, amalgamating their senior and junior games. There are competitions on the tie system for lower boy house cup and house challenge cup. Each important house has football colours, but it is only in the case of the two houses which meet in the final tie that to all the members of the team colours are given. In the houses which have fallen out earlier in the cup ties, colours are given to a number more or less in proportion to the success of the house in the ties. No house, however, can adopt colours until it has formally played and beaten some other house, selected by the captain of the boats, which possesses colours.

Wall game—This game is mainly kept up

by the Oppidans *v.* Collegers match on St. Andrew's Day. There are two Keepers, a Colleger and an Oppidan, of mixed wall, and a Colleger and an Oppidan wall eleven. "Mixed" or "school" wall colours are generally given to six of the winning team and five of the losers. Collegers, as a rule, play this game from their first Michaelmas half or term, while no Oppidan is likely to have a chance of playing until he has shown considerable proficiency in the field game, or possesses bulk and strength such as clearly qualify him for the position of "wall." The Collegers have thus the advantage of greater experience to counterbalance the advantage possessed by the Oppidans, in the larger number from whom their team can be selected.

Collegers also have their own field and cricket colours, but do not compete in house matches. They are seventy in number, while the largest house does not number more than forty boys.

Association football has been taken up of late with some keenness, but in the Lent half only.

The **field game** is played on grounds of varying sizes, the standard size being, according to some authorities, 130 yards by 90 yards. "School field" measures 143 yards by 97 yards. The ball is about half the size of an Association ball. The goal is 7 feet by 11 feet. The game lasts an hour, and ends are changed at half time.

ETON FOOTBALL. WALL GAME.

In most important matches the number of players on each side is eleven, but on ordinary occasions the players frequently exceed twenty-two, and the game does not suffer from this circumstance. Each side consists of the "bully," outsides, and behinds, but all except the behinds are commonly spoken of as "the bully." The "bully" proper comprises only those who form down compactly with the ball among them when the game is re-started after the ball has been out or play has been stopped under some rule requiring a "bully" to be held. In eleven a-side games the bully is formed of four players, post, back-up post, and two side posts. Immediately behind is "flying man," usually the most skilful forward on the side. The other three forwards, called "corners," stand two on one side of the bully, one on the other. The "behinds" are "short" and "long behind" and "goals." A bully is formed in the following manner: one post bends down, the opposing post leans over with his arms on his opponent's back. The side-posts form up in the same way on each side of the posts. A "corner" then puts the ball into the bully between the feet of his post, and the struggle begins. As a rule it is not long before the ball emerges from the bully, and then any forward who can get at the ball dribbles it down the field, backed up by the forwards on his side, each intent to take it on should the other overrun or be deprived of it. Passing is impossible, as a forward in advance of the ball is "sneaking," and should he touch the ball the penalty is a kick-off, *i.e.* a free kick. A forward not with the mass of the players is "cornering," and, should the ball come to him, he may not touch it under pain of a bully being formed at the place where he touches it.

When a behind gets the ball, he should as a rule kick hard and high, especially high, in order that his forwards may charge under the ball. When the ball goes "out" (*i.e.* over the side-line), a bully is formed 20 yards from the line opposite the point at which the ball crossed the line.

When the attacking side get near their opponents' goal-line, they should shoot at goal at once if the position is favourable, but if they are nearer to the side line than to goal they should dribble the ball slowly towards goal, close to the goal-line. If they get near to goal by this means, of course the chances are in favour of a successful shot, and it is to the interest of the defending side to prevent this,

but great care is necessary in attempting to take the ball from the attacking side. For if one of the attacking side, while in contact with one of the defenders who is in front of the goal-line, kicks the ball behind the goal line, or if it goes behind off a defender or off an attacking player when kicked into him by a defender, and the first player who crosses the goal line and touches the ball with the hand is one of the attacking side, a "rouge" is scored. If in any of these cases the first to cross the goal line and touch the ball is one of the defending side, or if the attack kicks it "cool" behind, *i.e.*, without being charged, a kick off is taken, subject however to the exception that if the ball has been actually kicked behind by one of the defending side a bully is held at the spot where he kicked it. When a rouge is scored, a bully is formed in the mouth of the goal, a yard in front of the goal line. The defence form down in much the same manner as for an ordinary bully, but all the side, except two, back up the post and side posts. These two are to be ready to take the ball away should it become loose or to touch it should it cross the goal line without going through goal. The ball is placed between the feet of the defending post. The side posts on the attacking side form down as usual, generally with one other player to back each of them up; one of the attacking side remains a short distance away to guard against contingencies. The remainder run in, in line, to the middle of the bully from a distance of three paces, each man clasping the man in front of him. If they succeed in forcing the ball through goal the rouge is cancelled and a goal is scored. If they fail, the rouge remains to their credit. Three rouges are equal to one goal. When a goal is scored the ball is kicked off from the centre of the ground by the side against whom the score has been made.

ETON FOOTBALL. A BULLY.

The **wall game** is played on a piece of ground 115 yards long, and varying in width from 8 to 4 yards, bounded on one side by a wall 11 feet high, on the other by a furrow, and at one end by another wall, at the other by a furrow. In the end or garden wall, 20 yards from the angle of the two walls, there is a door 7 feet by 3 feet, which forms one goal. Parallel to this end wall, and at a distance of 12 yards from it, is a white line, which meets the side wall. The piece of ground thus cut off is good calx, and a similar line 10 yards from the other end marks off bad calx. Part of the lower 7 feet of the trunk of an elm tree standing 28 yards from the side wall and 6 yards behind the furrow constitutes the goal at the "bad calx" end. Beyond the furrow is open field, but ropes are placed in this parallel to the furrow, and about 25 yards from it on the occasion of the Collegers *v.* Oppidans match.

There are eleven players on each side—three "walls," two "seconds," three "outsides," and three "behinds."

The game is begun by a bully at a point near the middle, where an iron ladder, removed for the occasion, affords the means of crossing the wall. Three players on each side form behind each other along the wall, the sides taking turns to form under and over. These players are the "walls": they wear thick fustian trousers and "wall sacks," *i.e.* jerseys padded with sacking, while their heads are protected by

padded caps with earflaps. Two more players on each side, known as "seconds," form alongside the walls in the bully; then between the bully and the side furrow come the outsides, "third," "fourth," and "line." A yard or so behind the bully is "flying man," close to the wall; a few yards further back is long behind, close to the furrow; still further back is "goal," close to the wall.

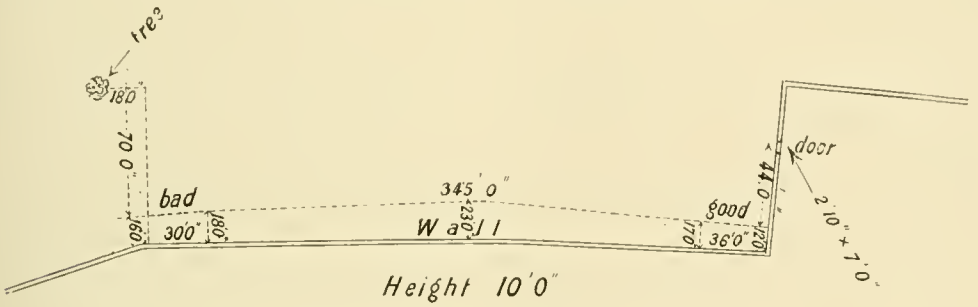
In this game, as in every other game of football, the first object is to score goals, but there are two special difficulties in attaining this object. The goals are very small, and they lie outside the immediate field of play, for as soon as the ball has crossed the side furrow it cannot be kicked. The goal must therefore be attacked by secondary means, and for this purpose it is necessary to get the ball into calx. The quickest way of gaining ground is to kick the ball out, that is, across the furrow, in the direction of the opponents' calx. When the ball has been kicked out, the next bully is formed opposite the point at which the ball stops, is kicked, or reaches the ropes, if the ropes are there. It follows that the deadliest of sins is to kick the ball "in," as this usually enables one of the opposing behinds to make a deliberate and effective kick out.

If the side defending good calx is heavy, they will endeavour to keep the ball in the bully, as the other side has the advantage of right shoulder to wall and right foot to kick out (hence good calx). Dribbling is practically impossible, as the space is so narrow, and the players try to rush through or kick out. Supposing that the bully is in calx, the object of the attacking side is to get a shy, *i.e.* to raise the ball off the ground between the foot and the wall and touch it with the hand, facing the goal which they are attacking. In calx the bully is formed somewhat differently. Three lines are drawn at right angles to the wall about 6 inches apart. Along the middle line the umpire rolls the ball, while no player's foot may cross the outside lines.

The attacking side have a getter to raise the ball, a toucher to touch it, and a furker, who stands with his back to the bully and tries to push or draw the ball out with his leg along the wall. The defenders have a stopper, whose duty is to prevent the ball being raised from the ground, and a furker to get it out to one of the behinds whose duty is, in good calx to kick the ball out of calx, in bad calx to kick it behind the line and touch it.

As soon as the ball is in, the whole bully sets to work. If the getting side is fortunate, there is presently a cry of "got it!" If the umpire gives a shy, the defenders run out to defend the goal while the ball is thrown with the hand from within the furrow at the goal. In the Collegers *v.* Oppidans match, a goal has never been scored from a kick, very seldom from a shy, as only three have been bossed or thrown.

If the ball goes behind in bad calx, and is touched by the attacking side, a bully is formed one yard from the back line; if it is touched by the defenders, it is kicked off.



PLAN OF GROUND FOR WALL GAME.

FETTES—(1) Cricket, football (R), fives, hockey.

(2) Loretto, Edinburgh Academy, Blair Lodge, Merchiston, Glenalmond (C and F).

Loretto is also met at fives and hockey.

At football the school is divided into Big and Little Side, and 1st, under 15, 3rd and 4th Below. The first and second eleven make up Big Side and like Little Side play two or three times a week, the Belows four times a week.

At cricket there are house leagues and form leagues from which first eleven are excluded, but these are merely to keep the game going, as house matches at both games are played in rounds.

GIGGLESWICK SCHOOL—(1) Cricket, football (R), fives (R).

(2) Sedbergh, Lancaster Grammar School, Leeds Clergy School, Leeds Grammar School, Bradford Grammar School (C and F).

GLENALMOND, TRINITY COLLEGE—(1) Cricket, football (R), fives (E).

(2) Fettes, Loretto, Merchiston, Edinburgh Academy (C and F), Blair Lodge (C).

HAILEYBURY—(1) Cricket, football (R), fives (E and R), hockey.

(2) Bedford Grammar School, Cheltenham, Dulwich, Merchant Taylors' (F), Wellington, Uppingham, Cheltenham (C).

The Cheltenham match is played at Lord's.

The school is divided into Big and Little Side, the former comprising those who play or are being tried for the first and second eleven or fifteen. The remainder play in Little Side on a system of dormitories and houses. House matches, however, are distinct from this, and both Big and Little Side take part in them, the unbeaten house being cockhouse.

HARROW—(1) Cricket, football (Harrow game), fives (Eton), rackets, squash rackets.

(2) Eton (C). (Winchester match dropped since 1854.)

House matches are played at all games on the tie system.

Association is played in the Easter term.

Harrow sports—There is no rowing of any kind at Harrow School, as there is no river near the Hill, but the boys have ample amusements with cricket, fives, rackets, rifle shooting, and bathing in "ducker" for the summer, and football in the winter.

Cricket is undoubtedly *facile princeps* among the games, and it is the ambition of every boy to play for the school against Eton at Lord's. Eton is the only school met by Harrow, the match against Winchester, once an annual fixture, having been dropped since 1854. Of the twenty-four matches played between Harrow and Winchester, all were played out, and Harrow won thirteen and lost eleven. Of the seventy-one matches with Eton, Harrow has won twenty-nine and Eton twenty-seven, fifteen having been left unfinished. Two other matches have been played in 1805 and 1857 between teams playing under the name of Harrow and Eton, but as in both cases boys played who had left the school, neither match is counted.

There are three school cricket grounds, the Sixth Form Ground, on which the school matches are played, the Philathletic Field, which includes the land purchased as a memorial to the old Harrow cricket coach, "Bob" Grimston, and a field given to the school by E. E. Bowen, and, lastly, the Nicholson Ground. On these grounds about twenty games are played every half-holiday afternoon, thus providing cricket for nearly 500 out of the 600 boys in the school.

The school possesses twelve good fives courts, and the Eton game is played in all, and twice a year matches are played with Eton.

There is only one hard-ball racket court, but, in spite of the poverty of the school in this respect, it can boast that its representatives have won the Public School Racket Cup sixteen times since the competition was started in 1868.

There are also six squash courts, a game of which Harrow can truly claim to be the home, and, besides, nearly every large house has a yard which is largely utilised for squash rackets. The squash courts are splendid training places for the wrist and quickness of eye. The origin of squash rackets is not known. It is played with a squash or rubber ball. The player who is in can alone score. The scoring is the same as at hard-ball rackets. The player who serves should first throw the ball up against the front wall.

Mention, too, must be made of the two open air racket courts, one of which, some fifteen years ago, was divided into four small squash courts, while the other yet remains, but does not help materially to bring on players at the present day, whatever glories its past may contain.

The Yard is the scene of the supporters of a form of football known commonly as "fug footer"; it is also the parade-ground of the Cadet Corps, and lastly, in summer, furnishes great fun through "yard cricket," a game almost unique at Harrow. Here any one may bowl who can get a ball, the more the merrier for the batsmen and the fielders, and anybody has an innings who gets a wicket or catches the batsmen out.

Harrow football—This game is played with eleven a side in house matches, school matches and second elevens, as the meetings in friendly rivalry between the different houses on whole school-day afternoons are called, but in house games the number of players depends on the number of boys in the house. Most houses have thirty-nine boys, but the head master's and the various small houses, which compose one house for game purposes, contain from sixty to eighty boys, so the number of players in house games varies between eleven a side as the minimum up to as many as thirty as the maximum. The ball is of a peculiar shape, with two flat sides joined together by a round piece of leather throughout the centre, thus resembling a cheese: consequently it is very difficult to kick straight or dribble with, and more suited to a heavy than to a light ground. It is very hard indeed for the dribbler to keep it under perfect control, as the variable size of the ball and the uneven nature of its sides give it a tendency to break off in unexpected directions, a tendency one does not meet with so frequently with the Association or Rugby Union ball. The position of the players is as follows. No goalkeeper being required, there is one full back and one half-back, but generally two half-backs are played, unless the full and half-back are thought strong enough to stand alone; two are placed on either "side," as the wings are called, and the rest play in the centre. The two "sides" are called "top" and "bot-

tom" side, the names, no doubt, being due to the slope of the ground on which the matches used to be played.

The peculiar features of the Harrow game are "giving yards," "catching the ball" or "taking yards," as it is called, the "following up" one behind the other, the almost entire absence of penalties for infringing the rules, the "free kick," given to any one who has got "yards," and the "offside rule."

Taking these points in order, we can describe "giving yards" as the act of giving a catch to one of his own side by the dribbler when he thinks he is near enough to his enemy's base for the player to whom he gives yards to secure a base, *i.e.*, kick the ball through the poles at any height from the ground. This is by no means easy, and the house which is best at giving yards is generally the most difficult to beat. It is a fine sight to see a good player after a brilliant run, suddenly stop in the middle of his career, turn round, and forgetful of self, "give yards" to another, who thus gets the honour of securing the base. The player who catches the ball must shout out "three yards" or "yards," to claim his right to a free kick, the three yards being defined as the utmost extent to which he can go in three running strides; if a player is thought to have run too far, his opponents may make him "step his yards," and he will then have to go back to the place where he took "yards" and jump to the point from which he kicked the ball in three strides, and if he fail in this, the base is disallowed. If a player does not shout out "yards" on having a catch, he may have the ball knocked out of his hands by his opponents. No player may claim yards unless the ball has come a catch to him from any point below the knee of the player who "gave yards."

In former days all the forwards had to be most careful in "following up" the player on the ball; hence the chorus of the great school football song "Follow up, follow up, follow up!" and a beautiful sight it was to see the various forwards supporting each other; but nowadays passing has come in, as so many Harrow boys, before they come to Harrow, have played the Association Game at their private schools, and so the old combined play is not so strong as it once was. Still, when found, it is indubitably most effective. The offside rule is very strictly enforced in school and house matches, and is the same as in Rugby Union, that is to say, a player is offside and may not touch the ball, unless he is nearer to his own base than the player who touched the ball last, unless one of his opponents has touched it. As there are no penalties for violating rules, a player if offside is merely shouted at by the umpires, and from very shame stops at once. But on very few occasions the umpires have ordered a player off the field for repeated unfair play.

If a player gets yards within jumping distance of the base, he may just jump through the base, instead of kicking the ball.

If the ball goes out of play at the sides, it may be thrown in to any distance by one of the side that did not kick it out. Should the umpire be unable to decide to which side the throw belongs, he throws the ball in himself perfectly straight. If the ball goes out behind the base line, it may be kicked out by the defending side, if one of the opposite side sent it out, all being "on side" at once; but if one of the defending side sent it behind, it may be thrown in quite straight by one of the attacking side, and when it goes out near the base, heading is naturally resorted to, to put the ball through.

Unfortunately, as none but Harrovians play the game, the list of matches played by the school is confined to Old Harrovians, but the school interest in the game does not suffer from this. There is no greater excitement in the year at Harrow—save of course the Harrow and Eton match—than is caused by the struggle for "Cock House at footer." The various houses compete with each other in nearly every manly game—cricket, football, rackets, fives, gymnastics, sports, swimming, shooting—but the keenest of all the competitions is that for the football championship. Of all athletic distinctions a Harrow boy most covets his "flannels," a term denoting membership of the school cricket eleven, as only the members of the eleven may wear white flannels and white boots, but the distinction next in order in the popular estimation is the house "fez," denoting a place in the house football team.

KING'S COLLEGE SCHOOL—(1) Cricket, football (R).

(2) Dulwich, Merchant Taylors', Christ's Hospital, University College School.

Matches are played between the classical, modern, and commercial sides, day boys and boarders, cadets and school.

LANCING—(1) Cricket, football (A), fives (R), rowing.

(2) Brighton, St. Paul's, Hurst College (C). Brighton, Bradfield, Hurst College, Felsted (F). Hurst College is met across country.

A modified form of cricket called "pintle" is played in the summer term, a tennis ball, formerly a wooden ball, is used and a bat cut down to a broomstick. Only slow bowling is allowed, a fast ball being known as a slinger. There are six a side and the game is played in two "pits" on hard beaten down earth. The wickets are blocks of stone presenting about same surface as ordinary wickets.

LLANDOVERY—(1) Cricket, football (R), fives (R).

(2) Christ's College, Brecon, is met at cricket and football.

In house matches formerly no boys in first and second fifteen or eleven were allowed to play; last year, however, in football this rule was altered. Houses meet each other twice, and if the points—one for each win, one against for a loss—are equal, the equal houses meet again.

LORETTO—(1) Cricket, football, fives (back wall and no buttress), hockey.

(2) Fettes, Glenalmond, Merchiston, Edinburgh Academy, Blair Lodge (C and F), Sedbergh, Watson's College (F), Rossall (C).

In the summer a modification of cricket called puddex [1] is played at odd times. A hard tennis ball and a thick round stick are used. House matches must not be played by less than five a side, bedroom matches by more than four. The pitch must be fourteen yards long, the wicket at least a foot wide. No hit behind the wicket counts. Every batsman retires when he has made twenty-five; only slow underhand is allowed. The other rules are the same as in single-wicket cricket.

MALVERN—(1) Cricket, football (A), fives (R), rackets.

(2) Repton and Uppingham (C), Repton, Radley, Shrewsbury (F).

In the Michaelmas term senior and junior house cups are competed for, the latter by boys under sixteen who have not their house colours. In the Easter term the Easter house cup is competed for.

The competition for all cups is on the tie system. In the house yard, games of football or "crockets" are played in their season under rules varying according to the surroundings.

MARLBOROUGH—(1) Cricket, football (R), hockey, rackets, squash-rackets, fives.

(2) Cheltenham and Rugby (C), Clifton and Wellington (F). Wellington and Cheltenham are also met at rackets. The match against Rugby is played at Lord's.

Football and hockey house matches are played on League system, but at cricket, owing to want of time, the ordinary system of drawing is followed. The house matches are got through as soon as possible, in order to get the XI ready for school matches.

"Snob" cricket is played with a club and ball made of string. The person who bowls or catches the batsman takes an innings. "Sweats" are the ordinary form of exercise on "fag" days, *i.e.*, full lesson days. The "Currey" cup for kicking, drop point, and place, is competed for by three representatives from each house.

Hockey is the game in the Easter term, as no football is played after Christmas.

[1] Also spelt puddocks, and podex. The name was invented by Mr. Andrew Lang; the derivation is disputed.

MERCHANT TAYLORS'—(1) Cricket, football (R), fives (R), rowing.

(2) Tonbridge, Bedford Grammar and Modern Schools, Felsted (C); St. Paul's, Bedford Grammar and Modern Schools, Dulwich, Haileybury (F); St. Paul's and Bedford are also met at fives.

MERCHISTON—(1) Cricket, football (R), fives (R).

(2) Fettes, Loretto, Blair Lodge, Edinburgh Academy, Glenalmond, Watson's College (C and F), Durham School (F).

There are no house matches at football, as all the above schools are played twice except Glenalmond and Durham. Football is played until the middle of March, when training for the school sports begins.

Against Fettes and Loretto three XV's play, against Academy and Watson's College eight and sometimes ten. On such occasions every fit boy has to turn out.

RADLEY—(1) Cricket, football (A), fives (R), rackets, rowing.

(2) Bradfield (C and F). Malvern is met at football, rackets and fives, Bradfield at fives.

Rowing claims the first place in any notice of Radley Athletics, as the school is best known in the world of sport through the annual entry of the "Eight" for the Ladies' Plate at Henley. The rowing records of the school go back to 1850, but it was not till 1858, when a match was made with Eton to row over the Henley course, that the sport was properly organised. The race, the details of which were arranged by the present headmaster of Eton, Lord Cloncurry, the Rev. R. W. Risley and H. Sewell, resulted in a win for Eton by three-quarters of a length. The schools did not meet again till 1861, when both entered at Henley Regatta. Since then Radley has always had an eight at Henley, and though the school has never won the Ladies' Plate, some of its crews have rowed extremely well, notably in 1865, when they were just beaten by Third Trinity, with C. B. Lawes at stroke and five other Blues in the boat, in 1882, 1884, 1891, and 1893, rowing in the final in three of these years. During each season races are held for senior fours, junior fours, lower fours, senior pairs, junior pairs, social pairs, in addition to senior and junior sculling races. It should be explained that as all boys live in College, each master or social tutor has under him a number of boys, who are called a Social set or Socials.

Two crews of junior oarsmen are made up early in the Lent term, and from these the more promising oars are selected to form with the available seniors the two trial eights. The course extends from Abingdon Lasher to Nuneham Island, a distance of about a mile and a quarter. The boat-house is at Sandford, where bumping races are held on four successive

evenings at the end of the summer term between "Social Fours," which in 1880, after the introduction of the more modern tutorial system at Radley, superseded "Form Fours."

The original Radley game was copied from Harrow with the omission of the "three yards" rule. It began about 1852, and continued to be played till the autumn of 1882, when Association was finally adopted. It was a very good school game, requiring great pace, good dribbling, charging, and first-rate kicking. Several college teams came over from Oxford to play, but the match against the Old Harrovians was the best, as they found no difficulty in following the rules. It had to be abandoned owing to the difficulty experienced in getting up matches, as the rules, more especially the offside rule, were opposed to the Association game.

The ground measured 100 × 60, with goals 3 yards wide. The ball was kicked off 6 yards in front of goal, the other side standing not nearer than the centre of the ground. The goal was scored by the ball passing between the posts at any height and touching the ground. But if the ball was caught by the defenders before it touched the ground, they retired behind the goal line and kicked off from that line or formed a "pudding," *i.e.*, scrimmage. When the ball went into touch, a pudding was formed 15 yards inside the ground. Ends were changed after each goal. When the ball was caught, it might be carried not more than 3 yards, but the opposite side could try and stop the kick or knock the ball on the ground. The ball could not be picked up, but might be stopped with the hands. The strict offside rule prevailed as in Rugby, and fifteen a-side played. Barter was the name for a drop-kick, and lob for punt.

REPTON—(1) Cricket, football (A), fives (R).
(2) Malvern and Uppingham (C), Shrewsbury, Malvern (F).

House matches are played for senior and junior challenge cups at football, cricket, and fives on the tie system; the hall (headmaster's house) is, owing to its size, divided into two parts, A to K and L to Z.

ROSSALL—(1) Cricket, football (A), hockey, fives (R), rackets.
(2) Loretto, Shrewsbury (C), Stoneyhurst (F).

The fives courts are intended for the Rugby game, but have not only a back wall but a small buttress at the back of each side wall projecting a couple of inches, and a buttress half way along the left wall up to the roof.

Hockey is the game of the Easter term, and is only played in Christmas term when the ground is unfit for football; as the hockey ground is the shore, it cannot always be played.

The rules are peculiar; eight men form the "bully," two are "flies" and one back. The ground for house matches is 100 yards by 50 yards. The goal is 3 yards wide, and no goal can be scored except from a free hit for a foul within the 20 yards line, from outside a piece of ground included by a straight line parallel to goal line and distant 3 yards from it, terminated by quarter circles described with goal post as centre and goal as radius. The offside is governed by the Rugby football rule, except in the case of a free hit, and all forwards must be in the "bully."

If the ball passes over the goal line off a defender and is touched by an attacking player with his stick, a rouge is scored, four of which equal a goal.

All house matches (cricket, football, hockey) are played on the knock-out system, but houses also meet in a compulsory league when the senior members of the houses are absent on "first club."

ROYAL HIGH SCHOOL EDINBURGH—(1) Cricket, football (R).
(2) Edinburgh Academy, Watson's College, Loretto, Merchiston, Blair Lodge (C. and F.).

The school, in some of the above matches, is helped by the masters.

RUGBY—(1) Football, cricket, fives (E and R), rackets, runs.
(2) Marlborough (C) (the first match was played in 1855), Cheltenham (F).

The old form of Rugby football is only played three times in the year, the matches being "Sixth *v.* School," "Old Rugbeians" and "Cockhouses."

In "Sixth *v.* School" all members of the Sixth past and present meet all boys who have their "caps," and some who have their "flannels" if the "caps" are too few, and any "Old Rugbeians" who were not in the Sixth when at school.

In the "Old Rugbeians" all present "caps" play all "Old Rugbeians" present. In case of need the Captain of the School can call on all boys looking on to help, and they endeavour, in their ordinary clothes, to keep "Old Rugbeians" out.

In "Cockhouses" the two "Cockhouses" play their two fifteens and any "Old Rugbeians" who were in those houses against all present "caps," not in "Cockhouses," and any "Old Rugbeians" who were not in "Cockhouses."

From this it will be seen that frequently fifty or sixty a side, or even more, may be playing.

"Cockhouses" are the two houses first in the contest which this year, for the first time, is on the League system, but in the event of a tie, the tie would be played off. Formerly the ten houses met in rounds in the usual way, as they still do at cricket.

For an account of the origin and early rules of football as played at Rugby, a pamphlet published by Lawrence of Rugby for the Old Rug-

beian Society should be consulted. In it are given rules issued in 1846 and 1865. There was also a set of rules issued in 1862, which is not mentioned in the pamphlet, containing one rule which does not appear in the other issues. It runs thus :—

"Though it is lawful to hold any player in a maul, this holding does not include attempts to throttle or strangle, which are totally opposed to all the principles of the game."

Distinctions at cricket are—"Ties," given by house captains subject to approval by captain of XI ; XXII, and eleven, given by captain of XI.

Distinctions at football are — "Flannels" (popularly "Bags") given by house captain subject to approval of captain of XV. "Cap" and XV given by captain of XV.

Bigside runs—The first bigside run took place in 1837, though it is not certain which of the present thirteen it was. The names of these thirteen, the dates when first run, the length of each, and the record times, are as follows :—

	Date	Length		Date	Time
		Miles			H. M. S.
The Barby Hill . .	1837	6½	C. E. Christie	1891	38 37
The Barby Village .	1838	8¼	A. L. Danson	1893	51 46
The Bilton	1837	5	E. B. Kellett	1888	28 40
The Churchover . .	1838	6¼	C. E. Green .	1886	39 2
The Coton House .	1839	5⅛	E. B. Kellett	1890	34 36
The Crick	1838	12¼	E. B. Kellett	1889	1 15 15
The Harboro' Magna	1838	6½	R. A. Wilson	1887	36 43
The Hillmorton . .	1882	5	R. A. Wilson	1885	33 12
The Lawford . . .	1837	5⅝	R. A. Wilson	1887	33 33
The Lilbourne and Catthorpe	1837	8 1/16	A. L. Danson	1892	47 1
The Shawell	1838	7 1/16	C. E. Christie	1891	42 6
The Thurlaston . .	1837	6⅛	R. A. Wilson	1887	41 43
The Willoughby and Woolscote	1839	8	C. E. Green .	1886	41 15

The match against Oxford University H. and H. was instituted in 1893.

The match against Thames H. and H. is a much older fixture, as it was first instituted in 1886, when the school were victorious by one point. It may be interesting to note that the Thames H. and H. took their origin from Rugby School, as it was the house runs here that prompted Mr. Rye to start the club in 1878.

A cup is held for one year by the fellow who scores most points in three runs, though originally it was held by the house which had the best VIII, and later by the house which supplied the winner of the Crick ; this has, however, since been changed.

The Crick is now run in the Easter term, which is essentially the running term, though originally it was held in the winter.

The senior member of the Running VIII holds the School "Bags," and the best runner in each house the House "Bags."

ST. PAUL'S—(1) Cricket, football (R), fives (R), rowing.

(2) Bedford Grammar School, Dulwich, Sherborne (C and F); Brighton, Lancing (C); Haileybury, Merchant Taylors', Tonbridge (F); Cheltenham is met on the river; Bedford, Dulwich and Merchant Taylors' at fives.

At cricket there are Form Matches in two divisions, partly on the League system, with a competition for a challenge shield, in which only the first division compete, and House Matches for a challenge cup. About 350 boys play cricket regularly.

At football about 300 boys play in Big, Middle and Little Side. A League is being organised for Middle and Little Side.

The rowing club has about sixty members. Rowing takes place three days a week after five, while there is light, and on Saturday morning all the year round. There are house fours, sides races (classical, modern, mathematical), and form pairs.

These are voluntary games, but since September 1896, the school has been divided into (1) Eighth Form, (2) Seventh, (3) Sixth (4) Fifth, (5) Lower, and each division has compulsory games once a week instead of work. The boys may choose their game, fives, football, rowing, &c., from a list sent round on or before the morning of their half-holiday, and are called over to see that they are present at the game. The reasons that brought about this change were the difficulty of making day boys play, 500 boys out of some 600 being day boys, and the size of the ground, which does not admit of all the school playing at once.

SEDBERGH — (1) Cricket, football (R), fives (R).

(2) Giggleswick is met twice a year at both games, Loretto once at football.

There are five houses which meet on the knock-out system at both games. Once a week during the Michaelmas and Lent terms, every house goes for a compulsory run of three or four miles, the boys being divided into two packs.

SHERBORNE—(1) Cricket, football (R), fives (R).

(2) St. Paul's, Bradfield (C), St. Paul's, Tonbridge (F).

At cricket there are junior and senior house matches, but the junior eleven is not a second eleven but an eleven from which a certain number of the best players are excluded. The schoolhouse plays as two houses at cricket (A to K and L to Z).

At football there are senior and junior cups. In the former the houses other than the school house play until it is decided which is the best house ; then the three best houses combine and play the school house. If the combined team wins, the cup is held by the champion house of the three. This match is called the "Three Cock."

The junior cup is competed for on the same lines, but only two houses combine.

In 1897–98, with the idea of stimulating the play, four teams were picked as nearly equal as possible, and competed in a League.

SHREWSBURY—(1) Cricket, football (A), fives (E), rowing, runs.

(2) Rossall (C) Repton and Malvern (F), Bedford Grammar School is met on the river and Uppingham at fives.

A Cricket Challenge Bat to be held by the house and Silver Challenge Bats to be held by the team are played for in two divisions on the League system, the two winning houses meeting in the final.

A Football Challenge Cup to be held by the house and caps for members of the team are played for on the League system.

The Junior House fours compete for a Silver Cup, early in the Winter term, trial eights are rowed in the Lent term, and the Senior House fours compete for a Cup to be held by the house, and for Silver Challenge Oars to be held by the members of the crew in the Summer term, when the race with Bedford is over. These are followed by Bumping Races, the "Head of the River" carrying off a Vase.

Compulsory football, called Dowling (from δοῦλος, a slave), now under Association rules and managed by each house captain, was originally played by all the boarders together and under rules peculiar to the school.

A player who caught the ball before it touched the ground, or else first bounce, unless he was within 10 yards of the goal, could claim 3 yards and take a drop kick. No passing forward was allowed, and the strict offside rule of the Rugby game was in force; a player when offside was said to be "in goal," and in that case a player on the opposite side calling "goal" could claim 3 yards without interference.

When the ball went "outside" (*i.e.* into touch), or was kicked by one of the defenders behind his own goal line, a "squash" was formed by the two sides standing in two lines at right angles to the touch line, the players putting their heads down but keeping their arms to their sides. The ball was then rolled between, every one taking a kick at it.

A goal was scored by the ball passing between the posts at any height.

A match was decided by the best of five goals or on the result of three hours' play, an hour at a time.

This method of decision was adhered to when Association rules were substituted for "Dowling" in the house matches and lasted until 1886–7.

The Run Books of the Royal Shrewsbury School Hunt now in existence begin with 1843, but in 1832 the runs were of old standing, so that they are probably at least 100 years old.

The Hunt consists of Gentlemen of the Runs, usually twelve or fourteen in number, addressed officially as Mr., of whom the three senior are Huntsman, Senior, and Junior Whip; the rest of the school, who choose or are chosen to run, are Hounds, and are made Gentlemen or "get their gents" as a reward for good running.

The Huntsman wears red vest and stockings and a black velvet cap, the Whips red caps, the Gentlemen blue caps, all with badges of crossed whips. Until recently, all Hounds had to wear "longs," coats, and "mortar-boards."

The Huntsman and Whips each carry a whip and a horn, the Gentlemen run-sticks formed, as a rule, from the top half of a walking-stick with a lace through the thin end. These were originally intended for the discomfiture of "rousters" who interfered with the runs, but are now used to pull weary Hounds. They are marked, like a trapper's rifle, with a nick for a run and a cross for a "kill"—a term still used, though the two foxes have disappeared.

The twelve runs taken in the Michaelmas term are over fixed courses named, as a rule, from the villages through which they pass, and vary in length from 4 to 12 miles. In the longer or picked runs no Hounds run unless they are known to be equal to the task.

The pack, each of whom has a name in the run book or diary, is headed by the Huntsman and Senior Whip. The Hounds, coupled up at the "throw off" for convenience in counting, at the words "gently forward" take what position they choose behind the Huntsman and before the Junior Whip, who whips in and at fixed points, where an "all up" is taken to allow the pack to close up, informs the Huntsman that "two couple" or "half a couple," as may be, "are out."

The object of the Huntsman is to get as many Hounds as possible through in the quickest time. The record is frequently broken owing to the vagaries of the timekeeper. After the last "all-up" the "tow" at a sharper pace commences, and unless it is a "run through" the Gentlemen and then the Hounds are lined up for the "run in," the runners who secure the greatest number of "kills" in the term being killing Gentleman and Hound respectively. The killing Hound in the "Long," the only run surviving from the Old Schools, is made a Gentleman on the spot. In some runs hot suppers are given to the first six couple.

In the Lent term the Hunt holds the Sports, the Senior and Junior Steeplechases, and manages the Paperchases, for which there is a house challenge cup. The course for the Senior Steeplechase is about a mile, and somewhat less for the Junior (under sixteen). It includes about ten hedges, in which the thickest parts are built up with boughs, and a brook with hedge on landing side followed by a very steep hill. The runners wear hedging gloves and knickers lined

with wash leather, and have their garments sewn together. The card of entries is got up like a race card, the runners, who formerly had nicknames more forcible than polite, being owned by prominent members of the school who in the Junior Steeplechase are the trainers of the runners and pay for their training food.

TONBRIDGE—(1) Cricket, football (R), fives (R), bat fives, rackets, hockey, rowing.

(2) Dulwich, St. Paul's, Sherborne (C), Dulwich (F).

For games the school is divided into "grounds" which on half-holidays play pick-up games. On whole school days the senior and junior Leagues, in each of which there are eight teams, meet, the head "ground" or "Fifty" being excluded. Distinct from these are the house matches, in which there are four or five rounds.

UNIVERSITY COLLEGE SCHOOL—(1) Cricket, football (R), fives (R).

(2) Whitgift Grammar School, Christ's Hospital, Royal Naval School (C and F), King's College School, City of London, St. John's School, Leatherhead (C).

City of London and Merchant Taylors' are also met at fives.

UPPINGHAM—(1) Cricket, football (R), fives (E), hockey.

(2) Repton, Haileybury, Malvern (C).

House matches are played on the ordinary tournament system, and are divided into two classes "all ages" and "under sixteen." The ordinary games are of two classes, ground games, in which boys are arranged according to ability, and house games, the former being played on the three halves, the latter on the other three days of the week.

Hockey is played at the beginning of the Easter term, no football being played after Christmas, and the remainder of the term is occupied with the athletic sports, in which the division into "all ages" and "under sixteen" holds good. The entries for each event are so large that the heats sometimes occupy the whole afternoon. The sports are managed by a boy known as captain of games.

Though the Fives Courts are built for the Eton game, all, both school and house-courts, differ in some small details.

WARWICK—(1) Cricket, football (R), association to a small extent in the Easter term; fives.

(2) Bromsgrove, King Edward's School, Birmingham, Trinity College, Stratford.

There are four "houses," one consisting of day boys, which meet at football and across country for a challenge shield.

WELLINGTON—(1) Cricket, football (R), rackets, paperchases, fives (E).

(2) Charterhouse and Haileybury (C), Marlborough (F); Marlborough is also met at rackets twice a year.

At cricket and football there is a game for the best twenty-two and thirty players; below these the houses play one another on the League system, but the house matches are distinct from this, and are played on the "Bumping Race" plan.

The houses start in the order of the last year. In the first week "Cockhouse" of last year has a bye, the second house plays the third, and so on to the bottom. In the second week the bottom house has a bye, and "Cockhouse" plays the second. At cricket the matches or bumps are decided on the first innings if two are not completed on Monday and Tuesday. There are generally six or seven rounds in the term. Some houses get blocked early, having been beaten by the house above and having beaten the house below. Any house that has gained a victory every week can challenge "Cockhouse" at the finish, and by beating it pass over all the other houses to the top.

Paperchases are managed by the Master of the Hunt, two Whips, and some Gentlemen of the Hunt who get their colours by Bigside Runs. The longest run, about fifteen miles, is known as the Fleet. It starts from Farnborough towards Aldershot and home through Fleet.

WESTMINSTER—(1) Cricket, football (A), rackets, fives (E).

(2) Charterhouse (C. and F.).

Cricket—Towards the end of last century, a series of cricket matches between Eton and Westminster began, the first obtainable record being of that played in 1796 at Hounslow Heath, when Westminster won. But for many years this has been abandoned, and Westminster play Charterhouse only of the public Schools. Formerly, this match took place every season at Lord's, but for some time past it has been played alternately at Vincent Square and Godalming.

Of school matches, that between "Town Boys" and "Queen's Scholars," is the most interesting and exciting. There is also a competition on the Cup Tie principle between Houses for possession of the cricket "Shield."

Football—Football, originally of a home-made description, now pure "Association," has long been played, both in Dean's Yard by fellows in their ordinary clothes, and "Upfields," *i.e.*, Vincent Square. In "Green" (or Dean's Yard) no sides are chosen, but boys coming in haphazard join in the game towards either goal, as they choose. In the early seventies, before the modern passing had been invented and become recognised, the practice of a boy stick-

ing to the ball as long as he could against a side of perhaps forty or fifty, produced some wonderful exponents of "dribbling."

"Sixes" are now played, a growth of the last five years or so, for a Cup, under the League system. "Pinks," *i.e.*, first XI fellows are barred, and all competitors are drawn by lot, quite irrespective of Houses or other considerations.

There is also a Footer Shield played for like the cricket competition between Houses, on the Cup Tie system.

Rowing was at one time a great institution at Westminster. In 1818, a Westminster six-oar beat a crew of the Temple Boat Club (stroked by Mr. Church) in a race from Johnson's Dock to Westminster Bridge. The first race with Eton took place in 1829, and this match was continued with intervals for many years, the last race taking place in 1864, when Eton won, the course being from Chiswick Eyot to Putney. The late Sir Patrick Colquhoun, who instituted the "Colquhoun Sculls" at Cambridge in 1836, was a mainstay of Westminster rowing in the days when Eton could be met on equal terms. But the building of the Embankment brought "water" at Westminster to an end about 1870, though afterwards for some years it was started again with a moderate degree of success, the boys coming up to Putney in a launch, and starting from there.

Rackets of a primitive kind in an open court, are played either with "Woodens" or "Wires," the former with a ball much larger than the ordinary racket ball. There is a silver racket for "Wires," and also a silver challenge cup for "Woodens," which are played for annually. In recent years, Fives have been played in two modern courts built in Little Dean's Yard.

WINCHESTER COLLEGE—(1) Cricket, football (Winchester game), rowing, rackets, fives. (2) Eton (C).

At cricket the school is divided for practice-games into clubs: senior XI.'s of the various houses compete for an annual challenge cup under the Tie system, junior XI.'s (under sixteen years of age) under the League system.

At football two series of matches are played, XV. and XV. matches in November, VI. and VI. matches in December, between three divisions of the school which exist for this and for some other purposes, viz., College (the seventy foundationers of the school), Commoners (a group of four houses representing the older non-foundationers of the school), Old Tutors' Houses (representing generally the latest additions to the older part of the school).

Annual challenge cups are also competed for by the various houses at rowing, fives, and rackets, and by the three divisions mentioned at rowing.

The bat-fives played in college deserves some mention. It is played on an open-air "ball-court," the front wall being formed by a building erected in 1688, the floor (which is now of concrete) having been originally made of tightly rammed chalk; the old pattern of bat is of wood, but almost of the size and shape of a small racket, something over 2 feet in length, with a thin flexible stem but with a heavy head, about equal in size to the palm of the hand: there are no side walls to the court, and the game probably represents pretty closely the rackets which Sam Weller watched in the old Fleet Prison.

The football played by the school is altogether peculiar to Winchester. The ground, strictly speaking, is 25 yards wide by 80 long, and the goal is the whole end of this piece of ground. Two special rules distinguish the game from probably every other form of football which is played, (1) the ball must not be dribbled, *i.e.*, a player may kick it gently once and back it up, but, if he is to take it down the ground, he must kick it as hard as in the umpire's opinion he can kick it: (2) if the ball comes to a player off one of the opposing side and is clearly on the bound, the player may kick it as high as he likes, otherwise he must kick it so that it does not rise above five feet from the ground. The following are some of the other more noticeable rules of the game: (1) If a player catch the ball off one of the other side, he must punt it ("kick off"), or, if the other side try to collar him, he may run, but only so long as they pursue him: (2) the ordinary rules as to off-side prevail as well as a further rule forbidding "tag," *i.e.*, forbidding a player to take on the ball when it is kicked forward, even if he himself comes from behind the player who kicked it; (3) the scrimmage ("hot") is formed in a peculiar manner; the ups of the two sides face each other arranged in rows of three, then as soon as the ball is put into the "hot," they lower their heads so as to receive their opponents' right shoulders upon their own right shoulders, and, seated upon the shoulders of their own supporters, try to force the ball through the ranks of the opposing side.

The boundaries of the narrow ground need some description; there are at the sides two ropes strained tight through posts at the height of three feet from the ground, and running the whole length of the field of play; again, outside these ropes, and parallel to them, at about one yard's distance, netting ("canvas") is stretched by means of iron-work, to a height of eight feet: the ends of the field of play are marked by lines cut in the ground ("worms"). The "canvas," which replaced two rows of spectators, who, until 1868, served to keep the ball in play, marks the extreme edge of the ground, and the ball is necessarily out of play when it passes over the canvas; the space between "ropes" and "canvas" is theoretically not a part of the field of play, but practically is the most important part

of it, for, as a goal kicked out of this space does not count and a catch caught out of it cannot be "kicked off," the defending side invariably try to get the ball into this space while the attacking side try to keep the ball out of it. A goal is scored whenever the ball passes over "worms," not having been kicked out of ropes nor having been touched (a point of similarity with the Rugby game) by any of the defending side. There are a vast number of rules and customs regulating the many parts of this intricate game. A match lasts one hour; as the game is played at present, about ten to fifteen goals are generally scored in a XV. and XV. match, nearly twice as many in a VI. and VI. match, but on the other hand a score of love all has occurred in the larger game.

It is interesting to note that there is clear evidence that football was played by the college as early as the year 1550 A.D., and it is fair to assume, therefore, that this form of the game which is peculiar to Winchester has an ancient origin, or at least has been developed from an ancient form of football. No doubt it has been developed in certain directions (directions which were necessitated by the small space available for play till recent times at Winchester) from the same general type of game (that in which catching and carrying the ball was allowed) from which Rugby School, founded in 1567, afterwards developed its well-known form of football. But in practice the game is as different from Rugby football as it is from every other form of football which is played.

[*See also* SCOTTISH SCHOOL CHAMPIONSHIPS.]

PUMA (*Felis concolor*)—The puma or cougar, also known as panther or painter, and as mountain lion and Mexican lion, is found from Patagonia to southern Canada. It is now very rare in most places north of Mexico, except in the Rocky Mountains and coast ranges, where it is locally not uncommon. It was formerly very plentiful in the Southern States; but, for some unexplained reason, neither the puma nor the wolf hold their ground in the presence of man so well as the black bear, which nevertheless seems an easier animal to kill than either of them.

Like all cats, the puma is not difficult to trap. It is, however, extremely difficult to kill according to the ordinary methods of the still hunter. The rifleman who trusts merely to his own skill hardly ever runs across the puma except by accident. In all my hunting I have come across but two, both by chance; and of these one escaped. If dogs are used, however, the puma is by no means a difficult quarry. In the wilder portions of the Southern States, the puma was often killed in olden times by the packs with which the planters hunted the deer and the grey fox; hounds readily run the trail of the puma, showing none of the fear and disgust which they are apt to betray at the scent of the wolf. These packs rarely did more than bay the puma, which was then shot by the hunters. Occasionally the pack was specially trained to rush in and take hold, and the hunter ended the battle by a thrust with his knife.

In the Rocky Mountains, of recent years, the practice has grown up in several localities of following the puma on foot with packs of dogs specially trained for the purpose. Such packs usually contain both the ordinary hound generally used in the chase of the deer and the fox, and large, active, hard-biting dogs, by preference collies. The puma will sometimes make a long

PUMA.

Maximum length from head to tip of tail, 8 ft. 2 in. (length of tail, 3 ft.).

and hard run, especially in difficult ground. At other times it will come to bay very speedily; or, what is more common, climb a tree. The puma is perhaps the least formidable of all the large cats, in spite of its extreme agility, for it is cowardly, and its head and jaws are small compared to those of the jaguar. There are on record authentic instances of its attacking man, but these are wholly exceptional. Even when at bay it can usually be killed without much danger; but it is never safe to take liberties with it, for exceptional individuals display the utmost ferocity, and I have known of several instances of men being maimed, and even killed in such contests. If the dogs are well trained, however, they usually occupy the puma's attention to the exclusion of everything else; and five or six of them, even ordinary hounds and collies, if thoroughly entered to their work, can themselves kill a puma. Such a fighting pack

performs the work in the most business-like manner, each dog having its own favourite hold, and each being confident in the support of its fellows. If a wolf is throttled by a powerful dog, it can inflict little damage; but if the puma is throttled it may rip open the dog with its hind claws. A trained pack will, therefore, rush in together and spread-eagle the puma, which is then soon worried to death. Accidents to the pack, of course, frequently happen.

THEODORE ROOSEVELT.

PUNTING RACE.

PUNTING AND PUNTS—No pastime n the river Thames has increased so much of late years as punting; and the evolution of the punt, from the slow, heavy, clumsy craft of the old fishing type to the light, long, 16-inch wide racer, has been equally remarkable. The old fishing punt was well adapted to the needs of the Thames fisherman, for it was divided into two unequal portions by a well near the stern, through which the water flowed. Thus the smaller fish were kept alive for bait, to say nothing of such larger ones as with greater or less frequency fell a prey to the angler. Moored across the stream, with two ryepecks, and carrying three chairs, it affords a safe and comfortable vantage ground for the roach and gudgeon fisher, who seldom fails to be accompanied by a stout jar of nut-brown ale, which is set to cool in the well. When it is let down stream by the skilful fisherman, who guides its course with a pole as quietly as he may, the spinner for trout or jack can cast his line with something firm and solid to stand upon; and, sitting safely in its stern, the barbel and chub fisher drops down to his haunts with no fear of his equilibrium being disturbed. The navigation of this craft required both skill and strength, more skill and strength than is wanted to keep a tolerably straight course in its much lighter successors, which are now seen in such numbers up and down the river Thames. The old Thames fishermen were adepts at the art; they were acquainted with each eddy in the stream, and knew the bottom not less well than the surface, and the way they pushed their heavy loads up some swift-rushing weir-stream was a triumph of art not easy to acquire. In time the punt was adopted as a pleasure boat, and its evolution was rapid. The old fishing punt was built to stand rough work, with oak knees and treads, and bottom of thick deal, heavily pitched and tarred. The modern punt is built as light as possible throughout, and the old pitch and tar has been replaced by paint the wet well has

disappeared, and its place been taken by back rails and comfortable cushions. As a pleasure boat for the Thames, the punt cannot be beaten.

Position in Racing Punt.

Its speed may not be great, but it is still great enough for those who are not in too much of a hurry to enjoy the river properly, and, as an exercise, punting cannot be excelled. One of its chief charms lies in its variety; no two strokes are exactly the same; the depth of the river is constantly varying; sometimes the bottom is hard and sometimes soft; on many of the reaches there are ballast holes of some considerable depth, and other pitfalls for the unwary; and in order to urge your craft upon the even tenour of its way you must never let your attention wander, but be prepared for every event. And in this consists one of the greatest attractions of punting as an exercise; in rowing, variety is strictly discouraged, and each stroke should be as similar as possible to the one before; in punting, varieties of strokes are forced upon you from the constantly changing nature of the conditions; while the upright position, facing the direction in which the boat is going, and the greater freedom of motion, form an additional advantage. No wonder then that the popularity of punting as an exercise has increased; it calls into play every set of muscles, and makes demands upon the intelligence as well. The exercise is also well adapted for women. Ladies' competitions, where the palm is awarded to those who show the greatest skill in handling the pole and punt, are not unknown at local regattas; and to the onlooker a lady punter, standing erect and propelling her craft with ease and dexterity, is a more graceful and grateful sight than that of an equally accomplished sister labouring at the oar.

The proficiency of punters, both amateur and professional, has greatly increased of late years. The vagaries of the old punting circumnavigators are much more rarely to be met with; the number of those who can stand still and keep a straight and speedy course has multiplied indefinitely. Both punts and punt-poles are much lighter and better made than those of days gone by; and the numerous amateur and professional punting races which take place annually have done very much to encourage their proper use.

Punt-racing—There are two styles of punt-racing, (1) running, (2) pricking; and the first may be described as the old method and the second as the new. The course has a turn in it, one or more ryepecks being fixed to mark it. In amateur races it is usual, when the river permits it and the stations are equal, to have a separate turning ryepeck for each competitor;

Putting in the Pole.—Going Slow.

and this practice has of late obviated to a great extent the collisions which took place when the competitors turned at the same pole. To do this

neatly has been always considered an important point in a punting race, and having the course with a turn enables the spectators to see the be-

BEGINNING OF THE STROKE.

ginning and the finish of the combat ; but it may be doubted whether a straight course down-stream, in which each man would be compelled to keep his own water, would not be a better test of speed.

Running the Punt—The old style of running was in vogue when the punts used were heavy fishing punts with poles to match. Edward Andrews, of Maidenhead, champion in 1876, was perhaps the most practised exponent of the style ; but when he went down in 1877 before Abel Beasley, of Oxford, who stood still and pricked his heavy punt, stern first, down-stream, the supporters of the old style experienced a rude shock. But even now, where the water is very deep and a strong stream or wind has to be faced, and the punt to be used is not a light one, running is still the best method of getting it along quickly ; but one or two maxims should be borne in mind :—Do not attempt to run the whole length of the punt, three steps are enough. Do not go too far into her head or too far towards her stern, or you will stop her way. Get your weight well on to the beginning of the stroke, take three long strides and get a good strong finish. Turn on your heels (do not take a step backwards, as is so often done, as that makes the boat roll), and then come back towards the head of the punt as quietly as may be, gathering up the pole as you go.

This was the style of running a punt adopted by Andrews, and it has not been beaten ; it is a kind of double shove, and, under certain circumstances, can even now be adopted with advantage. It is, however, a much rarer thing to see a punt well run than well pricked ; there is generally too much running and not enough shoving about it, the punt is not kept on an even keel, and the pace is not proportionate to the energy expended.

Pricking a Punt—This is the method now adopted both in racing and pleasure punts. The long shove, its highest development, came from Oxford, having been evolved by the Beasley family, Abel of that ilk, who held the professional championship from 1877 till he retired in 1890, being its most successful exponent. It is no less successful in light than in heavy punts, and as the old champion used to say, "it breaks their hearts." The secret of it is to keep the body upright, not to bend over the pole, and to finish the stroke well out. To keep the body upright and to work hard, strong loins are requisite, such as are seen in a well-ribbed-up hunter. All cannot acquire it ; some start with it well enough, but, when pace and distance have told their tale,

MIDDLE OF STROKE.

they fall away into the old bent body position and short stroke, which lead to destruction.

In a 16-inch wide-racing punt, which requires

steering as well as shoving, a good deal is wanted besides mere strength, and, unless a good style is acquired, the best results cannot be obtained; though practice under a competent instructor is the best receipt for the purpose, still a few hints may not be entirely useless.

A good punter should be able to punt either side equally well; but supposing that you are punting with the right hand leading, place your right foot firmly against a knee of the boat, or some other well-defined spot, where she balances the best, and keep it there. Fix your eyes on the bow of the punt right through the stroke, and do not let them come round with the pole, or you will lose your direction, and a punt should

FINISH OF STROKE.

never be allowed to deviate a hairsbreadth from the true course. If the punt is going fast, drop in the pole well in front of you (the distance depends in a great degree on the depth of the river and the pace at which you are going), raise your hands as far up the pole as you can, get the weight well on, keeping the pole quite close to the chest, and finish with the weight on and the chest square. Then recover the pole smartly with the hands, draw the extended foot gently back, so as not to shake the punt, and commence the next stroke. The work should be done with the weight, loins, and legs, and not with the arms. In fact it is not unlike rowing. You reach forward to the full extent, apply the weight then take a step back which corresponds to sliding, finish square, and, as it were, slide slowly forward and repeat the dose. The long body swing, smart recovery with the hands, and slow sliding forward will always beat the snatchy armwork which is the pitfall of racing punts.

The Amateur Punting Championship used to take place at Sunbury under the auspices of the old Thames Punting Club, and afterwards has been held at Staines, Maidenhead, and Shepperton; and the last course has proved so satisfactory that the amateur championship will probably be held there for the future. The following is a list of amateur champions, distance ¾ mile:—

1886	E. V. Gardner.
1887	F. Tomkins.
1888	W. H. Grenfell.
1889	W. H. Grenfell.
1890	W. H. Grenfell, resigned.
1891	N. M. Cohen.
1892	A. H. M. Kilbey.
1893	B. Rixon.
1894	H. S. Venty.
1895	B. Rixon.
1896	B. Rixon.
1897	W. Colin Romaine.

The Professional Championship takes place at Maidenhead over what has been known as the championship course below Maidenhead bridge, half a mile down stream and half a mile back, and was started as an annual event in 1888, though before then several matches between watermen had taken place over this course during the previous thirty years. The prizes are £15 and a gold medal to the winner, £12 to the second, £8 to the third, and £5 to the competitor, exclusive of the winners, who completes the course in the fastest time in any heat. When Abel Beasley was punting he carried all before him; but since his retirement in 1890, the meeting has been a profitable one to the Haines family of Old Windsor. There is usually a large number of entries, and the meeting takes a whole day; the entrance fee is 10*s*., and each competitor who punts his heats to the satisfaction of the committee receives £1. The punts are 27 feet long and 2 feet 9 inches wide, and are provided by the committee.

LIST OF PROFESSIONAL CHAMPIONS.

		mins.	secs.	
1876	E. Andrews	13		
1877–1890	Abel Beasley	10	59	(retired)
1891	W. Haines	11	14	
1892	G. Haines	11	59	
1893	C. Asplin	11	43	
1894	W. Haines	11	28	
1895	Meeting not held			
1896	F. H. Haines	11	41	
1897	W. Haines			

The Thames Punting Club was revived in 1890, and consists of more than 100 members. The committee have drawn up a body of rules and regulations, under which most punting races are now held, as well as their own championship

meeting, at which, besides the championship proper, there are novice races, junior races, senior races, and veterans' races, to say nothing of double punting. As catamarans, and strange flat-bottomed craft shaped like canoes, made their appearance under the name of punts, the T.P.C. committee were compelled to define a punt, which they did as follows:—

DEFINITION OF A PUNT.

A punt is a flat-bottomed craft without stern, keel, or stern-post, and the width at each end must be at least one half of the width at the widest part.

The length of a punt is its extreme measurement over all, and its width is its widest part measured inside on the bottom.

Subject to compliance with these definitions, a punt may be any length or width.

W. H. GRENFELL.

PUNT RACING.

RULES AND REGULATIONS FOR PUNT RACES.

DEFINITION OF AN AMATEUR PUNTER.

The following has been adapted from the definition of an amateur as settled by the Amateur Rowing Association:—

No person shall be considered an amateur punter:—

1.—Who has ever punted in any race for a stake, money or entrance fee.

2.—Who has ever knowingly punted with or against a professional for any prize.

3.—Who has ever taught, pursued, or assisted in the practice of athletic exercises of any kind for profit.

4.—Who has ever been employed in or about boats, or in manual labour, for money or wages.

5.—Who is or has been by trade or employment for wages, a mechanic, artisan, or labourer, or engaged in any menial duty.

6.—Who is disqualified as an amateur in any other branch of sport.

DEFINITION OF JUNIOR AND VETERAN.

A Junior Punter is one (*a*) who has never won an open single punting race: (*b*) who has never won the final of the junior club race, or any open race for juniors; (*c*) who has never competed for the championship.

A Junior Double Punter is one (*a*) who has never won an open double punting race; (*b*) who has never won the final of the club double punting race, or any double punting open race for juniors.

A Veteran may be either a senior or a junior punter who is over forty years of age.

DEFINITION OF A PUNT.

A punt is a flat bottomed craft without stem, keel, or sternpost, and the width at each end must be at least one half of the width at the widest part.

The length of a punt is its extreme measurement over all, and its width is its widest part measured inside on the bottom.

Subject to compliance with these definitions a punt may be any length or width.

A punt when used for racing shall have no external

attachment to assist the balance or for any other purpose.

For racing purposes a punt shall not be propelled by any means other than by a pole used by the punter.

RACING.

I. All punt races shall be started in the following manner:—The starter on being satisfied that the competitors are ready, and the sterns level, shall give the signal to start.

II. If the starter considers the start false, he shall at once recall the punts to their stations: and any punt refusing to start again shall be disqualified.

III. Any punt not at its post at the time specified, shall be liable to be disqualified by the umpire.

IV. The umpire may act as starter, as he thinks fit: where he does not so act, the starter shall be subject to the control of the umpire.

V. No competitor shall on any account put his pole in another competitor's punt, and any competitor who touches with his hand—or any part of his body—any object outside his own punt, will be liable to disqualification.

VI. It shall be considered a foul when, between the starting post and the turning ryepeck, a competitor's punt collides with the punt of another competitor, unless in the opinion of the umpire, such contact is so slight as not in any way to interfere with the same. The umpire shall be the sole judge of a punt's own water and due course during the race, and he may caution any competitor when in danger of committing a foul.

VII. At all regattas held under the rules of the Thames Punting Club, it shall be at the discretion of the local committee to decide whether one or more ryepecks shall be used at the turn. Competitors being clear of their opponents after turning may choose their own water, but no boring or fouling will be permitted, and the punt so offending shall be disqualified.

N.B.—Both this rule and that preceding it, assume that the first part of the race is down stream, as is the case in all the club races, and other of the principal punting events.

VIII. The umpire, when appealed to, shall decide all questions as to a foul.

IX. A claim of foul must be made to the umpire by the competitor himself before getting out of his punt.

X. In case of a foul, the umpire shall have the power—

A. To place the punts—except the punt committing the foul, which is disqualified—in the order in which they come in.

B. To order the punts engaged in the race, other than the punt committing the foul, to punt over again on the same or another day.

C. To re-start the qualified punts from the place where the foul was committed.

XI. All competitors must be in their punts on reaching the winning post.

XII. Every punt shall abide by its accidents.

XIII. No person shall be allowed to accompany a competitor for the purpose of directing his course or affording him other assistance. The punt receiving such direction or assistance shall be disqualified at the discretion of the umpire.

XIV. The jurisdiction of the umpire extends over the race and all matters connected with it, from the time the race is specified to start until its final termination, and his decision in all cases shall be final and without appeal.

XV. Any competitor refusing to abide by the decision or to follow the directions of the umpire shall be disqualified.

XVI. The umpire, if he thinks proper, may reserve his decision, providing that in every case such decision be given on the day of the race.

XVII. Subject to the foregoing rules, the race will be won by the competitor who is the first to take his punt up to the winning line.

XVIII. Any person who is reported to the committee of the T.P.C. by either the starter or umpire of any punting race for unbecoming conduct or intentional fouling may be declared incapable of competing for or winning a prize at any regatta or in any race held under the rules of the T.P.C. for such period as the committee of the T.P.C. may decide upon, including the race during which such conduct or fouling has occurred.

PUNT SHOOTING The pursuit of wild fowl with punt and swivel gun forms a branch of sport with which comparatively few shooting men are able to claim a close practical acquaintance. Those, however, who have been initiated into the real science of punt shooting, and who can therefore appreciate its difficulties, uncertainties, and exciting characteristics, will readily acknowledge that it is one of the most arduous and fascinating of all our sports.

History of the Sport—The history of wild-fowling, so admirably related by Mr. Folkard in *The Wildfowler*, is both curious and interesting. Quoting from the most reliable authorities, he traces the various devices which were formerly, and are to some extent even now, practised for the capture of wild fowl. As regards coast fowling, pure and simple, with a large gun, he says but little until the period preceding the invention of gunning punts. Heavy fowling-pieces, capable of killing many fowl at a shot, had long been in use. Indeed, Gervase Markham, in his *Hunger's Prevention and the Art of Fowling*, published so long ago as 1665, recommends a gun five feet and a half in length for wild fowling purposes.

At the commencement of this century, when fowling punts were built narrow, crank, and high sided, considerable difficulty must have been experienced in approaching fowl in open waters. It is not therefore surprising to read that gunners adopted the plan of shooting their birds at low tide, when the mud-banks afforded them sufficient cover to creep along the small channels in their flat bottomed boats. Their guns were generally fired from the shoulder, the barrel being supported by a wooden crutch, previously stuck in the mud. The advantages of the heavier stanchion or swivel guns at length became recognised by fowlers, but to Colonel Hawker is due the credit of perfecting the methods and appliances necessary for their safe employment.

The Art of punt shooting, broadly speaking, consists in the fowler's ability, firstly, whilst lying concealed on the floor of his punt, to propel stealthily his craft within gunshot of a number of wild fowl, and, secondly, so accurately to judge his distance, aim, and fire his gun, as to bag the largest possible number, whether there be many or few birds to shoot at.

To accomplish these objects neatly and effectively, much patience and practice is necessary, besides considerable judgment in choosing the right moments for approaching the fowl.

Localities—Punt shooting is more or less

carried on in all our fowl-frequented harbours, estuaries, and tidal waters by both gentlemen and professional gunners, the latter of whom endeavour to gain a livelihood thereby in winter. Favourite feeding resorts for fowl are those dreary wastes of ooze, whereon the sea grass (*Zostera marina*) grows most abundantly and luxuriantly. The following are some of the punting quarters which have gained notoriety in the past. In England: The Blackwater Estuary in Essex, the Solent, the Wash, and Poole Harbour. In Scotland: The Firths of Dornoch, Cromarty, Beauly and Tay, and the Bay of Findhorn. In Ireland: The River Shannon; Dingle, Tralee, Galway, Castlemaine, Killala and Sligo Bays; Wexford and Cork harbours, and Loughs Foyle, Strangford, Larne, Belfast, and Swilly. In many of these places fowl are still plentiful in severe weather, but owing to constant persecution and a variety of other causes, they are very wary and difficult to obtain. There are, also, many localities on neighbouring continental shores where fowl congregate in their thousands, especially during the autumn migration. The decoy-men, however, work sad havoc amongst them, the numbers taken at times being vast. The sport is almost entirely confined to the coast. On a few of the large Scotch and Irish lakes a little punting may be done, but its attractions ill compare with the charms of fowling on the tide.

Wild Fowl Proper There are few species which strictly come under the category of wild fowl proper, when considered from the punt-gunner's point of view. The principal kinds are the two divisions of geese, grey and black, all the surface feeding ducks, and some of the diving ducks. In addition, sport is sometimes had with plover, or the larger waders, such as curlews, knots, godwits, &c.

Before proceeding to describe how these different sorts of wild fowl are to be obtained, it will be necessary to give some idea of the appliances with which the fowler is to work.

Punt or Stanchion Guns are sometimes constructed to turn on a swivel or pivot attached to the barrel of the gun. They are then called swivel guns. Most fowlers, however, in these days use a crutch on which the gun lies balanced for shooting. In choosing the gun, the fowler must satisfy himself that it is (*a*) suitable for the style of punt he intends using; (*b*) that its size and weight are no greater than necessary, having regard to the numbers of fowl usually seen at his punting quarters; (*c*) that it is constructed on absolutely safe principles; and (*d*) that its mechanism is strong and simple. Furthermore, a well-turned-out gun should be so balanced, that, when in position for firing, the stock end does not intrude far into the cockpit of the punt, and thus reduce the available space. To secure good and regular performances, the barrel should be most carefully bored. The stock should be short, and the fore and back sights accurately adjusted. Muzzle-loading punt guns, being in every respect less costly, are in general use among professional fowlers, and they are for all practical purposes as serviceable as breech-loaders. Most amateurs, however, prefer breech-loaders, and doubtless they are more convenient, because they are easily loaded, and possess greater facilities for exchanging the size of shot when required. Moreover, the chance of a miss-fire is practically nil. A cylinder-bored barrel is considered preferable to a fully or medium choked barrel, as the former gives a wider spread to the shot at fair range.

Punt guns are usually single-barrelled, but many double-barrelled guns have been built which are said to be capable of doing good work under certain conditions. Notable examples of these latter are Colonel Hawker's famous double-barrelled muzzle-loader, built in 1824, and Sir R. Payne-Gallwey's double-barrelled breech-loader, which is of comparatively recent invention.

The demand for punt guns being limited, there are few gun makers who seriously undertake this class of business. Of the London firms with which the writer is acquainted, Messrs. Holland and Holland, Messrs J. and W. Tolley, and Messrs. W. W. Greener have all had considerable practical experience in their construction.

A glance at the figures that follow, however, will demonstrate that their respective systems differ widely in principle and detail.

The action of the first gun (Fig. A) is simple, safe, and ingenious. It is, probably, the most effective weapon yet made. The gun is the joint invention of Sir R. Payne-Gallwey, Captain G. J. Gould, and Mr. Henry Holland. This firm builds guns of other designs than the screw breech, the best known being "The London" drop down action.

The next (Fig. B) is an illustration of a gun weighing about 50 lbs., but the action is applicable to guns of all sizes. The whole of the breech action simply consists of one stout cross-bar, which contains the striker. To load open breech by turning the milled wheel: the cartridge chamber is then exposed ready to receive the cartridge. Replace the cross-bar by reversing the action of the milled wheel, and the gun is ready for firing.

The leading feature of the third gun, as described in the *Gun and its Development* (Fourth Edition), is the top connection between the barrel and the breech action, in addition to the usual double grip fastening. The top screw bolt is worked by a small winch handle, and, being very strong, prevents the breech action from wearing loose. Both top and bottom bolts work independently of each other. The gun is cocked by depressing the lever. The lock is back action upon

the rebounding principle—the tumbler being elongated, and striking a horizontal sliding plunger, working in the face of the breech action and firing the cap of the cartridge. The method of making the breech action and stock fast to the barrel without the aid of the fore-end allows the stock to be unshipped easily, and also makes a slight difference in the weight. Solid drawn brass cases are recommended for this gun.

The fourth gun (Fig. D) is fitted with the most approved system of ignition. By firing a small charge of powder into the main, misfires should be avoided.

Loading—The correct load for every punt gun mainly depends upon the length, bore, and weight of its barrel. It is noteworthy that, although the maximum and minimum loads can be approximately reckoned on these bases, the fowler can only discover by constant practice, and by observing carefully the results of fair shots at fowl, what is the exact load with which his gun performs best. Thus, approximate loads for the undermentioned guns would be as follows :—

	Total weight.	Bore.	Charge of powder.	Charge of shot.	Length of barrel.
(1)	75 lbs.	1¼ in.	2¼ oz.	12 oz.	7 ft. 8 in.
(2)	100 lbs.	1⅛ in.	3 oz.	16 oz.	8 ft. 2 in.
(3)	170 lbs.	1⅝ in.	5½ oz.	30 oz.	8 ft. 8 in.

Some idea of the shooting capabilities of punt guns may be gathered from a report of some target trials lately made by Sir R. Payne-Gallwey and published by him in the *Field* (November 27th, 1897). On a 12-foot square target, fixed at 70 yards from the muzzle, a 175 lb. gun (2 in. bore), firing 6¼—7 oz. of powder and 2 lbs. of B shot (80 pellets to the oz.), placed on an average two-thirds of the whole charge each time it was fired. The same gun, in three rounds at 90 yards, with 6¼—6¾ oz. of powder, and 2 lbs. of SSSG shot (18 pellets to the oz.), put on an average four-fifths of the charge on the target. Again, a 100 lb. gun (1½ in. bore), firing 3—3¼ oz. of powder, and 1 lb. of B shot, also placed two-thirds of the total charge on the target at 70 yards. In each case the pattern was satisfactory and the penetration excellent.

The subject of punt guns would be incomplete without reference to the following matters :—

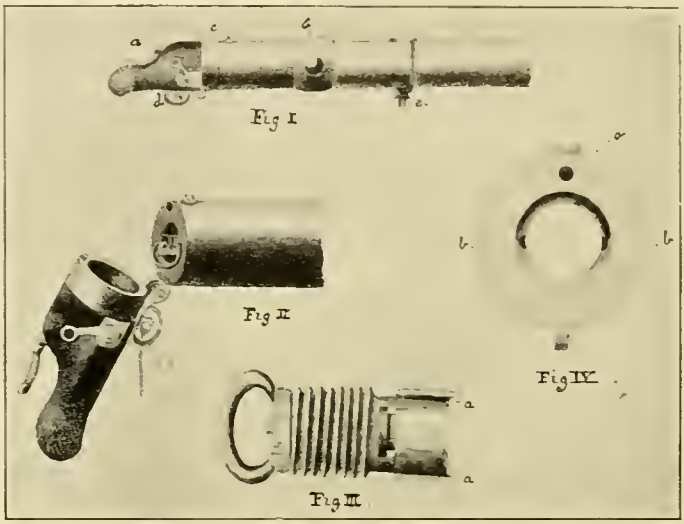


FIG. A.—MESSRS. HOLLAND AND HOLLAND'S PATENT SCREW-BREECH GUN.

Fig. 1.—Gun closed. (*a*) locking lever; (*b*) trunnions; (*c*) lever for cocking gun (*d*) trigger; (*e*) gun-crutch (figured to show balance.)
Fig. 2.—View of stock and breech end of barrel with breech screw turned in.
Fig. 3.—Breech screw with revolving head attached, and handle (for turning screw in or out of barrel) hinged to its square end. The two claws (*a a*) grip the rim of the cartridge case and withdraws the fired cartridge from the barrel, as the breech screw is turned out by means of its handle.
Fig. 4.—Section of breech end of barrel, showing back sight; also (*a*) screw hole for locking lever and (*b b*) slots for claws of revolving head.

Recoil Apparatus—For guns fitted with trunnions the best method of taking up the recoil is by a bolt rope breeching, rove through a hole in the stem of the punt and noosed to the trunnions. Col. Hawker's famous spiral recoil spring (*see* illustration of "The Handy" punt gun, Fig. B) is still used and answers admirably, but in case the spring fails it is well to have an additional safeguard in the shape of a rope breeching.

Cartridges and Ammunition—Thin paper cartridge cases are recommended, though some fowlers use brass or steel cases in guns specially built to take them.

Powder—Some successful target experiments have recently been made with a nitro-powder, known as "Rifleite 303," manufactured by the Smokeless Powder Company (*see* the *Field*, May 8th, 1897). Punt-shooters, however, have to be convinced of its superiority, or the superiority in fact of any nitro-powder, before they are likely to forsake the old standards of coarse-grained black powder, such as Captain Latour's or Colonel Hawker's qualities. **Wads**—both felt and cardboard, are specially cut to any size for punt guns. Cartridges should be loaded thus :—Over powder, (1) cardboard, (2) ⅝ felt, (3) cardboard, (4) ⅝ felt, (5) cardboard; over shot one cardboard. For muzzle-loaders a ball of oakum is best. **Shot**—can be obtained in various sizes adapted for shooting every species of wild fowl, but the tendency nowadays is to

use larger sizes than are really necessary. For ducks, &c., single "B" (75 to 80 pellets to the oz.) is a good size, and for Brent "AA" (40 to 42 pellets to the oz.). For any larger fowl, such as wild swans, grey geese, &c., "SSSG" (18 pellets to the oz.) is very effective.

Gunning Punts—Colonel Hawker's designs for the gunning punt are, with certain modifications, those on which the modern craft is built. Gunning punts are nearly flat bottomed, and those constructed to carry two fowlers and a large gun are called double-handed, the single-handed being built to carry a smaller gun and one fowler. The double punt is of course altogether on a bigger scale than the single, and is equipped with additional rowing spurs and gear, to enable the extra hand to do his share of the work. If the fowler intends shooting in open or dangerous localities, or if he possesses a very large gun, a double punt is recommended on the score of safety and convenience.

The diagram here given, representing side and portion to the size of the gun intended to be used, and also to the height and weight of the crew. Although punting men hold somewhat different views as to the best dimensions for either class of punt, it is obvious that, apart from individual ideas and personal capabilities, the character of the shooting locality must mainly influence the fowler's decision in this respect. Thus, in fairly sheltered quarters, a light punt with a low freeboard would answer well for killing fowl, but, if wide bays have to be sometimes crossed without the aid of a following boat, then the fowler will be properly advised to use a punt of rather stiffer construction. A punt of the latter description would necessarily float higher on the water, and the round of the decks would be perceptibly increased to weather a loppy sea. Sir R. Payne-Gallwey in his *Letters to Young Shooters* (Third Series), says very truly that it is impossible to build a gunning punt that is a good sea boat, and with which the fowler could successfully

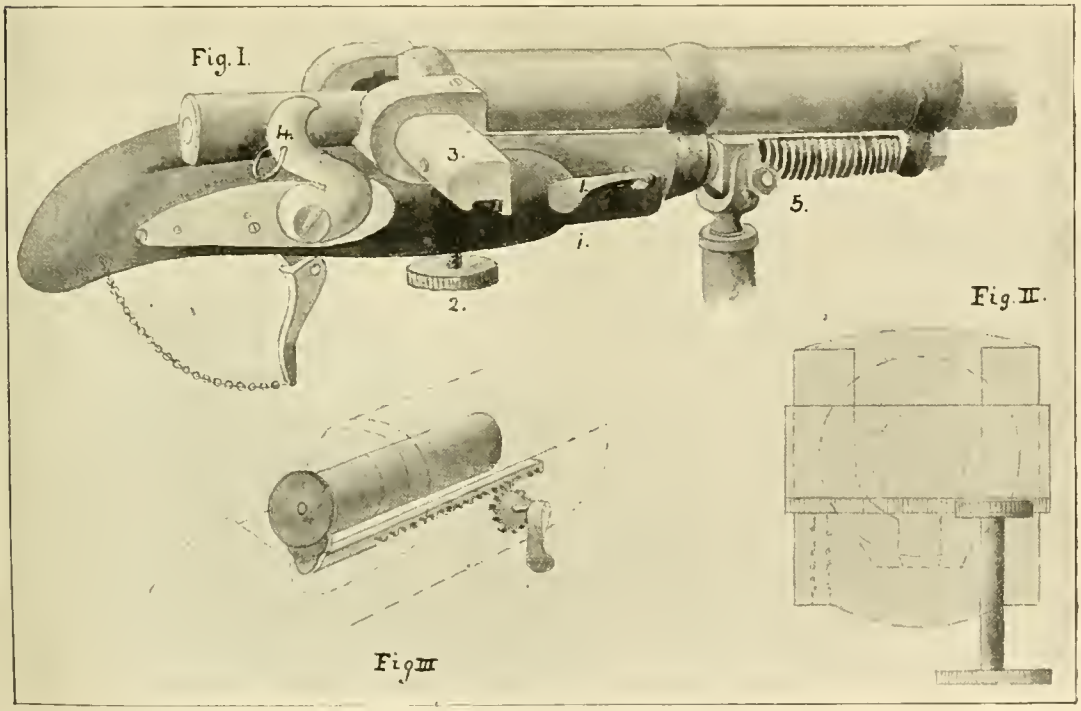


FIG. E.—MESSRS. TOLLEY'S "HANDY" PUNT GUN.

Fig. 1.—(1) shows lever of extractor; (2) shows wheel actuating breech block; (3) breech block (containing striker) calculated to sustain a strain of 80 tons; (4) hammer which is raised to full-cock by ring; (5) the spiral recoil spring.
Fig. 2.—Section of the breech. Fig. 3.—Sectional drawing of patent extractor.

interior views of a single-handed punt, will show the form and main details of construction in a modern fowling craft (Fig. E).

Dimensions of Punts—The punt, whether single or double-handed, must be built in proportion to the size of the gun intended to be used, and also to the height and weight of the crew. Although punting men hold somewhat different views as to the best dimensions for either class of punt, it is obvious that, apart from individual ideas and personal capabilities, the character of the shooting locality must mainly influence the fowler's decision in this respect. Thus, in fairly sheltered quarters, a light punt with a low freeboard would answer well for killing fowl, but, if wide bays have to be sometimes crossed without the aid of a following boat, then the fowler will be properly advised to use a punt of rather stiffer construction. A punt of the latter description would necessarily float higher on the water, and the round of the decks would be perceptibly increased to weather a loppy sea. Sir R. Payne-Gallwey in his *Letters to Young Shooters* (Third Series), says very truly that it is impossible to build a gunning punt that is a good sea boat, and with which the fowler could successfully stalk shy fowl. As a rough guide to punt-building, the principal dimensions are here given of the writer's double punt, suitable for a gun weighing from 140 to 170 lbs. in unexposed localities.

	Feet.	Inches.
Total length (along deck)	21	5
,, ,, on floor	20	10
Extreme width of floor	3	1
,, ,, deck	3	8
Height of stem		6
,, ,, stern		$7\frac{3}{4}$
Length of fore deck	8	0
,, ,, after deck	3	0
Greatest width of cockpit	2	5
Each side flared out		$3\frac{1}{2}$
Round of deck at gunbeam		$2\frac{3}{4}$
Spring on floor		$1\frac{1}{2}$
Rake of stem		3
,, ,, stern		4
Round of floor athwartships		$0\frac{1}{2}$

This punt was specially built by Messrs. Allen and Co., of Poole, for harbour shooting.

For service in unsheltered bays on the coast, a punt carrying a gun of the above-mentioned weight may be 1 foot longer and 1 inch wider over the decks. The round of deck at gunbeam may be increased also from 3 to $3\frac{1}{2}$ inches.

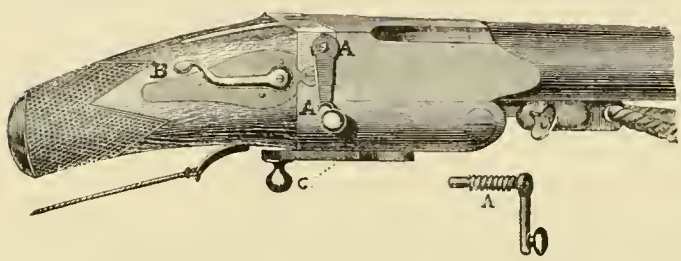


FIG. C.—MESSRS. GREENER'S "WEDGE FAST" PUNT GUN.

A A) The top screw bolt and winch handle; (B) hand lever for cocking the gun, which is hammerless; (C) the under lever for double grip fastening.

Below are also given some of the principal dimensions for a single-handed punt, carrying a gun weighing from 90 to 100 lb.

	Feet.	Inches.
Total length (along deck)	18	5
,, ,, (on floor)	18	0
Extreme width of floor	2	6
,, ,, deck	3	0
Height of stem	0	$5\frac{1}{2}$
,, ,, stern	0	$7\frac{1}{4}$
Length of fore deck	7	8
,, ,, after deck	2	9
Greatest width of cockpit	2	0
Each side flared out	0	3
Round of deck at gunbeam	0	$2\frac{1}{2}$
Spring on floor	0	$1\frac{1}{4}$
Rake of stem	0	2
,, ,, stern	0	3
Round of floor athwartships	0	$0\frac{1}{3}$

The Style of Punt used by fowlers varies on different parts of the coast, and amongst professionals it seems to rest upon local custom. A light well-built punt, being long and narrow, should possess speed, and be easy to propel and steer. Furthermore, in order that she may have life and buoyancy, her sides should be well flared out, and to the same intent the floor should be slightly sprung between stem and stern and rounded athwartships. Great importance is rightly attached to the question of "trim." It is therefore desirable that the punt should have sufficient length and beam to enable the weight of gun, gear, and crew to be comfortably carried, and evenly distributed fore and aft. Too much beam, however, is undesirable, as it makes the working of the punt heavy for the fowler. The colour of the punt may be of a light slate shade.

Accessories—The following accessories are of importance in a properly equipped punt:—

Ammunition box or sack, to hold cartridges, powder, shot, caps, &c. This must be quite water-tight. *Hand-paddles*, for a single-handed punt—to be made of ash—the bottom of the blade to be sheet-coppered. The large paddle (Fig. 3 in illustration E) 4 feet 3 inches in length, including handle suitable for a double punt, and the smaller (Fig. 4) 2 feet long, including handle for the single punt. *Set poles* (Fig. 5 in above illustration), 6 feet in length, used for punting on sand, or hard mud, also in water where the weeds are long and thick on the edge of the mud-banks. The blade is flat and the foot is shod with a brass fork. Fig. 6, which is 5 feet in length and has a wide wooden fork, weighted with lead or copper, is used for punting over soft mud. *Oars* (7 feet 6 inches in length). *Cruising paddle* (double bladed) if required. *Mud pattens*, for walking over soft mud. *Mast and sail*, a small sprit sail is recommended. *A centre-board* for sailing is sometimes useful where tides run hard, and long distances have to be covered. *Gun-rest* (*see* Fig. 2, *f f* in illustration E, of gunning

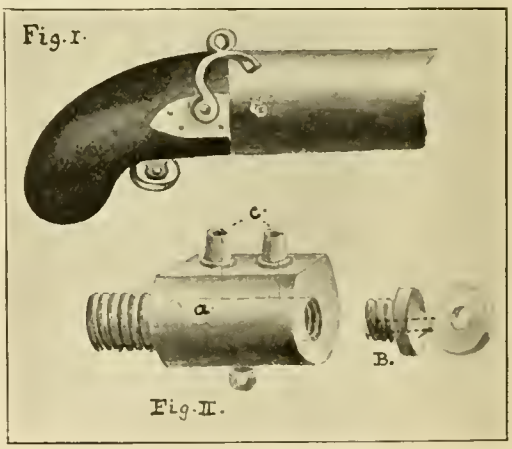


FIG. D.—A MUZZLE-LOADING PUNT GUN.

Fig. 1.—The gun with double cap ignition and double-headed hammer.

Fig. 2.—(*a*) The chamber, to be filled with coarse powder; (*b*) the plug, which must be screwed into the chamber; (*c*) the nipples, each of which must be capped.

Drawn by A. Sherburn — Swan Electric Engraving

Pond-Shooting

punt). *Shoulder gun* or "cripple-stopper," either a 12 or 16 bore. There should be two aboard a double punt, one for each fowler. *Loading-rod*, for muzzle-loader. *Marine-glasses*, or *telescope*. *Small anchor*. *Large pocket compass*.

Methods of Working Punt and Gun—Mechanical devices in the nature of screw motors may be of assistance to the fowler in propelling a punt against a strong tide in deep water, but, inasmuch as his shooting is generally obtained in the shallows and not in deep water, the occasion for their employment seldom arises. Should any fowler be disposed to add this cumbersome machinery to his equipment, a full description of the Hélice-Gouvernail is given in Dr. Quinet's book *Les Oiseaux du Bas-Escaut* (1897).

When setting to fowl in a *single* punt, the hand-paddles are used to propel and steer her in deep water, and the set pole for shoving the punt in over the shallows. To conceal all movements, the fowler must work the paddles or set-pole close to the water over the sides of the punt, as he lies full length on its floor. He can do this best through the openings in the wash streaks (Fig. 2, *i*, in illustration of gunning-punt), when the shutters are unshipped. Some support under the chest, such as a cork cushion, is desirable when paddling. Another, and, in the writer's opinion, a less exhausting method in deep water is to lie partly on the left side, and with the right hand scull an oar in the after starboard spur.

When within shot of fowl, one of the paddles is let loose on its lashings, and whilst the fowler is able to guide the punt with the other paddle, he can fire the gun, which has been previously "set" at a proper elevation on the gun-rest.

When stalking fowl in a *double* punt, the gunner lies face downwards, clear of the gun, until within about two gun shots of them; then, gently raising his head, he places his hand on the stock, gives the gun the necessary elevation, takes deliberate aim, and when within range fires at the fowl as they fly up, or as they sit, whichever seems best. The puntsman, or man who propels the punt, either "sculls" in deep water or stealthily pushes the punt over the shallows with the "set" pole as above described. Another method of propulsion is for the fowler to lie, face upwards, his head resting on the padded beam of the after deck, and work the long paddle over the side of the punt. When cruising in search of fowl the punt is usually rowed with oars, or paddled with the long paddle, stem or stern foremost.

Launching Punts—Since the early days of Colonel Hawker these punts have been in use among the majority of the fowlers, who shoot over the Lymington, Calshott and Keyhaven flats in the Solent. They are expressly built very light and are not decked. The method

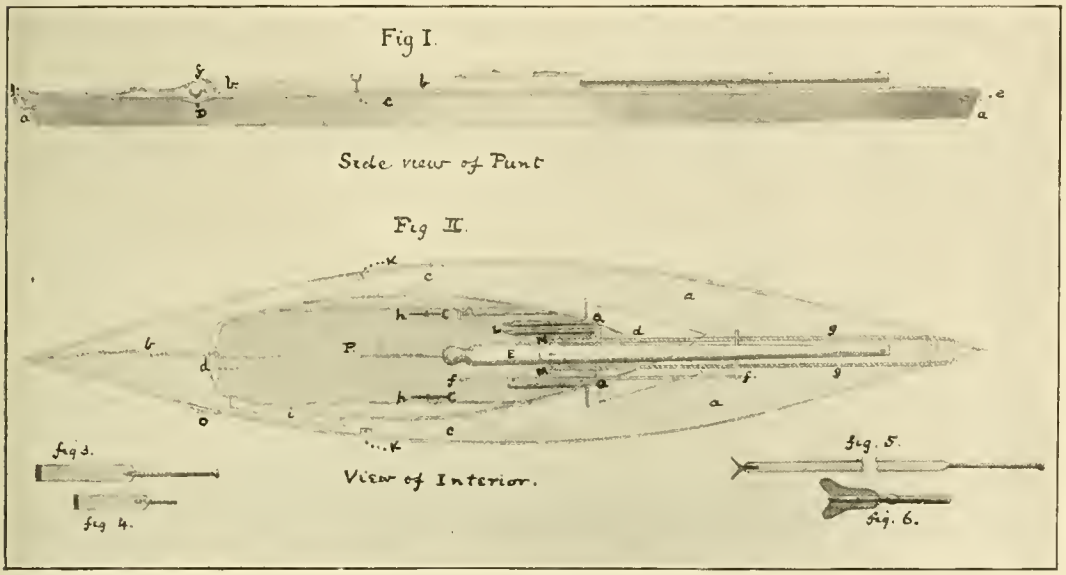


FIG. E.—SINGLE-HANDED PUNT.

Fig. 1.—(*a a*) Sides of punt; (*b b*) wash streaks, or coamings; (*c*) rowing spur; (*d*) sculling crutch; (*e*) hole in stem piece for breeching; (*f*) wash streak of aft deck; (*g*) painter

Fig. 2.—(*a a*) Fore deck; (*b*) after deck; (*c c*) side deck; (*d d*) cockpit; (*e*) punt gun; (*f f*) gun rest; (*g g*) breeching rope; (*h h*) rowing spurs (unshipped); (*i*) shutter; (*k k*) rowing spur sockets; (*l l*) oars; (*m m*) trunnions of gun; (*o*) socket for sculling crutch; (*p*) floor boards; (*q q*) gunbeam.

Figs. 3 and 4.—Hand paddles.

Figs. 5 and 6.—Set poles.

of working them is graphically described by Colonel Hawker in his *Instructions to Young Sportsmen*. Clad in waterproof garments, these fowlers start from the nearest creek at low water, crawling on their knees over the mud, and pushing the punt in front of them, until near enough to shoot at the birds. From a position just clear of the stern, they then pull the trigger by means of a long string. Most of the launching is done at night, but on rough cold days Colonel Hawker states that they occasionally made some heavy shots.

Setting, Aiming, and Firing Punt Guns—A punt gun can seldom be fired to the best advantage, even by expert gunners, without the aid of a gun-rest. Before attempting to approach fowl, the single-handed punter lies down in position, trims his punt and "sets" his gun. This is done by raising or lowering the muzzle with the gun-rest, so that the sights bear on an object within ordinary shooting range. In a double punt the gun is also "set" for night work, but in the day time the gunner can shift his rest as he pleases, even at the last moment before firing. He can thus draw a full bead on the birds, or elevate the muzzle for a flying shot. Correct distance judging on the water is a source of much trouble to the beginner. Plenty of practice is the only remedy.

THE BAG FOR THE DAY.

Punt-shooting by Day—The fowler's prospects of sport by day in these islands mainly depend upon the state of the weather and tides. On rough boisterous days, or during severe frosts, he will probably fall in with some of the more valuable forms of wild fowl, such as wigeon, teal, or mallard. On the other hand, in mild, open weather these fowl usually quit their feeding grounds at dawn, and fly to some safe retreat on the coast to spend the day. Such resting-places are generally too exposed and dangerous for punting, but by careful observation the fowler may, perhaps, track them to some accessible, though isolated, rocks or sandbanks, where he may advantageously follow them in his punt. A stiff following boat will, however, in such a case, be indispensable as a refuge in case of emergency. Brent geese are day feeding fowl, and, though in certain places likely to be seen, they are extremely vigilant and shy of a punt. The sport nevertheless is so uncertain that, in addition to any luck he may have with the waders, plovers, &c., a good shot at geese or ducks may be secured when he least expects it. In foreign waters, where fowl are less persecuted, their rules of life are not quite so regular, and it has been the writer's fortune on many occasions to make excellent bags in mild, open weather. It would seem that, in the absence of a strong frost, plenty of wind and other elemental discomforts form the best recipe for successful gunning in harbour. Though fowl may be numerous, a shore or sea haze will often ruin the chance of sport, because the punt then looks like a barge on the water and the birds will fly up long out of range. The most favourable moment to seek a shot is about dawn, when the tides are suitable, but there is always a chance at any time of the day, when the mudbanks are exposed, or about to be exposed, or re-covered, by the tide. In cold weather the fowl will generally be found thickly massed when feeding on the flats, or just about low water when reposing and preening their feathers under shelter of the mud. The method of approaching fowl has been already described, but, in order to disguise the outlines of his punt, the fowler is recommended to "set" to them from some background, such as the shore-line, patches of rocks, or even the shade of the mud-banks. When drawing within range, he must quickly decide how he can make the most of his opportunity, having regard to the general behaviour of the fowl and their position. Any hesitation at the last moment leads to certain failure. After a shot there are usually a few crippled birds to be stopped with the shoulder-gun. These must be circumvented and gathered without delay. *Generally* the fowler should avoid (*a*) attempting to approach any of the duck species down wind, as their nasal organs are most sensitive in a light breeze; (*b*) any rolling or unnatural motion of the punt when in the act of approach; (*c*) habitually firing long shots (*i.e.*, over 90 yards); (*d*) attempting to approach fowl, unless certain there is enough water to float the punt in range; (*e*) firing at scattered birds, especially at high water.

Punt-shooting by Night—Calm moonlight, or bright starlight nights, with a clear horizon, are favourable conditions for the fowler's sport. Soon after dark, wigeon, teal, mallard, and other surface feeding ducks will usually be found on or near their feeding grounds, though they may flight thither somewhat later when the moon is large or the tides unsuitable. Grey geese, too, may in some localities offer a fair chance if their roosting places are accessible to a punt. A trained ear and an intimate knowledge of the haunts and habits of fowl are of quite as much importance for night work as keenness of vision. By paddling his punt to leeward of their haunts, the fowler will be better able to hear their cries, and thus ascertain their exact whereabouts. The only way to approach them by moonlight is to work the punt from the shade towards the moon, when they will eventually become visible under its beams. On starlight nights, without a moon, he must work from the shade of the shore towards the birds in the open water, otherwise he will not see them at all if working towards land. In the early part of the night, fowl are frequently too scattered for successful shooting. The best time to shoot them is on the ebb, when they commence to assemble thickly over the highest part of their feeding grounds, and again on the flood, when the tide begins to make over the mud-banks. By starlight the shallows appear white, and the fowl will be distinctly seen, figured, or in a black mass against the white background. Experienced hands prefer to shoot under a half or three-quarter moon, which rises late in the night, because the punt cannot then be seen so distinctly by fowl, as is the case under a full, clear, overhead moon.

Generally, the fowler must avoid (*a*) night punting, unless he is well acquainted with the creeks and channels as well as the various hollows and high patches on the mud-banks; (*b*) making any noise to arouse suspicions of danger among the fowl; (*c*) allowing birds to "scent" him; (*d*) working his punt into such a position that they can see it under the moonbeams; (*e*) any risk of being stranded on the mud-banks: (*f*) shooting by guess-work; (*g*) fowling at all on dark or windy nights.

Punt-shooting under Sail in a steady breeze is an exciting and occasionally successful way of shooting fowl, more especially the Brent geese. In places where they are daily accustomed to see about them numbers of fishing and other boats, it is supposed that they mistake a gunning-punt, with its small sail and low freeboard, for a fishing-boat in the distance, and they are thus deceived to their cost.

Heavy shots with the Punt Gun—Considerable difficulty is experienced in verifying the reports of the big shots at geese, wigeon and other ducks which come to hand during severe winters. Punt-shooters, both amateur and professional, are naturally reticent about these matters, because publicity might lead to such an undesirable influx of fowlers into the locality as would speedily destroy the sport for everybody.

Below is given a table of shots made in home and foreign waters, which can be authenticated. Some of Colonel Hawker's performances are also recorded, as they were, of course, phenomenal in his day.

AT HOME.

Date	Locality.	Birds.	Punter's Name.
1895	Cromarty Firth	52 Brent geese	Sir Ch. Ross, Bart.
1880	River Maigue, Ireland	43 Bean geese	Grimes (pro.).
1887	The Blackwater Estuary, Essex	50 Brent geese	Stubbins (pro.).
	East Coast of England	52 Mallard	H. C. Folkard.
1864	Seariff Bay, Lough Derg, Ireland	50 Mallard	Mick Considine (pro.).
1842	Dingle Bay, Ireland	90 Wigeon	Buckle (pro).
1879	The Shannon, Ireland	106 Teal	Mr. A. Vincent.
1879	The Shannon, Ireland	96 Wigeon	Capt. Nugent,
1879	The Shannon, Ireland	83 Wigeon	Sir D. Roche, Bart.
1880	Tralee Bay, Ireland	93 Wigeon	Mr. E. Hickson.
1879	Castlemaine Bay, Ireland	87 Wigeon	Mr. W. V. Beart.
1884	Castlemaine Bay, Ireland	81 Wigeon	Mr. W. V. Beart.

Many years ago Captain Latour obtained some wonderful sport in Cromarty Firth, and it is said that he once bagged 101 Brent geese at a shot by night, also 103 ducks and teal, the latter shot on floating ice. In Dornoch Firth a professional named Hossacks is reported to have once killed 127 Brent geese, and the statement has been corroborated by some of his contemporaries. Colonel Hawker's best shots in the Solent were as follows:—January 21st, 1829, 105 ducks and wigeon in eighteen hours (53 wigeon and 2 mallard, one shot); January 20th, 1838, 42 wigeon and 9 geese; January 27th, 1838, 49 brent in two shots; February 3rd, 1838, 57 brent in three shots.

Probably the best day's bag which has been made in these islands was that obtained by the late Mr. A. Vincent in 1870 on the Fergus section of the river Shannon in Ireland, namely, 140 geese and ducks. In 1880 Sir R. Payne-Gallwey with Captain G. J. Gould bagged in one day 129 duck and wigeon on the same estuary in four shots. Still more recently, on February 11th, 1895, during the great frost, Sir Charles Ross bagged 109 brent geese in Cro-

marty Firth, the result of four shots, and in four successive days a total of nearly 300 of these fine fowl.

ABROAD.

Date	Locality.	Birds.	Punter's Name.
1864	The Nile .	64 Wildgeese	Lord Londesborough.
1891	France . .	52 Brent . .	Mr. W. H. Pope.
1890	South Holland . . .	40 Bernicle .	Mr. T. M. Pike.
1884-85	East Scheldt River, Holland . . .	110 Wigeon	Mr. J. A. Mottram.
1897	Holland . .	121 Wigeon	Captain G. J. Gould.
1892	France . .	89 Wigeon	Mr. W. H. Pope.
1893	France . .	85 Wigeon	Mr. W. H. Pope.
1895	Holland . .	96 Wigeon	Johannes Pape.
1894	River Loire, France . .	40 Mallard	Mr. W. Crawshay.
	Germany .	111 Wigeon	Captain F. E. Dowler.

The extraordinary numbers of grey geese killed in the 'sixties by Lord Londesborough on the Nile have been duly recorded in the Badminton edition of *Moor and Marsh*. In six shots, as many as 160 geese fell to his gun, loaded with 1 lb. of shot, in a single day. Captain Dowler, with a gun carrying 14 oz. of shot, killed 264 wigeon, ducks, teal, and bernicle geese in one day, and Captain Gould, 141 teal in three shots. These latter feats were respectively accomplished on the coasts of Germany and Holland.

The Essex Blackwater—In severe weather enormous numbers of brent geese sometimes assemble to feed on the mud flats near the mouth of this fine estuary. Several of the recorded bags made by the local punters seem almost incredible. When these rare visitations of brent take place, it is the custom for several punters to combine their chances and set up to the geese together, the signal for firing being given by a recognised leader. That celebrated fowler, the late Colonel Russell, often acted in this capacity, and in fact he was in command when, about thirty-five years ago, 704 brent were said to have been bagged by thirty-two gunners on the Dingie flats. Again, in January, 1871, 471 brent are reported to have been gathered by sixteen gunners on the Main, and, more recently, about twenty years ago, 360 brent on the St. Peter's Flats by eighteen gunners under the leadership of one, James Chaney. This latter shot was made by moonlight. Several of the participators in these deeds are alive, and corroborate these records in every detail. Mr. Miller Christie, F.L.S., in his *Birds of Essex*, likewise gives full information on the subject.

W. H. Pope.

Bibliography—The following works on wildfowling may be profitably consulted: Colonel Hawker's *Instructions to Young Sportsmen*, numerous editions (Longmans); *The Fowler in Ireland*, by Sir R. Payne-Gallwey, Bart. (Gurney and Jackson); also by the same author, *Letters to Young Shooters*, 3rd series (Longmans); *The Badminton Library, Shooting* (*Moor and Marsh*) (Longmans); *The Wildfowler*, by H. C. Folkard (Longmans); *The Art of Wildfowling*, by Abel Chapman (Horace Cox); also by the same author, *Bird Life of the Borders* (Gurney and Jackson); *The Dead Shot*, by "Marksman" (Longmans); *Practical Wildfowling*, by Henry Sharp (L. Upcott Gill); *Modern Wildfowling*, by "Wildfowler" (Horace Cox); and *Les Oiseaux du Bas-Escaut*, by Le Docteur Quinet (Bruxelles).

GLOSSARY.

Clothes—Wool and flannel throughout, and light leather thigh boats; oilskins for bad weather.

Elevating Gear is a contrivance consisting of a spindle and wheel for bodily raising the gun and its crutch so as to enable the fowler to shoot over the mud-banks. Useful for a light gun.

Gunner—Term applied to the man who works the big gun aboard a double punt; aboard a single, often styled a "big gunner."

Gunbeam—The principal beam in the fore deck, which supports the main weight of the gun in its crutch.

Gun-crutch—The spur in which the gun rests on the gunbeam.

Gun rest (*See* Fig. of Punt)—A flat wooden support for the barrel of the gun. It has a long handle, enabling the fowler to regulate the elevation of the gun.

Puntsman, Punter—The man who propels the double-handled punt. Also applied to any fowler who uses a punt and gun.

Punt-carriage—A specially designed light truck for transporting the punt by road from place to place.

Punt-cover—A wooden or waterproof cover for keeping the cockpit of the punt dry.

Sculling—A method of propulsion with the oar, similar to the working of a screw—resorted to when approaching fowl in deep water.

Sculling crutch—The spur on the starboard side of the punt in which the fowler "sculls" with his oar.

"Set" of the gun—The elevation given to the gun as it lies on the gun-rest.

"Setting" to fowl—The act of approaching fowl when the fowler is concealed in his punt.

Shutter—The movable portion of the wash streak, through which the punter works his punt with paddles or set pole.

Waterproof cap for the gun—To keep the stock and lock mechanism dry.

W. H. P.

PUSHBALL was developed out of mere experiments into an organised game about the year 1895 by the Newtown Athletic Club near Boston, U.S.A. The ball used is made after the same fashion as the ordinary round football used in the English Association game, but has a diameter of about 6 feet. Seven men a side are found sufficient to make a game, but there seems no reason to limit the players to that number. The field is divided up by white lines after the manner of the "gridiron" already described in the article on American football, and, within its limitations, pushball can make use of very much the same rules. In both the object is the same, to get the ball through the enemy's goal, and in both the same penalties are applied

to any failure in moving the ball a certain distance within a certain time.

But as kicking the ball, running with it, or throwing it, are all equally impossible, the only method of "propelling the sphere between the uprights" is by constant shoving, in the course of which the leathern mass only leaves the ground to roll ponderously over the prostrate bodies of the players. This has naturally produced a game in which applying weight through the arms and shoulders is of the highest importance, and rapid "screwing" tactics (either to avoid an attack or to get round a defence) are equally indispensable. The great object of any defending side is to prevent the attacking party from getting too much pace on the ball; for so large a sphere, when once in fairly rapid motion, is extremely difficult to stop, and shows an unruly inclination rather to surmount obstacles than to be diverted by them.

This narrowing down of the possibilities of the game has naturally resulted in its being neither widely known nor frequently practised; and the comparatively great expense of the large ball is no doubt another very probable drawback. But I doubt whether, taking even the broadest view of its possibilities, pushball can ever be considered as a really new and useful contribution to the many games in which a ball is the essential factor. Of them all it seems to partake the least in that feature which is common to the rest: viz., the propulsion of a sphere, either with the aid of instruments or without it, either in direct opposition to another's efforts, or as an individual display of strength and skill. I should prefer to class it among those varieties of bodily exercise which have been produced by the artificial exigencies of American football; and to consider it in the light of machinery devised for perfecting the pushing powers of a forward in a scrimmage, just as the swinging dummy has been invented for giving accuracy to the backs in tackling. Time alone can show whether the newly invented "pushball" will develop independent possibilities hitherto unknown, which might justify its being recognised as a valuable addition to athletics.

THEODORE ANDREA COOK.

QUAIL—It may be doubted whether any game bird has so extensive a geographical range as the so-called common quail (*Coturnix communis*). The red grouse is confined to the British Islands; the grey partridge is dispersed over Europe eastward to the Altai mountains, beyond which it is replaced by an allied species, but is not met with south of the Mediterranean, notwithstanding Malherbe's statement to the contrary. The quail, on the other hand, is to be found in Europe, Asia, and Africa, in all of which continents, or parts thereof, it is well known either as a resident or a regular migrant, while of late years it has been introduced into parts of the United States, as well as into New Zealand, so that it may be regarded as well-nigh cosmopolitan in its distribution. Sportsmen on both shores of the Mediterranean look eagerly for its appearance in spring on its northward journey to its breeding haunts, and again in autumn on the southward passage to its winter-quarters. At both these seasons an enormous toll is taken of the passing flocks. On the Spanish side of the Straits of Gibraltar, says Colonel Irby, the chief vernal migration of the quail is during March and April, whilst the autumnal passage takes place chiefly during the latter half of September, at which time the numbers which arrive are sometimes almost incredible.

"Though not strictly marsh-birds," says Mr. Abel Chapman (*Wild Spain*, p. 419), "yet quails at times abound among the moist rushy prairies both of Spain and Portugal, and hardly a hillock of drier ground or patch of maize stubble

QUAIL.

but will yield a brace or two." In such situations Mr. Chapman has shot 27½ couples in less than an hour, and as many as 52 brace in a day—a bag which he believes has been, and certainly might be, largely exceeded. From Algeria to Sardinia and Corsica, and from Tunis to Malta, Sicily, and Southern Italy, vast numbers cross over, and have to run a blockade, not only of the gunners who are expectantly awaiting them, but of fowlers who make use of nets to intercept the migratory flocks, and in this way capture thousands on their arrival.

In his recently-published *History of Fowling* the Rev. H. A. Macpherson has included a chapter on "Quail-catching in Italy," and to this the reader may be referred for a description of the different kinds of nets employed for the purpose, and other details of interest in connection with this subject. In a succeeding chapter he deals with quail-catching in other parts of Europe, as in France (particularly in the neighbourhood of Marseilles, whence large consignments of live birds are forwarded to Paris and London), Germany, Russia, and Greece. In all these countries the great bulk of the quails taken for the markets are captured in nets of

various kinds, supplemented by a judicious use of a "quail-call," by means of which the fowler imitates the trisyllabic note of the cock bird —*Whit-twit-twit*—or the more subdued *Tri-tri* of the hen. Sometimes the migrating strangers are lured towards the nets by the calls of caged decoy birds. In former days, when quail were more plentiful in England than at present, it was a common pastime with country gentlemen to entice these birds with quail-calls, and old books on field sports often contain directions on the subject. Burton, in his *Anatomy of Melancholy*, tells us that in his day "many gentlemen would take a singular pleasure at morning and evening to go abroad with their quail-pipes, and take any pains to satisfie their delight in that kinde." The practice has long since fallen into disuse in England, as has also the diversion of capturing them with a trained sparrowhawk.

The comparatively few quails that are now killed in England and Ireland are all secured with the shot-gun early in September, before the autumnal migration has commenced, a few now and again being met with in winter.

It has for some years been a matter of general remark amongst sportsmen that quails are not nearly so often met with in England as was formerly the case. Whether this is due to alteration in the methods of farming and cutting the crops, whereby a great many nests and eggs are destroyed in the spring, or whether it is due to the exorbitant toll taken of the birds in the South of Europe before they can reach the British Islands, can only be surmised. It is probable that both these causes have contributed to the present scarcity of this much-coveted little game-bird.

The distribution of the quail in this country during its sojourn with us between April and the end of September has been carefully traced by Mr. Howard Saunders, in the third volume of the fourth edition of Yarrell's *British Birds*, and it is noteworthy that it pushes its way, not only as far north as Orkney and Shetland, but has been found even in the Faroe Islands. In Ireland it has always been more plentiful than in England—a circumstance which has been accounted for by the fact that in Ireland there is so little frost that the food of the quail may generally be procured with ease at all seasons. The Irish naturalist Thompson remarked that "the slovenly system of farming unfortunately too common in Ireland is greatly in favour of the quail, as the seeds of weeds among the stubble supply these birds during winter and at other seasons with abundance of food." Thus the mildness of the climate with a sufficient supply of food induces many of these birds to remain the winter, as sometimes happens in the South of England, although the majority of those which escape the gun quit this country during the first month of partridge shooting.

English sportsmen desirous of making good bags of quail have to go abroad in search of them—to Egypt and other parts of Africa, the Ionian Islands, India, China, and Japan. In India, the common quail is well known, where it is called the "grey quail," to distinguish it from the "rain-quail" (or black-breasted quail), which is also common there. Jerdon states that our bird is found throughout India in considerable numbers during the cold weather, most migrating during the rains and breeding elsewhere; but a few remain and breed in various parts of the country, especially towards the west and north-west. Considerable numbers are often found together, and in certain seasons it occurs in great profusion and affords excellent sport to the gunner. Dogs stand very steadily to quail, and in the cool weather excellent sport is to be had, fifty couple being not unfrequently bagged by one gun in a morning's shooting in the North-West Provinces.

The question is sometimes asked whether the quail found in South Africa and that found in China or Japan are specifically identical with our bird, or distinct. On this point we may quote the remarks of Mr. W. Ogilvie Grant in his recently-published *Handbook to the Game Birds* (vol. i. p. 181). He says "the migratory quail has been constantly confused with two more or less resident local forms, *Coturnix capensis*, found in South Africa, and *Coturnix japonica* from Japan and China. The former is probably nothing more than a more richly-coloured, rather smaller resident local race of our common quail, but the latter is a perfectly distinct and easily characterised species. The migratory bird, wandering over an immensely wide range, visits the countries inhabited by both these forms, and constantly interbreeds with them, the result being that all sorts of intermediate forms occur."

The migratory quail also interbreeds freely with the chestnut-throated form, *Coturnix capensis*, found in South Africa and the islands surrounding the coast, and the results are to be seen in the many male birds from South Africa and Southern Europe, in which the white parts on the sides of the head and throat are more or less suffused with the bright rufous chestnut characteristic of the resident bird.

Thus it would seem that no game bird is better known than the quail, or stands less in need of description. It is the French *caille*, Italian *quaglia*, Spanish *codorniz*, German *wachtel*, Dutch *kwakel*, and Danish *vagtel*.

J. E. HARTING.

QUARTERSTAFF—The Weapon—The quarterstaff was formerly in common use among our English yeomen. Its dimensions vary from 6½ feet to 8½ feet, or even to 9½ feet in length and 4 or 5 inches in circumference.

Although there is no arbitrary rule as to the

length, anything beyond 9½ feet would be awkward to the user.

That the quarterstaff was not of an uniform length, the following verse from Evans' *Old Ballads* goes some way to prove. In the encounter between Robin Hood and Arthur a' Bland, the tanner of Nottingham, the former insists upon measuring weapons:

> "'But let me measure,' said jolly Robin,
> 'Before we begin our fray,
> For I'll not have mine, to be longer than thine,
> For that will be counted foul play.'"

And we learn from the next verse that Arthur's quarterstaff was 8½ feet in length, and was of oak, as was also that of Robin. But as there was no hard and fast rule as to length, so neither was there as to material, and we may be sure that there were as many good staves of ash or any other suitable wood, as easily procured, as there were of oak.

We may assume that the quarterstaff was never less than 6 feet, for it bore the same relation to the singlestick, as the two-handed sword did to the ordinary sword.

We think, therefore, a better name for it would have been the "great stick," or, the "two-handed staff," in contradistinction from the "singlestick," which is about 3 feet long, or half the length and proportions of the quarterstaff.

Its History, Literature, &c.—The etymology of the word is not very certain, and in default of a better, we must take Dr. Johnson's view, that it is so called from the manner of using it: "One hand being placed at the middle, and the other equally between the end and the middle." This, to our mind, is not a very satisfactory reason for the name, even if the staff were invariably held in this manner, but as a matter of fact, it is more usually held with both hands in the middle, about 2 feet apart, or in other words, each hand about 1 foot from the middle.

Whether the learned doctor has hit upon the right derivation or not, it is a more plausible one than that suggested by a writer in *Notes and Queries* of August 31st, 1895, who implies that it was so called from being the *quarter* of a rod or pole in measurement, and says that the Lancashire rod or pole being 7½ yards long, the quarterstaff of that county was a considerably more powerful weapon than those of other counties, whose rod or pole was only 5½ yards.

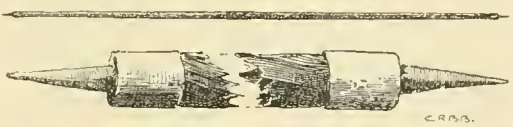
We unhesitatingly reject this derivation, as it would make even the Lancashire quarterstaff only 5 feet 3 inches, while that of other places would be only 4 feet 2½ inches, a length which would obviously be too short to use as a double-handed weapon.

It seems curious at first sight that so little should have been written either about the singlestick or the quarterstaff, seeing that almost every Old English sport has had its historian, and many of them a literature of their own, but while little enough has been written on singlestick, the writer on the quarterstaff has practically no data to go upon.

Were it not for the well-described scene of a "bout" with this weapon in the pages of Sir Walter Scott's novel *Ivanhoe*, Chap. XI, between the swineherd Gurth, and "the Miller," one of Robin Hood's men; and a short account in Strutt's *Sports and Pastimes of the English People*, and another in Chambers's *Book of Days*, together with a few legendary ballads, the sport would possibly have been lost, and never revived, even in the gymnasium, which is the only place in which it is now practised. The revival occurred, if we recollect right, about the year 1868, and was brought about by Captain Hutton of the King's Dragoon Guards.

The dearth of literature on the singlestick may be accounted for by the fact that it is only the dummy or practice weapon of the sword, about which everything that can be said has been said.

In like manner, the quarterstaff may have been the practice weapon of the Partisan, some earlier examples of whose blades partook more



QUARTERSTAFF OF THE SIXTEENTH CENTURY.

(*From Captain Hutton's collection.*)

of the character of a sword than of a spear, notably one of Edward IV.'s time (*vide* Skelton's *Illustrations of the Meyrick Collection*, plate 87, vol. ii.).

This, however, is only conjecture, and the quarterstaff may possibly have been only evolved from the ordinary staff, for the quarterstaff has existed in everything but name in every age and country.

It has its prototype in the club of the savage, the pilgrim's staff, the mountain climber's *alpenstock*, the Indian watchman's *latthi*, the *jereed* of the Arab, and the Egyptian peasant's *neboot*, which, Wilkinson remarks, the Moslems hold in such esteem, that they have a saying:

> "Nézel min e'semma e'nebóot, báraka min Allah,"
>
> "The stick came down from heaven, a blessing from God."
>
> (*Manners and Customs of the Ancient Egyptians*, vol. ii. p. 40.)

There is, we believe, no mention of the quarterstaff by name in Chaucer or in Shakespeare, and the earliest allusion that we can find to the word is in Dryden, who speaks of the manner in which it was carried when not in use in attack or defence:—

> "His quarterstaff which he could ne'er forsake,
> Hung half before, and half behind his back."

It seems probable that it went out of date soon after his time, for the bow was discarded as a weapon after the reign of Charles II., and the quarterstaff had been co-existent with the bow perhaps for centuries.

Use or Play—There is a little pamphlet still existing, but extremely rare, by one R. Peecke, published in London, 1626, 4to., entitled *Three to one: being an English-Spanish combat performed by a Western gentleman of Tavystock, in Devonshire, with an English quarterstaff, against three rapiers and poniards, at Sherries, in Spain* [on November 15th, 1625], *in the presence of the Dukes, Condes, Marquises, and other great Dons of Spain, being the Council of War.* Peecke himself was the actor in the combat.

That this is not the only occasion on which the staff has been pitted against the steel, we find in Pierce Egan's *Book of Sports*, p. 110, from an obituary account of "A Sportsman of the Old School," a Mr. Harry Smith who died at the age of eighty-four.

In this it is narrated that in the year 1779, a serjeant of Elliots' Horse, "who was reputed one of the best swordsmen of the day, challenged his sword against the squire's staff (quarterstaff) to draw first blood. At the expiration of four minutes, the squire gave his adversary the end of his staff in the forehead, which laid him flat on his back, and gained the victory. The staff, which is 7 feet 10 inches in length, is now preserved, and has thirteen cuts of the sword."

This mention of the delivery of a *point* would seem to agree with our conjecture that the quarterstaff might have been the practice weapon of the Partizan (whose nomenclature, by the way, is equally misty), and would thus have been used both to cut and thrust. Also, in Sir Walter Scott's account of the "bout" before alluded to, "Gurth darted his staff at his (antagonist's) face with his left hand."

There has been, we believe, only one attempt to reduce the play of quarterstaff to a method or manual exercise, and it is given in a small work by Thomas A. McCarthy, called *Quarterstaff: a Practical Manual, with 23 figures of position*, published by W. Swan Sonnenschein & Co., Paternoster Row, London, 1883. 24 pp., 12mo.

In our opinion, however, there is little to be gained by a *system*, and we would rather say: Let the combatants take their stand opposite each other, with the quarterstaves poised in their two hands, in the manner which is most convenient to each, whether fingers up or fingers down, right or left leg forward as they please.

Let either make a "hit" or a "point" wherever he can get one in, with either end of his staff, and let the other stop the blows as he may. All is fair in quarterstaff, and the combatants will learn for themselves more quickly than any book can teach them, the possibilities of this healthy and fascinating exercise.

A foreigner writing on the English in the 17th century says: "Everything that is called fighting is a delicious thing to an Englishman," and this statement is confirmed by one of our own countrymen, John Anstey, of *The Pleader's Guide* fame, when he says:

> "Now fighting's in itself an action
> That gives both parties satisfaction.
> A secret joy the bruiser knows
> In giving and receiving blows,
> A nameless pleasure, only tasted
> By those who've thoroughly been basted."

And this is the spirit, which, animating the lovers of "shrewd knocks," will speedily supply them with the ways and means of giving them and taking them, or giving them and avoiding them.

The same dress that is necessary for the practice of broadsword, is suitable for that of the quarterstaff, with the addition of a left hand padded glove.

F. H. Huth.

QUOITS—This game is played by driving two iron pegs into the ground 19 yards apart, but it can be altered by agreement to any distance varying from 15 to 30 yards.

It is usual to fix on the weights of each quoit. The quoit is a flattened ring of iron thick at its inner and thin at its outer edge: the pin is variously called spud, hob, or spike. To play it properly, a man should possess considerable strength in the arms and shoulders, and a quick eye will enable him to acquire the requisite pitch. The players are generally two or four—two on a side. Each player has two quoits and throws one round, endeavouring to fall over the hob; after each has had a turn, the first recommences, and so on, throwing back to the hob whence they commenced. The quoit is held with the forefinger along its outer edge, in which there is a small dent for the end of the finger to lie in without being cut. The two surfaces are held between the thumb and the other fingers, and the quoit is pitched with a slight rise and with a rotary motion to make it pass smoothly through the air. The score depends upon the quoit falling on the hob, or as near it as possible. A ringer, that is, a quoit which surrounds the pin, scores two; two ringers count four. If a player's two quoits are nearer the hob than his antagonist's, he scores two; if he has but one nearer, he scores only one, but when the nearest quoits are equidistant and belong to different players, neither scores.

F. T. Pollok.

Rules.

1. The distance from pin to pin shall be as agreed; the player shall stand level with the hob and deliver his quoit with the first step.

2. No quoit which measures more than eight inches external diameter shall be used; the weights may be unlimited or as agreed upon.

3. The hobs to be an inch above the surface of the ground, which should be if possible clayey, or sufficiently soft for the quoits to be partially embedded.

4. All measurements should be taken from the pin to the nearest visible part of the quoit; the quoit and the soil must not be disturbed.

5. No quoit shall count unless fairly delivered in the clay free from the outer rim. No quoit on its back shall count unless it holds the clay or is knocked out by another quoit. No quoit rolling on the ground shall count unless it first strikes another quoit or the pin.

6. Each player must deliver his quoits in succession, his opponents then following.

7. The fiat of an umpire shall be final in cases of dispute.

RABBITS—The rabbit, considering its size and insignificance, has probably been more productive of trouble among the human race than any other four-footed animal that one can readily name, hardly excepting the racehorse; on its account political factions have fought unceasingly, and legislation, beneficent or the reverse, has followed close upon its scut. For years the Antipodes have been up in arms against the beast, and thousands of pounds have been spent to discover some method for its extermination in the colonies. Poison, the importation of vermin, destruction of its food by fire, even the dissemination of most loathsome diseases among what some were wont to term the "feeble folk," have all been tried in vain. Although for many years, no doubt, curses have been hurled at the heads of the careless importers of the animal, yet, in the end, the settlers are sending it back, together with Australian beef and mutton, in cans or in ice, and selling him in this guise cheap, to the still further discomfiture of the British farmer.

It was generally thought that, after the passing of the Ground Game Act, the rabbit would diminish in numbers and possibly increase in value, his place among the items of our food-supply standing very high, more particularly in the manufacturing districts. Leeds and Sheffield were, and are still, amongst the best markets for a consignment of dead rabbits. Like most prognostications as to the effects of the Ground Game Act, the prophecy was falsified and rabbits are in the aggregate probably as plentiful as ever in this country, although their *habitat* and ownership have considerably altered. The tenant farmer now looks with a keen eye to his half of the ground game, and in most cases tries to steal a march upon his landlord's keepers in its acquisition. Unfortunately the deadly steel trap is not always, indeed very rarely, placed inside the "burrow" or "bury," as is contemplated by the Act, but it lies outside many a dry ditch, in a furrow or hedgerow, waiting for what pheasant, hare or partridge it may devour. By the way, why should not that same steel trap, with its cruel sharp tearing jaws, be abolished, and a more humane one with the catchment of thick rubber, rubber strengthened with some coarse linen material, or even fine wire, be substituted? An extra strong spring in front, and a wire one under either jaw to force up the sides and hold the victim firmly, might easily, one would imagine, be designed.

As to a humane gin to take rabbits alive and painlessly, we have accomplished that, and the contrivance has been in use upon the Rhiwlas Game Farm, Bala, for the purpose of transferring rabbits alive to the warrens, for many years. No inconvenience or pain whatever is felt by the captive, who continues peacefully browsing around the peg that holds it, until the keeper arrives to transport it to a new home.

In cover-shooting, the rabbit is not so much in evidence as he was before the passing of the Ground Game Act; indeed, except where covers are within an enclosed park, or some such demesne, ground game is nowadays generally conspicuous by its absence, and the use of back guns to walk with the beaters and mop up the running stuff has become obsolete. The back guns nowadays are only schoolboys, put there to be out of the way, or one or two taken in turn to stop birds turning back, a most necessary precaution. Such back guns do not, as a rule, keep in line with beaters, but are posted in suitable positions where a convenient open space occurs.

Keeping Under—It seems a waste of words almost to describe the various methods of keeping rabbits down, as nothing very new has been invented. Long nets and gate nets for the poachers, the ferret and purse-net for farmers, schoolboys, and gamekeepers, the pea-rifle for the ambitious, the lurcher for the loafer, the pitfall for the lazy, and the steel trap and gin for the professional: these efficient, though antiquated, weapons still constitute the main methods of attacking the rabbit, the gun being in the main only an auxiliary, and principally used for purposes of sport.

With regard to gins, humane or otherwise, it may be as well to describe, for the benefit of the tyro, the best and most accepted way of setting them.

Choose a frequented run, one well covered with herbage, if possible, to conceal the apparatus, either on the flat or, better still, on the side of a hill. Select the narrowest part of the same, between the "jumps" of the rabbit; his squatting places can easily be distinguished by the herbage being flattened out into a wider space. A rabbit, let me mention, does not, when unpressed and at his ease, run down the rack, so to speak, but seeks his goal by a series of leaps or jumps, stopping every few yards to squat before going on again. Having, then, pitched upon a narrow part of the run, drive the big peg firmly into the ground at the side of the run with a wooden mallet; let this be well hidden by the grass, heather, or what

not; then give a hitch or bend to the centre of the wire to hold the same in a loop just four inches in diameter. Next, stick the carrying peg in the ground to hold the loop (which should just easily go round your closed fist) at an acute angle to the run, also in the grass at the side, or otherwise concealed, four inches from the ground, and with the runner of the noose on the low side, so that the loop may run easily along the wire. Properly set, the catch loop should stand up at right angles or nearly so from the support peg, elevated above the surplus wire. If the latter be at the top, the noose will not run so freely; this can advantageously be hidden with bits of cut grass, leaves, &c., as also may the string which connects the wire with the holding peg. The time for setting all kinds of gins and traps is very important, and should be so chosen that as long a period as possible elapses before the hour at which the rabbit comes forth for its morning or evening meal, that in the meanwhile the scent of the human hand may die out. From nine to eleven in the morning for the evening catch, and from ten to midnight for the morning will be found to be the most suitable hours. Make as few marks in the grass and as little disturbance as possible.

An experienced hand can so manipulate and set his gins as to catch buck or doe rabbits at will, the difference in the length of the jumps being well known to the wily snarer, who sets his snares accordingly.

Increasing Stock—So much for the taking of the rabbit; now for a few words as to the best method of increasing the stock. Of course, all ground vermin must be kept down as close as possible. Ruthless war must be waged on stoats, weasels, cats, and the like. The rabbit has the advantage of being able to bolt underground at will, in consequence of which the depredations of winged vermin need not be a cause of very serious anxiety, although the buzzard is, where he still exists, an active and untiring enemy. The great secret in getting up a large stock of ground game, whether hares or rabbits, is to get annual change of blood. Too much stress cannot be laid on this point. Buy, or otherwise acquire, bucks from your neighbours, and from those neighbours more especially who live as far off as possible, and you will have plenty of rabbits. Our own plan is to kill off nearly all the rabbits in the warrens as early as possible, leaving the ground untainted for as long a period as can be managed, and then restock in January and February. In killing off, of course, we leave a certain number of does; fortunately, the buck rabbit, as is the case with the cock grouse, is the bolder and puts himself first into danger.

Such bags as have been procured in our warrens would have been impossible, had not this constant change of blood being rigorously insisted on. Bags by fair shooting, all walking up, no cornering, of 5,106 to nine guns in a day, commencing at 10 A.M., allowing an hour for luncheon, and ending at 6 P.M., also, in succeeding years, 4,065 and 3,567 rabbits in a day are not to be despised, and prove the efficacy of the advice now given.

By the way, the names of the nine guns who assisted in filling the largest bag on record, that of 5,096 rabbits, six pheasants, one grouse and three snipe, have often been asked for, and may as well here be given. The party consisted, on October 7th, 1885, of the Duke of Hamilton and Major-General Lord Abinger, both now, alas! passed away, Earl de Grey, Lord Berkeley Paget, Sir James Pender, Bart., M.P., Christopher Wilson of Rigmaden, R. Remington Wilson of Bromhead, W. R. M. Wynne of Peniarth, Merionethshire, and the writer. The cartridges used were lightly loaded Schultze Powder charged with only three-quarters of an ounce of No. 3 shot, which is the proper charge for rabbit shooting; no blowing to bits, and so spoiling for the market, will ever occur if this charge be adhered to.

Do not, when getting up your stock of rabbits, allow any admixture of Belgian hare or any other even approximately tame blood to creep in with a view to increasing the size of your animal, for disease and decimation are certain to follow such a disastrous introduction.

A warren, or shooting park, for rabbits can be made anywhere; even a plain grass field can be made to serve the purpose, and such an one has been turned to good account in Carnarvonshire, which thoroughly artificial rabbit preserve I will now attempt to describe. It will be easy for any who may be desirous of packing a wagon with dead rabbits to proceed upon the same lines.

Find a field or rough open space, either partially or wholly surrounded by woods in which the rabbits live and breed. Let this be walled round, and let holes be made in the wall at regular intervals, and closed by wooden or iron shutters at will. Encourage the rabbits to feed in your walled-in ground. (The best way to feed rabbits in winter time is with hay put in low miniature racks with wooden bars, such as are used for feeding sheep, only of course close to the ground, and of a smaller size suited to the rabbit. Never give turnips, they scour your rabbits and kill them off with dysentery.) Of course the beasts soon get quite at home in your enclosure. A night or two before you shoot, shut down the shutters, and the thing is done.

An improvement would be, to my mind, to make the shutters of light iron bars to swing outwards from the cover into the preserve, shambles, or whatever we choose to designate the scene of slaughter: the rabbits would soon learn to use these, and as the gratings would

swing back of themselves, preventing the return of the tenants, your enclosure would soon fill itself without any particular attention on the part of the keepers. Care must be taken, however, not to leave the huge trap too long without emptying, or else to supply plenty of food inside, or the rabbits would starve. The arrangements for the "Battue" are as follows—The whole space is laid out in lines of some 20 to 30 yards in breadth, marked out by heaps of sticks or brushwood euphemistically termed "castles," artistically arranged on faggots at the bottom, so that the whole structure shall lift up easily. If you wish to make your captives extra comfortable, put a few half drain tiles, split down the middle, under each heap for them to sit in should it rain.

On the day of reckoning, each gun takes up his position and walks slowly down the open space between the heaps of brushwood, keeping good line and looking right or left as his attendants lift them up. A boy or two dog his heels to run after and capture the cripples, otherwise the intervening spaces are kept clear.

Two beaters, armed with stout poles, walk on either side of each heap, and simultaneously at a bugle sound from the head-keeper, every castle is lifted up, while a third man, walking behind the other two, vigorously prods the natural mattress below, on which one bunny or more is reclining. When there are only one or two rabbits under the heap, all goes well, especially if they start, as every effort is made to induce them to do, straight ahead; but when three or more residents turn out together from the same "castle," and perchance bolt backwards, then complications ensue, the second gun comes into requisition, or your neighbour comes in for a share of the spoil.

When every heap has been turned over and its contents accounted for, or missed, to fight again five minutes later from another refuge, and the line of guns and beaters have reached the boundary wall, ground is taken to the right or left, the line reformed with fresh hummocks to conquer, and a repetition of the particularly edifying process goes on.

This is in truth shooting made easy; a man in a bath chair has been known to participate in the performance; it is not a bad way, though, to teach youngsters to be quick and careful with their weapons, while an occasional pheasant that has somehow got bottled up in a heap occasionally helps the bag. When last the writer assisted at this somewhat unique performance, a cloud of some fifty teal most obligingly swept over the guns, and twenty of them fell, the lay out at the end of the line being most eccentric.

RABBITS.

Beating—In beating for rabbits in any kind

of cover, always instruct your beaters to *poke*, not *beat*; a rabbit in a bush will refuse to go out for any kind of cudgelling, in fact I have seen them beaten to death sooner than move, whereas the gentlest little prod from the end even of a switch will send them flying.

It may be useful here to observe that the way a rabbit's head is pointed when at rest is the way he goes, so that if you are lucky enough to detect him in his retreat, you can without difficulty place yourself in the most favourable position to finish him.

Remember, also, that it is impossible to drive hares down-hill and up-wind to guns, and almost equally difficult to manipulate rabbits in these directions. In common with pheasants and all sorts of game, rabbits have a keen sense of smell, and will sooner a thousand times try to break back through the most compact line of beaters, stand they almost leg to leg, than go forward where, even though no danger be visible, their noses teach them that their most dreaded enemy is located.

Too little attention is paid to this point when organising big ground game shoots, as also to the question of "stopping," few keepers recognising the fact that rabbits require keeping off the ground that has been beaten quite as much as pheasants. A net should be run and duly guarded at proper intervals by responsible human beings—old women are not bad, if not gun-shy—or a sufficiency of stops should be placed to guard the exhausted beat.

Although a certain number of rabbits will always lie close and come to the gun, yet the experienced keeper well knows that considerably more will keep creeping ahead, and a large proportion of such will inevitably escape the gun, as instinct leads them on to the beaten ground and consequent safety; and beaters using one hand to beat and trailing a rope with the other, held of course at the further end by the next beater, will do far more in thick grass, or any cover over which a rope will pass, than will beaters armed with sticks alone. Rabbits are far more frightened of a rope than of any stick.

Should you wish to keep rabbits out of any particular bury or burrow, say in a shrubbery, pleasure-ground, lawn, or what not, an excellent plan is to put a piece of rabbit's paunch down each hole and then block up the opening. No rabbit will come near the place for weeks. The same applies to scratches under a wire fence or other obstruction, where rabbits are attempting to break in; indeed, a piece of flannel placed upon the spot of forcible entry will often drive away the intruder.

But be careful not to use rabbit paunches for manure, at any rate not till they have been decomposed in soil for many months; they are, when fresh, most destructive to vegetation of any sort, as the present writer found when, some years ago, after one of the first of the big rabbit battues he had the paunches dug into the vine border, thinking to improve the grapes. In a short time every vine was dead, and the head gardener passed his time during some barren years objurgating his master.

Whilst on this savoury subject, it may be as well to suggest that pits, dug beforehand at convenient spots for the accommodation of whoever presides over the last obsequies of our subject, are a cleanly and sanitary precaution, and that no rabbit should be paunched until the blood has set, not whilst warm. The pits when used can be filled in with soil.

Packing—In packing rabbits for market, let them get quite cold and stiff, then lay them in layers in hampers, turning the heads over the shoulders so as to fit the carcases well into the interstices; press them in all round; let there be no shaking about. They should come out a compact mass. Fill in the top of the hamper with clean straw or fern. Do not believe in those nice-looking baskets with holes across them to sling the rabbits on. A porter is quite sure to throw the whole affair upside down into the van. Hang your rabbits up for a night before packing, then, if at all wet, dress the fur over with a curry comb and finish off with a good hard brush. The appearance of your merchandise at market is vastly improved by these simple precautions.

Laying out—In laying out rabbits for shooting, do not use ferrets or anything but gas tar, which is cheap enough. The proper way to set out rabbits is to send men round with spades, and block every hole with earth, which must be sprinkled on the outside with tar from a can. In twenty hours the rabbits will scratch out for food, and carry with them to their dinners a recollection of the unsavoury scent of the gas tar. The men should then go and again block the holes and again besprinkle the stoppings with the tar; let this operation be repeated every day until the last before shooting. Four or five days will complete the whole process, and you will find every rabbit lying out. If this is done in a wood, they will be found lying in the rough fields around, if in a park or warren in the cover nearest to their habitations.

Do not believe your keeper if he tries to insist upon the use of ferrets, a lengthy operation, and ruinous to your stock, as the mere scratch of a ferret is poisonous to a rabbit, although, if you can find your rabbits out and manage to run a ferret whose coat has been well saturated with train oil (avoid paraffin, it burns the poor animal) through the burys, the rabbits will not return to them for a considerable time.

The gas tar plan is absolutely effectual if strictly carried out as described above, and has been proved effectually in the shooting warrens on the Rhiwlas property, where as many rabbits are probably shot in the season as on any other estate in Great Britain. But keepers are hard

to convince, and will, unless very strictly looked after, keep harking back to the old methods of ferretting, papering, smoking, and other obsolete and exploded ideas.

Fencing—Now as to the best way of fencing rabbits, out or in.

Wire-netting forms the best, lightest, and cheapest fence for rabbits, whether for park, warren or plantation. A special kind is made nowadays—I get mine from Boulton and Paul of Norwich, graduated as to its meshes from bottom to top, very small at the bottom to stop the baby bunnies, and gradually increasing in size as it ascends. This is the most effectual plan. Have your posts cut to stand 4 feet out of the ground (I am quoting now from my book "Rabbits for Powder and Rabbits for Profit," p. 42, published in 1888—so its instructions have been proved reliable by time). Make them of larch, or still better of oak, or iron if you please; if of wood, be sure to char them well before fixing in the ground. The stouter they are, the better; and they should be round, or at least triangular, with the blunt side outermost. These posts should then be driven into the ground 4 feet apart, and a barbed wire run all round them on the top, or, better still, an inch or two below, so as to offer the firmest resistance to any animal pushing against it. At the height of 3 feet 6 inches from the ground, or even 3 feet, fix on each post iron or wooden arms to carry a black annealed wire on both sides of the posts, outside and in, so as to turn over your wire netting both ways, to prevent rabbits from scrambling and climbing up the wire and thus entering, or escaping from, the enclosure. Rabbits will learn to climb like cats. I have often seen them do it myself, so that it is absolutely necessary that the wire netting should be turned both outwards and inwards, not only at bottom, but at top, to give you a really secure fence. Another black annealed wire should be stapled on the posts on the outside, or that furthest from the rabbits. From this the wire netting should be turned both ways over the other wires, supported by the projecting arms. Of course it will be necessary to piece, or attach, a loose strip of wire netting to form one of the turns over. Another annealed wire should be stapled on to the posts 21 inches from the ground, and yet another quite close to the soil, underneath which let the netting be again turned outwards and inwards some 5 or 6 inches, lying along the surface of the ground. Then you have a perfectly secure fence, both ways, and, strange though it may appear, not a rabbit will scratch out, while, if you sink the wire netting into the ground after the usual fashion, escapes will be frequent, and a man's time almost entirely taken up in blocking and repairing the holes where the rabbits scratch out and in. The grass and other herbage soon grows up through the turned-in wire, and forms a matted surface through or underneath which the rabbits will not attempt to scratch, their habit being to go right up to any obstacle, and then dig downwards until they get underneath it, when out they bolt; fortunately, they never go right away and tunnel under.

Having now got your rabbit-proof fence complete and in order, do not forget to put some ladder-stiles to get over it at the points most frequently used, or even a couple of stumps, one each side, to enable a man to stride over; this will save your fence and also your knickerbockers from the effects of wear and tear. Now, having got your rabbits safely housed, the next thing to do is to see that no depredators help themselves without leave. To guard against long netting, put parallel lines of barbed wire pegged up 3 or 4 inches from the ground at right angles to the spot at which the nets would have to be set. Leave plenty of cut brambles and thorns about; loose bundles of barbed wire rolled round short thick pieces of wood are also awkward for a net.

Drive your rabbits in early on moonlight nights; if there be no poachers about, it is a good habit for them to get into their holes at once on sight or sound of a dog.

Beware of midnight ferretting with purse nets; this is the most dangerous form of all poaching, and the most difficult to detect. A poacher gets into some quiet part of your warren, park, or cover, with no dog, nothing but his ferrets and nets. He lays himself down in the fern and quietly goes to work; and, unfortunately, rabbits will bolt well to ferrets at night Nothing but midnight prowls and very careful watching on the part of your keepers will obviate this most destructive form of depredation.

Retrievers—Editors of sporting papers are constantly being asked by would-be "rabbit potters" as to the best kind of retriever to take out rabbit shooting. The question is easily answered with "don't."

A retriever is quite out of place when out after rabbits. Either your whole time is taken up in trying to keep him to heel, or he has seen so much of the game that it bores him, and he will not try when you want him.

If you must have a retriever, get a fast one, keep him in a string and have him in good condition. Do not be satisfied with giving him lumps of sugar to make him wag his tail, which is what many people consider quite sufficient exercise for their retrievers when off duty. The only use for a retriever is to retrieve your bungles, and when a rabbit is racing for home, even on three legs only, he puts in very good time, and the dog has to be pretty smart to have a chance with him.

Concluding Hints—Undoubtedly the best way—it cannot be too often repeated—to get up a good stock of rabbits is to kill off your

stock, more especially as regards the bucks, before December, if possible, and then turn in plenty of fresh blood on the untainted ground to start you well for the next season. Feeding what you have left in the winter, and more especially during snow, must on no account be overlooked. Never give your rabbits turnips; as already mentioned, it only scours them, and they die like flies. Put a little Indian corn into their burrows, and keep them well supplied with hay in little low racks, made on the same principle as those for sheep. Do not spread the hay about the ground; it gets damp, sodden, and trodden in. Those who wish to catch their rabbits wholesale will find a pitfall with a swing plank across it, which goes down at a rabbit's weight, very effectual. A turnip or two at the bottom will prove irresistible; but do not forget to examine and deal with the captives every morning without fail. A general enclosure for rabbits can be easily and expeditiously filled from the outside where there are any walls, or turf banks, or even hedges, if properly trimmed down at the end nearest to the place into which you wish to entice the quarry. A plank projecting from the end of your wall, which should be pulled down for a foot or two away from the rabbit fence, well over the wire, into the warren or cover, will lead the rabbits in; and they will jump down off the plank to join their comrades inside. Jealousy forms a striking point in the rabbit's disposition; he always thinks every other rabbit is better off than himself. I have seen an iron bar projecting from the end of this plank, on the point of which a turnip can be occasionally impaled, to tempt the rabbits to the extremity and their subsequent downfall, and this is a very effective device.

R. J. Lloyd Price.

RACING—ORIGIN AND DEVELOPMENT—A duller task could scarcely be undertaken than that of endeavouring to trace the history of horse-racing from material furnished by the vague and contradictory accounts of the earliest writers on the subject. It may safely be assumed that racing dates from the period when two energetic men found themselves side by side on high-couraged horses. Whether the steeds or their riders were first fired by the spirit of emulation no one can say; but surely such a prehistoric spin was the nucleus of the Derby. This is not a theme that could profitably be enlarged upon by a writer whose object is to be practical. Antiquity will be entirely disregarded; and, skipping over centuries, no effort will be made to summarise the history of Newmarket, or relate what potentates and princes have shaped and sustained the sport upon the historic Heath. There is so much to be said about racing in its modern developments, that no space could well be devoted to archaic matter even if it seemed desirable; and one of many reasons why it does not so seem is that, in all essentials, the sport, as it is conducted in the nineteenth century, differs completely in its character and surroundings from what it was before the Turf became so widely popular. When race meetings were first organised they were held annually near many cities and towns, the runners being provided by the local magnates and gentry. The horses, usually hunters, were ridden at catch weights by their owners or their grooms, and, to spin out the programme, in contests other than matches the races were run in heats. By degrees it became apparent that horses trained systematically and kept exclusively for racing had enormous advantages over others: and it appeared furthermore that men who were accustomed to riding races turned their experience to highly profitable account. By degrees the vast importance of weight began to be recognised, and some rough rules were formulated. Racing, indeed, showed some signs of growing into shape as it is now conducted. Owners of proved good horses ceased to be content with local successes. Prize winners were sent into neighbouring counties, ridden and led by their jockeys with racing saddles strapped on their backs; and it was probably imagined that finality in the way of convenience had been reached when Lord George Bentinck hit on the brilliant notion of sending one of his horses, Elis, to Doncaster in a van. How animals are now despatched from one end of the country to another, often by special train on the morning of a race, so that those who dislike strange quarters should be away from their stables for as short a time as possible, need not be described; nor is it necessary to dwell on the immeasurable impetus which has been given to the sport by the introduction of railways, telegraphs, and the modern increase of newspapers.

A few words may be interpolated as to the serviceability of racing as a means to an end. The English thoroughbred horse is the most valuable animal in the world. Five thousand five hundred guineas was paid for La Flêche as a yearling, and as a brood mare she fetched 14,500 guineas; 30,000 guineas was refused for Ormonde; that sum would not have bought Isinglass, and it is credibly reported that signed cheques with blanks left for figures have been proffered to the lucky possessors of other famous animals. The only method by which the excellence of a horse can be demonstrated is by racing him. Opponents of the sport, who do not fail to recognise the value of the blood, have expressed the belief that the exhibition of racehorses at agricultural shows and similar functions would meet every requirement; but this is not the case, for the reason that the

Langlass Winning the Derby

creature's worth depends upon the possession of other than external qualities. One does not want a horse merely to look at. Make and shape are not to be despised, but the great point is whether the horse has speed, stamina, constitution, soundness, and other attributes calculated to render its offspring worthy upholders of the family; and this can only be ascertained by submitting the animals to the ordeal of preparation and testing them on the course. An infusion of thoroughbred blood confers special and peculiar benefits on those so endowed, whether chargers, hunters, hacks, or carriage horses. The fact has been constantly made obvious when horses of what may be described as the royal strain have drifted out of their own class and been put to try conclusions with their coarser bred cousins. The "blood" horse—thoroughbred or even half-bred—that comes to carry a soldier or a sportsman in the hunting-field may not have the size and scope of some of his companions, and may not look so well able to bear weight; but as a very general rule his action and courage will unmistakably prove what his breeding signifies.

As is generally known, the racehorses of to-day are almost exclusively descended from three sires—the "Godolphin Arabian," the "Darley Arabian," and the "Byerly Turk." The history of the importation of these three animals has been told so often that it would be superfluous to repeat it here. Previously to this, horses were introduced into England from all quarters of Europe; and it seems nowadays rather curious to find that many came from Italy, the horsemanship of which country was at one time so highly esteemed that a number of Italian terms and phrases were current in this country in relation to horses; as will be found on reference to the book of Thomas Blunderville, Master of the Horse to Lord Leicester in the reign of Elizabeth, and one of the first writers of authority who published works on the subject.

Eclipse was the grandson of the Darley Arabian; he became the sire of three of the first five winners of the Derby, and thus is gained something like a direct connection between the earliest days of recognised racing and the present time. It is said of Eclipse that he galloped at the rate of a mile a minute; and the statement is valuable as showing how utterly untrustworthy and ridiculous the records of sport in the last century must be. No horse has ever galloped a mile in that time with half as much again added to it. There is a doubt as to whether a mile in 1 minute $35\frac{3}{5}$ seconds has ever been done (though it is claimed for an American colt named Salvator); and this would lead, if one were tempted into it, to a discussion as to the relative speed and stamina of the thoroughbred horse now and a century ago—a profitless theme, as there can be no better basis of argument than general belief. That belief is that the horse of to-day is speedier than his predecessor was, but less gifted with staying power; though as to the latter article of faith opinions again differ. The crop of thoroughbred horses is now annually so enormous that there must inevitably be a large proportion of weeds; the more so as, for many years past, at any rate, speed rather than stamina has been the object aimed at by breeders; but there is no sound reason to doubt that the best horses of to-day would gallop the four miles and a quarter (less 43 yards, if strict accuracy be demanded) of the Beacon Course at Newmarket at least as speedily as did the horses of any former period. It is not a little strange that, whereas the infusion of Arab blood from the three sires named has made the English racehorse of to-day what he is, the Arab of to-day should be in all respects such a vastly inferior animal. The fact is unquestionable. No weight—and what weight means will be presently considered—will "bring together" the best Arab and the poorest of English horses. This was demonstrated some years ago at Newmarket in a race between Asil and Iambic, between the best Arab of his day and the worst thoroughbred; for, with a huge advantage in weight for Asil and over a course which was supposed to suit him and to be four times more than Iambic could compass, the latter won in a trot. The value of the English thoroughbred is indeed universally recognised, and the whole world supplies itself from England. Europe, America (North and South), India, the Colonies, have each derived their racing stock from this country, and they can only sustain it by continuing to draw from the same supply.

BREEDING—That there is no royal road to the production of good horses is shown by the fact that many owners to whom money has been of no importance, who have added long experience and keen observation to practically unlimited expenditure, have vainly tried all their lives to breed the object of every racing man's ambition—a Derby winner. Much is written about scientific breeding, but the most that can be really maintained in regard to it is that by the judicious union of certain strains of blood a fair proportion of valuable horses is likely to be secured. When a horse wins a number of the principal stakes, strong evidence seems to be furnished that he is bred on highly judicious principles; but all the own brothers and sisters of such a horse—not only one or two, but all of them—not seldom prove absolutely worthless for racing purposes, and this is an argument against scientific breeding which takes a vast deal of explaining away. The different supporters of the theory of scientific breeding have different ideas on the subject; there are no set rules. The majority of them, however,

would doubtless have agreed cordially as to the absolutely and unimpeachably scientific breeding of several horses who finished far behind St. Gatien in the Derby and behind Robert the Devil in the St. Leger; and it is certain that neither of these two animals would ever have been picked out as an example of the science. One naturally chooses a sire of approved merit, and looks for size and quality in the mare; but if she is good-looking and comes of a distinguished family, it is not essential that she should have won races. A great many of the mares that have been most successful when in training have failed to produce winners. Possibly in some cases their vital energy has been more or less exhausted during their career on the Turf. The fact remains, whatever the cause may be; and, on the other hand, many mares that ran moderately, or even badly, have become the dams of famous horses. There are what may be called "chance" sires also. An example is Wisdom, a wretchedly bad horse when in training, who greatly distinguished himself at the stud, one of his sons having won the Derby, another the Ascot Cup, and a daughter the Oaks. Reference has already been made to The Rover, sire of St. Gatien, and to Bertram, sire of Robert the Devil, though it must be remembered that unless a horse has shown capacity to win races he rarely has a good mare sent to him.

Advocates of scientific breeding are specially contemptuous about what they describe as "rule-of-thumb," that is to say, disregard of intricate and exhaustive calculations of strains of blood, in favour of the simple attempt to supply from the dam deficiencies in the sire, to obtain from the sire correction of weak points in the dam, and so forth. It is far from certain, however, that, if this is carefully done, the secret of breeding, so far as there is any, has not been discovered. The suggestion will no doubt provoke the contempt of the theorists, but it is an idea firmly held by many men who have considered the subject and dealt with it practically all their lives—and have very likely in their time been themselves ardent supporters of theories, before the futility of their most ingenious calculations had been repeatedly exposed. Certain questions as to make and shape being borne in mind, if a man sends a dam of winners to an approved good sire, the result is very likely to be a good animal.

A Stud Paddock.

Of late years the majority of breeders have paid attention to a point which was formerly much neglected—the necessity of keeping the stallions in good health by giving them sufficient exercise. Opinions differ as to whether it is advisable to ride the horse or to lead or lunge him, and the truth is that this depends in a great measure upon the disposition of the individual

animal. But robust exercise is essential, particularly in the autumn, that he may be hard and in good health when he begins his stud duties. It can scarcely be necessary to remark that the age of thoroughbreds dates from January 1st, and that the period of gestation is a year. Foals have occasionally appeared during the last days of December, and the unfortunate owners find themselves possessed of "yearlings" that are actually only a few hours old, the little creatures therefore rating as two-year-olds when their age is really twelve months *plus* the hours by which they anticipated the beginning of the year; and it is obvious that they are at a hopeless disadvantage with their *quasi* contemporaries who have months of additional growth; for a few weeks make a great difference to a foal when he once begins to grow the right way and to "do well." Some breeders like their foals to be born in January, so that they may have the more time to get forward; others think that the young creatures thrive better if they do not come into the world till the spring grasses have begun to grow, till there is more sun and the winter winds are gone. Seeing that days in March are not seldom as bleak and cold as any in the year, attempts to avoid winter winds are likely to have doubtful results. Here, as elsewhere, hard-and-fast rules are in truth impossible. Much depends upon the mildness or inclemency of the season; much more on the treatment to which the foals are subjected, the shelter afforded them, and so forth; very much again on the young animals' constitutions. Roughly speaking, it would seem that a colt born in February would have great advantages over the one born three months later, when as two-year-olds they run against each other; but some of the most successful horses known have been May foals. The Bard, Saraband, and Best Man, may be cited as examples.

TRAINERS—As a rule the trainer has worked his way to the position he occupies after apprenticeship as a jockey. In very many cases, having become too heavy to ride on the flat, he has afterwards taken to riding over a country; for under the National Hunt Rules, which govern steeplechasing and hurdleracing, the minimum was an irreducible 10 stone until within the last two years, when, though only for handicap steeplechases of three miles and a half or upwards, a minimum of 9 st. 7 lb. was introduced. Of the principal trainers now in active pursuit of their calling, those who acquired a knowledge of the business in the manner indicated include Charles Archer, Joseph Cannon, Tom Cannon (who, however, only rode as a jockey on the flat), Richard Chaloner, George Chaloner (a flat race jockey only), E. Craddock, S. Darling, H. Escott, Fallon, Holt, W. A. Jarvis, T. Jennings, jun., James Jewitt, the Hon. George Lambton (exclusively an amateur rider under National Hunt Rules, or on the flat for the clubs to which he belonged), F. Lynham, R. Marsh, W. Mumford, A. and W. Nightingall, John Osborne (on the flat only), John Porter (on the flat), J. Prince, W. F. Robinson (on the flat), and F. Webb, the last-named having ridden in the Grand National, though only on one occasion. There could not be so good a way of obtaining practical experience of every detail of the sport; for no one can tell the condition of a horse better than the jockey who rides day after day and year after year; and to get a horse into perfect condition is the aim and end of the trainer's art. At the same time, that this apprenticeship is not essential is proved by the successes, for example, of the famous Dawson family. The four brothers, of whom Matthew and John are happily still busily engaged in their profession, and the two sons of the latter, John and George, have for a long time past most successfully superintended large stables of horses, George in particular having been associated with many notable triumphs, for he was fortunate in finding animals of especial excellence—Ayrshire, Donovan, Semolina, Memoir, Mrs. Butterwick, and Amiable, all classic winners—under his control.

The modern trainer is a far more prosperous person than the old training groom; but if his rewards are higher he has more work to do in the majority of cases, for racing has enormously increased during the last half century; usually trainers have a larger number of horses to look after, and it is a common thing for owners to rely much—in some instances exclusively—on their trainer's advice as to when horses shall be engaged and which of the engagements they shall fulfil. Making entries, striking horses out of stakes for which they are not to run, sending them about the country in all directions, finding jockeys to ride, are all duties which require anxious care; and then there are the yearly sales at Ascot, Newmarket, Doncaster, and elsewhere. Some owners recruit their stables entirely from sales, nearly all buy occasionally; and it is part of a trainer's business very critically to look over what is to be sold, estimate the value of the animals, and advise as to what may judiciously be bought. The opinions of experts, it may be remarked, differ very widely on the subject of yearlings. Some trainers—good judges and in all honesty—will strongly recommend their employer to buy horses which other trainers—equally capable men and actuated by the best motives—regard as worthless, and beg their masters not to bid for. This may be partially due, no doubt, to prejudice against sires or dams or strains of blood; there may be a suspicion, more or less well founded, that the stock of a certain horse exhibit a tendency to "make a noise," that the progeny of a certain mare are "soft," that hereditary bad temper will break out

or that some defect is likely to show itself; but, apart from this, in examining the animal one trainer will see some fault—coarse hocks that threaten to be curby, badly shaped feet, a jowl which suggests roaring, lightness of bone, uprightness, hocks too far back, want of length, or one of a score of weaknesses which will escape other eyes or will be set down as unimportant. "A nice compact horse," one man will say. "Too set and furnished; no room for improvement," will be the verdict of another. "Too small: nothing of him," A. will decide, turning from some youngster that is being led round. "Very well shaped colt: good bone; I like him; he ought to grow into a very useful sort of horse," B. will observe. It will be found that there are two ways of regarding almost everything that is inspected. When owners have many horses, a very large sum can be annually saved by keeping a careful eye on the *Calendar* and paying minor forfeits for animals which it is certain will not be sent for races in which they are engaged. By inattention to this matter a well-known trainer who died not long since annually cost his employers many hundreds of pounds. Of course this was the fault of the owners for not looking into the matter themselves; but, as so many gentlemen do, they left the matter in the trainer's hands and continually found when too late that they had to pay for his carelessness. If the owner breeds for racing, again, it frequently happens that the trainer is called in to superintend that department, also to advise as to mating the mares, to see that they have all possible attention at critical times, and to keep an eye on the foals when they are born.

Many persons imagine that the trainer's duties consist in riding out on a well-broken hack to look after his string at exercise in the morning, and say which are to canter and which to gallop; in going round the stable once a day, accompanied by the head lad, who will be ready to answer all questions; and attending race meetings where he may look on at, or occasionally assist in, saddling his horses when they are about to run. He is supposed by the outside world to have an almost positive knowledge of what is going to win; so that he can bet as much as he pleases, with a comfortable conviction that he will make a great deal of money, and can experience no possible disappointment or vexation in this matter, except, indeed, habitual displeasure at the shortness of the price which the ring will lay against his "certainties." It seems such easy work to canter over the heath or the downs, to inhale the fresh morning breeze, to watch, chatting to a friend, while the string come past, beckoning with his whip for some to go a little faster, or raising his hand to check the pace of others. Then there is the pleasurable excitement of the trial, in which, of course, the right horse always wins with 10 lb. more on his back than the touts can possibly imagine he carries; and so back to a luxurious breakfast—after wiring off in cypher to make arrangements for winning a fortune on

A Gallop on the Tan.

the good thing just brought to light—a meal made more enjoyable by perusal of sporting journals, full of compliments on his skill, astuteness, and the perfect manner in which yesterday's winners from his stable were turned out.

That is the conventional view, and it is not entirely accurate. The trainer may not improbably have been kept awake half the night wondering whether he dare "go on" with the Derby colt, or the favourite for some big race on which he has invested money he cannot afford to lose. The animal's shortened stride in his gallop yesterday was not to be mistaken, and certainly there was something suspicious in the manner in which he walked away afterwards. Shall he stop him, or chance it? This worry is increased by perplexity as to whether his most promising two-year-old—so charmingly shaped, with such perfect action—did or did not whistle—or worse—as she passed him. Was it the beginning of a "noise"? The boy "did not hear anything," but he is stupid; a jockey shall be put up when they next go out, she shall be sent a good gallop, and he will find out the worst. The morning, when it dawns, is dull and dispiriting; he rides out in the drizzle, gallops the two-year-old, and discovers—a fact too surely confirmed by the jockey—that she does make a noise; the Derby colt, there can be no further doubt about it, is lame; and a horse which is well in in a little handicap next week, with nothing to beat, in fact, coughs badly several times. Breakfast is not made more agreeable by the *Calendar*, which shows that two horses which have been entered in forthcoming handicaps can have no possible chance, two or three belonging to other stables being "thrown in," and by some irritating remarks in a newspaper to the effect that a horse which he ran yesterday, knowing it to be in perfect condition and believing that it could not lose, had, in the opinion of the critic, evidently been galloped to death, could obviously from its appearance have had no chance, had doubtless left the race on its training ground; "but if trainers will try their horses every other day, they must expect," &c., &c., with a hint to conclude with—not impossibly the critic had lost money on the horse—that it may not have been the animal's "day out," it may do better later on; a suggestion, in fact, that it was not trying. A grumbling letter from his employer, an intimation that the only light-weight jockey who could "get out" a troublesome horse, a lad he supposed he had definitely engaged, will not be able to ride; and the bad news that his best foal had been kicked and had her leg broken—a filly that would have been worth a handsome price for the paddocks if she never won a race—make up a companion picture which is very often the truer one of the two.

Much more of the trainer's business is done in the stable than the outsider would suppose. He must, if he does his work thoroughly, study and get to understand the peculiarities of every horse under his charge. So many feeds a day, consisting of so much hay and oats, will not assist the purpose; in certain cases food must be varied if the best results are to be obtained, and there are many examples of horses that have not done well on ordinary diet thriving on very unusual varieties of food. His knowledge of the structure, anatomy and constitution of the horse must be practically complete, and more than this, of the varying constitutions of different horses; he must be, in fact, a thorough "stableman," which is another way of saying a veterinary surgeon. The professional M.R.C.V.S. is called in at intervals; but unless operations of some sort have become necessary, the chances are that the trainer knows quite as well as the "vet." what is wrong, and how the ailment had best be treated; if the two differ it is far from certain that the man with letters after his name is correct; but he is consulted mainly for the satisfaction of the owner, who may complain, if anything goes wrong, that the "best advice" was not obtained. The trainer's first essential is to be a judge of condition. Some horses thrive on little work, run better when rather "above themselves in condition"; others, gross horses, require a great deal more exercise to make them really fit; and the position is complicated by the fact that some animals look perfectly trained, or even light, when they are not really "wound up," and, as the expressive phrase goes, "clean inside." It is necessary, therefore, to find out exactly what work is required by each horse. There are some points upon which the most knowledgeable and experienced owners are almost bound to seek their trainer's advice; for the man who has charge of the horses naturally sees much more of them than the man to whom they belong. The trainer, for example, is best able to judge over what distance of ground a horse is likely to be seen to the greatest advantage, that is to say whether or not he stays. This he judges from the way in which the animal does his work. This is a more difficult process than the inexperienced might imagine. "If you want to find out whether a horse can get a mile and a half, gallop him the course and see," would be the simple philosophy of the unpractical; but he may get a mile and a half when he has done work over something like the distance, and the question is whether it is worth while to train him and try him for such a course with the not improbable effect of impairing his speed if he is in truth not even a miler. The owner, if he has any familiarity with the sport, will see whether his horse appears to finish his races strongly, to be "running on" at the end, and will draw his own deductions; but on the all important question of an animal's best distance,

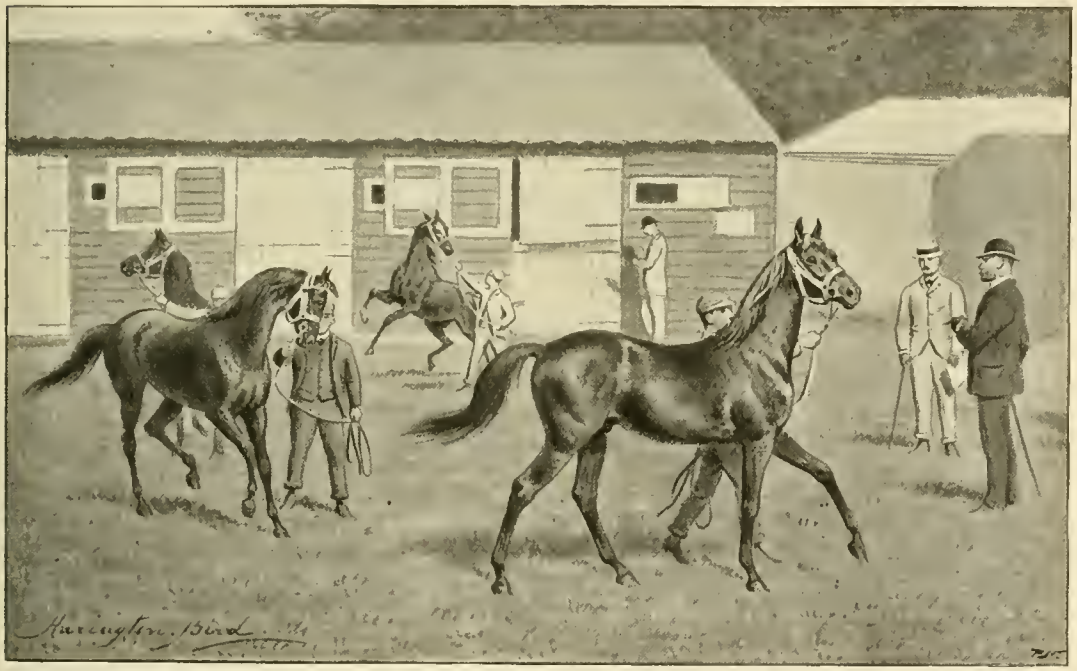
the trainer will almost certainly be the safer guide. He must also necessarily be a sound judge of pace and of riding, or else his trials are likely to be very wrong and his reading of public running likewise much at fault. He must be sure whether a trial is run at a good pace, or whether the boys have been able to "get out" their horses—whether, in fact, it has been the equivalent of a true-run race. To him generally falls the important duty of giving the jockey orders how to ride—after or without consultation with the owner according to circumstances. If the trainer has not a keen appreciation of horsemanship, subsequent confusion is likely when it is achieved. The jockey who has narrowly and luckily escaped defeat by a head when he would have won comfortably by a couple of lengths if he had done justice to the horse and obeyed orders, is eulogised for having ridden a brilliant race; while the labour of the trainer, who has overcome many difficulties in bringing the animal to the post fit and well, is too often lightly esteemed, or accepted as a matter of course. Appreciation of a handicap is another requisite, that the trainer may perceive what chance his horse has, and if it is desirable to accept. Few professions are, indeed, more arduous, anxious, and responsible.

Watching the Trial.

to arise, as he will not know what his horse had in hand if he wins, or what happened in the course of the race—whether any legitimate excuse can be found for defeat—if he was beaten; and it is very desirable that the trainer should form his own opinion instead of depending upon the explanation of the average jockey, who, for instance, if he did not get well away when the flag fell, will be found not inapt to declare that he was first off. Some jockeys can and will give a trustworthy account of what has happened in a race, but these are a very small minority, for by no means all of them possess sufficient keenness of observation to take in what other animals are really doing, and if they themselves have done anything clumsy or stupid in the race they will not improbably find an excuse in some misleading explanation. The trainer's work is unending, and it is rather the custom to ignore his labours and to underrate his share of success

YEARLING SALES—A particularly interesting feature of the season to genuine lovers of the thoroughbred horse is the sales of yearlings which take place periodically. On the mornings and evenings of the days on which the Newmarket July Meetings are held Messrs. Tattersall are busy. The mornings of the Doncaster week are devoted to the same occupation, but at this time of year, approaching mid-September, the days are beginning to "draw in," and after racing the sales are not carried on, intending purchasers, or the curious who would like to purchase if they could, devoting themselves to an inspection of the lots that are still to be put up. Little groups of owners, trainers, their friends and acquaintances, go from box to box, reading the statement of pedigree that is fastened to the door—unless, indeed, they have read it before and have it in their minds—and critically examining the youngsters, who are not seldom

upset by their strange quarters and unaccustomed relays of visitors, though some of them stand it calmly enough. Now is the time when one may hear much shrewd and instructive comment, together with a vast deal of nonsense and affected knowledge. How greatly the opinions of experts differ is dwelt on elsewhere, in the pages devoted to "Trainers." By reason of an evil practice much followed by breeders for sale, the yearlings are frequently so overloaded with fat that it requires a particularly experienced eye to detect their real merits and shape, and only the expert can tell whether they are likely to grow out of suggested defects and



YEARLING SALES.

progress in the right way. A few leading points, however, will be evident. One looks to see that their feet are well shaped and that they stand truly, not turning in their toes or showing other malformation. Evidence of good bone is sought, and the slope of the shoulders is specially noted. It is a great source of probable trouble if a horse is too upright in front. Many good judges are particularly careful to examine the eye, which is believed to indicate much, though others scornfully observe that "horses do not gallop with their heads," and disregard this. The way in which the head is put on, and certain formations of throat and jowl are very generally supposed to indicate danger of "roaring," however, and animals so made are to be carefully avoided ; though their breeders, who are usually at hand in person, or are else well represented, are slow to admit the evidence of such failings, and probably ready to name and describe other animals of precisely similar structure, and very likely nearly related to these young ones, who are said to have emphatically upset all such theories and done great things when in training. One is careful to note whether the yearling is well ribbed up, and, if he be not, to refrain from paying too much heed to the theory that slackness here may very probably be a sign of speed—many breeders have a pretty invention. Good second thighs may be traceable even at this early age, undeveloped as they necessarily are ; and particular attention must be paid to the hocks, to see that they are not coarse or curby, that there is good length from hip to hock, and that the hocks are not sickle or cow-shaped for one thing, and are well under the horse—not too far away from him—for another. A powerful broad back is also desirable. If the breeder notes his prospective customer standing by the yearling's shoulder and looking at his back, he will perhaps tell him that he "might play billiards on it." He will scarcely want to do so, but he will desire to be assured that there is strength. Size is a further requisite, and in this respect an animal may be too big or too small. A little horse is apt to be deficient in length of stride, though here action comes in ; and those who saw the Derby of 1886 will not easily forget how the little Bard for a few exciting moments fairly held his own with his in all ways greater rival, the far striding Ormonde. On the other hand, it requires specially strong legs and sound joints to carry an exceptionally large frame. Many yearlings, however, come

triumphantly out of the ordeal of examination, have fascinating pedigrees to support their title to consideration, claim close relationship are often own brothers and sisters—to animals that have done great things; and are nevertheless presently found to be worthless for racing purposes. Those who give three or four thousand guineas for such an animal are usually rather slow to understand, or at any rate to approve, the appositeness of the adjective in that common phrase, "the glorious uncertainty of the Turf." In the so-called "Figure System," which is supposed to show how Derby winners are to be bred by mathematics, I have no confidence.

The Queen's yearlings, which used to be sold at Bushey Park, appear no more, the Royal stud having been abolished; but at the Ascot Meeting a number of lots come up, and at various other times and places yearlings are offered: though at the Newmarket December sales, which have of late years grown to considerable importance, few yearlings are to be found, the catalogues being chiefly made up of horses in training, mares and foals. In the sales of blood stock from December 1896 to October 1897, tabulated in *Ruff's Guide to the Turf*, no fewer than 110 animals sold for ten guineas or less; some only fetched three or four, and if the figures had been extended to include a minimum of eleven guineas, the number would have been considerably increased. Some of these may or may not be cheap; for if a seller may be well out of a worthless animal at five guineas, a buyer may make an excellent bargain when he gives eleven hundred times as much. This, 5,500 guineas precisely, was, as already mentioned, the sum paid by the late Baron Hirsch for La Flêche (St. Simon—Quiver), who won £34,585 in stakes, and was then sold for 14,600 guineas. La Flêche was obviously a very cheap animal indeed; and it may be added that her total of winnings as just quoted was substantially increased by the amounts she gained by running second for the Derby and other races where she was just beaten. It is a set phrase with a certain school of critics that "no yearling is worth more than a thousand"; but that always remains an open question at the time of purchase. That large sums are often paid for worthless animals, and that at the best there must always be a grave risk about the transaction, are other matters. Perhaps, on the whole, purchasers of high-priced yearlings have had an exceptional amount of bad fortune; not a few horses of whom high hopes were formed on apparently sound premisses have never been seen in public again after leaving the sale ring. But buyers must take their chance; and, indeed, year after year many are found quite ready to do so. No one can guess what a yearling will fetch, because no one knows what reasons a certain person or persons may have for desiring to possess it; and there are not a few rich men who, if they take a fancy to a thing, are not deterred by monetary considerations from obtaining it; but at the same time, it is strange to note how often the expert foretells approximately the prices for which lots will be knocked down, except, indeed, when something very specially tempting is brought into the ring; and then, if 2,000 guineas are bid, it is often very possible that twice that amount will have to be given to obtain the apparent treasure. The largest sum ever paid for a yearling was the 6,000 guineas given for Childwick (St. Simon—Plaisanterie) in 1891. He was not a failure, for he won three races, amounting in value to rather over a third of his cost price. Whether he proves valuable at the stud still remains to be seen.

WEIGHT—The usual record of a race states that a horse has won by a short head, a head—a very narrow distinction—a neck, half a length, three-quarters of a length or more as the case may be. This is the common formula; but the critical expert is accustomed to say, "he won with 3 lbs. in hand," "it was a 7 lbs. beating," or to use some such phrase which deals with weight and not with distance. The reason of this is plain. A horse may win by a neck and have 3 lbs. in hand or 3 stones, because jockeys do not want to win their races by a much larger margin than is necessary, though it may be incidentally added that the very best riders have thrown away not a few races by attempting to draw things too fine—a stumble, a peck, some trivial accident, and a victory that had seemed inevitable is turned into a defeat. Weight, as the phrase runs, "brings horses together," hence the origin of handicapping, and of the system of penalties and allowances which is adopted to make chances more equal. It is impossible to give figures setting distance against weight, saying for instance that a length means 5 lbs., for the reason that races are run over distances varying from five furlongs to three miles—on rare occasions even more than three—and the farther a horse goes the more the weight tells. If the finish of a mile race is ridden out, and the winner beats the second by a good length, the chances are that with 5 lbs. less on the latter the two would have as nearly as possible run a dead-heat, and in considering the relative capacity of the pair, the handicapper would probably make that allowance. Authorities differ. After a race, when the question arises what beating the second has received, the estimate of good judges not seldom varies to the extent of several pounds; but in such cases it will often be found on investigation that prejudice has a good deal to do with the opinions expressed. Success in a race usually entails a penalty, and in many weight-for-age contests, "maidens," that is to say horses that have never won, have allowances of from 3 lbs. to as much as seven times that figure. As a rule, 5 lbs. or 7 lbs. is the maiden allowance; in almost every weight-for-age race mares and geldings

YEARLINGS AT EXERCISE.

are allowed 3 lbs The fact that a man's clothes weigh 3 lbs. or 4 lbs. more or less makes very little perceptible difference to him even when taking brisk exercise; and when the strength of a horse is considered, when, furthermore, one remembers that the racehorse is full of muscle and "condition," in the plenitude of health and strength, it seems strange that so slight an additional burden should really have any considerable effect upon him. That it has such effect is, however, daily demonstrated. The matter is still further complicated when one observes what heavy weights some good horses carry to victory on the one hand, and how frequently the tables are turned by a small penalty or allowance on the other. Foxhall, Plaisanterie, and La Flèche, all as three-year-olds, won the Cambridgeshire with 9 st., 8 st. 12 lbs., and 8 st. 10 lbs., the last-named in a canter, with her ears pricked; Isonomy and Carlton won the Manchester Handicap with 9 st. 12 lbs. These are instances of brilliant successes under severe burdens; and to grasp the opposite side of the question a glance at Turf records will show how many moderate horses have been helped first past the post in the Prince of Wales's Stakes at Ascot by the 7 lbs. maiden allowance. During the first three years of a horse's Turf career he is supposed to be constantly growing in capacity, and to adjust these ever-varying differences a scale of weight for age has been constructed. It runs as follows:—

SCALE OF WEIGHT FOR AGE.

The following Scale of Weight for Age is published under the sanction of the Stewards of the Jockey Club as a guide to managers of race meetings, but is not intended to be imperative, especially as regards the weights of two- and three-year-olds relatively to the old horses in selling races early in the year.

It is founded on the scale published by Admiral Rous, and revised by him in 1873, but has been modified in accordance with suggestions from the principal trainers and practical authorities.

Age.	Mar. and April.		May.		June		July.		Aug.		Sept.		Oct. and Nov.	
Five Furlongs.	st.	lb.	st.	lb.	st.	lb.	st.	lb.	st.	lb.	st.	lb.	st.	lb.
Two years . . .	6	0	6	2	6	7	6	9	7	0	7	4	7	7
Three years .	8	2	8	3	8	5	8	7	8	9	8	10	8	11
Four years . . .	9	0	9	0	9	0	9	0	9	0	9	0	9	0
Five, six, & aged	9	1	9	0	9	0	9	0	9	0	9	0	9	0
Six Furlongs.														
Two years . . .	6	0	6	4	6	7	6	11	7	0	7	5	7	7
Three years . .	8	4	8	6	8	8	8	10	8	12	9	0	9	2
Four years . . .	9	7	9	7	9	7	9	7	9	7	9	7	9	7
Five, six, & aged	9	9	9	8	9	7	9	7	9	7	9	7	9	7
One Mile.														
Two years . . .	—		—		—		—		—		6	5	6	7
Three years . .	7	9	7	11	7	13	8	2	8	4	8	5	8	6
Four years . . .	9	0	9	0	9	0	9	0	9	0	9	0	9	0
Five, six, & aged	9	4	9	3	9	2	9	0	9	0	9	0	9	0
One Mile and a Half.														
Two years . . .	—		—		—		—		—		6	0	6	4
Three years . .	7	7	7	9	7	11	7	13	8	1	8	3	8	5
Four years . . .	9	0	9	0	9	0	9	0	9	0	9	0	9	0
Five, six, & aged	9	5	9	4	9	3	9	2	9	1	9	0	9	0
Two Miles.														
Two years . . .	—		—		—		—		—		6	0	6	2
Three years . .	7	8	7	11	7	12	8	0	8	3	8	4	8	5
Four years . . .	9	4	9	4	9	4	9	4	9	4	9	4	9	4
Five, six, & aged	9	10	9	9	9	8	9	7	9	6	9	5	9	4
Three Miles.														
Three years . .	7	1	7	4	7	5	7	7	7	9	7	11	7	13
Four years . . .	9	0	9	0	9	0	9	0	9	0	9	0	9	0
Five years . . .	9	8	9	7	9	6	9	5	9	5	9	4	9	3
Six & aged . .	9	10	9	8	9	7	9	6	9	5	9	4	9	3

TIME—Occasionally in reports of races a comment is appended to the effect that the time was so many minutes, seconds, and fifths of seconds. The chances are that the figures lack correctness; but, if they happen to be accurate, they are utterly worthless for all practical purposes. The accuracy is to be doubted, because in this country men have so little experience of taking time, and as a matter of fact, when it is done, the totals are usually found to vary considerably on different watches; moreover, when so little as fifths of a second are reckoned, it is to be noted that horses do not start exactly at the post, but "at such reasonable distance behind the starting-post as the starter thinks necessary." After the flag has fallen therefore, and before the precise distance-line is crossed, some fifths of a second must often be occupied. Of course it is obvious that the animal which really covers a given distance in exceptionally short time must have great speed. No one can deny that. But the utter worthlessness of the "time test" is proved by the circumstance that horses which are unquestionably bad have very frequently won races in better time than that taken by horses universally acknowledged to be of the very first rank. It is far from certain that a mile has ever been covered in better time than the 1 min. 39 secs. recorded for Brag in the Brighton Cup, for about this time there seemed to be an unusual agreement: but it is certain that very few persons would care to maintain that Brag was the best horse of his generation, or indeed anything approaching to it. The object of a race is not to accomplish the distance in the least possible time, but to arrive first at the winning-post. Nothing is more common than to read that some good horse has "won in a canter." If he had galloped his best, it is obvious that his time would have been considerably shorter. The fallaciousness of the "test" is further increased by differences in the going and in the nature of courses. If the turf is deep and holding, horses are likely to take longer than they would if they were galloping "on the top of the ground," and five furlongs down the hill at Epsom or at Brighton is a speedier business than up the hill at Ascot or to the finish of the Bunbury Mile, or of the Criterion course, if any five-furlong races are run there. Examples bearing on this have not seldom been quoted, but may be repeated here. Galopin, one of the very best horses that ever won the Derby, took 2 min. 48 secs.: Sir Visto, one of the very worst, took 2 min. 43⅖ secs.; Lord Lyon, whose excellence will be dwelt on in the section on "Famous Horses," took 2 min. 50 secs.; Merry Hampton, a very poor specimen of a Derby winner, took 2 min. 43 secs. Wheel of Fortune, one of the best mares ever known, took 3 min. 2 secs. to win the Oaks; Lonely, one of the worst, took 2 min. 43⅖ secs. The mighty Ormonde's Leger time was 3 min. 21⅖ secs.; The Lambkin, a very moderate animal, was only 3 min. 14 secs. in doing the distance. These instances will probably suffice. "The watch" may possibly be of some service in showing whether a two-year-old has speed, whether he can cover five furlongs in such time as to suggest his ability to race with good prospects; but it has been found in many years' experience that a carefully-chosen trial horse will give the same assurance. As an almost universal rule, to take (or attempt to take) the time of a race and to draw deductions from it is an utterly futile proceeding.

THE JOCKEY CLUB—The Jockey Club, an association of noblemen and gentlemen dating from 1751, gradually became the supreme authority and the governing body of the Turf. The control of racing exercised by the Club is absolute. The Rules of Racing have been drawn up by the members with such continual additions and alterations as circumstances have seemed to demand, and adherence to them is rigidly enforced, offences against them being visited by fines of various amounts, and penalties which may effectually prevent those by whom they are incurred from running horses or taking any part in the sport; for horses may be disqualified from racing under Jockey Club Rules if, for instance, their owners are found guilty of corrupt practices, or if they run at unauthorised meetings—that is to say, meetings not under Rules; and men may be warned off Newmarket Heath and other places where the Rules are in force, as in fact they practically are at every place where a thoroughbred horse is at all likely to run. During the off season, when there is no regular flat racing, and in connection with steeplechases, hurdle-races, and a few other contests when flat racing is in progress, the National Hunt Committee is the governing body; but this is in close relation with the Jockey Club, and may be said to execute a delegated power. The seasons used to be distinguished as the "legitimate" and "illegitimate," but the expressions are less common than they were. There is no more select Club in the country, as will be judged from the following list of the present members.

His Royal Highness the Prince of Wales
His Royal Highness the Duke of Saxe Coburg-Gotha
His Royal Highness the Duke of Connaught
His Royal Highness the Duke of York
His Royal Highness the Duke of Cambridge
His Royal Highness Prince Christian of Schleswig-Holstein
*His Majesty the King of the Belgians
*His Imperial Highness the Grand Duke Vladimir of Russia
Lord Alington | Capt. E. W. Baird
Douglas Baird, Esq. | H.. T. Barclay, Esq.

* Honorary Members.

*Count Elemer Batthyany
Duke of Beaufort
*Count de Berteux
Earl of Bradford
Earl Cadogan
Earl Cawdor
Right Hon. H. Chaplin
Lord Colville
R. H. Combe, Esq.
Daniel Cooper, Esq.
Earl of Cork and Orrery
Earl of Coventry
W. G. Craven, Esq.
Earl of Crewe
*Prince d'Arenberg
*M. Henri Delamarre
Earl of Derby
Duke of Devonshire
Viscount Downe
Earl of Dunraven
Earl of Durham
Earl of Ellesmere
*Count Tasselo Festetics
Earl of Feversham
Earl Fitzwilliam
Hon. H. W. Fitzwilliam
Lord Gerard
Sir Reginald Graham
Earl of Harewood
Lord Hastings
Hon. Sir H. Hawkins
J. H. Houldsworth, Esq.
Earl Howe
Earl of Ilchester
Sir R. Jardine, Bart.
Sir F. Johnstone, Bart.
*Comte de Juigne
Capt. D. Lane
*Count Lehndorff
Sir W. A. Lethbridge, Bart.
Marquis of Londonderry
Right Hon. James Lowther
H. L. B. McCalmont, Esq.
Earl of March
Duke of Montrose
Lord Newton
Sir G. Ernest Paget, Bart.
Lord Penrhyn
Duke of Portland
Lord Rendlesham
Duke of Richmond and Gordon
C. D. Rose, Esq.
Earl of Rosebery
Leopold de Rothschild, Esq.
*Lord Russell of Killowen
Duke of St. Albans
Prince D. Soltykoff
Lord Stanley
Lord Suffield
Earl of Suffolk and Berkshire
*Montagu Tharp, Esq.
Sir W. Throckmorton, Bart.
Duke of Westminster
Gen. Owen Williams
Marquis of Zetland

*The Master of Her Majesty's Buckhounds
*The President of the French Jockey Club
*The Vice-President of the French Jockey Club
*The three Stewards of the French Jockey Club
*The President of the Jockey Club, New York
*The Chairman of Committee of the Victoria Racing Club
*The Chairman of Committee of the Australian Jockey Club, New South Wales

* Honorary Members.

All officials—clerks of the course, handicappers, stakeholders, clerks of the scales, starters, and judges—must receive licences from the Stewards before they can act, as must all jockeys. Election to the Club is by ballot; nine members must be present and two black balls exclude. The affairs of the Club are actively directed by three Stewards, the senior of whom retires annually, and is replaced in the spring by some energetic member who has been recommended by the retiring Steward and has consented to act. The Stewards have much more work to do than is usually imagined. Arranging the dates of meetings for the following year is by itself a most troublesome business, for it involves an infinity of correspondence. It rarely happens that charges are not annually brought, openly or anonymously, against some of the jockeys; and the Stewards have the task of investigating what they come to hear in one way or another, and of considering whether to renew the riding licences. The attendance of the Stewards at Messrs. Weatherby's offices is constantly requested; indeed there is always pressing business demanding their attention. The three Stewards of the Jockey Club are Stewards of all races run at Newmarket, and are also, *ex officio*, Stewards of Epsom, Ascot, and Goodwood; in conjunction with the Jockey Club Estate Committee they have complete possession and control of the property and estates of the Club, and the management of the course and the training and trial grounds at Newmarket is in their hands. There is practically no appeal from them for men convicted of offences against the Rules of Racing. On a few occasions the common law has been invoked, but with no satisfactory result to those who have thus taken measures against the Club. The Stewards are frequently grumbled at for what they either do or fail to do, their action having very likely been influenced by excellent reasons of which the fault-finders can know nothing; but no one ever attributes their proceedings to unworthy motives, and the most absolute confidence is reposed in their earnest desire to do their best for the sport. Their powers are great; for to be "warned off" not only prevents a man from visiting Newmarket Heath or entering any ring or enclosure at a race meeting, but involves a social stigma which irreparably ruins character; and, to make the penalty more sweeping, the warning off is usually reported to the National Hunt Committee, and various foreign Jockey Clubs, by which it is extended to meetings under their control.

Racing Officials—The duties of the various officials will be found fully set forth in the Rules of Racing, and need not be repeated here at length. That a HANDICAPPER should give general satisfaction is of course not for a moment to be expected, as there are many owners who do not really want a handicap with which no fault can be found, but a compilation of weights which gives their horses an advantage. Very palpable blunders are, however, not rare. They sometimes arise from carelessness in trusting to recollection instead of looking up form; sometimes they are due to haste, a handicapper undertaking work which he cannot possibly do in the short time he can give to it; and not seldom they are a consequence of too close an adherence to book form with no special knowledge behind it. Thus, it has been previously pointed out that a horse may win by a neck and have 3 lbs. in hand or 3 stone; and unless the handicapper sees the race, and is a judge of riding, he is likely to go far astray. Neglect of this last essential led to results which induced the Jockey Club about a year since (at the beginning of 1897) to make an addition to the Rule of Racing which deals with handicappers, to limit the work they do, and to declare that they must attend the meetings for which they have adjusted weights, either personally or by licensed deputy—and when they are vicariously represented it can only be hoped that the deputy is alert, ready to make notes

and careful to ensure that his principal has them put before him.

The JUDGE must be in his box when the horses pass the post. He carefully scrutinises the approaching field through his glasses, takes in generally the positions of the leading horses, puts down his glass when the leaders are near at hand, and so notes precisely how the first three at least—usually the fourth, and occasionally others—pass the imaginary line between his box and the winning post. He can see infinitely better than anyone else how the horses finish; and though there are legends of judges having made mistakes in short head verdicts, the chances are that their decisions have been correct. There is reason to suppose that once or twice a blunder has occurred, and never been protested against, when a horse, out by himself, has been an easy winner, but has come up on one side of the course under the box of a judge whose attention has been fixed upon two or three others on the opposite side fighting out what he has mistaken for the finish. On one occasion there was nearly being no verdict at all. The late Judge Clark, a wholly admirable occupant of the position—though he took no sort of interest in horses or any other animals, and occupied his leisure hours in the study of ecclesiastical architecture—went fast asleep one hot summer's afternoon at Goodwood when the horses were at the post for the Stewards' Cup. He gazed over the shimmering landscape before him till he dozed away, to be suddenly aroused by a happily observant policeman, who shook him up to consciousness just when the field had reached the distance, so that he had time to fulfil his duties. Only men who have hoped, feared, and anticipated much from the result of a race can realise what those most deeply interested in the winner would have felt had it been declared that the race was void and must be run again, as would probably have been inevitable. When there are objections to winners on the ground of crossing, jostling, bumping, or anything that has occurred in the course of the race, the evidence of the judge is sought, and always carries great weight with the Stewards. Very often after a close race only the judge can say for certain which has won, and the spectators wait with the utmost tension of anxiety to see what number he has instructed his assistant to hoist in the frame; or possibly it may be no number at all, but the "o o," which stands for a dead heat.

The STARTER's duties are at present threatened with supersession by the introduction of the "starting machine," a colonial invention, first tried in this country last year (1897), which has found warm advocates and no less energetic opponents. Starts under the system which has for so long a time prevailed not seldom occupy much time, and with the machine in use there is likely to be less delay at the post; so much must certainly be admitted; but good starts are by no means assured by the employment of the contrivance. Some horses never take to it kindly, others become very clever at it, and when it is used there must always be a grave risk of accidents; for the horses advance to the barrier in a compact line, and if a vicious, irritable, or "calfish" animal kicks out, as some always will, broken limbs are an exceedingly probable result. If there is no machine in front of the field, a jockey whose horse becomes troublesome can ride it on in advance, or swing it to right or left: the field are not all wedged together. The opinion of the very great majority of those professionally engaged in the sport is most strongly opposed to the starting machine. Where the English method is in vogue, the starter makes his way to the post, usually on horseback, dismounts, and, red flag in hand, takes the field in charge. The jockeys have drawn numbers in the weighing-room, to determine their places in the line, and these the starter reads out from a paper. His assistant, with a large white flag, then takes his place some fifty yards in advance, his business being to lower his white flag when the starter, by dropping the red flag, has given the signal: for the red flag will be hidden from several of the jockeys farthest away from it, all of whom, however, can see the white flag well in front of them. The starter's object is to get the field in a line, to see that no jockey is trotting or cantering, but that all are at a walk; and, when the line is once straight, to say "Go!" and flash his flag to the ground. The business is difficult, for several reasons. Jockeys often cannot restrain their horses; sometimes a few are all anxiety to get away, just to anticipate the fall of the flag, and so steal an advantage; on occasions, it is to be feared, they do not all want to get off too well; and there are times when they lose their tempers and give as much trouble as they dare, persistently disobeying orders to "come on" or to "come back." Admirable patience and equanimity are among the chief requisites for a starter: and it must be added that these are found to an extraordinary extent in the present chief occupant of the post, Mr. Arthur Coventry.

THE CLERK OF THE SCALES is on duty in the weighing room, his business being to weigh every jockey who is going to ride, and make out a list of those competing. The jockeys declare their weights as they take their places in the scales, and he sees if they draw the amount. After the race he again weighs the riders of the horses that have been placed by the judge, putting an extra 2 lbs. in the scale to prove that the horse has not carried too much. Jockeys of course weigh with their saddle and weight clothes, and, if they do not quite turn the beam, the bridle may be sent for to ascertain if that will make up the necessary difference.

The Clerk of the Course is responsible for the general arrangements of the meeting at which he officiates. He must see that the distances of the course are correctly measured and marked, though this is not often a source of trouble, as the various posts on most courses have stood for many years. A more pressing duty is the publication of cards of the races. He must also engage officials, and see that the meeting is provided with Stewards. Very often those who have consented to act neither appear nor send any intimation of their inability to attend, and the Clerk of the Course is hard put to it to find suitable substitutes.

Stewards may for convenience be here included. They are appointed to fulfil duties which they very often perform in a perfunctory manner or not seldom entirely neglect—occasionally from ignorance; for clerks of courses are apt to invite distinguished persons to act as stewards because they are locally popular or important, and notwithstanding the fact that they know nothing of the sport they are requested to control. There must be at least two stewards, whose task it is to see that in all respects the Rules of Racing are observed and obeyed; and some knowledge of these Rules is obviously essential. Any disputes which arise are submitted to the stewards, who seek the best evidence obtainable, and act accordingly. If an owner or jockey make an objection for foul riding, bumping, or some such offence, intentional or unintentional, the stewards hear what he has to say, examine other jockeys that have ridden in the race, obtain the judge's version of the affair, and sustain or overrule the objection as they may consider just. They may suspend an offender for the rest of the meeting, and in some cases inflict fines. When serious offences are committed, the stewards of meetings usually report the matter to the Stewards of the Jockey Club, who investigate the subject, and, if proof be forthcoming, sentence the culprits to such penalties as they decide will meet the justice of the case. If stewards of meetings did with more strictness what they were appointed to do, there would be much less scandal and suspicion than are at present found on the Turf. One does not want a steward to be fussy and unnecessarily prone to investigate; but there are occasions when horses or their riders perform oddly, when perhaps the betting has foreshadowed or suggested something suspicious, and when after the race shrewd and experienced men—not the foolish public who generally lose their temper when they lose their money, and immediately proclaim their certain conviction that a robbery has been committed, but cool headed men who know what racing is—are deliberately of opinion that dishonesty has been practised. Stewards not seldom hear such whispers—if the comments are confined to whisperings—and do nothing. There may be, there often is, a simple explanation of what has seemed inexplicable

After the Race.

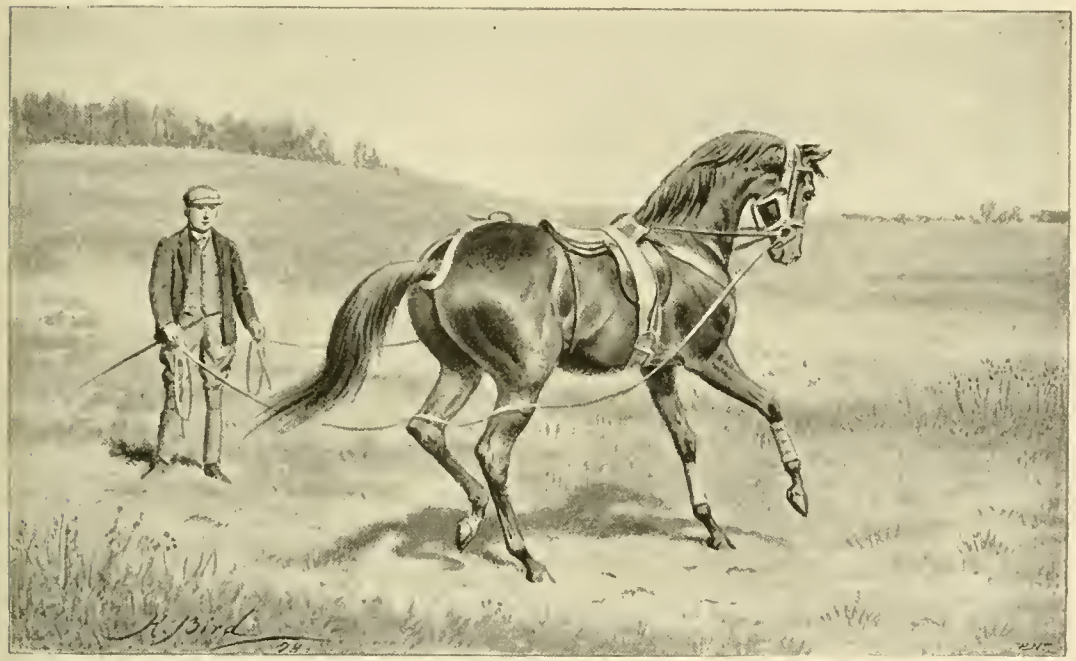
except on the ground of roguery; and if only to clear characters that are besmirched, the Stewards should enquire into such cases; especially as, if they feel themselves unable to decide, they can always report the matter to the Stewards of the Jockey Club, leaving the onus of decision on them.

MESSRS. WEATHERBY. The name of Messrs. Weatherby occurs more than once in this article, and a few words must be added about the firm. Messrs. Weatherby are the active agents of the Jockey Club, the connexion having apparently arisen from the fact that in the year 1773 a Mr. James Weatherby first published the *Racing Calendar*, which became the official organ of the Club. The *Sheet Calendar*, which comes out every Thursday afternoon, and occasionally at other times also, contains records of all races run since the previous issue (including sport under National Hunt Rules), programmes of races to come, notices and orders of the Jockey Club, lists of licensed jockeys, etc., the forfeit lists, and indeed all matters which the Club desire to make known. There are also *Monthly Calendars* and *Book Calendars*; a volume of "Races Past" and another of "Races to Come" are published annually; and at irregular periods Messrs. Weatherby add to their already long array of volumes of the "Stud Book," which gives the pedigree of every thoroughbred foal destined to race—or to be prepared with a hope that he may be able to do so. "Not in the Stud Book" is equivalent to not thoroughbred. Messrs. Weatherby keep what is known as the "Registry Office," and matters too numerous to mention pass through their hands. Before a horse's name is registered it must be sent to their office: and they have authority, delegated by the Jockey Club, to reject it if there is another animal with a similar name, so that the existence of the two might cause confusion. They receive entries for almost all races, and charge fees for their services. But the firm has other functions besides those which arise from their agency to the Jockey Club. They act as bankers for the great majority of owners, and certainly save them an infinity of trouble. It would be a serious business if every owner had to send cheques for his entrance and forfeits, collect his own winnings from stakeholders, pay jockeys and so on. Messrs. Weatherby do all this for their clients. When a man "goes on the Turf" it is customary for him to start an account with Messrs. Weatherby (one or two other firms seek the same sort of business) by paying in a sum of money; all forfeits, entrances, etc., are then paid for him as long as the money lasts, and his winnings are put to his credit. He may win so much that he can draw money for private use, or he may have to replenish his account. Some member of the firm has almost always, if not invariably, filled the position of "Keeper of the Match Book," his business being to receive the stakes and collect entrance money and all other funds belonging to the Club, and he is entitled to charge half-a-crown for every horse entered to run at Newmarket. Once a year, shortly before the Derby, he makes a handicap of the chief three-years-old, thus giving the opinion as to the relative merit. Until a few years since, Messrs. Weatherby were handicappers to the Jockey Club, but they resigned.

JOCKEYS—Considerably over 3,000 horses run every year in England. The number in 1896 was 3,189, and almost all these horses have their own boys, who ride at exercise, and, as the phrase goes, "do" them, that is to say groom and attend to them in their stables. Nearly all these boys are at any rate able to perform the elementary duty of sitting tight on a thoroughbred horse—a wiry, eel-like animal, given to antics which would be very liable frequently to displace an inexperienced rider. They constantly have opportunities of learning much about pace, and keen-eyed trainers are always on the alert to discover boys who show any real skill in horsemanship. When symptoms of ability are perceived the boy is put up to ride trials, races on the home training ground, from which, in the ordinary course of events, he should learn much; and if he displays any promise, and his weight is suitable, he is tolerably sure to be given a mount in public. Out of all this multitude of boys, however, an extremely small percentage ever blossom into jockeys, and there are usually fewer than half-a-dozen of these so far ahead of their compeers that they practically command what terms they like. As much as £5,000 a year has been given for the first call on a leading jockey; for every race this jockey rode he would be paid in the ordinary course of events, in addition to his retaining fee, three guineas for a losing mount, and five guineas for a win. The owner who had the first call on him would of course only utilise his services on occasions; at many meetings he would have no horses running, and that would leave the jockey free to accept other mounts. As a matter of fact large sums are paid for second and third claims on a successful jockey. One of the leading horsemen now riding not long since refused £1,500 a year for a second claim. It will be seen what handsome rewards await success in this profession, and it may also be judged how rare is the combination of qualities which ensure it. A jockey must have in the first place a very accurate knowledge of pace; he must know how fast his horse is going, so that though at times he is in front he may still be "waiting"; he must also be able to sum up at a glance what the other horses in a race are doing, what in fact they have left in them for the finish. He must have patience, and at the same time must ride with resolution, noting the psychological moment

when his effort has to be made. If he waits too long he will be beaten, and if he comes too soon he may exhaust his horse just before the post is reached. When it is considered what success in a great race means, the mere difference of a few inches, whether the horse just wins or just loses, will be appreciated; races on the flat may be worth any sum from £100, the smallest amount permitted by the Rules of Racing, up to over £10,000. In many cases owners have bets which amount to thousands more, and in addition to these there is the enormously increased value of the horse which has the reputation of having won a great race.

A few names stand out among recent or contemporary riders whose styles were in many cases widely different but who attained the same admirable results. It may be noted that the most successful jockeys for many years past have, as a rule, averaged about one win in four mounts. In some cases this has been exceeded, as it was notably by the late Fred Archer, though at the same time it must be remembered that he had a great advantage, inasmuch as owners were always eager to secure his services. If they thought their horses had a good chance of winning they were always anxious to engage Archer, unless, of course, they had at command the services of one of his few capable rivals. During one year, when Archer rode an enormous number of races, from 600 to 700, his successes averaged two in five. He possessed one of the chief secrets of his profession, the ability to understand the peculiarities of the various horses he rode. His principal fault was extreme severity; what might happen to a horse afterwards appeared to be no concern of his; his mind was set on winning the race he was at the moment contesting, and not a few two-year-olds on whom he had won were good for very little afterwards, his whip and spur having taken all the heart out of them. At the same time, if he could persuade a horse instead of coercing him he would do so. On one occasion at Sandown, in a five furlong race, before the distance had been half covered he leant forward and patted the neck of his horse; his quick eye had already assured him, even at that early point of the struggle, that he had nothing to fear from any of his opponents. His method of sitting back, and as it were driving his horse before him, was in striking contrast to that of his great rival, George Fordham, who had anything but a graceful seat upon a horse and was a man of little education and general knowledge, but whose appreciation of the delicacies of his profession was simply phenomenal. It may be doubted whether any one who ever lived understood horses and the art of race riding more thoroughly. The value of a jockey's services, it may be incidentally remarked, has vastly increased of late years. It is not long since for the first call on his services Fordham received £100 a year. In contrast again to Fordham was his friend, Tom Cannon, who to the other requisites of perfect jockeyship added extra-



Driving a Youngster.

ordinary grace. For George Fordham Cannon had the warmest admiration, declaring that all he knew he learnt from his colleague—an expression, however, which may be taken as not a little exaggerated, for he continually profited by his own experiences and singularly astute observation. Tom Cannon's hands on a two-year-old will long be famous in the history of horsemanship. He was usually the personification of gentleness on a horse, and declared that he would as soon hit a child as an anxious young two-year-old that was doing its best; and in this respect, it may be remarked, George Fordham entirely agreed with him. There can be no doubt that Tom Cannon often got more out of a horse by his persuasive methods than any other jockey could have done by the administration of punishment. At the same time, if he had to use his whip, he could do so most effectually; but as a general rule one or two cuts in the last three or four strides was the most he did towards what is called "a punishing finish," and when he did hit a horse, moreover, he always hit him at the right moment, not in the middle of his stride, when the stroke would make him "curl up" and shorten, but as he was about to make it; for such *minutiæ*, which scarcely any one notices, are part of the perfect horseman's equipment. Cannon, so admirable a rider himself, was also the cause of good riding in others. His pupils include his son Mornington and John Watts, who have no superiors in the saddle at the time of writing. S. Loates and Kempton Cannon were also his apprentices and do the fullest justice to their master. Mr. Arthur Coventry, the present starter, in his time unrivalled as a gentleman rider, was another pupil of the famous jockey. Watts' style is closely modelled on that of his teacher, as indeed is that of Mornington Cannon, who, however, perhaps finishes with more vigour and determination than his father was accustomed to exhibit. Both father and son were much given to waiting, a practice which some critics consider that Mornington Cannon carries to excess. Both riders, however, when they have just lost races have sometimes expressed the conviction that if they had only dared to wait for two or three strides longer, they would just have won; and it is by no means certain in this matter that lookers on see most of the game, or at any rate are best able to estimate the situation. It is quite certain that the most usual fault in young riders is the reverse of this, a disposition to begin to finish too soon: they are in too great a hurry to get home, and there can be no doubt that many races have been won by these waiting tactics. It is absolutely certain that Enthusiast ought not to have beaten Donovan in the Two Thousand Guineas of 1889, but Donovan, and Pioneer, who was esteemed his most dangerous rival, spun themselves out before the post was reached. As Tom Cannon said, in accounting for his most unexpected victory, "they had two or three little races to themselves a long way from the judge's box, and when they came near it I thought I would join in." Few persons who saw the race for the Leger of 1894 will doubt that Mornington Cannon only won on Throstle because he waited well behind.

In the season of 1897, an American jockey named Tod Sloan came to England and won a good proportion of races by tactics of a diametrically opposite sort. His method was to jump off and "come through," as the phrase runs. He was a sound judge of pace and so avoided the common fault when races are thus ridden, of keeping nothing in hand for the final struggle. The fact is that both plans are good on occasions, but the circumstances of nearly every race differ according to the pace, the distance, and the capacity and disposition of various horses.

A few lines must be added about amateurs. At rare times an enthusiast obtains leave from the Stewards of the Jockey Club to ride on equal terms with professional jockeys, but the number of these gentlemen is necessarily limited, because the man who seeks the permission must be what he represents himself to be, and not a jockey in disguise; there are few gentlemen whose weight enables them to ride on the flat; and unless the amateur has shown that he is really an expert the Stewards would refuse his request, for the reason that he would be likely to hamper and interfere in a dangerous way with the other riders. The late Mr. George Baird, who ran horses in the name of "Abingdon" and won the Derby and Oaks with Merry Hampton and Busybody, was one of the few amateurs who have ridden much of late years; and in spite of wasting and severe privation he could only take part in welter races. By constant practice he acquired considerable skill, and at the last held his own with fair success against professional opponents of the second class.

TWO-YEAR-OLD RACES—It must be assumed that by a happy combination of gentleness and firmness, by good hands, a strong seat in the saddle, and a temper most under control when most severely tried, the yearling has been backed, after the preliminary processes of bitting, saddling and lunging; that he has been accustomed to daily exercise with his companions, led by a placid old horse; and that after being "jumped off" he has shown the possession of such speed as suggests that he is worth training. The 1st of January comes and he is a two-year-old with a prospect of running possibly in as little as three months. In some instances a two-year-old has been entered for races before he was born, as for example in the Buckenham Stakes at the Newmarket First October Meeting, for which subscribers name three mares

and send the produce of one to the post. In various other races the animals are entered as foals, and in others again at different periods of their yearling existence. It will readily be understood why entries close so long before the time set for the race. If owners could wait till their young horses gave some actual proof of capacity the number of subscribers to many stakes would be small. A foal or a yearling, well bred, good looking, and with no apparent defects, may, however, turn out well, and so the owner nominates his colt or filly and takes his chance, the conditions of races very often enabling him to strike it out on payment of a minor forfeit should it entirely disappoint expectations or in any way suggest inability to gallop. Much misapplied criticism is directed by ill-informed persons to what they regard as the forcing of the immature animal. The truth is that there are some two-year-olds, usually small and well developed, who if they did not win races early in the season would never win at all. Owners and trainers take stock of their youngsters and enter them accordingly.

Examination of the volumes of *Races to Come* will show that some horses are entered for stakes run early in the season, their names being rarely or never found in races that take place later in the year; for other animals no engagements are made till the summer and they are nominated frequently for events in the autumn. It will be understood why this is so—owners and trainers judge when their representatives are likely to "come to hand." There are those again that give promise of early maturity and have something about them which forbids their owners to despair of subsequent development. It is an extremely rare thing to find a horse entered for, say, the Brocklesby Stakes, run towards the end of March, and the Middle Park Plate, run in the middle of October, though at the same time, Donovan, in 1888, actually won both. As a general rule, however, when October comes the winner of the Brocklesby is very lightly esteemed and the chances are that before June the winner of the Middle Park has not been seen on a racecourse. The winner of the Brocklesby "may be anything," as the phrase goes. The Bard won in 1885 and held his own next year, running a good second to Ormonde for the Derby; in four years out of six The Bard would doubtless easily have won the great race. In 1886 April Fool won and soon sank to "plating." In 1887 Volcano won and not long afterwards was being badly beaten in selling handicap hurdle races, the lowest form of contest the Turf knows. In 1888 Donovan won and subsequently proved himself one of the most successful horses ever known on the Turf. But The Bard and Donovan were notable exceptions to the average run of Brocklesby winners.

It is seldom that two-year-olds destined to attain to the front rank are out before, at any rate, the Woodcote Stakes at Epsom. The Woodcote was originated in 1807, and with the exception of the July Stakes at Newmarket, first run in 1786, is about the oldest two-year-old contest now surviving. Derby winners have won the Woodcote—Cremorne (1871) and Ladas (1893); but in the ordinary course of events it is not till Ascot, a fortnight after the Derby, that one sees the two-year-olds on which the fame of the English racehorse is to depend. The New Stakes at Ascot dates from 1843; the list of winners is a brilliant one, and now come names that are to be met with again in the Middle Park Plate, the most important stake for horses in their first season. Of late (since 1890) the Coventry Stakes has been added to the Ascot programme, and this is of equal interest with the older race; indeed, it is in one respect superior, for in the Coventry all competitors meet at even weights (except as regards the usual 3 lbs. allowance for fillies) and in the New Stakes there are penalties and allowances. Kermesse, Melton, Friar's Balsam, Donovan, Isinglass won both New Stakes and Middle Park Plate, and Ladas won the latter after carrying off the Coventry. At Ascot one begins (often, however, arriving at most incorrect conclusions) to speculate upon how the two-year-olds of the season should be rated, and it is probable that further light will be thrown upon the question by the July Stakes at the Newmarket First July Meeting and the Chesterfield (1834) at the Second July. Here, too, Middle Park winners and Dewhurst winners (the Dewhurst ranking only second to the Middle Park) are found, as they are in the Richmond and Prince of Wales's Stakes at Goodwood. It was at Goodwood that St. Simon ran for the first time, though in a minor event called the Halnaker. There are rich stakes at Sandown, Kempton and elsewhere which attract excellent fields, but the programmes here are somewhat mutable, and these races have not yet existed long enough to gain prestige by their association with many famous names. The most valuable two-year-old race now is the National Breeders' Produce Stakes, run at Sandown the day after the Eclipse, and worth well over £4,000; but the Portland Plate at Leicester, won by Donovan in 1888, amounted to £6,000. As to the importance of the Champagne Stakes (1823) at Doncaster there can be no question. Occasionally it falls to a moderate horse—Ayah, Solaro and Grandison are poor examples of Champagne winners—but of late years one finds the names of Velasquez, Ladas, La Flèche, Riviera, Chittabob (one of three horses that—with an advantage of 13 lbs. in weights—beat Donovan), Ayrshire, Minting: and further back many others of note. There had for a long time been urgent necessity for a good two-year-old race late in the year, a contest that would attract the best horses and really show the capacity of the principal two-year-olds, and

such a prize was founded at the suggestion of Mr. Blenkiron in 1870. This gentleman was a breeder of thoroughbred stock at the Middle Park Stud, and the race was named accordingly, he having subscribed £500 towards the stake. At once it became established as the chief two-year-old event of the season. An average of exactly fourteen starters has gone to the post, and the winners have nearly always been animals of the very highest class since Albert Victor's name was inscribed at the head of the list. A fair share of the misfortunes that horse flesh is heir to has befallen winners, it is true. A horse entered here would almost invariably be nominated for the Derby and the St. Leger, so that if all went well with the winner his chance at Epsom should have been specially good; but for a long time an unfortunate fate seemed to overshadow Middle Park winners in their advance to Derby honours. Something untoward happened year after year. St. Louis and Macheath failed to stand training, and it was not till 1885 that Melton broke the spell, and won the Derby after winning the Middle Park—though Busybody after taking the latter in 1883 had won the Oaks next year. Since then the result of the Middle Park has pointed strongly to the result of the Derby. Six horses have run in both, four of them have won both—Donovan (1888), Isinglass (1892), Ladas (1893), Galtee More (1896). Gouverneur won the Middle Park in 1890 and ran second, the colt that beat him, Common, not having run in the Newmarket race. St. Frusquin, who won the two-year-old race in 1895, was just beaten at Epsom.

The Middle Park Plate takes place over the Bretby Stakes Course, six furlongs, and soon after its inauguration it was felt desirable to have another and a still severer test of merit in the shape of a seven-furlong race. The Dewhurst Plate was therefore started at the Houghton Meeting in 1875, and speedily shared the success of the race which makes so interesting a feature in the Second October. The Middle Park Plate is usually worth nearer £2,000 than £3,000, the Dewhurst about £1,000 less, but the lists of winners are of nearly equal merit, and on several occasions both races have been won by the same horse—Chamant (1876), Friar's Balsam (1887), Donovan (1888), Orme (1891), and St. Frusquin (1895). Another noteworthy race at the Houghton Meeting is the Criterion Stakes, first run for in 1829. This is a good test of staying ability as it finishes up the Criterion Hill at "the top of the town," a severe six furlongs. It has fallen to horses of very various capacity, to very bad ones, such as Oakdene, Aureus and Cayenne, and to Jannette, winner of the St. Leger, Thebais, winner of the Oaks, Bruce who would have won the Derby had he been properly ridden and who did win the Grand Prix, to Melton, Ormonde and others of high standing.

Two-year-olds are not permitted by the rules of racing to run a longer distance than six furlongs before the 1st of July; and until the 1st of September they always run at weight for age, with or without penalties or allowances, according to the nature of the race; but on the 1st of September "Nurseries," or two-year-old handicaps are allowed, and restrictions as to distance are removed; indeed, in the Houghton Meeting there is a Feather Plate over the trying Cesarewitch course, two miles two furlongs, in which the young horses meet their elders, and the race is nearly always won by a two-year-old—who is as a rule worthless afterwards. Another race at the Houghton Meeting, which always promises well and nearly always disappoints expectation is the Free Handicap for Two-year-olds. Horses are not entered by their owners for this stake. The handicapper takes the best known two-year-olds and weights them according to his estimate of their capacity, thus enabling one to learn how they stand in the eyes of an impartial authority. The field, however, very seldom includes those that the lover of the Turf would chiefly desire to see in antagonism.

WEIGHT-FOR-AGE RACES—It has been seen that practically everything depends upon the weight a horse carries. There is an old saying that weight will bring together a donkey and a Derby winner, and the extravagant assertion may be accepted as tending to show how vast a difference a horse's burden is recognised as making. Weight-for-age races are of three varieties. In the first place there is what may be called weight-for-age proper, in which animals of the same age carry the same weight, as in the Coventry Stakes at Ascot and the Champagne at Doncaster, for two-year-olds; the five "classic" races for three-year-olds, and a very few stakes which linger for older horses. Here the only variation from even weights is that mares and geldings are allowed 3 lbs. In the second place, there are races, like the New Stakes at Ascot and the Middle Park Plate at Newmarket, for two-year-olds; the Prince of Wales's Plate at Ascot, for three-year-olds, &c., where horses of the same age carry the same weight, with, however, penalties for previous successes, and, in the case of the Ascot race, maiden allowances. In the third place, there are weight-for-age races in which horses of different ages meet and are weighted according to the table already given.

Of weight-for-age races, the five "classic" events are supposed to come first, and the Derby first of these. Since this point of view was adopted, a number of valuable and important stakes have been introduced, wherein Derby winners may and do meet each other; and a special prestige has always attached to the Ascot Cup, in which there are none of the penalties

and allowances that "bring horses together," and where also Derby winners and others of the highest class may be found in opposition. The five three-year-old classic races are, however, the Two Thousand Guineas, for colts and fillies, dating from 1809, and the One Thousand, for fillies only (1814), run at the Newmarket First Spring Meeting; the Derby, for colts and fillies (1780), and the Oaks (1779), for fillies only, run at the Epsom Summer; and the St. Leger, for colts and fillies (1776), run at Doncaster. It is difficult to understand why the Derby should be so generally, if not universally, regarded as the chief of these. The mile and a half Epsom course is far from

GOING TO THE POST.

one of the fairest, as a horse that has the misfortune to be badly placed when Tattenham Corner is rounded is at a great disadvantage; whereas the Doncaster course (1 mile, 6 furlongs, 132 yards) is one on which there is much less chance of jostling and accidental interference; it is longer, and so affords a better test of merit—except that in the period of from three to four months that elapse between the races the young horses have "come on" and acquired stamina; and, besides these things, the Derby winner usually runs, to prove or disprove the correctness of the Epsom race, and not seldom he meets the Oaks winner, so that an interesting point as to the relative capacity of the colts and fillies of the season comes on for decision.

Horses are entered for the Derby in the middle of their yearling season—thus the entries for the Derby of 1898 closed on July 21st, 1896. The reason for these early entries has already been given: if owners were allowed to wait until they had ascertained something of the real ability of their animals, many fewer subscriptions would be taken; as it is, the chances are that the most promising colts and a smaller proportion of the most promising fillies are given an opportunity of obtaining what is supposed to be the highest honour the Turf affords. A few years since there was no "minor forfeit" for the Derby, that is to say, a man entered his horse, paid £50 if he ran it, and £25—half forfeit—if he did not. Now, however, if his representative turns out disappointingly, and seems to have no chance, further liability can be escaped by payment of £5 at a date in the January after entry. The subscriptions seldom fall far short of 300, and have exceeded that total—there were 301 for the Derby of 1897. The stakes have been well over £7,000, but they have also sunk to under £5,000, and now the value is fixed at £6,000, of which the second horse receives £300, and the third £200; so that the winner saves his £50 stake and secures the balance, £5,450. Derby time is never very good, because of the nature of the course. The average for a considerable number of years past has been a rate of 1 minute 48 seconds a mile, and in a well run race a mile

ought not to take much more than 1 minute 40 seconds; but, as is elsewhere remarked, nothing is more foolish and absurd than paying attention to the times races occupy. The subject of Derby winners is treated later on in this article, under the side-head "Famous Horses."

Entries for the St. Leger are made as nearly as possible two years before the event, in the September of the animals' yearling existence. Subscribers pay £25 whether they run or not, and the value of the stake therefore depends entirely upon the number of subscriptions. These are usually some sixty or seventy fewer than for the Derby, but there is no minor forfeit, and the two races are as a rule worth not very far from the same amount. For the Two Thousand and One Thousand Guineas, £100 each, half forfeit, is the condition. Entries for these close about six weeks after the St. Leger, and in number they usually fall short of a hundred. The stakes vary in total between £4,000 and £5,000. The conditions of the Oaks are the same as for the Derby, except that in the fillies' race the nominator of the winner receives £400, the owners of second and third £200 and £100. Another important three-year-old race is the Newmarket Stakes of at least £3,500, by subscription of £30 each. This is run at the Newmarket Second Spring Meeting, and the tendency of it is not wholly for good, as it affords a temptation to owners to run horses which have probably taken part in the Two Thousand a fortnight previously, are to go for the Derby, a fortnight later, and are thus overtaxed. For several years there was a three-year-old race at Epsom called the Grand Prize, set for the day after the Derby: but this failed for obvious causes, and has been discontinued. Horses that had run the day before were likely to be feeling the effects of their exertions, if, indeed, their owners sent them to the post; animals that seemed to have any chance for the Derby were almost certain to have been run in it; if any were specially kept for the Grand Prize it was because of their obvious inferiority, and the contest was felt to be unsatisfactory. One thing to be specially desired every year is a good field for the Ascot Cup, but the average of runners is only from three to four, and it is perhaps not unnatural that this should be so. Two or three horses nearly always stand out by themselves, if, indeed, one animal does not appear to do so, and as there are here no penalties or allowances (beyond the inevitable 3 lbs. for mares and geldings), few owners care to submit their horses to the ordeal of a preparation for a struggle over two miles and a half, with a very faint prospect of victory. Three-year-olds carry 7 st. 7 lbs., four-year-olds 9 st., five, six, and aged 9 st. 4 lbs. But when worthy opponents are in opposition it is truly a great race. The Goodwood Cup is weight-for-age with a difference. One horse may be penalised 21 lbs., another may be allowed 14 lbs., if a maiden four-year-old, 8 lbs. in addition if bred in British colonies or dependencies, making 22 lbs. in all, so that one four-year-old might have to give another no less a weight than 3 st. 1 lb.

About the year 1884 it occurred to the managers of Sandown Park to inaugurate a race that should be the richest in England, and ingeniously to do so in a way that would not be likely to cost them anything; for these gate-money meetings are commercial speculations, whatever they may do for the sport. A round sum of £10,000 was to be the prize, and owners were to subscribe it out of their own pockets, though if a sufficient number of entries were not obtained there might be an amount for the Club to make up. The idea will be understood by a study of the conditions, which were as follows for the first Eclipse, run in 1886:—

> The ECLIPSE STAKES of 10,000 sovs. nett, with 500 sovs. for the second, the third to save his stake of 110 sovs.; three-year-olds, 8 st.; four, 8 st. 12 lbs.; five and upwards, 9 st.: mares and geldings allowed 3 lbs.; winners of a stake value 500 sovs. to carry 4 lbs., of 1,000 sovs., 7 lbs. extra (handicaps not included); winners of the Derby, Oaks, St. Leger, or Grand Prix de Paris to carry 10 lbs. extra; about one mile and a quarter.—265 subs., 103 of whom pay 10 sovs. each, and 66 of whom pay 30 sovs. each. By subscription of 10 sovs. each, the only forfeit if declared by the first Tuesday in October, 1884: if left in after the first Tuesday in October, 1884, a further subscription of 20 sovs.; if left in after the first Tuesday in January, 1885, a further subscription of 30 sovs.; if left in after the first Tuesday in January, 1886, a further subscription of 50 sovs. In the event of the forfeits exceeding the expenses of the stake, the surplus will be devoted either to a Consolation Stakes for the unplaced starters, or will be divided between the second and third horses, at the discretion of the Executive.

It thus cost £110 to run, that is to say, owners were taking the liberal odds of 10,000 to 110 about their horses, with the chance of certain other recompenses or compensations. The scheme was successful, though in 1887 and 1890 there was no race. In amount, the total of the stakes has varied, dependent as it is on the number of entries. Ayrshire's Eclipse was worth £11,160, St. Frusquin's £9,310. These Ten Thousand Pounders, as they were called, were tempting races for conductors of meetings, and other places followed the lead of Sandown. The Lancashire Plate was started (1888) at Manchester, and Seabreeze, who had beaten Ayrshire in the St. Leger a fortnight previously, beat him again, and credited her owner with the curious sum of £10,222 10*s.* 10*d.* Le Sancy, at the time of writing the best sire in France, was third. A race called the Royal Stakes was run at Kempton, and added £9,500 to Ayrshire's large winnings on the year. There he had the best of Seabreeze, who was second. The Prince of Wales's Stakes, for three-year-

olds, was also devised at Leicester, and Donovan in 1889 earned £11,000 by his victory; but the race was a mistake, as it was fixed for April, and it was felt to be doubtful policy for owners who wanted to run their horses in the classic races to have them ready so soon. Colts and fillies could not well be trained for this event and be at their best a few weeks later in the Two Thousand, a month afterwards in the Derby, and between three and four months later still, in the St. Leger. The Leicester race was for a time transferred to the Summer Meeting and reduced in value; but this, together with the Royal Stakes and the Lancashire Plate, have now been abandoned, though on the other hand, the Stewards of the Jockey Club have introduced two £10,000 races at Newmarket, the Princess of Wales's Stakes, run at the First July Meeting, and the Jockey Club Stakes at the First October. The conditions of these are on the lines of the Eclipse, and these three are now the only stakes of this value. Comments on them are made in the division of the article headed "Famous Horses." The two Newmarket Ten Thousand Pounders date from 1894.

Other more or less notable weight-for-age races are the Alexandra Plate at Ascot, the only three mile contest run regularly. It is always fixed for the last day, and, as the Cup has been run for on the previous afternoon, and stayers are so few, the field is invariably very small, owners of Cup horses seldom being willing to subject their animals to the ordeal of two such races, especially on the well-nigh inevitably hard ground. The Doncaster Cup (1801) must also be mentioned, and the Jockey Club Cup, over the Cesarewitch course, at the Houghton Meeting; but for the last twenty years there have never been more than half a dozen starters; four times it has resulted in a walk over, and on seven occasions been reduced to a match. The Champion Stakes, also at the Houghton, must not be omitted, by reason of the good horses that have won it—Jannette, Rayon d'Or, Robert the Devil, Bend Or, Tristan (twice, besides a dead heat on a third occasion), Paradox, Ormonde, Bendigo, Friar's Balsam, Amphion, Orme and La Flêche. The conditions of the Challenge Cup and Whip will be found set forth in the "Rules of Racing," and need not be repeated. The Whip is a trophy containing hairs from the tail of Eclipse.

FAMOUS HORSES—Some few years since a journal devoted to racing sought the ideas of a number of authorities as to the names of the best ten horses of the century. Great difference of opinion prevailed, there being general agreement about only a few animals. Ormonde and St. Simon were in all the lists, and they could not well have been omitted, seeing that neither had ever been beaten; and, indeed, except when Ormonde, after he had become a roarer, was pressed by Minting in the Hardwicke Stakes of 1887, all their races had been won with ease, though if I remember correctly, T. Cannon, the jockey who rode him in his last race, told me that he touched the horse with his spurs. This, however, was a furlong scurry. The Flying Dutchman, Voltigeur, and West Australian were usually included. Blair Athol had supporters, notwithstanding that doubts were expressed as to whether he was really a stayer; and Gladiateur was not forgotten. Galopin was almost the first choice with a band of enthusiasts who chanced to know how greatly superior he was to some amongst his contemporaries that were almost universally accepted as really good horses. Isonomy, in spite of the fact that his chief performances were in handicaps, was rated as one of the ten by numerous votes; and in fact these nine received most suffrage. Donovan and Isinglass had not made their names at the time when this difficult question was being discussed, or no doubt both would have had pronounced admirers.

It is absolutely impossible to form any trustworthy estimate of the relative capacity of horses of the present day and their remote predecessors. The late Sir Francis Doyle and some other lovers of the Turf, who wrote plausibly and well, have endeavoured to prove that the modern thoroughbred has deteriorated in stamina if not in speed, and that over the Beacon Course the horses of the '80's and '90's would have had no chance against the stalwart racers of the first half of the century; but there is no real basis of justification for this argument. Horses were formerly trained to gallop the Beacon Course; they are not so trained now; and as to the pace at which they went, we have no knowledge. In all probability they took a long while about it, but records as to time are, we may be sure, altogether untrustworthy, considering for how many years the preposterous fiction of a mile a minute received credence. It is a perplexing business to endeavour to sift out the truth about the capacity of horses. Some writers are given to eulogising bygone days. The horses of their youth appear to them far better than any they have seen since; others, again, are constantly making fresh idols, and discover the "horse of the century" every other year. Prejudice, too, is a mighty factor in most comparisons. Men are interested in horses and magnify their achievements; possibly they base their calculations on some trial which was never authenticated by public running, and they implicitly believe that it was quite right when it may, in fact, have been quite wrong. More probably still, they are prejudiced against a horse, disgusted, it may be, by the panegyrics expressed in wild and whirling words by fatuous enthusiasts, and so try to pick holes by way of

proving that these enthusiasts are writing nonsense. Unbiassed and dispassionate judgment is rare, and when it is found, it may be based on inaccurate or insufficient grounds.

In these articles I have sedulously avoided quotations, of which so many books on racing are so largely made up, but it is obvious that no new ideas can now be promulgated about the famous horses of long ago; and it may be very briefly stated that Marlow's observation when he first rode the Flying Dutchman (on whom he won the Derby of 1849) must surely be accepted as going far to stamp that colt a great one. "I was never on such a one as this before!" was the remark of that experienced jockey. Voltigeur is naturally coupled with his immediate predecessor in the list of Derby winners, and it is curious to recall the fact that when this notable animal was offered for sale at auction as a yearling no one would bid 100 guineas for him. Frank Butler's inarticulate admiration when first he saw West Australian, and the circumstance that he found the colt did more than justify his appearance, tend to gain for this notable son of Melbourne a place in the very front rank. The question was not whether he was sure of the St. Leger, but by how much it would be desirable to win, Butler declaring that if he won by the length of his arm it would do, whilst Isaac Walker, who managed the colt, protested against heads and half-necks, and running things close generally. Blink Bonny (a daughter of Melbourne) was doubtless one of the best mares of modern times, and therefore in all probability in the history of the Turf; and Stockwell's name is almost unsurpassed in racing annals. It is usually discreet to avoid superlatives, but if it should not be said that no horse ever did such good service to the race of the English thoroughbred, it is safe to assert that none has ever done better. His sire, The Baron, won the Leger of 1845, and from him we have a direct line to some of the greatest horses of the present day. Here is a list of his contributions to the roll of classic winners.

TWO THOUSAND GUINEAS.

1852.	Lord Exeter's ch. c. Stockwell,	by The Baron.
1862.	Mr. S. Hawke's b. c. The Marquis,	by Stockwell.
1866.	Mr. Sutton's b. c. Lord Lyon .	,, ,,
1871.	Mr. J. Johnstone's br. c. Bothwell.	,, ,,
1873.	Mr. W. S. Crawfurd's ch. c. Gang Forward	,, ,,

ONE THOUSAND GUINEAS.

1863.	Lord Stamford's ch. f. Lady Augusta .	,, ,,
1866.	Marquis of Hastings' b. Repulse .	,, ,,
1867.	Col. Pearson's br. Achievement .	,, ,,

THE DERBY.

1864.	Mr. W. I'Anson's ch. c. Blair Athol .	,, ,,
1866.	Mr. Sutton's b. c. Lord Lyon . .	,, ,,
1873.	Mr. Merry's ch. c. Doncaster . .	,, ,,

THE OAKS.

1865.	Mr. W. Graham's Regalia . .	,, ,,

THE ST. LEGER.

1860.	Lord Ailesbury's St. Albans . .	by Stockwell.
1861.	Mr. W. I'Anson's Caller Ou . .	,, ,,
1862.	Mr. S. Hawke's The Marquis . .	,, ,,
1864.	Mr. W. I'Anson's Blair Athol . .	,, ,,
1866.	Mr. Sutton's Lord Lyon . . .	,, ,,
1867.	Col. Pearson's Achievement . .	,, ,,

Six times in eight years, it will be seen, Stockwell's sons and daughters carried off the St. Leger, whilst Doncaster's son, Bend Or, won the Derby of 1880, and became the sire of Ormonde, who won the Two Thousand, Derby, and St. Leger six years later.

If this division of my work deals chiefly with comparatively recent times, it is because we have more trustworthy data to go on, and in consequence of a belief that readers will be more interested in animals whom they have seen, or the exploits of whose progeny they have witnessed. The success of Blink Bonny in the Derby of 1857—the second of the three fillies that have won it in 118 years—reminds one that the old rivalry which used to exist between northern and southern stables, notably between Yorkshire and Newmarket, has practically disappeared. John Scott of Whitehall, the "Wizard of the North," as he was called, was a power in the racing world of his day; and his brother William, if not too scrupulous or too sober, was doubtless a highly effective horseman. The Dawsons, too, came from the north—from farther north than Whitehall, indeed—and the great reputation of John Scott and one or two more northern trainers tended directly or indirectly to the establishment of other north country stables, as head lads and capable men who had learnt their business under masterly tuition found patrons to fill stables for them. Newmarket was really very little esteemed as a training centre some fifty years ago, odd as that may seem at present. The Dawsons came south, however; other establishments followed, and nowadays, though the name of I'Anson, associated with Blink Bonny, Blair Athol, and other famous animals, survives and is prominent on occasions, the northern stables are regarded by the southerners—whatever opinions may survive in Yorkshire—as generally inferior. Blair Athol was the culmination of northern glory, and that the chestnut made something of a sensation when he cantered to the post for the Derby on his first appearance on any racecourse there can be no doubt. The Duke of Beaufort recounts—though the story has never been published—how greatly he was struck by the looks and action of the son of Stockwell; so much so, indeed, that, having had a great fancy for, and having backed, another horse in the race, he straightway went to the ring, and took care that Blair Athol's victory should not be unprofitable to him. The colt had great speed and a certain amount of stamina, but, as already remarked, he was not universally

accepted as a stayer. When a handicap horse called The Miner beat him at York, excuses were made, as they always are in such cases, for his defeat; but John Osborne, who rode The Miner, states that he was not at all surprised at his success, and, indeed, expected to win. Two of Blair Athol's sons won the St. Leger, but neither Craigmillar nor Silvio (who also won the Derby) was a good horse; indeed, it is demonstrable that Craigmillar was greatly inferior to Galopin.

This is somewhat overshooting the mark, however, for Blair Athol's year was 1864, and there was a three-year-old in 1863 who had and has staunch admirers. He did not win the Derby either, having been just beaten in that race; for reference is made to Lord Clifden, who—possibly by ill luck, but the point does not now need argument—succumbed at Epsom to Macaroni. There are some animals that, for reasons not very easy to trace, firmly win a place in the affections of lovers of the horse, and Lord Clifden was one of these, possibly because this idea of his bad luck in the Derby so strongly prevailed. He carried off the St. Leger, after having been left at the post, so that he had an apparently impossible distance to make up, and it was a triumph of patience and judgment on the part of his jockey, John Osborne, that he beat his eighteen opponents. Whatever may have been the relative merits of Macaroni and Lord Clifden when in training, the chestnut son of Newminster has done far better service at the stud. Macaroni is chiefly remembered by his two daughters, Spinaway and Camelia (who won the One Thousand and ran a dead heat for the Oaks with Euguerrande) although the former, it is true, was the mother of a memorable family; but no fewer than four Leger winners were sired by Lord Clifden: Hawthornden (1870), Wenlock (1872), Petrarch (1876), and Jannette (1878). The blue blood of Wenlock is still in evidence, with promise of much to come, moreover. His daughter, Wedlock, dam of Best Man, was sold at auction when twelve years old for 4,600 guineas; and Petrarch was sire of The Bard, who has done excellent things at the stud in France; for though critics complain that his stock are light of bone and are prone to bad hocks, they keep on winning. Another Petrarch, Throstle, won the Leger of 1894, moreover, so that Lord Clifden must assuredly be included among famous horses.

The idea that a French bred horse could win the Derby had been deemed impossible prior to 1865. Gladiateur had beaten a big field of twenty-nine starters in the Two Thousand, and not a little fluttered the holders of pronounced opinions on the subject of the invincibility of the English horse; but the Two Thousand was not the Derby, and a strong conviction was felt that something or other would come to the rescue of the British reputation at Epsom. But nothing did. The son of Monarque followed in the footsteps of West Australian, who won all three "classic" races in 1853, and there was nothing to be said beyond the expression of an unworthy doubt, started by bad losers who could not take defeat gracefully, as to whether he was really a three-year-old. The feat was to be repeated next year by Lord Lyon, and both were horses of the very first rank. Lord Lyon's early trials were exceptionally good, indeed, his first gallop was wonderful, for on September 10th, 1864, the Saturday before Doncaster, when he was a yearling—an age at which very few horses are ever asked to gallop, and if they are at all it is usually three months later—he was only beaten a head over a severe three furlongs by a really smart two-year-old named Jezebel, who was giving him no more than 7 lbs, the weight being—Jezebel, 2 years, 8 st. 10 lbs., and Lyon, 1 year, 8 st. 3 lbs. "A tremendous performance for a yearling," is Lord Suffolk's commentary in his admirable book on *Racing*. Afterwards he did great things in private and in public; but the "glorious uncertainty of the Turf" was exhibited in those days at the stud. Gladiateur never got a good horse, though his name is found in the pedigrees of French winners, and Lord Lyon—unless the useful mare, Placida, be counted—is memorable only as the sire of Minting, one of those horses who would have made a mighty name for himself but for the fact of his always having to beat, or to try to beat if he was asked to attempt it, one unquestionably superior animal—Ormonde.

Hermit was certainly a famous horse, though by no means of the first rank. The story of his sensational Derby victory in a snowstorm after he had broken a blood-vessel and been stopped in his work is too familiar to bear repetition; it was, indeed, less the race itself than the circumstances attending it which made the event remarkable, and this romance of the Turf is unsuitable for discussion in these pages. The rivalry between the Marquis of Hastings, represented by Lady Elizabeth, and Mr. Chaplin (now and for long past a sedate politician), with Hermit to run for him, was keen in the extreme; Marksman was a colt of whom the greatest things were expected, and until the Duke of Beaufort went to Danebury and found that John Day had sorely overdone the Two Thousand Guineas winner, Vauban, the prospects of the Badminton light blue and white hoops had looked rosy. That Lady Elizabeth had been run to pieces as a two-year-old there can be no doubt, and though, as a rule, what is past soon becomes archaic and uninteresting in this rapid age, the true story of Lord Hastings's racing career would always be absorbing. It has, indeed, occupied many pens, but it is all too evident that the writers have usually drawn upon their imaginations for their

facts, and they differ ludicrously about their fiction.

In some years the fillies are greatly superior to the colts, and 1867 furnishes a case in point. Achievement, the daughter of Stockwell and own sister to Lord Lyon, the hero of the previous season, was doubtless unapproachable, and a wonderful animal to boot, for though she never ran as a four-year-old, and in her day the rich stakes of £10,000 (and upwards for they have sometimes exceeded the nominal amount), which afterwards came into origin, were not inaugurated, she is one of a select little company of horses that won over £20,000, a list of which will presently be given; and she was followed by another filly of almost equal fame, who also comes into the narrow list of "over £20,000," and whose reputation is scarcely all that it should be for a very simple reason. Formosa, a daughter of Buccaneer, carried off the One Thousand, the Oaks, and St. Leger; and she was not beaten for the Two Thousand. In that race she ran a dead heat with a horse of Mr. W. S. Crawfurd's named Moslem; he subsequently walked over, and she is consequently not enrolled as a winner of the first classic race of 1868; but that he was inferior to Formosa few ever doubted, and he consequently enjoys credit, which he does not really deserve, as the victor in this event. He was a sadly bad-tempered horse, and sank to the lowest depths.

"He won the Derby" is the best recommendation a horse can have whilst he lives, the most effective and suggestive epitaph he can earn. The world in general accepts this as fame, in spite of all that is urged about the probably higher value of the St. Leger as a real test of merit, disregarding the circumstances, so obvious to experts, that between Derby winners there is a vast amount of difference. Ormonde won the Derby; so did Sir Visto; and as Derby winners the outsider would very likely place them on the same mark; but though it is quite impossible accurately to gauge the respective capacity of the fields of 1886 and 1895, if experts do not agree that Ormonde was a 2 st. better horse, it is only because many good judges will continue to doubt whether that difference of weight would have brought the two together had they been contemporaries. Accepting this view, and having regard to the need of brevity in this article, it is not every Derby or Leger winner whose performances can be discussed at length or even liberally summarised.

Avoiding not thrice, but thirty-times-told tales, little need be said about the Derby of 1868, which Sir Joseph Hawley won with Blue Gown. To win the Derby at all is so great an object of every owner's ambition, or of every owner with very few exceptions, that one might have supposed Sir Joseph Hawley would have been content, the more so as his success was achieved for the fourth time; but he was anxious to win with Rosicrucian, always maintaining that this was the better of his three starters, for Green Sleeves ran as well as Blue Gown. The details of this story are given in John Porter's book, *Kingsclere*, and in numerous other publications, so that it need not be dwelt on here, the more so as Blue Gown's name has now dropped out of Turf history, the horse having died while crossing the Atlantic to stand in America. For the next few years the Derby and St. Leger winners were chiefly famous because they won the Derby or the St. Leger. Pretender's success in 1869 was one of the races about which the crowd differed from the judge; there was an idea that Pero Gomez had just got up, but the judge doubtless knew best, though Pero Gomez had his revenge at Doncaster. Lord Falmouth certainly managed his racing affairs with great discretion: but that luck, which has been spoken of as a prevailing element, certainly aided him in his two Derbys; for Kingcraft in 1870 and Silvio in 1877 were both a good deal below the average of Derby winners. It has already been remarked that Galopin has admirers who believe him to be as good as any horse that ever ran. A son of Vedette, he could not have been more English, but his owner, Prince Batthyany, was one of the many distinguished foreigners who have found an irresistible attraction in the English Turf; and in the next year also the Derby went abroad, Mr. A. Baltazzi having been the owner of Kisber, a son of Buccaneer, and so a close relation of Formosa. What is the worst horse that ever won the Derby is a point upon which agreement could hardly be reached. Sefton, Sir Bevys, Merry Hampton, Sainfoin, and Sir Visto would probably all be named if the question were put to the vote, and so little need be said about them under the present heading. Probably Sir Bevys owed his victory in a great measure to the fact of Fordham having ridden him with peculiar discretion. The weather is generally fine during the Epsom Summer Meeting, but that year the course was a quagmire on the lower side, and Fordham came wide on the right, thus running a little farther, but securing firm ground to gallop over. He was a great believer in the difference made by good going, thinking the smallest advantage well worth gaining, and there was a track at Newmarket along which he always took his horse under certain conditions of going. The Derby of 1880 is memorable for the desperately close struggle between Bend Or and Robert the Devil, and hard as I am trying to avoid the repetition of facts which will probably be known to most of my readers, it must be remarked that Robert the Devil ought certainly to have won, but that his jockey looked round and was apparently paralysed by Archer's desperate rush with the Duke of Westminster's colt, notwithstanding that the famous jockey was riding with one arm at the time, not having recovered

from the injuries inflicted when he was savaged by Muley Edris.

When there are two notable horses of the same age it not seldom happens that some unfortunate chance keeps them apart, as, for instance, was the case in 1884, when lovers of the Turf were exceedingly anxious to see what would happen if St. Simon and St. Gatien could meet over two miles. Bend Or and Robert the Devil, however, had several tussles, and each scored in turn, though in the St. Leger Robert the Devil had it all his own way, Bend Or being nowhere in the race; and when they repeated their struggle over the Epsom course for the Cup, Robert the Devil turned the tables on the Derby victor, though as a matter of fact the neck by which he won did not mean very much, as neither horse was really himself at the time. The fact of the matter doubtless is that Bend Or had the better speed and that Robert the Devil was the better stayer. At the distance of a mile and a quarter it is probable that the chestnut would have won, but over the Cesarewitch course the general opinion would have leant almost unanimously to his rival. The French and the Hungarians had, it will be seen, carried off the Derby, and in 1881 it was to go to America by the aid of Iroquois, a son of Leamington. Iroquois was probably not a good horse, though he won the Prince of Wales' Stakes at Ascot with the full penalty, an achievement which always counts in reckoning up a horse's capacity, and he did all that was asked of him in the St. Leger without difficulty. About this time the fillies were doing well. Going back a little way, it is obvious that Marie Stuart (in 1873), who won the Oaks, was better than her stable companion, Doncaster, who won the Derby, because the two fought it out in the St. Leger, one of the most exciting contests ever seen on the Town Moor, and the filly beat the colt by a short head. Next season, too, Apology was surely the best of her year, and Turf historians are fond of relating how there was a doubt about her being able to run at Doncaster, as she had shown signs of lameness, and how the clergyman who owned her insisted upon her fulfilling her engagement, which she won gallantly in the hands of John Osborne.

In 1883 there was what is called a sensational Derby, Galliard, Highland Chief, and St. Blaise, all three having staunch supporters, running a close finish, and only the judge could say for certain which had won. There was a scandal about the race into which it is not necessary to go at present. Charles Wood on St. Blaise shot round Tattenham Corner in a fashion of which Archer was very fond when he got the chance; thus St. Blaise gained some two lengths, and his resolute jockey never lost his advantage. St. Blaise, it may be added, went to America, where he has done excellent service at the stud. In 1884 it is tolerably certain that Busybody must have won the Derby had she run, as there is no doubt of her superiority to Harvester, who ran a dead heat with St. Gatien. Busybody was, indeed, a very good mare, but she showed signs of lameness after her Oaks victory, and though sent to Ascot, was never able to run there or subsequently; she finally broke down a fortnight before the St. Leger, but has distinguished herself as the dam of Meddler, whose loss to this country is to be regretted. There can be no doubt he was a good horse, who would in all probability have earned a place in this chapter had he remained in England. He won the Dewhurst Plate.

St. Simon, a contemporary of St. Gatien and Busybody, was not entered for the Derby. Before the death of Prince Batthyany it had been rumoured that he owned a remarkably promising colt in a son of the Derby winner Galopin and of a mare called St. Angela. More than one man, however, who had reason to believe in the colt's

St. Simon.

capacity, timidly let him slip when he was for sale after his master's terribly sudden death at Newmarket, and the lucky Duke of Portland bought him for 1,600 guineas, his dam being sold the same afternoon for 320 guineas. Four weeks afterwards to the day St. Simon made his first appearance on a racecourse in the Halnaker Stakes at Goodwood, ridden by Archer, and won in a canter by half-a-dozen lengths. Next afternoon he came out again for a Maiden Plate against a solitary opponent, of whom he disposed without an effort. The few engagements which had been made for him were of course rendered void by the death of his first owner, and his next race was in the Devonshire Nursery at Derby. He had now earned 8 st. 12 lbs., and played with his opponents. In the Prince of Wales' Nursery at Doncaster he was top weight, 9 st., in a field of twenty-one, and "won by eight lengths" was the verdict, —the judge was not called upon to say that the eight lengths might have been eighteen if Archer had wished it. As it happened, this was a year when the fillies seemed to be doing much better than the colts. Wild Thyme,

a daughter of Lowlander and Fragrance, won the Woodcote, the New Stakes at Ascot, the Exeter Stakes at the Newmarket July, and the Lavant Stakes at Goodwood; the Hermit—Adelaide filly, known afterwards as Solitaire and then called Queen Adelaide, won the July; Superba carried off the Astley Stakes at Lewes and the Champagne at Doncaster; Busybody won the Rous Memorial at Newmarket and the Middle Park Plate; but there was a colt, who strangely enough had run for the first time in public within an hour of St. Simon's *début*, who was believed by his friends to be quite as good as, if not better than, the son of Galopin. This was the Duke of Westminster's Bushey, as he had been originally named, by Hampton—Preference, who had gone to Goodwood with a great reputation, and, having won the Richmond Stakes, was re-named Duke of Richmond. A match was consequently made between the two and came off immediately before the Dewhurst Plate (in which Queen Adelaide, 8 st. 13 lbs., beat Busybody, 9 st. 2 lbs., a neck, thus showing themselves practically the same animal). They ran at even weights and St. Simon won, easily, Archer, who rode him, declared; with scarcely 7 lbs. in hand was the estimate of Tom Cannon, the jockey of the defeated colt. Duke of Richmond may be here dismissed with the remark that hard struggles in the Hunt Cup and Stewards' Cup next year, for both of which he was just beaten, apparently broke his heart, or at least disgusted him with racing, and he sunk to hurdle jumping, St. Simon to begin as a three-year-old in the same way he had ended as a two-year old—with a match. It had been questioned whether he could stay, and M. Lefevre, the owner of Tristan, one of the few sons of Hermit who had exhibited capacity to win over a distance of ground, challenged St. Simon to run a mile and a half, each having a pacemaker to bring him along. That was if they could, for the pace-makers were reduced to helplessness very soon after the start; then St. Simon left Tristan and won at his ease by half a dozen lengths. There was nothing that dared to oppose St. Simon for the Epsom Gold Cup (an extinct race). Tristan came out again to run against St. Simon for the Ascot Cup, to see if the additional mile of that race would make a difference, but "won by twenty lengths, a bad third"—Faugh-a-Ballagh occupied the place—was this time the result; at Newcastle, with odds of 100 to 9 on him, St. Simon very easily disposed of a solitary opponent, Chislehurst, and with odds of 100 to 7 on him in the Goodwood Cup he cantered away from Ossian, who had won the Leger of the year before but was not sound in his wind. That was St. Simon's last appearance on a racecourse: he retired to the stud, where his success had been very great, his fillies having been considered specially good, until his sons St. Frusquin and Persimmon, not to mention St. Serf, showed that he could produce horses as well as mares. As for the latter, in five years his daughters won the Oaks four times. That handsome is as handsome does is a proverb not to be disputed, but certainly St. Simon was as different as he well could be from the "long, low, level" horse, whose make and shape has been so often eulogised. He was unusually short and had slight looking hind quarters.

Melton's beautiful action gave him distinction, but he misses a place quite in the first rank, as other animals were too close to him, for he only beat Paradox a head in the Derby, and Paradox only beat Crafton a head in the Two Thousand Guineas. Moreover, it is very probable that Paradox won only because Archer hustled Crafton out of it, and that if the owner of the latter had objected he would have got the race. During this year (1885) a rumour which was not uncommon at the time, and has often been repeated since, became current, to the effect that there was something out of the common at Kingsclere; and the rumour subsequently proved to be true. The animal in question was a bay son of Bend Or and Lily Agnes; but it was not until late in the year, at Newmarket in October, that he appeared to run in a Post Sweepstakes, and his excellence was not so generally recognised as to prevent backers from laying a slight shade of odds, 6 to 5, on Modwena, a little filly belonging to the Duke of Portland. Ormonde, however, had warm supporters at 5 to 4, and he won with very great ease; it was then perceived that the stories which had been told about him were true, and he was a very strong favourite for the Criterion, which he won, having some speedy animals behind him, notably Oberon and Mephisto. Oberon, it may be interpolated, was the son of Galopin and Wheel of Fortune, and his dam must certainly hold a prominent place in the list of famous horses; for when asked by the present writer which was the best animal he had ever ridden, Fred Archer replied that he could not decide between St. Simon and this mare; though it must be added that this was before the appearance of Ormonde. Ormonde came out for a third time in the Dewhurst Plate, and with long odds on him again gave proof of his capacity, though he had not much behind him, his best opponent being Miss Jummy, only a moderate animal who, however, won the Oaks.

1886 was a great year, for there were several three-year-olds of altogether exceptional excellence. A handsome little horse, called The Bard, had won the Brocklesby Stakes at Lincoln, and ran sixteen times during the season without ever having been beaten. A colt named Saraband had come out at Kempton and won his race so easily that there seemed to be no saying how good he was; and Matthew Dawson was training a son of Lord Lyon, named

Minting, whom he declared to be one of the very best animals he had ever known. Here, it will be seen, was material for most exciting contests; and, indeed, a race has rarely been more absorbing than the Two Thousand Guineas of 1886. Matthew Dawson's opinion of Minting led to his starting favourite at even money; in many cases odds were laid on him, though the *Racing Calendar* returns his price at 11 to 10 against. Saraband was second favourite at 3 to 1, and Ormonde came next at 7 to 2, 33 to 1 bar three being the price of those next in demand, if it can be said that there was any sort of demand for them. Mephisto and St. Mirin figured at these odds. Watts rode Minting, Archer was on Saraband, George Barrett on Ormonde, and the race was never in doubt. At the distance Minting was rolling about hopelessly beaten, and Ormonde won in a canter. So unmistakable was the result that Mr. Vyner, the owner of Minting, perceived he could have no chance for the Derby, and with great discretion determined to reserve his horse for the Grand Prix. Of course Ormonde was a very strong favourite for the Derby, nothing else being supposed to have the least chance with him except The Bard. The betting is returned at 85 to 40 on Ormonde, 7 to 2 The Bard, 25 to 1 bar one, a horse of Lord Zetland's called Grey Friars being the nominal third favourite. The betting, it may be added, extended to "1000 to 5 Ariel and Coracle coupled," probably the longest odds ever offered, but a great deal too short to indicate their chances. The little Bard ran a gallant race, though his jockey, who had been told to keep him well in front, as it was thought he might stay better than his great rival, did not obey instructions—or possibly could not do as he was told. Down the hill, however, The Bard for a moment got on terms, and just for half a moment flattered the hopes of his friends; but Ormonde's stride told, and Archer, who rode him, won quite comfortably by a length and a half. Ormonde went to Ascot and played with two indifferent opponents in the St. James's Palace Stakes. In the Hardwicke next day he had a Derby winner against him, Melton, but the result was never in doubt. Going on to Doncaster he ran for the St. Leger, and with odds of 7 to 1 on him won in a common canter by four lengths. 25 to 1 was laid on him the next time he appeared for the Great Foal Stakes at the Newmarket First October, where he cantered away from Mephisto; and for the Newmarket St. Leger nothing ventured to oppose him—a wise discretion. He came out next for the Champion Stakes. "100 to 1 on" being his price, and again for the Free Handicap, where he gave two stone to Mephisto and won in a canter by eight lengths, ending his year's labours, —though in fact there had been no labour about his performances, except possibly for a few strides in the Derby—by walking over for a Private Sweepstakes on the last day of the Houghton meeting.

During the winter an ugly rumour became current that Ormonde had begun to "make a noise," and the story was in fact too true. Notwithstanding, backers were content to lay 4 to 1 on him for the Rous Memorial at Ascot, when he beat Kilwarlin by six lengths; the race, however, leaving no sort of doubt as to the noise. In the Hardwicke Stakes, therefore, it was supposed that his old rival Minting would have a great chance against him; and for the first time for more than a year Ormonde started at reasonable odds, 5 to 4 on, 7 to 4 being taken about Minting. They carried even weights, 9 st 10 lbs each; but, hampered as he was by his infirmity, Ormonde held his own, only winning by a neck, it is true; but Tom Cannon, who rode him, let it be understood that he could have somewhat increased the distance had it been desirable, the race not having been quite so

Ormonde.

close a thing as it appeared to spectators. His final appearance was made at the Newmarket July Meeting, over the last six furlongs of the Bunbury mile, for the Imperial Gold Cup, and this time, though the verdict was in his favour, he had to be driven in order to shake off Whitefriar, who was in receipt of only 4 lbs. So ended the turf career of what is regarded by many as the best horse that ever ran, though of course there is no possibility of getting a line between him and St. Simon. The Duke of Westminster sold him for 17,000 guineas, and he stayed for some time in South America; subsequently he was brought back to England, and again sold to an American, at whose establishment in California he is at present. His recent stock are described as most promising. His sons Orme and Goldfinch are standing in England. Up to the time of writing the children of Orme have not greatly distinguished themselves. Only one of them has carried off a race, but Goldfinch has Chelàndry and Monterey to his credit.

It was a sad drop from 1886 to 1887, from Ormonde to Merry Hampton, the latter colt

carrying off the Derby on his first appearance on any racecourse, and beating The Baron, a very bad animal, on whom odds were laid; but happily the two-year-olds for this season were more promising, one in particular seeming likely to rival the deeds of Ormonde himself. This was Friar's Balsam. The colt made his first appearance at Ascot in the New Stakes, for which a horse of the Duke of Portland's called Ayrshire, and a mare of the late Lord Calthorpe's called Seabreeze, both of whom were highly esteemed, went to the post; but Friar's Balsam won with the most consummate ease, following up his success by a career of six uninterrupted victories, in the Hurstbourne Stakes at Stockbridge, the July Stakes at Newmarket, the Richmond Stakes at Goodwood, the Molecombe Stakes at the same meeting, the Middle Park and Dewhurst Plates; all, it will be seen, except perhaps the Molecombe, races of the highest class, the seven wins crediting his owner, Sir Frederick Johnstone, with a total of £8,666. It was supposed that he could not be beaten for the Two Thousand Guineas next year, and he started a very hot favourite; but on the way to the post Tom Cannon, who rode him, discovered that something was wrong: in fact, a large abscess had formed in the colt's mouth and broke under the pressure of the bit. It was supposed that his boy, while dressing him some time before, had irritably jerked his mouth; but however it arose this misfortune had befallen him, and Friar's Balsam was for the time at any rate practically ruined. This cleared the way for Ayrshire, a son of the once little esteemed Hampton, who was thus enabled to make a great name for himself. He won the Two Thousand Guineas, the Derby, and started first favourite for the St. Leger, which led to the contest which is always desired in the great Doncaster race, a fight between the winners of the Derby and the Oaks; and here the filly had the best of it. Both of these, it will be seen, figure in the list given elsewhere of horses that have won over £20,000 in stakes. Luck of course greatly aided Ayrshire in achieving this result. His weak point, doubtless, was that he was not a genuine stayer, but over a mile or a little more he was a really good horse, and it happened, fortunately for his owner, that this was a time when great stakes were to be won.

After the age of three years no horse ever won as much money as was won by Ayrshire, for at this time there was a £10,000 race at Kempton Park called the Royal Stakes, as well as the Eclipse at Sandown, and this latter, though nominally worth that sum, in reality credited the Duke of Portland with £11,160. Friar's Balsam, now a four-year-old, was supposed to have recovered his form sufficiently to give him a very good chance for the Kempton Park Royal Stakes (he having indeed beaten Minting in the Champion Stakes at Newmarket the previous autumn), in which, however, he did badly, finishing last of the seven competitors with the exception of the Baron. The Duke of Portland had another horse in this race besides Ayrshire, a colt called Melanion, who was believed to be better than his stable-companion. One friend of the Duke had rather a disagreeable experience on this occasion, which is perhaps worth recording. He had invested £1,000 on Ayrshire at odds of 6 to 1; but hearing that Melanion was superior to the four-year-old, he gave the bookmaker with whom he had made the bet £100 to let him transfer it to Melanion; thus losing £1,100 instead of winning £7,000. Ayrshire won by a length from his old opponent Seabreeze, thus reversing their performance in the valuable Lancashire Plate, another £10,000 race, which has since been dropped, for in that the filly beat the colt by three-quarters of a length.

The Duke of Portland was in the heyday of his wonderful success, for whilst Ayrshire was doing great things, his colt Donovan, a son of Galopin, was carrying well-nigh all before him as a two-year-old. Donovan came out in the Brocklesby Stakes, and, as already remarked, was one of the few good animals that have won that race. Going on to Leicester he very appropriately secured the Portland Stakes, then worth £6,000; but on his third appearance he met with one of the three defeats which marked his career. Chittabob, a son of Robert the Devil and the Oaks winner Jenny Howlet, who had 13 lbs. the best of the weights, won by four lengths, and there can be little doubt that Chittabob was a really good animal, though he suffered during his career from constant lameness in the shoulder, and so was very rarely in a position to do himself anything like justice. Donovan resumed his victorious career in the New Stakes at Ascot, following it up by taking the Homebred Foal Stakes at the Bibury Club meeting, and next day won the Hurstbourne, thus carrying on the traditions of good two-year-old racing at Stockbridge. He only found one opponent, Prince Soltykoff's Gold, in the July Stakes at Newmarket and beat him. Going on to Goodwood he won the Ham Stakes, and for the Prince of Wales' Stakes on the Thursday started favourite at 2 to 1 on. The going at Goodwood is generally excellent, but this year there had been torrents of rain, and the course was almost a morass, with a great pool of water standing at the end of the lawn; such a state of things had not been experienced within living memory, and it may be that Donovan fell a victim to the consequences of the weather, for here he met with his second defeat, El Dorado winning by six lengths from Gold, with Donovan another six lengths behind. That the horse had not deteriorated in any way was made plain

enough subsequently. He cantered away with the Buckenham, having there nothing to beat, however, and a similarly easy task was before him in the Hopeful Stakes: but the Middle Park Plate was of course a different matter. Here he met thirteen opponents, including Gold, and Donovan won comfortably, Gold not being in the first six: he ended the labours of the season by taking the Dewhurst Plate, having secured in all eleven races, worth £16,487, the largest sum ever won by a two-year-old. Donovan wintered well and started next season brilliantly by winning the Prince of Wales' Stakes at the Leicester Spring Meeting, then worth £11,000. Nothing had ever seemed much more certain than that he would win the Two Thousand guineas: but how Enthusiast beat him, or rather how Tom Cannon beat F. Barrett, has been described in the division of this article on "Jockeys." Of course it was an accident, and Donovan never again knew defeat. In the Newmarket Stakes he beat Enthusiast and fifteen other horses without the least difficulty, Enthusiast, indeed, not being in the first four, and continued his victorious career by winning the Derby from Miguel, with El Dorado a bad third and Enthusiast eighth: the Princess of Wales' Stakes at Ascot with the full penalty—and with odds of 9 to 2 on him; the St. Leger with Miguel again second and El Dorado fourth; the Lancashire Plate with Chittabob second, beaten two lengths, and the French mare Alicante, a two-year-old, third: Seabreeze, winner the year before, as just mentioned, unplaced. The Royal Stakes at the Newmarket Second October Meeting was Donovan's last appearance carrying a silk jacket, but in his two seasons he had won for his owner the sum of £54,935, not counting what he secured by running second on the occasion of two of his three defeats, and until Isinglass topped this record, Donovan's winnings had been nearly £20,000 more than had ever been won by any other horse, Ayrshire coming third on the list with under £36,000, as will be seen by reference to the table. He was of course a very good horse indeed, though the disposition is not to rank him with Ormonde and St. Simon, and whether he or Isinglass was the better is a subject on which opinions are and always must be divided. At the stud he has not so far proved notably successful, Velasquez having been by far his best son.

A two-year-old who it was fondly hoped by his friends would rival Donovan's achievements was running when the Duke of Portland's colt was a three-year-old. This was Surefoot, a son of Wisdom and of an unnamed daughter of Galopin and Miss Foot, the property of Mr. A. W. Merry, a son of the owner of Doncaster, Thormanby, MacGregor, Marie Stuart, and other famous animals. Surefoot came out in the Woodcote Stakes at Epsom, and won from a very speedy mare called Heresy in a style which evoked general admiration, but at Ascot he just failed by a head to beat one of the Duke of Portland's St. Simon fillies named Semolina, though in the New Stakes he had things all his own way, and won the only other race for which he ran, the Findon Stakes at Goodwood, with odds of 100 to 6 on him. St. Simon fillies have of late years gained a great name for themselves, and as regards speed, there are many impartial judges who believe that no horse ever went faster than Signorina, who was now a two-year-old. She was the property of an Italian gentleman, Signor Ginistrelli, who had raced in England with a persistence which was very little rewarded for a number of years. His colours have been registered for something like a quarter of a century, but the Turf world in general knew very little of them until he had sent his mare, Star of Portici, to St. Simon, and Signorina was the result. The owner gave her an excellent chance by entering her liberally, and she abundantly repaid him. As a two-year-old she ran eight times and won eight races, beating, moreover—and a test of high success is not how much or how often an animal wins, but what horses of reputation he defeats—notable opponents. Martagon, who has since won fame as the sire of Champ de Mars and Cap Martin, had been tried a good horse before the Whitsuntide Plate at Manchester, and with 6 lbs. the best of the weights, carefully handled, moreover, by Tom Cannon, he ran Signorina to a head; but that was the only time she really came near to defeat. One has to beware of the critics, and it might, for instance, be pointed out that Signorina only beat Orwell a head at Sandown, to which, however, it may be remarked that she was giving Orwell 15 lbs. including sex allowance, and that the head might have been extended. The stable over which Ryan presided hoped to wipe out the defeat of Martagon by the victory of Alloway at Kempton, but Signorina gave him 7 lbs. and no chance: and later on she did something much more noteworthy. Her relative, the Duke of Portland's Memoir (St. Simon—Quiver) subsequent winner of Oaks and St. Leger amongst other races, had been tried a really good filly, and at Derby Signorina was set to give her no less than 16 lbs.; but the result was never in doubt, and the seal was set on her fame in the Middle Park Plate. There she met Le Nord, a horse of brilliant speed, Semolina (better than Memoir as a two-year-old) was in the field, as were her old opponents Martagon and Alloway, both in receipt of 7 lbs., and she ran right away from the lot of them. The race was won in the first two hundred yards; she "squandered her field" as the phrase goes, and came in at her ease. What she did for Signor Ginistrelli is best

shown by his position in the list of winning owners.

1886.	1887.	1888.	1889.
£	£	£	£
251¾	—	—	11,867½

Of this Signorina won all but £162.

It is the custom of writers on turf affairs to waste much time and ink during the winter and spring in weighing up the two-year-old form of fillies (as well as of colts), and in endeavouring to deduce from it the probable winner of the Oaks. As a matter of fact, two-year-old fillies lose their form as often as they retain it; and after her extraordinary succession of victories in her first season, Signorina, as a three-year-old, ran five times and won only a single race worth £200, her one victory having been in a match with a filly (Susiana) who displayed an amazing aptitude for running second, as in the nine races she ran that year she was second on eight occasions. How Memoir must have come on to beat Signorina in the Oaks, or how Signorina must have gone off to be beaten, is obvious. Next year in four attempts she again won a single race; but it was a valuable one, the Lancashire Plate of £8,971, which raised her total to the sum that gives her admission to the select list of winners of over £20,000; but it was generally agreed that she owed her success here to the unsatisfactory performance of G. Barrett, who rode Orme. Like so many other horses that did great things on the turf, she has been a failure in the paddocks. Another of the Duke of Portland's St. Simon fillies, Memoir, did not very greatly distinguish herself this year, though she won three of the six races in which she took part; events of no great importance, however, three of them being worth only just over £1,300; but she was a filly who made great improvement with time. There was another very good two-year-old also this year, belonging to the Duchess of Montrose, who raced under the name of "Mr. Manton," in Riviera, a daughter of St. Simon and Marguerite, who won ten races in thirteen attempts, worth altogether £12,237, and that she would have made a great name for herself is probable, in spite of the fact of her having failed in the Oaks, but she had the misfortune to break her back while at exercise on Newmarket Heath. She had met Signorina at Manchester and ran unplaced to the flying filly.

Surefoot, to return to him after the digression necessitated by the mention of Signorina, came out and won the Two Thousand in brilliant fashion. He started the hottest favourite for the Derby that had ever been known up to that date, odds of 95 to 40 being laid on him; but he could not stay for one thing, and he was an extremely bad-tempered horse for another. Coming round Tattenham corner he devoted himself to savaging his opponents, and only got fourth to Sainfoin, who has been already described as one of the worst Derby winners on record. Surefoot's penalty and the distance stopped him in the Prince of Wales' Stakes, and that beautiful horse Amphion easily beat him in the Hardwicke Stakes, where also Sainfoin had four lengths the best of him. Surefoot had by this time lost much of his character, but over a mile he had extraordinary speed, and carried off the Prince of Wales' Stakes at Leicester, a race worth £7,750, beating Memoir by two lengths. He was also to have one other success of a very surprising character during his career in the Eclipse Stakes. Common, a horse that was probably a good deal overrated in his day, was supposed to be a "certainty" for the Eclipse; odds were laid on him, and Surefoot was going so badly as they turned into the straight, that 20 to 1 was offered against him by the ring. The mile and a quarter round the turns was, however, just within his compass, and coming up the hill with an amazing flash of speed—speed being probably what Common lacked—he secured this valuable prize. Though it will be seen that he wins a place in the list of over £20,000, he has been so far a comparative failure at the stud.

Had the Leicester race been over a mile and a half instead of a mile, Surefoot's chance of beating Memoir would have been remote. She did not win the One Thousand Guineas for the reason that the Duke of Portland had declared to win with her stable companion Semolina, having a natural preference for an animal he had bred over one he had bought, for Memoir was purchased by auction at a Royal stud at Bushey Park for 1,500 guineas, little more than a quarter of the sum which was paid two years after for her sister La Flèche. In the Oaks, however, no declaration was made, it being obvious that Memoir was the better of the pair, and she won this race, following it up with the St. Leger, a success which may or may not have been affected by a scrimmage which took place at the bend—a rare event in the great race at Doncaster. She was a good mare; but if she is so rated Amphion must be accepted as a very good horse, in spite of the fact that he never took part in any of the classic races, for which his owner, General Byrne, had not entered him. Amphion was trained for his first races at Stockbridge on ground leased from Tom Cannon, and a more charming horse has rarely been seen. It was not often that such animals as he ran at the Croydon meetings, where "class" was seldom well represented, and it is a somewhat curious fact that he and L'Abbesse de Jouarre, who won the Oaks, should have made their first appearance there in the same race. Amphion's total of winnings gives him a place in the list, but he cannot be rated as a stayer in view of the ease with which Sheen beat him over the last two miles of the Cesarewitch course, giving him a couple of pounds, moreover,

when there is no doubt Amphion was very well and greatly fancied by his friends. Common, who never ran as a two-year-old, carried off the three classic races next season, but failed as just described in the Eclipse Stakes.

Whilst he was running, another horse from Kingsclere, and a filly from the same stable, were distinguishing themselves. These were Orme and La Flèche. Probably Orme was a good deal overrated, there being a natural tendency to make much of a son of Ormonde, but he was a very good colt, as his two-year-old success sufficiently proved. That he would win the Derby was generally assumed, if without much warrant, for there can be no doubt that he was not a stayer. In the spring of 1892, however, a sensation was created by the report that Orme had been poisoned. Possibly this may have been so, for John Porter, who must know more about it than any one else, maintains the fact in his "Kingsclere"; but it is a strange circumstance that Orme's symptoms, which led to the supposition of poisoning, were that season found in several other stables where horses were attacked with a similar complaint, though no suspicion of a malicious origin ever gained the slightest ground. Orme, however, could not run for the Two Thousand Guineas or for the Derby, for which race it seemed that a fourth filly was to be added to the list of winners, in La Flèche. Fillies are, however, notoriously uncertain in the summer, and she was beaten by Sir Hugo, a most unexpected result, for that she was a vast deal the better of the two subsequent running, both in the St. Leger and in the Lancashire Plate, most unmistakably demonstrated. Orme was sufficiently recovered by July to take part in the Eclipse Stakes, which he won, his victory producing a great burst of enthusiasm; but in the St. Leger, La Flèche, who had meantime narrowly escaped defeat in the Oaks from a moderate mare called The Smew, thus strengthening the supposition that she was not herself at Epsom, won with considerable ease, Orme never looking in the least dangerous from start to finish. There was an Orme party and a La Flèche party, between whom feeling ran very high, each eulogising the animal of its choice and endeavouring to depreciate the performances of the other. The truth appears to be that over a mile the colt would have beaten the filly; but Orme assuredly did not stay, and in contests of a longer distance the filly would have had no difficulty in defeating the colt. She ran in all sorts of races, some of which are mentioned in the chapter on "Handicaps." Whether she will prove worth the money (14,600 guineas) paid for her at the sale of her late owner's horse is, of course, a question for the future. Her daughter, La Veine, though a mere pony, won a race in the autumn of 1897.

Whilst La Flèche and Orme were running their three-year-old races, a two-year-old named Isinglass was gradually making a reputation which was somewhat grudgingly accorded him. Racegoers were curiously slow to recognise the merit of Isinglass, who, however, did everything that was asked of him as a two-year-old. He was one of those horses of whom it is said that they would "make a race with a donkey;" he did what was necessary, but wasted no exertion. That index of public opinion, the ring, continually showed that Isinglass was not properly appreciated; however, he won the New Stakes at Ascot, the Middle Park Plate, and went into winter quarters with an unbeaten certificate. Next year he came out for the Two Thousand Guineas, which he won easily enough; he won the Derby, the St. Leger, and again throughout the season did everything that he was asked to do. That he could beat Ladas in the Prince of Wales' Stakes at the Newmarket July Meeting was, next year, deemed incredible by the supporters of Lord Rosebery's colt, but there was no sort of doubt about the result when it came to racing, and, in fact, Isinglass only once met with defeat—in the Lancashire Plate, when he failed to give the weight to Raeburn; this, however, doubtless being because he was a horse that hated to make his own running, and his little jockey, T. Loates, could not persuade him to go on in front. It is no disparagement of Loates, in the face of the colt's succession of victories in which that jockey always rode him, to say that a stronger, longer-legged horseman would have shown Isinglass off to much better advantage than he was able to do. The result of his career, which ended with a victory in the Ascot Cup, was that Isinglass won in stakes the largest sum ever gained by a single horse, £57,185, the produce of eleven victories in the twelve races in which he took part. Details are here tabulated:

		£
1892.	Two-Year-Old Plate	196
,,	New Stakes, Ascot	2,006
,,	Middle Park Plate	2,375
1893.	Two Thousand Guineas	4,250
,,	Newmarket Stakes	3,795
,,	The Derby	5,525
,,	The St. Leger	5,300
1894.	Princess of Wales' Stakes	10,911
,,	Eclipse Stakes	9,285
,,	Jockey Club Stakes	11,302
1895.	Gold Cup, Ascot	2,250
		£57,185

It was very bad luck for Mr. C. D. Rose, the owner of Ravensbury, that his colt should have been born in the same year as Mr. M'Calmont's well-nigh invincible animal, as Ravensbury was constantly meeting him, and invariably running second except when he was third. Supposing that Isinglass had been out of the way, that his dam had not been bought for the nineteen sovereigns that were given for her, and

that Isinglass had never been born, Ravensbury would have made a great name for himself. Isinglass had fine speed and was also a genuine stayer. Not a few critics place him only if at all behind Ormonde and St. Simon in the list of famous horses. Whilst, as just noted, the tendency always was to underate Isinglass, there was a disposition to magnify the merits of Ladas, who barely misses a place in the list of winners of £20,000. He was something more than useful, no doubt, and the scene of enthusiasm which broke out at Epsom when he won the Derby, Lord Rosebery, his owner, being Prime Minister at the time, will not soon be forgotten. There is no reason to assume that Lord Rosebery ever rated him as really in the very first class, for it is known that during the two-year-old career of Velasquez his owner considered that the son of Donovan and Vista was the best animal he had ever owned. Ladas failed in the St. Leger, which was most unexpectedly won by Throstle, who was considered by her stable to be at least 21 lbs. inferior to Match Box, whom she beat on the Doncaster Town Moor. Throstle was an exceedingly wayward animal. Her friends had hopes that she would beat Isinglass in the Jockey Club Stakes after her St. Leger victory, but their hopes would probably have been vain, even had she not bolted, as she did, in the course of the race. She gave her running truly enough at Sandown shortly afterwards in the Select Stakes, but never had the remotest chance with Best Man. Her owner, it is true, did not read the race in this way, and when the horses returned to the paddock remarked to Webb, who had ridden Best Man, "Three hundred yards further and we should have beaten you!" "Not if we had gone round the course three times more, Sir Frederick!" was Webb's reply. Next year Lord Rosebery won the Derby and St. Leger again with Sir Visto, about whom there is no more to be said than that his owner was marvellously lucky.

The two-year-olds of 1895, however, were a very different class from the three-year-olds, Mr. Leopold de Rothschild's St. Frusquin and the Prince of Wales' Persimmon being far in advance of all the rest. Which was the better of the two will always remain a disputed point, for when St. Frusquin beat Persimmon in the Middle Park Plate, the Prince of Wales' colt was said to be not at his best—a statement, however, which seemed to be negatived by the betting, for Persimmon was a very hot favourite. In the Derby next year, on the other hand, St. Frusquin was believed to be not quite himself, and Persimmon here beat him by a neck. The two met shortly afterwards in the Princess of Wales' Stakes at Newmarket, when St. Frusquin had considerably the best of it, though it is true that he carried 3 lbs. less than his rival. The general impression of the Turf world as to the relative merits of the pair was, however, unmistakably shown by the St. Leger betting. St. Frusquin was here greatly preferred to the other; but unfortunately Mr. Leopold de Rothschild's colt gave way and was never able to run again after his success in the Eclipse, a piece of extraordinary good luck for the Prince of Wales, who thus found a most dangerous opponent removed from his path. Many excellent judges are firmly convinced that had St. Frusquin remained sound and kept his form, Persimmon would have had a very remote chance of approaching inclusion in the list of winners of over £20,000.

Whilst these things were happening Velasquez, carrying, it will be gathered from what has been said, the extreme confidence of his owner—one of the shrewdest and soundest judges known on the turf for a very great many years past—had cantered home for the New Stakes at Ascot, where he had only to beat Monterey, a son of Goldfinch and so a grandson of Ormonde. He sustained his reputation in the Prince of Wales' Stakes at Goodwood, and with odds of 100 to 9 on him beat a solitary opponent for the Champion Stakes at Doncaster. It was natural, therefore, that he should have started a very strong favourite for the Middle Park Plate, where odds of 5 to 1 were freely laid on him; but here he met with his first defeat, from Galtee More (Kendal—Morganette), a colt that had won three races out of four previously to this, without, however, making any great impression. Mornington Cannon, who rode Galtee More, said after the Middle Park, however, that when the two met again Galtee More would always beat the other, for whom excuses were made on the ground that he could not act in the very heavy going at Newmarket that autumn, but the jockey was right, and Galtee More, as history records, beat Velasquez in the Two Thousand and Derby, winning also the St. Leger, but not in at all brilliant fashion, and quite failing to justify the confidence of his friends in the Cambridgeshire. In spite of his heavy weight he was supposed by too ardent enthusiasts to be invincible, but he could only finish tenth.

HANDICAPS—From one point of view the handicap is an altogether absurd institution; for the result is simply and solely to show how far wrong the handicapper is in his estimate of the ability of the horses he weights. The winner comes in two lengths ahead of his field, and thereby demonstrates either that the adjuster of the weights regarded him as a 7 lbs. or 10 lbs. worse animal than he is, or else that he accepted the second as a 7 lbs. or 10 lbs. better. A horse wins by a neck. The handicapper is shown to be only a couple of pounds or so wrong; but that is all the race has proved. Handicaps, however, are practically indispensable, for the reason that it takes more than the

general scale of penalties and allowances to give the moderate animal a chance, and if racing were confined to the comparatively few good horses, the sport would be enormously circumscribed. Selling handicaps—dealt with in a later division of this article, under the head of "Selling Races"—are of course infinitely more preposterous, for here a horse carrying 9 st. may give a 3 st. beating to a horse carrying 6 st., yet both are entered to be sold for the same price and supposed to be worth the same amount. Such races merely serve the purpose of filling cards and providing opportunity for betting; they assuredly tend little to accomplish the professed object of the Turf—the improvement of the

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thoroughbred. The principal handicaps, nevertheless, have frequently an interest of their own—on certain occasions, when really good horses are called upon to perform very difficult tasks, and succeed in accomplishing them in handsome fashion, a very great and special interest. The handicap, indeed, is of value as serving to show what good horses can do; for those that have most to carry are often called upon to give more weight away to moderate, useful, or even to horses of no small proved capacity, than would be the case in any other variety of contest.

Horses may thus make reputations in handicaps, and of late years the old distinction between the weight-for-age and the handicap horse has been well nigh obliterated; one reason for this doubtless being that handicaps are often worth so much that there are very few owners who do not enter the best animals they possess. Ormonde, St. Simon, Donovan, Isinglass, are among the rare exceptions. The Duke of Westminster is a typical owner who races habitually for the most distinguished prizes the turf offers; but he did not hesitate to enter his Derby winner Bend Or in handicaps, the sire of Ormonde having won the City and Suburban the spring after his Epsom triumph, and having failed the same autumn in the Cambridgeshire. Here Bend Or, 4 years old, carrying 9 st. 8 lbs., ran unplaced to Foxhall, 3 years old, 9 st. The two thus met at weight-for-age, and the younger colt, who had never taken part in a "classic" race, very easily beat the classic winner. To Lucy Glitters, who was second to Thebais for the Oaks and a good third to Iroquois for the St. Leger—beaten less than two lengths—Foxhall gave no less than 3 st. 7 lbs. In the face of this what ground can there be for disparaging Foxhall as a "handicap horse"? St. Gatien, a Derby winner, or dead-heater, which is much the same thing, gained lustre by his success in the Cesarewitch as a three-year-old with 8 st. 10 lbs. Melton failed in the Cambridgeshire, but carried 9 st. 3 lbs. home, as a four-year-old, in the Liverpool Autumn Cup. La Flèche, beaten for the Derby by a horse subsequently proved to be much her inferior, but winner of the One Thousand, Oaks, and St. Leger, ran in handicaps, won the Cambridgeshire as a three-year-old

with 8 st. 10 lbs., and the Liverpool Autumn Cup next year with 9 st. 6 lbs. Memoir, an Oaks and Leger winner, ran in handicaps. Throstle won the St. Leger, beating Ladas and Matchbox, for which latter the Austrian Government paid 18,000 guineas. Soon afterwards Throstle met Best Man, a "handicap horse," and he beat her easily. Isonomy was a "handicap horse," but it would be difficult to say how much superior he was to the Derby winner of that year, Sefton.

The Lincolnshire handicap is always the first of the season, and is invariably run during the week which includes the 25th of March, unless that week is the week next before Easter Sunday. A few three-year-olds occasionally take part in it —Clarence won in 1892 and Wolf's Crag in 1893 —but are rarely successful, even in these days of early maturity. The class of competitors is generally rather moderate or useful than very good, yet Bendigo (1885, 5 years old, 8 st. 5 lb.) was a horse of class, and the reputations of Clorane (1896, 5 years, 9 st. 4 lbs.), and Winkfield's Pride (1897, 4 years, 8 st. 9 lbs.), were greatly enhanced by their victories. The next really important handicap is the City and Suburban at the Epsom Spring Meeting, and here class is often well represented. Sefton, who *did* win the Derby—modest specimen as he was of the horses that have earned that fame—carried off the City and Suburban as a three-year-old in 1878 with 5 st. 8 lbs.; it was not till afterwards that the minimum weight in handicaps was raised to 6 st. that Master Kildare (5 years, 9 st. 2 lbs.) won in 1880, and in course of time became notable as the sire of Melton; Bend Or, as already remarked, won with 9 st. in 1881. Bird of Freedom, who (albeit in a bad year) won the Ascot Cup, preceded that event by securing the City and Suburban in 1885 (3 years, 6 st. 9 lbs.), and Buccaneer comes into the same category, except that he won at Epsom as a four-year-old, carrying 7st. 10 lbs. The previous season the race had fallen to an Oaks winner, Rêve d'Or (6 years, 7 st. 13 lbs.). The Great Metropolitan is the companion race at the Epsom Spring, but, as is usually the case in long distance handicaps except the Cesarewitch, good horses are the exception in Metropolitan fields. They have, moreover, much deteriorated during the last few years; indeed, a few extremely bad animals have won the Metropolitan. Previously some good, sound, honest stayers had been successful in this race. Dutch Skater, who did credit to himself at the stud, as the sire of the St. Leger winner Dutch Oven, won in 1872. There is an incident of some interest about the Metropolitan of the following year. Tom Cannon won on Mornington; his second son was born on the same day, and named after the horse in celebration of the victory. That Mornington Cannon's name is now written large in Turf history need scarcely be stated, he having headed the annual list of winning jockeys on six occasions. Hampton, a horse who grew from little things to great, won in 1875, as a three-year-old, carrying 6st. 3 lbs., a creditable performance with the low minimum which then ruled. New Holland, a slow, muddling horse belonging to Prince Soltykoff, managed to get home in 1876, and 1879 was memorable for the victory of a good honest animal in the American Parole. Chippendale, who afterwards won the Cesarewitch, and on two other occasions came very near to victory, was successful in 1880, and the Duke of Hamilton carried off the prize in 1882 with Fiddler, a horse who afterwards gained a reputation by beating Foxhall for the Alexandra Plate at Ascot. But this was one of those instances in which horses win fame which they scarcely deserve, for after his severe exertions on the previous day in the Ascot Cup, Foxhall was too stiff and sore to do himself justice. In 1883 Lord Rosebery won with Vista, who subsequently distinguished herself by becoming the dam of a Derby winner, albeit an extremely bad one, in Sir Visto. Althorp, too, won the Asco Cup the year after taking the Metropolitan, bu he was probably the worst horse that ever carried off that trophy, and had the luck to meet two extremely poor opponents.

The Chester Cup, first run in 1824, was for many years one of the most important handicaps of the year. Entries were made many months before the race, and betting on it was heavy and continuous throughout the winter. Alice Hawthorn, Leamington (twice), St. Albans, Tim Whiffler, Beeswing, Paul Jones—who seems to have been admiringly called "The Steam Engine" by his friends—Knight of the Garter, and other good horses have won the Chester Cup. The day on which it was run used to be a holiday all round the district and along the borders of North Wales; but for some reason or other the race diminished in interest, and the number of starters fell off. When Joe Miller won in 1852 no fewer than forty-three animals went to the post, and it is said that they had to be started in two rows; of late years, however, the fields have not seldom failed to reach double figures; Prudhomme in 1882 and Merry Prince in 1885 met only six opponents, and Biserta in 1883 had only five. Eastern Emperor, who carried the Duke of Beaufort's colours, the disappearance of which has been so sincerely regretted by lovers of the Turf of all classes, must be reckoned as a good horse, for previously to winning the Chester Cup in 1886 he had carried off the Royal Hunt Cup at Ascot, thus showing himself to be possessed of both speed and stamina. Next year Carlton, who ran in the colours of the Duke of Beaufort's son, the late Lord Edward Somerset, won the race before making a great name for himself by his success

in the Manchester November Handicap, carrying the great weight of 9 st. 12 lbs. Tyrant, who won in 1890, was also a good horse, the Chester Cup being one of a skilfully planned succession of victories. The Duke of Westminster has always taken a strong interest in the meeting, which is held in the neighbourhood of Eaton Hall, and Mr. R. K. Mainwaring, the handicapper, has sedulously devoted himself, with satisfactory results, to the revival of Chester. It is never, perhaps, likely to be all it once was, for the reason that there are so many rival meetings of importance, and unfortunately for Chester, one of these takes place during the same week. This is at Kempton Park, where the feature is the Jubilee Handicap. As the name implies, this was started in 1887, and few races in the *Calendar* have ever so speedily made their way to popularity. Good fields invariably go to the post, and some notable horses have carried heavy weights to victory. In the first year of the race it was won by Bendigo with 9 st. 7 lbs. on his back, and the fame of this achievement was surpassed next season when Minting won in a field of nineteen with 10 st. Amphion, one of the handsomest horses the contemporary Turf has seen, sustained the character of the Jubilee in 1889 by his victory with 7 st. 1 lb. in the saddle, a heavy weight in view of the fact that he was only a three-year-old, and the race was run at the beginning of May. Next year, however, The Imp, a moderate animal who afterwards belonged to the Prince of Wales, lowered the class of the list of winners; but it was sustained again by Euclid, 3 years, 7 st. 4 lbs.; Orvieto, 5 years, 9 st. 5 lbs.; Avington, 4 years, 8 st. 1 lb.; and Victor Wild, an extremely good horse over this course, who won in 1895 as a five-year-old with 8 st. 4 lbs., repeated his victory in the ensuing season with 9 st. 7 lbs., and was only beaten a length in 1897 with 9 st. 9 lbs.

The Manchester Cup is noteworthy for the fact that Isonomy in 1880 made a great stir in the Turf world by his success in a field of twenty-one, carrying the huge weight of 9 st. 12 lbs. The performance had been deemed well nigh impossible until it was accomplished by that good horse. To go into the history of this race, however, it may be said that Isonomy was very lucky to win; a colt called The Abbot, who was only just beaten, could not have lost but that his jockey rode with a most total disregard of the orders that had been given him; nevertheless the latter was in receipt of a great amount of weight from Isonomy, whose performance would still have been memorable even had he just been beaten. But there is naturally a glamour about success. Between defeat and victory there is only, in many cases, a difference really of a very few inches—a pound or two, if it be calculated in weight; a little luck in the course of the race would have turned the scale; but the horse that is just beaten is apt to seem a very inferior animal to the horse that just wins. It was supposed that the gallant little Bard would have taken this Cup in 1886, but the lightly-weighted Riversdale, with 6 st. 1 lb. to carry, just had the best of him, though this defeat scarcely diminished the prestige of The Bard, who carried 8 st. 4 lbs. over this mile and three quarters. Carlton, a good sound stayer, as he showed in the Chester Cup and the Manchester November Handicap, won here in 1887 with the respectable burden of 8 st. 9 lbs., and L'Abbesse de Jouarre, the year after her Oaks victory, was successful with 8 st. 6 lbs.

Like so many other long distance races, the Ascot Stakes has fallen off of late years. The stake was originated in 1839 and won by a three-year-old mare called Marchioness, who carried the indefinite light weight described as a "feather." There was at this time no minimum, and indeed in the following year the Stakes was won by Darkness, with only 5 st. 4 lbs. on her back. That good stayer, Musket, who has done such admirable service at the stud in Australia, won in 1870 with 8 st. 12 lbs., a very heavy burden for a three-year-old, though for some reason or other the field consisted of only four runners. There have indeed seldom been many starters for this race; twenty-three ran in 1848, when Vampyre won the first time (he was successful again the following year), but on no other occasion have the runners exceeded eighteen. The late Sir Joseph Hawley in 1870 won with Rosicrucian, who three years previously had been regarded as good enough to win the Derby, in which he was beaten by his stable companion, Blue Gown. The remark, "horses for courses," has already been noted, and it is remarkable how often there seems justification for it. Thus Pageant won the Chester Cup twice, as did Dalby and Dare Devil. Ivanhoff was twice successful in the Manchester Cup, Shancrotha won in 1893, and was not beaten—he ran a dead-heat—in 1894. Vampyre, as just remarked, twice carried off the Ascot Stakes; Teviotdale did so in 1880 and 1881, and Lord Lorne in 1889 and 1890. Previously to the success of Dan Dancer in 1888, he had been jumping hurdles, as had Billow before she won in 1892, and, it may be added, Prudhomme, before he won the Chester Cup. There is generally supposed to be some derogation in character when a horse runs over hurdles, though to this rule, if it be one, there are some notable exceptions, Hampton himself having been a hurdle jumper before he gained fame for himself and fortune for his owner. Class was found again in the Ascot Stakes in 1895, when Ravensbury carried off the Cup with 9 st. 9 lbs. It went to France by the aid of Arlequin in 1896, and of Masqué in 1897.

Of all handicaps throughout the year, perhaps the Cambridgeshire is universally regarded as the most important; but the Royal

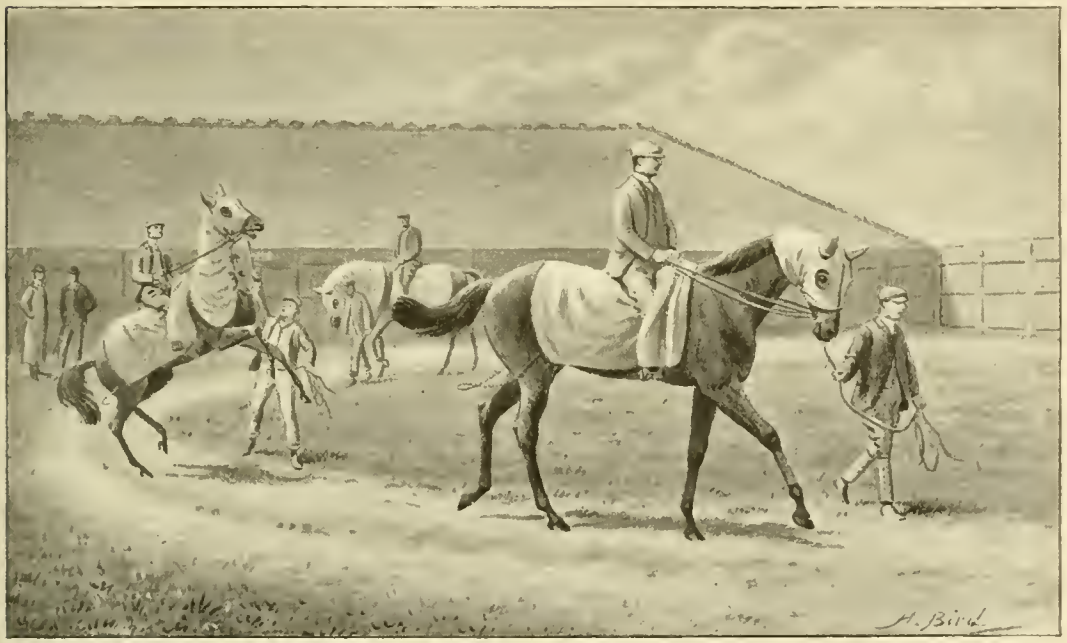
Hunt Cup at Ascot runs it close. This race was originated in 1843 and has always attracted large fields and usually brought out horses of good class. Of late years, indeed, it has rather increased than diminished in interest. See Saw, who won in 1869, was in all respects a creditable example of the English thoroughbred, though the same cannot be said for Judge, successful in the following year. Judge had been bought for a very few sovereigns, but his light weight enabled him to get home before animals of better class. That extraordinarily speedy horse Lowlander, by the way, was also a hurdle-racer, and won the Hunt Cup in 1874. There was a sensational race in 1881, when the five-year-old Peter, with 9 st. 3 lbs. on his back, stopped to kick and was left far behind after the field had gone some way. That Archer should have persuaded him to gallop, and that he should subsequently have won with his heavy weight, assuredly stamps him as a remarkable animal. Such an event is unprecedented under the circumstances. The distance is only a mile ; to be accurate, it is short of that measurement by 74 yards ; considering the speed at which horses gallop, and that the pace is always good in this race, it will be readily understood how very little time there is to lose on the journey. Morion, three years old, 7 st. 9 lbs., showed what a good horse he was by winning in 1890. No animal of his age had successfully carried so heavy a weight before, though his record was broken two years later when Suspender, also three years old, won with 7 st. 10 lbs. in a field of twenty-five. Suspender was never beaten, and there is no saying how good he may have been ; unfortunately it could never be ascertained in public, for he fell one of the many victims of the hard ground at Ascot, and was never able to run again after his victory in the Hunt Cup. That good miler, Victor Wild, gained one of his many victories here in 1894, and notwithstanding that he did not win in 1896, he ran an extraordinarily good race, being only just beaten by Knight of the Thistle, a four-year-old who had proved himself to be something more than useful, and who was in receipt of no less than 2 st. 7 lbs. from the winner of 1894. The Wokingham Stakes, run over six furlongs, is a species of minor edition of the Hunt Cup, and, as good animals are nearly always found in the field, success here adds much to a horse's reputation ; except of course that if an animal does not fairly "get a mile" his character as a racehorse, having regard to the assumed aim and object of racing, does not rank high.

At Goodwood there are two noteworthy handicaps : the Stakes, first run in 1823 over a distance of 2½ miles, and therefore a test of staying, and the Stewards' Cup, run over the T.Y.C., which, as elsewhere noted, is here six furlongs. The same remark that has been made about the Metropolitan and the Ascot Stakes applies to Goodwood. Horses of class and character are rarely found in the Stakes ; and what has been said about "horses for courses" also comes in here, as Stumps and Orelia both won twice. This, by the way, is still more remarkable in the Chesterfield Cup at the same meeting, for Coomassie won it in 1876 and 1877, Victor Emmanuel in 1880 and 1881, and Vibration in 1882 and 1883. Hampton won the Stakes in 1876, and that he too liked the course is demonstrated by the fact of his having carried off the Cup in the following year. Bay Archer, who has done good service to the stud in France, won in 1879, and that good mare Corrie Roy was not stopped in 1883 by her 9 st., a weight that was also carried successfully by Carlton in 1887. How little competition there has been for long distance races of late years is made evident by the fact that in 1885 the race was void for lack of entries ; and the next year it resulted rather curiously, for the Duke of Beaufort's Winter Cherry, who had only been started to make running for Sir Kenneth (belonging to Lord Hartington, now Duke of Devonshire), carried off the prize. An anecdote may here be interpolated to show how Turf "certainties" are upset and how totally unexpected results occur. The present writer chanced to drive up to the course in a fly with the Duke of Beaufort ; as we were getting out of the carriage the flyman obviously had something to say. An opportunity being afforded him, he begged to know whether the Duke had any fancy for his mare, which the flyman, for some mysterious reason, said he thought was sure to win. The Duke overheard the question, and with characteristic kindness said, "No, my man, don't waste your money on her ; she has no chance whatever." Walking to the stand he remarked to his companion, "I am only starting my mare to make running for Hartington ; Sir Kenneth, he thinks, cannot be beaten. I have backed him and should advise you to do the same." It was never supposed that Winter Cherry could possibly win, the idea being that she would fade out before a couple of miles had been covered. Her jockey was only told to jump off at the best pace he could and come along all the way ; and he did this so effectually that she was never headed. The flyman met his fares after the races with a somewhat reproachful look, evidently feeling that he had been put off a good thing, and the kindly Duke felt the man's disappointment much more than the loss of his own money, though an extra sovereign consoled the would-be backer of Winter Cherry.

The late Alec Taylor was about this time extraordinarily successful in the preparation of horses for long distance races. In four successive years from 1886 his stable carried off the Goodwood Stakes, with Winter Cherry, Carlton, Stourhead, and Ingram ; he won the Metro-

politan with The Cob in 1887, with Parlington in 1890, and with Ragimunde in 1891. The Northamptonshire Stakes fell to the Manton trained Claymore in 1889. Eastern Emperor and Carlton won the Chester Cup in 1886 and 1887 respectively; Ragimunde won the Cesarewitch in 1891, and The Cob should have done so in 1886; Carlton won the Doncaster Cup in 1887 as did Claymore in 1889; and four times in five years from 1886 the stable carried off the Manchester November Handicap, with Stourhead, Carlton (20 runners) Claymore (18), and Parlington (19).

Returning to the Stewards' Cup at Goodwood, there is comparatively little to be said in comparison with the interest which the contest annually awakens. It is, indeed, rather as a medium of speculation than as a great race that the Stewards' Cup has to be considered. Some notably speedy horses have won—Oxonian, Trappist, Herald, and Peter. Another horse who went a great pace ought to have won in 1888. This was Bismarck, whose jockey, however, after he had passed the distance, turned round to grin derisively at his followers, whom he supposed he had easily beaten, when his horse seized the opportunity of swerving and running right across the course, leaving a half-bred five-year-old mare from Danebury, Tib by name, to carry her light burden of 6 st. 7 lbs. first past the post by a short head. After Goodwood, what is called the "Sussex fortnight" is completed at Brighton and Lewes. The Brighton Stakes dates from 1824. The race used to be over two miles: it was afterwards reduced to a mile and a half, and subsequently to a mile, the usual difficulty having been found of getting good fields for a long distance. The Brighton Cup has been reduced in the same way. Some good horses have won this latter, including Caller Ou, Dollar, Ely, Speculum, Albert Victor, Lilian, Marie Stuart, and Isonomy; but in 1883 there was nothing to oppose Border Minstrel. Fields for the previous dozen years had not averaged four in number, and the distance was consequently lessened to a mile. Brag, a speedy horse belonging to Mr. Leopold de Rothschild, carried 8 st. 10 lbs. in 1885 in the exceptionally short time of 1 min. 39 sec. The Baron, who had started an odds-on favourite for the Derby (he had consistently shown himself a bad horse), succeeded here in beating three opponents in 1889. For some reason or other it seems impossible to find starters for this race even now that the distance has been diminished, and the average is much what it was previously. The same story of reduced distance has to be told about the Lewes Handicap, though only half a mile has been taken off the length of this course, and it is now a mile and a half instead of two miles. Lord Hartington's Rylstone carried out the principle of "horses for courses" in notable fashion by winning three times running, the only handicap



In the "Birdcage," Newmarket.

that has fallen in three consecutive years to the same horse. For the rest, there is nothing particular to be said about the race, which is contested as a rule by average handicap horses. Much the same may be written of the Great Yorkshire Handicap, which is one of the features of the Doncaster Meeting. It has fallen to good and bad animals in turn. The Portland Plate at Doncaster is one of the most popular of short races, the distance being 5 fur. 152 yds., and as the field is nearly always numerous, success here is a genuine test of speed. Oxonian, Lollipop, Hackthorpe, are three horses that have carried off this stake, which in 1881 was secured by Mowerina, who was presently to win fame as the dam of Donovan. This was one of the races won by Goldseeker, with whom a succession of victories had been very cleverly planned. The horse, it may be incidentally remarked, injured his friends by winning once too often. This was in the following year at Epsom. Goldseeker started for the City and Suburban, and there can perhaps be little harm at this time of day in saying that those connected with him had neither hope nor desire of victory, though it must be distinctly understood that in saying this no sort of implication is made as to the integrity of those concerned. They thought the race would do him good, and help towards preparing him for the Jubilee Handicap at Kempton Park, for which they had backed him very heavily. Tom Cannon, junior, had the mount at Epsom, and was put up without any instructions as to how he was to ride; he jumped off, and was never headed from start to finish, backward in condition as the colt was. The effect of this was to earn for him a substantial penalty for the event at Kempton Park. He had not been backed for a shilling at Epsom, and his penalty cost him the other race, for which, however, so good had his chance been esteemed, that he started first favourite in spite of the additional 14 lbs. L'Abbesse de Jouarre, the Oaks winner, won with 9 st. in 1890, and the Duke of Portland's very speedy horse, Greyleg, one of the few greys that have run of late years—Eastern Empress was another—was successful in 1894. Whiston, who went wrong in his wind and speedily sank to plating, won in 1895, and Grig, a mare belonging to Mr. Leopold de Rothschild, who galloped at a great pace, was successful the year afterwards.

Of the Great Eastern Handicap and the Newmarket October Handicap there is nothing special to be said except that they are popular races; but the Cesarewitch is one of the great contests of the year. Class is better represented in this race than in any other of the long distance handicaps, and the field is almost invariably good. It is run over a severe course of two and a quarter miles, and though a moderate animal has occasionally got home with a light weight, it usually takes a really good horse to win the Cesarewitch. The race dates from 1839 and several interesting chapters might be compiled about it. The success of Prioress in 1857, after a dead-heat with two other animals, El Hakim and Queen Bess, was one of the first victories gained by American horses in England. She was brought to this country by the late Mr. Ten Broeck, a keen sportsman who met with varying fortune on the Turf. 1866 was a very sensational year. The race fell to the Marquis of Hastings' Lecturer, and the owner won a large fortune at a time when, there can now be no harm in saying, the money was sorely needed. The horse was trained at Danebury by the late John Day, and did so well in a trial with Ackworth and others that Day could not believe that the result was true. After a short interval the gallop was repeated, with precisely the same result, and it then became apparent that the colt, a three-year-old, not by any means leniently weighted with 7 st. 3 lbs., could scarcely fail. John Day's brother, William, who had taken the race in 1860 with Dulcibella, and knew well what was required to win the Cesarewitch, believed he had a horse which could not be beaten; but when the two brothers compared notes on arrival at Newmarket, William was convinced that he could have no possible chance, and that the money he had invested on his own horse was as good as lost. He had time, however, to secure himself, the Marquis of Hastings having very generously let him stand £25 at the odds of 40 to 1 which he had at first been able to obtain about his horse. A terrible scare arose in the Danebury camp shortly before the race when it was remembered that Lord Hastings had struck out all animals entered in his name; but by an extraordinary piece of good luck Lecturer chanced to have been entered for the Cesarewitch in the name of a friend, Mr. Peter Wilkinson, so that he was able to run, and he won at his ease. 1876 was notable for the fact that Rosebery, who won this race, afterwards carried off the Cambridgeshire, the first horse that had ever secured the two. One cannot pass the name of that good honest stayer, Chippendale, without a word; he won in 1879 with 7 st. 5 lbs., ran well next year with 9 st. 4 lbs. and was second both in 1881 and 1882 with 8 st. 12 lbs. In 1880 the Cesarewitch was memorable for the victory of Robert the Devil, who carried the great weight for a three-year-old of 8 st. 6 lbs. It had been supposed by many that no horse of this age could win with so heavy a burden; but there was never any doubt as to the result after the flag had fallen. Another American, Foxhall, won with 7 st. 12 lbs., he being a three-year-old, in 1881, and followed Rosebery's example in carrying off the Cambridgeshire. The success of Corrie Roy in 1882 is worthy of note from the fact that she never had what is

called "an orthodox Cesarewitch preparation." There is a generally well founded idea among trainers that no horse can win the Cesarewitch who has not previously been galloped on several occasions over the full distance; but there are exceptions to every rule, and Corrie Roy's trainer well understood that such treatment would not suit her; her gallops were seldom much over a mile, but she won decisively. Robert the Devil's exploit was surpassed in 1884 by St. Gatien, who won with 8 st. 10 lbs. on his three-year-old back; in the following year none of the English horses could hold their own against Plaisanterie, who came from France and had things all her own way. practically won the race; but the jockey, believing that victory was secure, dropped his hands as he had been so earnestly cautioned not to do, the result being that The Cob stopped, and Stone Clink crawled home by a neck. The French carried off the race again in 1888 with Ténébreuse, and in 1890 Sheen beat all records by winning with 9 st. 2 lbs. in the saddle, though, of course, having regard to the scale of weight-for-age, the success of a five-year-old with this burden was less remarkable than the victories of Robert the Devil and St. Gatien, it being estimated that over this distance in the month of October a five-year-old is a stone better than a three. How greatly owners

THE "DITCH STABLES," NEWMARKET.

It may be noted that her son Childwick repeated his dam's success nine years later. Stone Clink won in 1886 by a piece of good fortune. A game, sturdy little horse called The Cob, belonging to the Duke of Beaufort, and noteworthy for the fact that his dam, The Roe, was twenty-four years old when he was born, had been prepared for the race by Alec Taylor, who, with every justification for the opinion, believed that he could not be beaten. Like many other good horses The Cob was very lazy, and before the race it was repeatedly impressed upon his jockey that he must ride quite past the post. "If you drop your hands on him he will stop directly" his rider was told again and again by both the Duke and his trainer. The Cob led his field a rare gallop across the flat, and had may be mistaken about their horses is proved by the fact that Red Eyes, who ran a dead-heat with Cypria in 1893, had been given away to his trainer, Joseph Cannon, as worthless, after having been beaten in selling races.

The Cambridgeshire, run at the Houghton Meeting, was also originated in 1839, and, as has been already remarked, is generally considered the most interesting and important handicap of the season. Until the year 1887 the Cambridgeshire was run up the hill to the finish at the Criterion Course post at the "top of the town," and accounts of the race used always to contain a description of what was happening at the "Red Post," a post painted red which still stands at about the distance; but from 1888 the course has been altered and the

race is now run over a distance of 2,000 yards, finishing at the Rowley Mile stand. The story of Catch-'em-alive's victory in 1863 has been so often told that it need not be here repeated. The scales were tampered with, and it seemed that the winner must be disqualified until the malicious attempt was fortunately detected. French owners have been specially keen to win the Cambridgeshire, and succeeded in 1873 with Montargis, in the following year with Peut-être, with Jongleur in 1877, with Plaisanterie in 1885 (the third animal that has carried off both this and the Cesarewitch), and with Alicante in 1890. La Merveille and La Flèche, who won in 1879 and 1892, were English-bred horses in spite of their French names. In 1878 Isonomy, undoubtedly the best three-year-old of his year, and who might have won the Derby had his owner pleased—for Sefton could have had no sort of chance with him—was specially kept for the Cambridgeshire and won the race with 7 st. 1 lb. on his back. Foxhall's penalty raised his weight to 9 st., which it was supposed by not a few practical judges he could not possibly carry, especially as he had a field of notable excellence to beat, and his achievement was consequently a great one. 1882 is remarkable for the fact that the race had to be postponed in consequence of a terrific storm. Fog and frost may lead to postponements, but for wind and rain to do so is an altogether exceptional occurrence. The horses had gone to the post when the Stewards decided that the race could not possibly be run, and Mr. Arthur Coventry, the present starter, offered to go down on his hack to convey this intimation. The crowd, meantime, knowing nothing of this, waited for the field to come in sight, the delay being made exciting by the circumstance that several flies and carriages were blown over, their wheels revolving at a tremendous pace in the hurricane that was blowing. After a time the first of the horses that had been taken to the post returned a long way ahead of everything else, the jockey's colours indistinguishable in consequence of the saturation they had received. It appeared that something had won very easily indeed, but no one could say what, and when the others appeared at wide intervals an idea prevailed that this was the most extraordinary race ever seen; but presently it became known that it had not been a race at all. Hackness won the next day, when there were no fewer than thirteen races. Bendigo's success in 1883 was altogether unexpected. The horse's throat had been dressed and he was really not fit to run, but 6 st. 10 lbs. was a burden under which he could not be beaten, though he gave his opponents every chance, as towards the finish he swerved right across the course, from one side to the other; and it was only by a head that he succumbed to Florence (four years, 9 st. 1 lb.) next year.

The Cambridgeshire of 1886 was perhaps the most sensational on record. Possibly the true story of it will some day be told, but the time has not arrived to tell it yet. Carlton was favourite, and his party at Manton had the most implicit belief in him. St. Mirin was trained in the same stable, the two had been tried together, and of the superiority of Carlton there seemed to be no possibility of question; but Archer, who was to ride St. Mirin, notwithstanding the trial maintained that he was sure to beat the other, and for reasons that have never yet been explained he did so. The Derby winner Melton ran in this race, and in spite of the heavy weight he carried was going so well when they neared the Red Post that Archer began to race with him, making his effort sooner than he otherwise would have done. This no doubt took much of the steel out of St. Mirin, who, however, seemed to have the victory assured when the despised Sailor Prince suddenly challenged him, a desperate finish ensued, and Archer, weakened by wasting in order to ride the weight, was beaten a head. Three-year-olds had a run of luck from 1887, when Gloriation won, which has only been interrupted by the success of the four-year-old Veracity in 1888 and of Molly Morgan (four years, 6 st. 7 lbs.), in 1893. La Flèche's performance of winning with 8 st. 10 lbs. on her back in 1892 was a notable one; considering sex allowance it was more than equal to that of Foxhall, as he only won a short head, and the gallant mare cantered home with her ears pricked. That good horse Best Man was a strong favourite in 1895 in spite of the 9 st. he had to carry, but he could only get second to Marco (7 st. 9 lb.), who was probably much the best of the three-year-olds of his season. The handicapper in 1896 committed a grave error in letting in so good a colt as Winkfield's Pride with so little as 6 st. 10 lbs., and of course the horse had no difficulty in winning.

The Liverpool Autumn Cup and the Manchester November Handicap are other races which may be mentioned. Sterling, the sire of Isonomy, won the former with 9 st. 4 lbs. in 1873, a great achievement, especially considering that the minimum weight at this time was 5 st. 7 lbs. Master Kildare, the sire of Melton, won in 1879, and Melton, following in his sire's footsteps, was successful next year. Lady Rosebery, who had a great partiality for this course, won in 1888 and again in 1890, being successful also the following year in the Spring Cup, another instance of "horses for courses"; and in 1893 La Flèche ended her Turf career, with the exception of one essay a little later at Manchester, by a brilliant success with 9 st. 6 lbs. Belphœbe won both these races in 1878; Carlton's performance with 9 st. 12 lbs. in 1887 has already been mentioned, and Ravensbury, who would have had such a brilliant career on the Turf if he had lived in almost any other year except that which

made him so unfortunately the constant opponent of Isinglass, won with 9 st. 4 lbs. in 1894.

"Nurseries," it should here be added, are handicaps for two-year-olds exclusively, and they are frequent items on race cards during the last three months of the season, for by the Rules of Racing no "Nursery" can be run before the 1st of September.

SELLING RACES—Selling races are the lowest forms of contest recognised by the rules of racing; and selling handicaps, the lowest of all, are, on the face of them, manifestly ridiculous. "Winner to be sold for 50 sovs." is the notification in the conditions of the smallest, the selling price being raised on occasions to much larger sums, though perhaps £100 is the most common, and no prize can be less than £100 under Jockey Club Rules. Weights range from 9 st. to 6 st.; and it is manifest that if one horse can give another 3 st. and a beating—a beating which may tend to prove that he could have given much more—and if the winner is only worth £50, the defeated light-weight must be worth a great deal less; or, on the other hand, if the bottom weight wins, and the top weight, giving the 3 st., is only just defeated, receives, let us say, a 3 lb. or 4 lb. beating, he or she must be worth a great deal more than the winner. No one can fail to see the cogency of this argument; and the man of logical mind who did not understand the exigencies of racing would at once say that there was no denying the common sense of the cry for the abolition of, at any rate, the selling handicap. But the exigencies of racing are not governed by logical considerations. The point is how a man can get rid of a very bad horse; and the selling handicap supplies the nearest approach to an answer. An owner tries a two-year-old to be very bad—a youngster of which, very likely, he may have formed high hopes, based on his breeding, make and shape, action and apparent capacity to gallop. He fulfils an engagement, and runs wretchedly. "First time out; ran green," is the excuse; and he is started again. Again he is badly beaten; but the owner, perhaps, lays the flattering unction to his soul that the winner is something out of the common, has extraordinary speed, chopped his field, that his own horse did not get off, was shut in, or in some way the victim of accident. Once more he tries his luck in moderate company; and the truth, which has in fact been actually plain all the while, has to be recognised: he is a very bad horse. "We shall have to put him in a selling race," is the verdict, and in such a contest he figures. If beaten, he descends still further to the selling handicap, and should he fail even here his future becomes indefinite. If he is believed to "look like jumping," he may be claimed and tried at hurdles; if not, some one may pick him up at auction for a hunter, a hack or a cab—one may be dragged down Piccadilly by an animal whose name not long before has figured largely among the entries for great stakes. The decadence of a promising but deceptive two-year-old has here been traced; but horses come to run in selling races later in life. Possibly, for some mysterious reason, they have lost their form; perhaps they show a more or less pronounced tendency to go wrong in the wind; it may be that a leg has gone and been patched up, or else shows signs of going. For some cause or other it appears urgently desirable to get rid of them while they retain a scrap of form and reputation; and the doubtful animal is put into a selling race. Some screw must be loose or he would not be there, is the natural deduction; but many who want to bet will reply that he has never run in such company before, and at any rate ought to beat *this* lot. Thus one object of latter day sport, the making up of a race which may lead to an exciting struggle (and possibly to a brilliant display of horsemanship) is fulfilled.

It will at once be seen how readily such a system might be turned to a source of very possible profit by what are called "astute practitioners." Place a really smart horse in a selling plate, a horse that could win in good company, he will only have platers—the term is one of reproach—to beat, he is sure to win and his friends may bet, as the phrase goes, "till the cows come home." The plan has often been carried out with profitable results—supposing that two or three other owners are not playing the same game at the time—but there are dangers attached to the experiment. In the first pl c "the ring" are very ready to estimate the situation of affairs, to refuse to bet against the good thing, or at bes to make the backers lay long odds on it. It wins; but the stake is paltry; in order to make money by betting a very great risk has to be undergone, and the danger is not yet over. The winner of a selling race has, of course, to be sold by auction; the owner receives no more than the entered selling price, probably £100, possibly £50 (the lowest sum recognised), and the surplus is divided between the race fund and the owner of the second horse. If the owner of the winner, who has effected his *coup*, wants to retain his animal, he may very likely have to give a great deal of money for it, as the circumstances of the race, the confidence with which it has been backed, and the ease with which it won, have left no doubt about its value. Buying in is, therefore, an exceedingly expensive business. An actual example will best demonstrate the case. An American importation, named Banquet II., won a selling plate at Newmarket, worth £100; he was entered to be sold for another £100 (so far as memory serves—the record of the race in *Ruff's Guide* omits the selling price), and he was bought in for 1,510 guineas—£1,575 10*s*. The deficit, therefore, £1,375, had to be won by betting, which in this particular case would have involved a risk of probably at least £1,000. The owner (Mr. Croker, the "Boss of Tammany"), received £100 for the stake and had to pay £1,475 to retain his horse. Banquet II., as was then made evident, was regarded by his owner as worth at least some £1,600; but let us see what happened in this typical case. Notwithstanding his appearance as a "plater," the horse was entered for a £2,000 stake, and beaten; he ran again in a race of character, and again suffered defeat; after which another *coup* was attempted in a selling race. This time it miscarried. The horse was beaten a length by an outsider and promptly "claimed."

This is another risk run by owners who wish to gamble on selling platers. A rule of racing says that "all other horses starting" [other than the winner, that is] "may be claimed for the selling price *plus* the value of the stake or plate by the owners of horses running in the race or their authorised agents." Claims may be made by owners according to the places their representatives obtain; thus the owner of the third has priority of claim for the horse that ran second. In this case Banquet was entered to be sold for £200; the stake was worth another £200, so that he was claimed for £400; just a quarter of what has been shown to be his owner's lowest possible estimate of his worth; and of course the money betted on him, doubtless a heavy amount or the gamble would not have been remunerative, was also lost. It will be seen from this example how dangerous a game it is. The owner of the exploited plater must bet heavily in order to be able to afford to buy in his horse if he wins; and if he is beaten he is very likely to lose the animal, for a ridiculously inadequate sum, as well as his bets. It happens on occasions that an owner loses money by winning a selling race. His horse runs better than he has expected it would do, and he thinks he would like to keep it. He has not backed it, and so, entered to be sold for £100, he may have to bid, say £500, to retain it; which means that he must pay £400 for division between the owner of the second and the race fund—£500, less the £100 entered selling price. He is consequently £300 out of pocket, *plus* the jockey's winning fee of five guineas and incidental expenses. These gambles are not healthy; they are not in accordance with the true spirit of the sport, and by way of preventing them a rule was some time since instituted in

France that horses might be claimed for the entered selling price *plus* the value of the stake, before a race was run. The owner who had intended to "have a dash" on a useful horse that was put in to meet inferior class animals might thus be very awkwardly circumvented. There was a good deal of common sense in the idea, but apparently it did not answer.

It is inevitable that mistakes should be made, and at times horses rise from the ranks of the selling platers and greatly distinguish themselves. Their owners have lost patience with them after a disappointment, it may be; or they improve in an unexpected way, possibly by shaking off some ailment which has affected them, and has not been recognised by their first trainer; or it may be that he has misunderstood their constitution or capacity, so that in more appreciative hands they do better. If space permitted a string of examples might be given, but the case of Victor Wild may be quoted as a remarkable one. He belonged to Golding, a particularly shrewd and capable trainer, who makes as few mistakes as any one, but who, however, doubtless for some reason that seemed good at the time, put him in a wretched little £100 selling race, the Brockhurst Plate, at the now extinct Portsmouth Park Meeting. He won a couple of lengths from the best of four wretches who followed him, and, entered to be sold for £100, fetched 330 guineas—less than a twentieth part of his value. He next ran in a Nursery Handicap with a selling clause, met opponents of the most moderate character, and won comfortably, actually receiving weight from some of them. This time he was bought in for 640 guineas, and gradually started the career in the course of which he has often so memorably distinguished himself. Hampton, who won such fame as a sire, also figured in selling races. Thus a "plater" may become a famous horse; but he will be an exception to the rule, for the course of the plater is almost invariably down hill by more or less rapid stages.

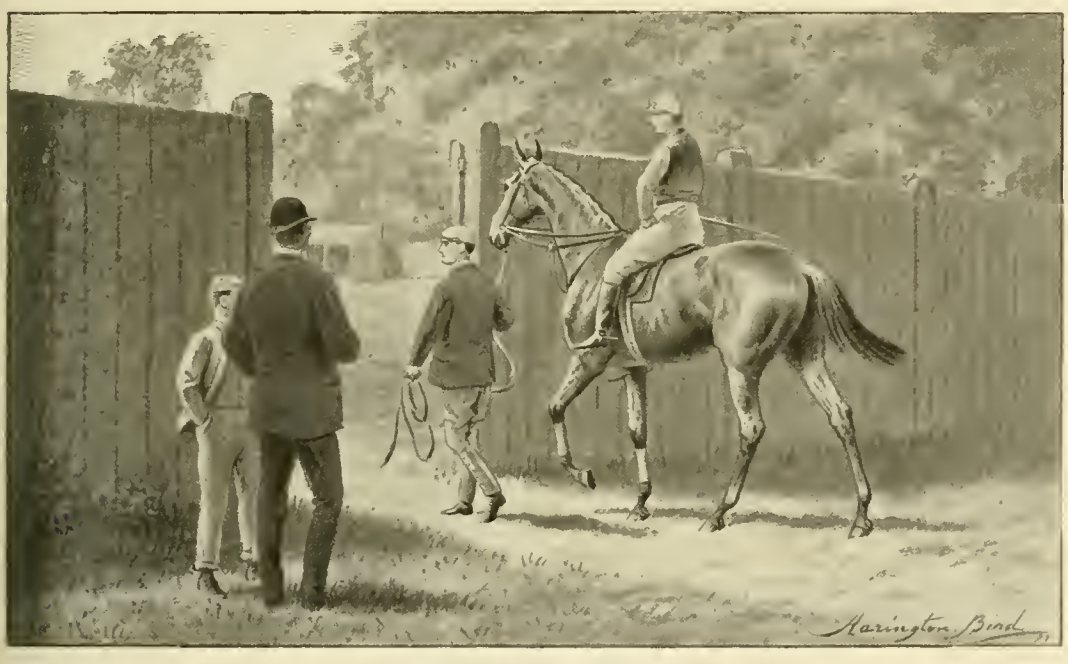
SPEED AND STAYING—Speed is the first requisite of the racehorse, his value depending largely upon the distance of ground over which he can maintain his best pace, that is to say, whether or not he is a stayer. A good definition of a stayer is much needed, and for want of a better he may perhaps be described as a horse who can keep on galloping for a long way when fully extended. Many, perhaps the majority of, racehorses have a flash of speed with which to finish a race—"one effort in them," as the phrase runs, and it is among the first essentials of jockeyship to know precisely when this effort should be demanded. There are not a few horses that cannot "get" even five furlongs, and among these very much depends upon the selection of the course, whether it is easy, as down the hill at Epsom (if the animal has good shoulders and can come down hill), at Derby and elsewhere, or severe as at Ascot, on the Rowley Mile, the old Cambridgeshire (or Criterion) courses, the Bunbury Mile, or where the winning post is at the top of an ascent. A really speedy horse that does not stay will beat bad animals over long distances, when running far beyond his course, in fact, because they fail to extend him. He is cantering while they are galloping hard; going on well within himself he does not tire, and so can keep with them at no exertion, reserving his speed: but put the same horse in his own class, among worthy rivals, so that he is kept at or near full stretch, and he is exhausted by a very much shorter course—as is natural. A "stayer" is a somewhat vague term, as regards the question of distance, but one generally understands a horse that can last with animals of his own class for at least a mile and a half. It would have been extremely interesting after Sheen had beaten Amphion at two miles to see what would have happened had the two run together over a mile, and then over a mile and a half. At a mile most people would have expected to see Amphion win easily; at a mile and a half opinions would have been divided; when they met at two miles Sheen won without difficulty. Kilcock's best distance is probably six furlongs, but he won at Newmarket over a course nearly twice as long (1 mile 3 furlongs), because against the horses that opposed him he had not to exert himself. The combination of great speed and staying power is occasionally found, but it is exceedingly rare.

RACE COURSES—By general consent the best meeting of the year is held at Ascot. The sport here is consistently good, and it is the one place where no selling race is found in the programme. There are only five handicaps during the four days over which the meeting extends, and one of these, the Royal Hunt Cup, is perhaps only second in general interest to the Cambridgeshire. The Ascot Stakes and the Wokingham are also events of importance, though the former is over two miles, and nowadays for all long distance races except the Cesarewitch fields are usually no better than moderate. The Ascot Cup stands out by itself as the great race of its kind. A few years since it was generally understood that a race for a Cup was invariably like the Cup at the "Royal Meeting" as it is called, over a long distance of ground, but in this respect things have altered on many courses and Cups are often run for at distances of less than a mile. Nearly all the stakes at Ascot are of considerable value. The Cup is now worth as a rule not far short of £4,000; the Coronation Stakes for three-year-old fillies often amounts to over £3,000, and the St. James's Palace and Hardwicke Stakes are also reckoned in thousands. The Hardwicke, it may be remarked, was named after the late Earl, who revised the Ascot programme during his tenancy of the Mastership of the Buckhounds. The Ascot course is circular, and only some sixty-six yards short of two miles round. The ground rises and falls, with a finish uphill, which is a severe test of a horse's ability, and some of the best jockeys who ride and have ridden there say that races are not seldom lost because riders do not appreciate the severity of the finish, and so make their effort too soon. The great drawback to Ascot, as a rule, is the hardness of the going. The meeting always takes place about the middle of June, when the sun has baked the course, and scarcely a year passes in which some good animals do not permanently injure themselves by running here.

But to a great many devotees of the sport there is no place which approaches Newmarket. The whole of Newmarket is practically given up to the horse. Most of the training here is done on what is called the "Bury Side," an expanse of ground including the famous Lime-kilns, on which, as a rule, the going is always good. Even when it is hard on other parts of the Heath, if one passes through the belt of trees which separates the Lime-kilns from the Bury Hill, horses can be freely galloped at almost all times, though elsewhere they have to do their work on the tan tracks which have been laid down, and are utilised by trainers who desire to avoid the jar which would be caused by the hard ground. What is called the "Race Course Side" is also busy in the morning, however. Most of the races take place on some portion of the Rowley Mile, though not all of them

finish at what may be called the principal winning post, opposite to the stand. There are three other winning posts on this portion of the course. First comes the Abingdon Mile. This post is situated at the bottom of a descent, so that the course is suitable for speedy horses with little staying power, as they have not to climb up the rise to the Rowley Mile post. The next is the Ditch Mile, and the last is the T.Y.C., capitals which stand for "Two Year Old Course." Every course, it may be remarked, has its T.Y.C. extending to something from 5 to 6 furlongs; thus the T.Y.C. at Newmarket (that is to say on the Rowley Mile course) is 5 furlongs 140 yards; at Ascot it is 5 furlongs 136 yards; at Doncaster the "Red House in" does duty for a T.Y.C., and is 5 furlongs 152 yards; at Epsom and Goodwood it is 6 furlongs exactly. The Cambridgeshire used to finish, as a few races do still, at the Criterion Course winning post, commonly called "the top of the town," but in 1888 the course which had been in use since this handicap was first established, in 1839, was altered. The Cambridgeshire now finishes at the Rowley Mile stand, and is run over exactly 2,000 yards, that is to say a mile and a "distance"; for a "distance" is not a vague term as some people appear to suppose, but a measurement of 240 yards. The hill from the Rowley Mile stand to the winning post at the "top of the town" is a severe one and forms a useful test of a horse's staying powers. Here it was that the old Beacon course, about which one often reads in old racing histories, came to an end. This course was 4 miles 1 furlong 177 yards in length. It is very seldom used now, never, indeed, unless the Whip is challenged for. On the Rowley Mile and its appurtenances are held the three Spring and three Autumn meetings, called the Craven, the First Spring, the Second Spring: the First October, which usually takes place at the end of September, the Second October, and the Houghton. The two Summer Meetings, the First and Second July, are held on another course, familiarly described as "Behind the Ditch." The course runs parallel to the famous "ditch" which was erected—for it is an embankment as well as a ditch proper—in time immemorial for military purposes, and may still be traced through several counties. Here there are two winning posts: one opposite the stand at the top of a hill, the other, the new T.Y.C., which is 5 furlongs 142 yards, at the bottom of the rise, so that it is not nearly so severe. How trying this hill is to horses is shown by the frequency with which they fail to carry a penalty up it. There can scarcely be a better proof of a horse's merit than success in a race "A.F.," assuming of course that the field is made up of good animals. "A.F." are initials that signify "Across the Flat," and the course consists of the Rowley Mile together with 2 furlongs beyond it at the start. It is, quite straight, with ascents and descents just enough to try a horse's action; for though it is in no part very steep, if an animal cannot come down a hill, a consequence of bad shoulders or of his being what is called "upright" in front, the descent into the Abingdon Mile Bottom is sufficient to make him falter. A straight course is more arduous than one round turns, in "negotiating" which an animal must be slightly eased. The breadth of the Newmarket courses is a great advantage, as horses have plenty of room, and with moderate luck and judgment a jockey should never be shut in; though not long since in a match one of the horses was disqualified for bumping. Before the stands were erected, a great many visitors to Newmarket did their racing on horseback, and not a few gentlemen and trainers have their hacks there at present. When races finish, as they do on some days, at several of the different winning posts, a good deal of exercise is involved in getting about, and a hack is a great convenience. The Round Course is now little more than a name. It extended over 3 miles 4 furlongs 138 yards; the "Ditch In," 2 miles 118 yards from the running gap (a cutting through the "ditch") to the end of the Beacon Course, is also seldom used, but one or two races are still run over the Two Middle Miles, a course in reality 17 yards short of its nominal distance.

The Epsom Course is one of the worst in the country by reason of the very awkward turn at Tattenham corner.



RETURNING TO THE PADDOCK.

This was not long since to some extent modified, but it is still extremely dangerous, and on rounding it the jockey finds himself at the top of a steep hill, dashing down which must be something of a trial to the nerves if they are not of the best. The Derby Course is much in the form of a horseshoe, the first part of it being on the ascent, and though, certainly, riders do not seem to ease at all in coming round the corner, it is evident that they must do so, because the Derby time is invariably rather slow. The Bell stands at the bottom of the hill: from there to the winning post is a slight rise, but its distance is short, and thus horses that cannot come down hill have naturally a bad chance at Epsom, though it may be noted that to judge from a horse's formation whether he can come down hill or not is apt to lead the observer into error. Those who remember Bay Middleton declare that he was as upright as a walking stick, but he came down the hill in perfect style when he won the Derby.

Goodwood, one of the best and most picturesque courses in the country, is some five miles from Chichester on the borders of the Duke of Richmond's park. The swelling Downs with the Solent beyond make a beautiful view from the stands, and for some reason or other, though the meeting is held on the last days of July or the first days of August, the going never seems to be very hard. The courses are very varied in character, the long distance races being run round a hill called "the Clump." Doncaster is a circular course nearly flat, 1 mile 7 furlongs 92 yards round; there is a turn into the straight—for when a course is spoken of as circular it must not be understood that it bears anything like a close resemblance to a circle—but it is a long way from home, and trouble in the nature of jostling seldom happens there, though in Memoir's St. Leger there was a scrimmage at this point, T. Loates on St. Serf having been knocked uite out of his saddle, to which he was restored by Tom Cannon. The nearest approach to a circular course, using the word in its proper meaning, is at Chester on the Roodee, by the side of the river Dee; the course indeed has been derisively spoken of as a "soup plate." It is only about 50 yards more than a mile round, and so is very much on the turn and unsuitable for long-striding horses.

A familiar phrase on the turf is "horses for courses," and that there is a good deal in the expression often seems to be proved. Thus the Brighton Course is very like Epsom, and horses that win at one meeting often win at the other, a circumstance, however, which may no doubt partially be explained by the fact that these courses down a long hill are easy, so that a speedy animal who cannot stay has a specially good chance. York has an oval flat course on the famous Knavesmire about a mile from the city. One of the most popular of the few "open courses," as opposed to gate money meetings, which still remain, is at Stockbridge, the headquarters of the Bibury Club, one of the oldest established racing clubs in the country, members of which are *ipso facto* gentlemen riders, the only other English racing clubs which confer this distinction being the Jockey Club, Croxton Park, Southdown and Ludlow. Besides races for gentlemen riders Stockbridge, situated on the Downs near the historical training establishment of Danebury, has usually some very good two-year-old sport. The place has long been specially popular with many of the leading patrons of the turf, and it is seldom that good horses do not go to the post for the Hurstbourne Stakes—Stockbridge indeed is recognised as having a charm of its own, and much regret has been expressed at the report that a renewal of the lease for the training ground and racecourse cannot be obtained. It was here that the Marquis of Hastings and the Duke of Beaufort had their horses under the charge of John Day, father-in-law of the present tenant, Tom Cannon, during a very sensational period of turf history. The Southdown Club meeting is held at Lewes, where the course on the top of a range of hills near the capital of Sussex has some resemblance to Stockbridge. Of the racing clubs which have lately come into existence Sandown Park was one of the first. This has a pear-shaped course rather more than a mile and a half in circumference, and is on the whole tolerably easy; for though there is a stiffish hill at the finish, horses in a race of six furlongs or more have to come round turns which necessitate a certain amount of easing. There is also a new T.Y.C. here, quite straight, running through the middle of the park, the awkward point about which is that if races are viewed from the Stand it is impossible to judge with anything approaching accuracy what has won until the judge has confirmed impressions—or perhaps in most cases destroyed them—by hoisting the number. Kempton Park also has a trying turn, by reason of which many calculations are upset. When horses are heavily weighted their jockeys are not seldom greatly perplexed as to the best method of proceeding. Unless they race for the turn, so as to get a good place there, they are in considerable danger of being shut in; and on a horse that carries a heavy burden it is usually good policy to wait. Gatwick is on the lines of Sandown and Kempton, and like them is undoubtedly well managed. The drawback to the place lies in the nature of the soil; the clay forms deep and holding mud in very wet weather, and in very dry weather becomes extremely hard. Credit for good management must also be extended to Hurst Park and Lingfield. The former is at Moulsey Hurst, where once the old Hampton Races, the great Cockney carnival, used to be held. Great pains have been taken with the ground, and the going here is almost always good. Lingfield, too, is in all respects a pleasant and picturesque meeting, though the Stands are, as on so many other courses, placed so that it is difficult for a majority of their occupants to obtain a good view of the sport. There is also a racing club at Derby and a very good flat oval course with moderately easy turns rather more than a mile and a quarter round. The racing here is notably popular with all classes. Manchester and Liverpool (the former, to be strictly accurate, at Aintree, some five miles from the city) are leading homes of racing. Newcastle is served by Gosforth Park, and Birmingham has lately started a course marked by special advantages. There is here a straight mile and a quarter, straight actually, not only nominally, and an excellent view of the sport can be had from the stands, the architects having understood at what angle to the running ground they should be built. Leicester has a very good course, and the meeting has lately attained a degree of popularity which was for some time denied it. There is here, however, a rather steep descent into a hollow and a trying ascent out of it before the level run in is reached. The season always opens at Lincoln, and one of the last meetings is also held there. The course is (nominally) circular, 1 mile 6 furlongs 6 yards. The T.Y.C. is about 5 furlongs, to suit the young horses in their earliest public essays.

THE COST OF RACING—The cost of racing may, of course, be anything. It may result in an annual profit or loss of many thousands of pounds, according to the scale on which it is followed and the luck which befalls an owner. The word "luck" is not carelessly employed; for much, very much, as judgment may achieve, the element of luck supervenes and practically governs well nigh everything. When the Duke of Westminster was mating his mares in 1882, it was surely to a great extent luck or chance that made him send Lily Agnes to Bend Or, with the result that Ormonde was born to show himself invincible, and to become the sire of Orme and Goldfinch. Chance had much to do with the fact that the Duke of Portland became possessed of St. Simon; an accident prevented the purchase of the colt

after Prince Batthyany's death, before he was sold to his present owner; and, similarly, it was luck which induced the Duke, who seldom buys at an auction, to go to Bushey the day Memoir was put up, thereby securing an Oaks and Leger winner. Without examining the matter too closely, it must be acknowledged that luck enormously influences victory or defeat. But, returning to the cost of racing, there are certain inevitable expenses, and some light may be thrown on the subject by a little consideration of them. A thoroughbred horse may cost from five guineas up to at least six thousand times that sum—at meetings towards the end of the season runners in selling races have been knocked down for the small amount named, and the larger sum is understood to have been offered and declined for Ormonde. Horses, therefore, go at all prices. Often, moreover, the dearest prove worthless, and the cheapest gallop their way to glory.

When an animal has been acquired, training and running have to come into consideration. The usual fee per horse is 50*s.* a week, though some trainers have of late years raised this to three guineas, and in certain cases the trainer also has a salary, or a percentage on the stakes won by the horses in his charge. After the weekly payment the question of entries arises; and this is a very important one. A specially well-bred, good-looking animal will be, as a rule, freely entered in weight-for-age races, and the cost here may be anything from a minor forfeit of a sovereign to a hard-and-fast sum—"p.p." as it is called, meaning "play or pay,"—of 200 guineas. The sum named is the price of entrance, for example, to the Prince of Wales's Stake at Goodwood. It is not at all an unusual thing for a young horse to have a thousand pounds worth of engagements made for him; and if he is no good for racing, as so often happens, the money is lost at once. Having shown inability to win important stakes an animal may be entered for little handicaps, and being beaten in them so add to the total of loss. In order to run he must be ridden, and here the payment of jockey comes in. The set fee is three guineas for a losing mount on the flat, five guineas for a win; but, in addition to this, special terms have to be made in order to secure the services of particularly accomplished horsemen, either by agreement for a sum per mount, or in the way of a retainer for first, second, or, in the case of riders who are much sought after, even a third call on the jockey's services. The writer of this article has been commissioned by a friend to offer as much as 4,000 guineas a year for first call on a popular jockey—who was compelled to refuse. It will be perceived that when an owner is anxious that the fullest justice shall be done to his horses, the jockey's payment is an important item. Travelling is another expense. Most of the leading owners have their own vans on the railway, which is not only a convenience, as the van is always ready when wanted, but also to a great extent a safeguard against disease, as in a public horse-box an animal affected by some infectious ailment may have left mischief behind for the next user. Stabling at the place where the meeting is being held is a further detail, though of late the managers of a few courses, in order to attract horses to run, have offered stabling and forage free. There are some few additional expenses. For every horse trained at Newmarket a Heath Tax of seven guineas is charged; owners almost invariably provide their horses with distinctive clothing—some have two suits, one for general use on the training ground, the other, which frequently reproduces or suggests the colours, for use on the racecourse. Caps and jackets have also to be bought for the jockeys; there are saddlers' bills, and, not seldom, accounts for veterinary attendance. If an owner breeds his own animals, there is the cost of paddocks, of men to look after the mares, and fees for the services of sires, which may be anything downwards from 500 guineas—the primary cost of a possible St. Simon foal. As for the rewards, the Duke of Portland in 1889 headed the list of winning owners with £73,858. That sum stands out by itself, most nearly approached by Mr. H. B. McCalmont's £37,674 in 1894. From the winning totals entries and forfeits have to be deducted. If an owner bets, the cost of racing may be reduced or enhanced; as a general rule he will, at any rate in the long run, find himself a loser by taking the odds.

HORSES WINNING OVER £20,000 IN STAKES

Name of Owner.	Name of Horse.	Amounts won. At two years.	At three years.	At four years and upwards.	Total.
		£	£	£	£
Mr. M'Calmont	Isinglass (1892–95)	4,577	18,690	34,018	57,185
Duke of Portland	Donovan (1888–89)	16,487	38,448	—	54,935
Duke of Portland	Ayrshire (1887–89)	6,765	8,575	20,560	35,900
Prince of Wales	Persimmon (1895–97)	2,551	19,510	12,665	34,726
Baron Hirsch	La Flèche (1891–94)	3,415	25,535	5,635	34,585
Duke of Westminster	Orme (1891–93)	8,574	13,023	11,329	32,926
Mr. Leopold Rothschild	St. Frusquin (1895–96)	9,537	23,043	—	32,880
Mr. A. W. Merry	Surefoot (1889–91)	2,411	14,322	15,545	32,278
Count de Lagrange	Gladiateur (1864–66)	960	25,318	4,807	31,105
Duke of Westminster	Ormonde (1885–87)	3,008	21,552	3,905	28,465
Mr. J. Gubbins	Galtee More (1896–97)	4,382	22,637	—	27,019
Sir Richard Sutton	Lord Lyon (1865–67)	3,625	20,350	1,590	25,465
Lord Calthorpe	Seabreeze (1887–89)	4,122	20,144	—	24,266
General Pearson	Achievement (1866–68)	10,390	12,073	—	22,463
Duke of Portland	Memoir (1889–91)	5,308	15,702	290	21,520
Chevalier Ginistrelli	Signorina (1889–91)	14,905	200	8,976	21,181
General Byrne	Amphion (1888–91)	1,070	4,730	15,068	21,588
Mr. Vyner	Minting (1885–88)	7,596	5,504	6,518	20,378

RULES OF RACING.

The following Rules came into operation on January 1st, 1890:—

[These Rules apply to all meetings held under the sanction of the Jockey Club, and to all races run at such meetings.]

Interpretation of Words and Phrases.—1. A "recognised meeting" is a meeting held under the sanction of the Jockey Club, or other Turf authority, of the country in which it is held; or (where no such authority exists) under these Rules. The Turf authorities of the United Kingdom are—The Jockey Club, The National Hunt Committee, The Turf Club of Ireland, The Irish National Hunt Committee, The Channel Islands Racing and Hunt Club. "Stewards."—Wherever the word "Steward" or "Stewards" is used, it means Steward or Stewards of the meeting, or their duly appointed deputy or deputies. Ireland, the Channel Islands, and the Isle of Man are not included in the expression "Great Britain," but they are in the expression "the United Kingdom." The "Registry Office" is the office for the time being appointed as the Registry Office by the Jockey Club. "Registered" and "Registration" mean "Registered" and "Registration" at such office. The "Racing Calendar," comprising the "Sheet Calendar," the "Monthly Calendar," the "Book Calendars" of "Races Past" and of "Races to Come," and the "Stud Book" are the works published under those names respectively by authority of the Jockey Club. A "horse" includes mare, gelding, colt and filly.

[N B.—The present Registry Office is Messrs. Weatherby's office, 6 Old Burlington Street, London, W., and at Newmarket.]

A "maiden" is a horse which has never won a race (other than a match or private sweepstakes) at any recognised meeting in the United Kingdom, or in any other country. A maiden means a maiden at the time of the start. A "race" means plate, cup, sweepstakes, private sweepstakes, or match, but not steeple chase, hurdle race, or hunters' race on the flat. A "plate" is a race to be run for money or other prize without any stake being made by the owners of the horses engaged. A "sweepstakes" is a race in which stakes are made, or a fixed sum subscribed for, by the owners of three or more horses engaged; and any such race is still a sweepstakes when money or other prize is added. A "private sweepstakes" is one to which no money is added, and which has not been advertised previous to closing. A "match" at "catch weights" means one for which the riders need not weigh before or after the race. A "cup" is any prize not given in money. The "Forfeit List" is a record of arrears published under the sanction of the Turf authorities of the United Kingdom. A "handicap" is a race in which the weights to be carried by the horses are adjusted by the handicapper for the purpose of equalising their chances of winning. A "free handicap" is one in which no liability for stake or forfeit is incurred until acceptance. A "nursery handicap" is one confined to two-year-old horses. A "post race" is a race for which a person may, under one subscription, enter two or more horses, and run any one or more of them, as the conditions prescribe. A "produce race" is one to be run for by the produce of the horses named or described at the time of entry. A "selling race" is one the conditions of which require that every horse running, if a loser, may be claimed, and if the winner, must be offered for sale by auction, or be liable to be claimed. A "weight-for-age race" is a race in which weights are apportioned to horses according to their ages, and remains a weight-for-age race, even if there are penalties and allowances. The "nominator" is the person in whose name a horse is entered for a race. "Owner" includes "part owner" or "lessee." "Authorised agent" means an agent appointed by a document signed by the owner and lodged at the Registry Office, or, if for a single meeting only, with the Clerk of the Course. "Authorised agent" includes sub-agent, if authority to appoint a sub-agent is provided by the document. "Arrears" are any sums unpaid in respect of fines, fees, entrance money, stakes, subscriptions, forfeits, and purchase money in races with selling conditions. The "time of entry" means the time fixed for closing. "Started"—every horse shall be considered as having started which is under the Starter's orders when the advance flag has been raised.

Calculation of Time.—2. When the last day for doing anything under these Rules falls on a Sunday, it may be done on the following Monday, unless a race to which such act relates is appointed for that day, in which case it must be done on the previous Saturday. 3. "A month" means a calendar month; "a day" means twenty-four hours.

Racing Season.—4. No race shall be run earlier than in the week which includes the 25th of March, unless that week be the week next before Easter Sunday, in which case races may be run in the week preceding. No race shall be run later than in the week which includes the 22nd of November.

Stewards of Meetings.—5. There must be at least two Stewards for every meeting. 6. Each Steward may appoint a deputy at any time; or if there be only one Steward present, he shall, in case of necessity, appoint one or more persons to act with him. If none of the Stewards are present, the Clerk of the Course shall request two or more persons to act during the absence of such Stewards.

Powers of the Stewards.—7. The Stewards of a meeting have full power to make (and, if necessary, to vary) all such arrangements for the conduct of the meeting as they think fit, and, under special circumstances, to put off any races from day to day until a Sunday intervene. 8. The Stewards have control over, and they and the Stewards of the Jockey Club have free access to all stands, rooms, enclosures, and other places used for the purposes of the meeting. 9. They shall exclude from all places under their control—(i) Every person who is warned off Newmarket Heath. (ii) Every person whose name has been published in the Unpaid Forfeit List, until the default is cleared. (iii) Every person who has been reported as a defaulter under Rules 176–178, until it has been officially notified that his default is cleared. (iv) Every person who has been declared by the Turf authorities of, or by the Stewards of any recognised meeting in, this or any other country, to have been guilty of any corrupt or fraudulent practice on the Turf. (v) They have power to exclude at their discretion any person from all or any places under their control. 10. The Stewards have power to regulate and control the conduct of all officials, and of all trainers, jockeys, grooms, and persons attendant on horses. 11. They have power to punish at their discretion any person subject to their control with a fine not exceeding £50, and with suspension from acting or riding at the same meeting, and to report to the Stewards of the Jockey Club, should they consider any further fine or punishment necessary. 12. The Stewards have power to determine all questions arising in reference to racing at the meeting, subject to appeal under Rule 168, and should no decision have been arrived at by the Stewards within seven days of an objection being lodged, the Clerk of the Course shall then report the case to the Stewards of the Jockey Club, who may at their discretion decide the matter, and if they consider there has been any negligence, may order any additional expense arising therefrom to be defrayed out of the funds of the meeting at which the case occurred. 13. The Stewards have power to call for proof that a horse is neither itself disqualified in any respect, nor nominated by, nor the property, wholly or in part, of a disqualified person; and in default of such proof being given to their satisfaction they may declare the horse disqualified. 14. The Stewards have power at any time to order an examination, by such person or persons as they think fit, of any horse entered for a race, or which has run in a race. 15. The Stewards, as such, shall not entertain any disputes relating to bets.

Powers of the Stewards of the Jockey Club.—16. The Stewards of the Jockey Club may impose any fine not exceeding £100. 17. The Stewards of the Jockey Club have power, at their discretion, to grant, and to withdraw, licences to officials, jockeys, and race-courses; to fix the dates on which all meetings shall be held; to make inquiry into and deal with any matters relating to racing; and to warn any person off Newmarket Heath. 18. The Stewards of the Jockey Club take no cognisance of any disputes or claims with respect to bets, but they will give effect to an official report of default made to them by the Committee of the Subscription Rooms at Newmarket, or at Tattersall's.

Officials.—19. The following officials shall be appointed for every meeting, subject to the approval of the Stewards, viz., Clerk of the Course, Handicapper, Stakeholder, Clerk of the Scales, Starter and Judge, each of whom, as a qualification for his office, requires a licence, to be granted annually by the Stewards of the Jockey Club. 20. In case of emergency, the Stewards may, during a meeting, appoint an unlicensed substitute to fill any of the above-named offices for that meeting only. 21. Every complaint against an official shall be made to the Stewards in writing, signed by the complainant.

Clerk of the Course.—22. The Clerk of the Course, or his authorised substitute, is the sole person responsible to the Stewards for the general arrangements of the meeting, and shall see that all courses are properly measured and marked. 23. The Clerk of the Course shall arrange for the publication, under the sanction of the Stewards, of a daily official card of the Races, containing the conditions of each race, as published in the "Racing Calendar," the names, or other description, of the horses engaged, with a number attached to each, and such further particulars as the Stewards may require. A horse may appear on the card in the name of the owner instead of that of the nominator, and the Stewards may, under special circumstances, grant permission for a horse to run in the name of the trainer. The Clerk of the Course shall, in such latter case, make a report to the Registry Office, stating the grounds upon which the permission was granted. 24. The Clerk of the Course shall make a return to the Registry Office of any Deputy Steward or official appointed, of all complaints to and decisions of the Stewards, of all fines inflicted, and of all horses sold or claimed. 25. The Clerk of the Course shall have in his possession, for the information of the Stewards, a list of persons warned off Newmarket Heath, and of suspended jockeys, and also a copy of the latest Monthly Forfeit List; and he shall not allow any horse which, or the owner or nominator of which, is in the Forfeit List to start for any race.

Handicapper.—26. The Handicapper shall append to the weights for every handicap the day and hour from which winners will be liable to a penalty, and no alteration shall be made after publication. 27. No Handicapper shall hold any other office at a meeting, nor handicap at any other meeting held during the same week, except by express permission of the Stewards of the Jockey Club. He must attend the meeting either personally or by licensed deputy. The name of the Handicapper attending the meeting shall appear in the Calendar containing the Report.

Stakeholder.—28. The Stakeholder shall not allow a jockey to be weighed out for any horse until such horse's stake for that race, and the forfeits for every horse belonging to the same owner, or standing in his name, the jockey's fee, and any arrears claimed under these rules have been paid, or the Stakeholder shall himself be liable. Providing that he shall not be liable for arrears in respect of a meeting elsewhere than the place at which the race is run, unless notice of such arrears being overdue has been published in the Forfeit List, or delivered in writing, signed by the party claiming the arrears, to him, and to the persons indebted, before ten in the evening preceding the race. 29. The Stakeholder shall at the expiration of fifteen days after the meeting render an account and pay over all stakes and added money to the persons entitled, and at the same time notify at the Registry Office all arrears; and one month before the publication of the next available Forfeit List he shall further notify at the Registry Office all arrears then remaining unpaid, for publication therein.

Clerk of the Scales.—30. The Clerk of the Scales shall exhibit the number as allotted on the official card of each horse for which a jockey has been weighed out, and shall forthwith furnish the Starter with a list of such numbers, and the numbers shall not be

taken down until the horses are started. 31. If extra, or special, weight be declared for any horse, such weight shall be exhibited with the number; also any declaration to win, or alteration of colours. 32. He shall in all cases weigh in the riders of the horses placed by the Judge, and report to the Stewards any jockey not presenting himself to be weighed in. 33. The Clerk of the Scales shall always put 2lb. extra into the scale to prove that the horse has not carried too much weight. 34. He shall at the close of each day's racing send a return to the Registry Office of the weights carried in every race, and the names of the jockeys, specifying overweight if any.

The Starter.—35. The Starter shall give all orders necessary for securing a fair start. The horses must be started from a walk, and also, as far as possible, in a line, but they may be started at such reasonable distance behind the starting-post as the Starter thinks necessary. 36. Any jockey presuming to start, or even to put his horse into a trot or canter, with a view to take any advantage before the flags are dropped, wilfully turning his horse round, not starting when the flags are dropped, hanging behind, or refusing to obey the commands of the Starter in any respect whatever, shall be reported to the Stewards. 37. A start in front of the starting-post, or on a wrong course, or before the appointed time, is void, and the horses must be started again as soon as practicable. 38. The Starter shall report to the Stewards the time at which each race was actually started; and shall also report by whom, or by what cause, any delay was occasioned.

The Judge.—39. The Judge, or his authorised substitute, must occupy the Judge's box at the time the horses pass the winning-post. He must announce his decision immediately, and such decision shall be final, unless an objection to the winner, or any placed horses is made and sustained. Provided that this rule shall not prevent a Judge from correcting any mistake, such correction being subject to confirmation by the Stewards. 40. The Judge shall, at the close of each day's racing, sign and send a report of the result of each race to the Registry Office.

Regulations for Race Meetings.—41. All racecourses must be licensed, and all meetings sanctioned, by the Stewards of the Jockey Club. 42. The conditions of every race before closing, and the full programme of every meeting before it takes place, must be advertised in the "Racing Calendar," and no alteration can be made in the conditions of any race after the last advertisement. 43. The last rule shall not preclude the addition of more money to a race, or of a new race to the programme of a meeting subsequent to the publication of the last "Calendar" issued previous to the meeting being held. 44. The Stewards of the Jockey Club may at their discretion prohibit the advertisement of any race or meeting "in the Racing Calendar," or call upon the Stewards to alter or expunge any conditions, even after advertisement. 45. At every meeting advertised in the "Racing Calendar," one half at least of the total amount guaranteed for prizes shall be apportioned to races of a mile or over for three-year-olds or upwards. 46. There shall be in each day's programme the following races, to fill with five entries for each of them:—(i) Two races of a mile or upwards. (ii) One race, being neither a handicap, a race in which there are any selling conditions, nor confined to two-year-olds. This race may be one of the two races specified in the last clause. 47. There shall be no race less than five furlongs, nor more than two races per day, of those confined to three-year-olds and upwards, of less than six furlongs. 48. The advertisements must state the days on which the meeting is to be held, the dates for closing the stakes, the names of the persons to receive nominations and declarations of forfeit, and a place or places for the entry for every race, the dates when weights for the handicaps will be published and when forfeits will be due and, before the time fixed for closing (racing for future years excepted), the names of two or more persons as Stewards, and of the Judge, Starter, Clerk of the Course, Handicapper, Stakeholder, and Clerk of the Scales.

Omitted Conditions.—49. When the weights are omitted from the advertised conditions of any race, the colts shall carry 9st., and fillies 8st. 11lb., subject to penalties and allowances. If the horses be of different age the weights shall be fixed by the sanctioned scale appended to these Rules. 50. When no course is mentioned, it shall be as follows:—If two-year-olds, six furlongs. If three-year-olds, one mile. If four-year-olds, two miles. If five-year-olds, or upwards, four miles. And if the horses be of different age the course shall be fixed by the age of the youngest. At any meeting where there are two or more courses of the same distance, the special course shall be selected by the Stewards. 51. When no day is fixed for a race, it shall be run on the last day of the meeting, unless otherwise agreed by all the parties engaged, and sanctioned by the Stewards.

Special Conditions applicable to Handicaps, Produce Races, and Selling Races.—Handicaps.—52. The top weight to be allotted in a handicap shall not be less than 9st. If in a handicap for which there is a minor forfeit declared by a fixed time the highest weight accepting was originally less than 9st., it shall be raised to that weight, and the other acceptances equally. It shall be in the power of Stewards, by notice in the programme, to extend this last-mentioned rule to the highest weight left in at ten o'clock the preceding evening in handicaps for plates and stakes, where there is no declaration of forfeit, provided the weights are fixed the night before running. 53. In handicaps there shall be no clause permitting an alteration of the weights after publication by the claim of a selling allowance.

Produce Races.—54. If the produce of a mare is dropped before the 1st of January, or if there is no produce, or if the produce is dead when dropped, a declaration to that effect by the time prescribed in the conditions renders the entry of such mare void; if twins are dropped, the nominator shall at the same time declare to which of them the engagement attaches.

Selling Races.—55. All lads who, while under age, have of their own free will, and with the consent of their parents or guardians, bound themselves to a trainer for a term of not less than three years, are permitted, during their apprenticeship, to claim 5lb. allowance in all selling races which are not handicaps, provided no horse carry less than 6st. They will be entitled to this 5lb. allowance for one year (or 365 days) after winning their first race in any country. 56. Every horse running shall, if the winner, be liable to be claimed for the selling price by the owner of any other horse engaged in the race, or his authorised agent; but if it is a condition of the race that the winner is to be sold by auction, the sale shall take place immediately after the race, and the surplus over the selling price shall be divided between the owner of the second horse and the Race Fund. If sold, or bought in, the horse shall not leave the place of sale without permission of the auctioneer, and a written order given for his delivery; and if the horse be not paid for, or the price secured to the satisfaction of the auctioneer within a quarter of an hour, he may put the horse up a second time, and the purchaser at the first sale shall be responsible for any deficiency arising from the second, and shall be treated as a defaulter until it is paid. Whoever issues the delivery order for a horse sold, bought in, or claimed, is responsible for the money, and shall, if required, pay the same over to the person entitled, the day after the horse is delivered. 57. All other horses starting may be claimed for the selling price plus the value of the stakes or plate by the owners of horses running in the race, or their authorised agents. (i) Owners of horses placed shall have priority of claim in the order of their places; and if the owners of two or more horses having equal rights claim, they are to draw lots. The owner of the winner has the last claim. (ii) No person can claim more than one horse. (iii) Every claim must be made in writing to the Clerk of the Scales within a quarter of an hour after the winner has passed the scale. 58. The price of every horse claimed must be paid to the Stakeholder, and an order given by him for the delivery of the horse, but subject to the rules in cases of objection. In the case of a horse being claimed, if the price be not paid before seven o'clock in the evening of the day of the race, the claimant forfeits his right. But the owner may insist on the claimant taking and paying for the horse; and if he refuse or neglect to do so, he shall be treated as a defaulter in respect of the price. 59. If a horse walk over (or there be no second horse placed) for a selling race, the winner is still liable to be sold, but any surplus above the selling price will go to the fund. 60. The foregoing rules relating to claiming and selling races, in cases where a horse placed first is objected to, are subject when practicable to the following provisions:—(i) If an objection be made before the horse has been sold, the time for selling and claiming shall be fixed by the Stewards. (ii) Where the objection is made and sustained after the horse has been sold or bought in, the sale or buying in, and any claim in respect of the horse placed second, shall be annulled, and all moneys paid thereunder returned. The horse disqualified shall be liable to be claimed as a beaten horse, and the Stewards shall fix a time for the exercise of such right of claiming, and a time and place for the sale of the horse adjudged to be the winner. Should the Stewards find the above provisions impracticable, they shall make a report to the Registry Office. (iii) In the case of a dead-heat, the time for claiming or selling is postponed until the dead-heat is run off. In case of a division, each of the horses dividing is a winner for the purposes of the rules relating to claiming and selling; and if an auction race, both shall be put up to auction, and any surplus shall be divided, half to go between those horses, and half to the Race Fund. 61. In all other races with selling conditions only such horses as run to be sold shall be liable to be sold or claimed, but with this exception and allowance to apprentices the foregoing rules relating to selling races shall apply.

Race-Horses.—Age.—62. The age of a horse shall be reckoned as beginning on the 1st of January in the year in which he is foaled. 63. Yearlings shall not run for any race. 64. Two-year-olds shall not run more than six furlongs before the 1st of July, nor shall they run for handicaps before the 1st of September, nor in handicaps with older horses.

Names of Horses.—65. (i) A name can only be claimed for a horse by application at the Registry Office in London, with the description according to rule, when, if there is no other horse of the same name, the name will be registered and published in the first Sheet Calendar after it has been claimed, and will, from the date of publication, be the horse's name under these rules. (ii) In the case of a horse which has been entered elsewhere than in Great Britain under the same name as one already registered, the name may be claimed for him if accompanied by a numeral, and the name with the numeral will then be registered and published as his name. (iii) If the same name be simultaneously claimed for two or more horses, the order of priority shall be determined by lot at the Registry Office.

Disqualification of Horses.—66. If a horse run at any unrecognised meeting, he is disqualified for all races to which these Rules apply. 67. No horse is qualified to be entered or run which is wholly or partly the property of, or in any way under the care or superintendence of a disqualified person. 68. Any horse which has been the subject of fraudulent practice may, at the discretion of the Stewards of the Jockey Club, be disqualified for such time and for such races as they shall determine.

Foreign Horses.—69. A horse foaled out of the United Kingdom shall not be qualified to start for any race until there have been deposited at the Registry Office, and a fee of 5s. paid on each certificate (1) such a foreign certificate, and (2) such a certificate of age as are next mentioned; that is to say:—The foreign certificate must state the age, sex, pedigree and colour of the horse, and any mark by which it may be distinguished, and must be signed by the secretary or other officer of some approved racing club of the country in which the horse was foaled, or by some magistrate, mayor, or public officer of that country. The Stewards of the

Jockey Club may from time to time approve any racing club for the purposes of this rule, and prescribe the magistrate, mayor, or public officer by whom a foreign certificate must be signed. They may also require any further proof or confirmation in any particular case, and may declare any horse disqualified in default thereof. The certificate of age must be signed by a veterinary surgeon in the United Kingdom, approved for this purpose by the Stewards of the Jockey Club, either by general order or in the particular case. 70. A horse which has been out of the United Kingdom (otherwise than as a foal at the foot of his dam) before having run in Great Britain, shall not be qualified to start for any race until a certificate of age, signed as in the last rule mentioned, has been deposited at the Registry Office. NOTE.—The Stewards of the Jockey Club have approved generally of certificates given by the members of the Royal College of Veterinary Surgeons, and by persons holding the Highland and Agricultural Society's diploma.

Entries, Subscriptions, Declarations of Forfeit, and Acceptances for Races.—71. Every entry shall close, and every declaration of forfeit or of acceptance shall be fixed to be made, at 10 p.m., and upon Tuesdays only, except in the cases of races closing within four days of their being run. All entries for handicaps for which the weights are to appear before the week in which a meeting is held must be in the Sheet Calendar at least one week before the weights are published, and for those handicaps for which the weights are to appear during the week of the Meeting the entries shall close at least twenty-four hours before the publication of the weights. No declaration of forfeit shall be fixed to be made for races for two-year-olds only, between the second Tuesday in October, when they are yearlings, and the last Tuesday in March in the following year. 72. A horse is not qualified to run for any race unless he is duly entered for the same. 73. All entries made elsewhere than at the Registry Office (except entries made during the week of, or on the Saturday preceding, the meeting) shall be lodged at that office within forty-eight hours, or, if intended for publication in the next "Calendar," within twelve hours after the day of closing In default of observance of this rule, the receiver of nominations shall be reported to the Stewards of the Jockey Club, and unless the nominator can prove to their satisfaction that the entry was made in due time, it shall be void. 74. The list of entries shall be closed at the advertised time, and no entry shall be admitted on any ground after that time. 75. An entry or subscription may, before the time of closing, be altered or withdrawn. 76. Allowances, when practicable under the conditions of the race, must be claimed at the time of entry, or they shall not be allowed.

Form of Entry or Nomination—77. Entries shall be made in writing, signed by the owner of the horse or his authorised agent, and declarations of forfeit in like manner by the owner of the engagement or his authorised agent, subject to the rules relating to sales with engagements. Entries made by telegraph shall be equally binding, but must be confirmed in writing before the time of weighing, or the horse shall not be qualified to start. Declarations of forfeits made by telegraph shall be confirmed in writing, or the forfeit shall not be saved. The above confirmations must be made as soon as possible, and if the Stewards consider there has been any unnecessary delay they may inflict a fine. 78. A horse cannot be entered in the real or assumed name of any person as his owner unless that person's interest or property in the horse is at least equal to that of any other one person, and has been so registered. 79. The entry shall be in the name, or assumed name, of one person, and shall state the name, or assumed name, of the owner, the name of the horse, if registered, or his description according to rule if name not registered. 80. In entering a horse whose name has not been registered, it shall be described by stating the age, the colour (when possible), and whether it is a horse, mare, or gelding, and the registered or Stud Book names or description of its sire and dam. If the dam was covered by more than one stallion, the names of all must be stated. In all cases such pedigree and description must be given as will clearly distinguish the horse entered from all other horses; and if the pedigree of the sire or dam be unknown, such further particulars must be given as to where, when, and from whom it was purchased or obtained as will identify it. 81. Whenever the name under which a horse has run at any recognised meeting in any country is changed or abandoned, his old name, as well as his new name or description, must be given in every entry until the change has been published in two Monthly "Calendars" or the Book "Calendar," and a fee of £5 paid. 82. No alteration or addition shall be made in any entry after the time fixed for closing, except in cases expressly sanctioned by these rules. 83. In the event of a horse being entered for a race with an incorrect or imperfect description according to the rules of entry, such error or omission may, if accidental, be corrected on payment of a fine of £5, at any time before the horse's number is exhibited for that race, provided that the identity of the horse be satisfactorily proved. If the above correction be not made, or the horse struck out, within seven days after the error has been officially brought to the knowledge of the owner or his agent, or if any horse runs without the prescribed correction having been made, the Stewards of the Jockey Club may inflict fines upon, or otherwise deal with, any persons responsible for such errors. 84. When, subsequently to the time fixed for closing, a registered name has been published for any horse entered, the entry may be amended by inserting such name in addition to the name or the description given in the original entry. 85. A subscriber to a race may transfer the right of entry under his subscription to any other person. 86. Subscriptions and all entries, or rights of entry under them, become void on the death of the subscriber, and entries (except such as are made under another person's subscription) become void on the death of the person in whose name they are made. 87. If either party to a match die the match is off. 88. An acceptance of the weight for a free handicap shall be considered as equivalent to an entry; but if the horse be wrongly described, the acceptance shall be void. 89. In making an entry for a produce race, the produce is entered by specifying the dam and sire or sires 90. No horse shall be considered as struck out of any of his engagements until the owner, or some duly authorised person, shall have given notice in writing or by telegraph to be confirmed in writing, at the Registry Office or to the Clerk of the Course where the horse is engaged. The notification of the death of a horse shall be equivalent to a declaration of forfeit.

Sale with Engagements.—91. When a horse is sold with his engagements, or any part of them, the seller cannot strike the horse out of any such engagements, but, on default of the purchaser, remains liable for the amount of the forfeits in each. 92. In all cases of sale by private treaty, the written acknowledgment of both parties that the horse was sold with engagements is necessary to prove the fact; but when the horse is sold by public auction, or claimed out of a selling race, the advertised conditions of either the race or sale are sufficient evidence. If certain engagements only be specified, those only are sold with the horse. NOTE.—The following are known and recognised as "Lord Exeter's Conditions":—"The horses are sold without their engagements, but the purchaser has the right of running for any of them by paying half the stake, and in the event of the horse winning, or being entitled to second or third money, one-third shall be paid to the vendor, but the vendor reserves to himself the right of striking the horse out of any race in time to save a minor forfeit or discount, unless the purchaser shall give notice that he wishes to run for any particular race, when he will become liable for half the stake or forfeit. Horses purchased under Lord Exeter's conditions cannot be resold under the same conditions without the written consent of the original vendor."

Assumed Names and Partnerships.—93. An assumed name cannot be used unless annually registered and the fee paid. A registration continues effectual only during the current year. (i) A person cannot register more than one assumed name at the same time, nor can he use his real name so long as he has a registered one. (ii) An assumed name may be changed at any time by registering a new assumed name. (iii) A person cannot register as his assumed name one which has been already registered by any other person, or the real name of any owner of racehorses. (iv) Any person who has registered an assumed name may at any time abandon it by giving written notice at the Registry Office; such notice of cancellation shall be published in the next "Racing Calendar," after which all entries which have been made in the assumed shall be altered to the real name of the owner.

Partnerships.—94. All partnerships and the name and address of every person having any interest in a horse, the *relative* proportions of such interest, and the terms of any sale, with contingencies, lease, or arrangement, must be signed by all the parties, or their authorised agents, and lodged at the Registry Office, or with the Clerk of the Course for transmission to the Registry Office, before a horse sold with contingencies, or leased, or which is a joint property, can be entered or start for any race, and the document shall state with whom the power of entry or declaration of forfeit rests, and all partners shall be jointly and severally liable for every stake or forfeit. No part owner shall assign his share or any part thereof in a horse without the consent of his partners. A fee of £1 shall be paid on each horse, and all partnerships, sales with contingencies, or leases shall be published in the real or assumed names in the next available "Racing Calendar," and partnerships and leases republished annually so long as they continue. Any termination or severance must be notified at once to the Registry Office for publication.

Jockeys' Licences, &c.—95. (i) No jockey or apprentice shall, after the last day of the week in which he shall have first ridden, ride in any race until he shall have obtained a licence from the Stewards of the Jockey Club. Such licence must be applied for annually, with full name and address, at the Registry Office, and will only be granted on the condition that a jockey is not an owner of any racehorse. Under exceptional circumstances, leave may be granted to jockeys, who are also trainers, to own one or more horses, provided that such horse or horses are trained in their own stables. (ii) Any person who shall employ a jockey, in contravention of this rule, shall be liable to be fined by the Stewards of the Jockey Club. (iii) A list of the licensed jockeys shall be published in the "Racing Calendar." (iv) Every jockey shall pay £1, and every apprentice 10s., for his licence, to be applied as his subscription to the Bentinck Benevolent and Provident Fund. (v) No jockey whose licence has been withdrawn or refused on the ground of misconduct will be eligible to ride trials, or be allowed in any weighing room, stand, or enclosure during his time of suspension from riding continues. 96. Any gentleman wishing to ride in races on even terms with jockeys shall obtain a permission, current till revoked, from the Stewards of the Jockey Club, and make a donation of £5 to the Bentinck Benevolent Fund.

Jockeys' Retainers.—97. In the absence of special agreement, a jockey's retainer terminates at the end of the racing season. Half the agreed retaining fee must be paid in advance, and the remainder at the termination of the retainer. 98. Every jockey at the termination of his apprenticeship is free to form engagements for himself, irrespective of any which have been made for him during such apprenticeship. The terms of all agreements shall be registered, and a fee of 5s. shall be paid. 99. Employers retaining the same jockey have precedence according to the priority of their retainers. 100. The Stewards of the Jockey Club may adjudicate between persons claiming the services of any jockey, and on disputes between jockeys and their employers, and have power to cancel any agreement between them.

Jockeys' Fees—101. In the absence of special agreement to ride for a lower sum, the fee to a winning jockey shall be £5 5s., and to a losing jockey £3 3s., and no further charge shall be made, except when requested to leave home for the purpose of riding, in which case the cost of travelling expenses and £1 a day for living, shall be charged to the owner, or divided between the owners, at whose re-

quest he left home. (*a*) In the case of a dead-heat, if the owners divide, each jockey shall be paid a winning fee; in case of a run off, no additional fee shall be paid, but when either horse is ridden by a fresh jockey, the rider on each occasion is entitled to the prescribed fee. All jockeys' fees shall be paid to the Stakeholder at the same time as the stakes.

Stable Lads.—102. (i) No trainer shall engage any stable servant who has previously been in a training stable without referring to his last employer, and receiving a satisfactory reply in writing. (ii) Any trainer infringing this rule, and continuing to employ such servant after notice has been served on him by the late employer, or through the Registry Office, shall be reported to the Stewards of the Jockey Club. (iii) Any servant prevented by this rule from obtaining or retaining employment shall have the right of appeal to the Stewards of the Jockey Club.

Racing-Colours.—103. Racing-colours shall be registered either annually on payment of 5*s.* or for the life of the person registered on payment of £5. Colours so registered shall not be taken by any other person. All disputes as to the right to particular colours shall be settled by the Stewards of the Jockey Club. 104. Any person running a horse in colours other than those registered in his own or assumed name, without a special declaration over night to the Clerk of the Course (at a time to be prescribed), shall be fined not less than £1, nor more than £10. A special declaration is also required where the owner is not the nominator.

Entrance Money, Forfeits, and Stakes.—105. Entrance money, forfeits, stakes, and arrears must be paid in cash (if so required) to the Clerk of the Course, or authorised Stakeholder; and entrance money must (if so required) be paid at the time of entry. 106. Entrance money shall go to the Race Fund of the meeting unless otherwise specified in the conditions of the race and subject to the application of surplus under Rule 159. 107. Entrance fees, subscriptions, stakes, and forfeits shall be in pounds, not guineas. 108. The nominator is liable, as well as every partner in the horse at the time of nomination, for the entrance money and stake or forfeit. A person making a wrong nomination is equally liable, but where a horse has been accidentally entered for a race for which he is not qualified, he may be withdrawn on payment of a fine, in lieu of forfeit, of £5 at any time before the race, the fines under this rule to go as the forfeits. A subscriber to a sweepstakes is liable for the stake or forfeit; but if he transfer the right of entry to any other person he is liable only in case of default by the transferee. 109. A person taking an entry under another person's subscription, where forfeit must be declared by a particular time, shall, if he do not declare forfeit by that time, be considered to have taken the engagement upon himself, and it shall be transferred to his name. 110. A jockey shall not be weighed out for any horse for a race unless there have been previously paid (1) any stake, forfeit, entrance money, or fee payable by the owner or nominator in respect of that race; (2) all arrears due from any person for such horse, or due for the same or any other horse from any person by whom such horse is wholly or partly owned, or in whose name or under whose subscription he is entered: and (3) the jockey's fee.

The Unpaid Forfeit.—111. An Unpaid Forfeit List shall be kept at the Registry Office, and shall be published in the Sheet "Calendar" after the Newmarket July Meeting, and again at the conclusion of the racing season in every year. It shall include all arrears which have been notified by the Stakeholder of any recognised meeting in the United Kingdom, or as otherwise provided under these Rules, and shall state the real name or names, and also the assumed name or names (if any), of the persons from whom, and the horses in respect of which, the same are due. "Arrears" which have been so published must be paid directly into the Registry Office, with fees according to rule, and until so paid shall not be removed from the list. 112. Where a person is prevented by these Rules from entering or starting a horse for any race without paying arrears, for which he would not otherwise be liable, he may, by paying the same, enter or start the horse and place the arrears on the Forfeit List as due to himself, and in like manner the seller of a horse with engagements may, if compelled to pay them by the purchaser's default, place the amount on the Forfeit List, as due from the purchaser to himself. 113. So long as the name of a person is in the Forfeit List, no horse can be entered by him or under his subscription for any race, whether acting as an agent or otherwise; and no horse which has been entered by him, or in his name, or under his subscription, or of which he is, or was at the time of entry, wholly or partly the owner, can run for any race; and no horse which shall be proved to the satisfaction of the Stewards to be directly or indirectly under the care, training, management, or superintendence of a person whose default has been twice published in the "Racing Calendar" shall be qualified to be entered or run for any race. So long as any horse is in the Forfeit List, such horse shall not be qualified to be entered or run for any race. This rule shall not prevent the entry for a Produce Stake of mares and stallions that are in the Forfeit List. The disabilities under this rule extend to all arrears officially notified by a recognised Turf authority of any country. 114. A corrected alphabetical Index of the horses and owners in the last Forfeit List and Irish Forfeit List shall be published in the first "Calendar" of every month during the racing season. Such monthly list shall commence not less than three years before the time at which it is published, and shall be carried down to and include the latest Forfeit List which has been published in the Sheet "Calendar" as above mentioned. 115. If a horse which, or the owner of which, is in the Forfeit List be entered for any race in contravention of these Rules, the nominator of such horse may be fined £50.

Weights, Penalties, and Allowances.—116. No horse shall carry less than 6st. in any race.

Penalties.—117. In estimating the amount a horse has won in any one or more races, account shall be taken of all cups or moneys, whether derived from stakes, bonus, or any other source, gained by him for his owner or for any other person, deducting only his own stake and entrance. 118. Winnings during the year shall include all prizes from the commencement of the racing season to the time appointed for the start, and shall apply to all races in any country, and winning shall include dividing, walking over, or receiving forfeit. Penalties for winning a fixed sum shall be understood to mean for winning it in one race unless specified to the contrary. 119. No horse shall carry extra weight for having run second or in any lower place in a race. 120. Extra weights shall not be incurred in respect of matches or private sweepstakes. 121. Penalties are not cumulative unless so declared by the conditions of the race. 122. When any race is in dispute, both the horse that came in first and any horse claiming the race shall be liable to all the penalties attaching to the winner of that race till the matter be decided. For penalties on dividing after dead-heats, see Rule 144. 123. All penalties and allowances shall be calculated according to the amount of the value of each race as reported in the "Racing Calendar."

Allowances—124. Allowances must be claimed at the time of entry where practicable (see Rule 76), but omission to claim is not a source of disqualification, and a claim for allowance to which a horse is not entitled does not disqualify unless carried out at scale. 125. No horse shall receive allowance of weight, or be relieved from extra weight, for having been beaten in one or more races; provided that this rule shall not prohibit maiden allowances, or allowances to horses that have not won within a specified time, or races of a specified value. 126. Allowances to the produce of untried horses are for the produce of horses whose produce never won a race in any country. 127. Allowances are cumulative unless otherwise specified.

Weighing out, Exhibiting Numbers, &c.—The Weighing Room.—128. No person shall, without special leave from the Stewards, be admitted to the weighing room except the owner, trainer, and jockey, or other person having the care of a horse engaged in the race; and any person refusing to leave shall be reported to the Stewards.

Weighing out.—129. Every jockey must be weighed for a specified horse by the Clerk of the Scales, at the appointed place, not less than a quarter of an hour before the time fixed for the race, and the number shall then be exhibited as soon as possible. In exceptional cases, or where the delay of a previous race has rendered punctuality impossible, the Stewards may extend the time allowed for weighing, declaring weight, and for exhibiting the numbers. 130. When the numbers have been exhibited no alteration or addition can be made without the leave of the Stewards, whose reasons for such permission shall be reported at the Registry Office. Should any horse not start whose number has been exhibited, the owner and any other person responsible may be fined, or otherwise dealt with, at the discretion of the Stewards. 131. If a jockey intend to carry overweight, he must declare the amount thereof at the time of weighing out, or, if in doubt as to his proper weight, he may declare the weight he intends to carry. 132. It is optional for the jockey to weigh out or in with his bridle, and the Clerk of the Scales shall, if requested, allow 1 lb. for a curb or double bridle; but if a horse run in a hood, muzzle, martingale, breastplate or clothing, it must be put into the scale and included in the jockey's weight. 133. No whip or substitute for a whip shall be allowed in the scales.

Starting.—134. The horses must be started by the official Starter or his authorised substitute. 135. Every horse shall be at the post, ready to start, at the appointed time. 136. All jockeys, on arrival at the starting-post, must immediately place themselves under the Starter's orders. 137. No horse, when once under the Starter's hands, shall go back, except in the case of an accident. 138. The horses shall (so far as is practicable) be drawn up before the start in an order to be determined by lots to be drawn by the jockeys at the time of weighing out.

Running and Walking Over.—139. An owner running two or more horses in a race may declare to win with one of them, and such declaration must be made at scale. A jockey, riding a horse with which the owner has not declared to win, must on no account stop such horse, except in favour of the stable companion on whose behalf declaration to win has been made. 140. (i) A horse which crosses another in any part of the race is disqualified, unless it be proved that he was two clear lengths ahead of the other when he crossed. (ii) If a horse or his jockey jostle another horse or jockey, the aggressor is disqualified, unless it be proved that the jostle was wholly caused by the fault of some other jockey, or that the jostled horse or his jockey was partly in fault. (iii) If a horse run the wrong side of a post he must turn back and run the course from such post. 141. If a race has been run by all the horses at wrong weights, or over a wrong course, or distance, or before the appointed time, or if the Judge is not in the box at the time the horses pass the winning-post, the Stewards shall order the race to be run again the same day if practicable, but if otherwise it shall be void.

Walking Over.—142. When one horse pays forfeit for a match, the other need not walk over; but for a sweepstakes, even if all the horses but one have declared forfeit, that horse must walk over, except by the written consent of the persons who pay forfeit; in the case of a plate the consent of the Stewards is necessary. 143. On a division after a dead-heat it shall not be necessary for a horse to walk over.

Dead-Heats.—144. Every horse running a dead-heat for first place shall be deemed the winner of the race until the dead-heat is run off or the owners agree to divide; and, if the owners agree to divide, each horse which divides shall be deemed a winner of the race, and liable to any penalty for the full amount he would have received if he had won. 145. (i) A dead-heat for the first place shall be run off on the same day, at a time to be appointed by the Stewards unless the owners agree to divide. The other horses shall be deemed to have been beaten, but they shall be entitled to their places (if any) as if the race had been finally determined the first time. (ii) In running off a dead-heat the rules as to declaration of

over-weight, weighing out, and weighing in, shall apply, but the same jockeys need not ride. (iii) If, in running a dead-heat off, either horse should be disqualified, it shall be decided by the Stewards whether the disqualification shall extend to the loss of the second place, and, if so, the horse that originally ran third shall be entitled to the second place. 146. When a dead-heat is run for second place, and an objection is made to the winner of the race, if such objection be declared valid in time for the dead-heat to be run off on a day of the race, the Stewards may direct it to be run off accordingly; otherwise the horses which ran the dead-heat shall divide. 147. If a dead-heat be run by two or more horses for second or any lower place in a race, the owners shall divide, subject to the provisions of the last preceding rule. 148. When owners divide they shall divide equally all the moneys or other prizes which any of them could take if the dead-heat were run off. 149. If the dividing owners cannot agree as to which of them is to have a cup or other prize which cannot be divided, the question shall be determined by lot by the Stewards, who shall decide what sum of money shall be paid by the owner who takes such cup or other indivisible prize, to the other owners or owner. 150. On a dead-heat for a match the match is off.

Weighing in.—151. Every jockey must, immediately after pulling up, ride his horse to the place of weighing, dismount, and present himself to be weighed by the Clerk of the Scales. Provided that, if a jockey be prevented from riding to the place of weighing by reason of accident or illness, by which he or his horse is disabled, he may walk or be carried to the scales. 152. If a horse carry more than two pounds over his proper or declared weight he is disqualified, unless the Stewards be satisfied that such excess of weight has been caused by wet. 153. If a jockey do not present himself to weigh in, or be short of weight, or be guilty of any fraudulent practice with respect to weight or weighing, or dismount before reaching the scales, or touch (except accidentally) any person or thing other than his own equipments before weighing in, his horse is disqualified, unless he can satisfy the Stewards that he was justified by extraordinary circumstances.

Prizes.—154. The value of prizes not in money must be advertised. 155. Prizes, stakes, and forfeits in a race belong to the winner, except as otherwise declared in the conditions. 156. No plate or sweepstakes shall be run for unless the clear value to the winner (calculated as in Rule 117), in case the race be run by two or more horses, will amount to £100. But if the value would amount to £100 if the race was so run, a horse may walk over, although he thereby receives less than £100. 157. In all races with not less than five entries, the second horse shall at least save his stake and entrance. 158. When a sweepstakes has been so reduced by the death of subscribers that the payments to second or other horses, according to conditions, would reduce the value, if run for, to less than £100, the winner shall receive a clear £100, and only the balance, if any, be divided proportionately between the other horses entitled to participate in the stakes. 159. In all races, should there be any surplus from entrance or subscription over the advertised value, it shall be paid to the winner, unless provided by the conditions to go to other horses in the race. A race may be declared void provided the number of entries required by advertisement be not obtained, but the value of a prize once advertised shall not be reduced. 160. When a cup or plate or any added money is advertised to be run for, it shall be given in the event of a walk-over. When a walk-over (except after a dead-heat) is the result of arrangement by the owners of horses engaged, neither a cup nor any portion of the advertised money need be given. 161. Any money or prize which by the conditions is to go to the horse placed second, or in any lower place, shall, if the winner have walked over or no horse has been placed second, be dealt with as follows, namely:—(i) If part of the stakes or plate, it shall go to the winner; or (ii) If a separate donation from the Race Fund, or any other source, it shall not be given at all; or (iii) If entrance money for the race, it shall go to the Race Fund of the meeting. 162. No prize shall be given to any but the first four horses placed. 163. No deductions shall be made from the value of any race except such as are gained by other horses in the race, and except Clerk's stakeholding and weighing fees, as fixed by rule, or any sums assigned under the conditions of a race to the Bentinck Benevolent or Rous Memorial Funds. 164. If a race be never run or be void, stakes, forfeits, and entrance money shall be returned. 165. A race may be declared void if no qualified horse cover the course according to rule.

Disputes, Objections, Appeals, &c.—166. Every objection shall be decided by the Stewards, but their decision shall (if they are not the Stewards of the Jockey Club) be subject to appeal to the Stewards of the Jockey Club, so far as relates to points involving the interpretation of these Rules, or to any question other than a question of fact; on which there shall be no appeal unless by leave of the Stewards, and with the consent of the Stewards of the Jockey Club. Notice of appeal must be given in writing to the Clerk of the Course within forty-eight hours of the decision being made known. 167. All disputes, objections, and appeals referred to or brought before the Stewards of the Jockey Club for their decision, shall be decided by the three Stewards; if only two Stewards be present they shall fix upon a third person, being a member of the Club, in lieu of the absent Steward, but the Stewards may call in any other members of the Jockey Club to their assistance, or may, if they think the importance or difficulty of the case requires such a course, refer it to a general meeting.

Objections, when and how made.—168. (i) If an objection to a horse engaged in a race be made not later than half-past ten in the morning of the day of the race, the Stewards may require his qualification to be proved before the race; and in default of such proof being given to their satisfaction, they may declare him disqualified. (ii) An objection to the distance of a course officially designated must be made before a race. (iii) An objection to any decision of the Clerk of the Scales must be made at once. (iv) An objection to a horse, on the ground of a cross, jostle, or any act on the part of his jockey, or of his not having run the proper course, or of the race having been run on a wrong course, or of any other matter occurring in the race, must be made within a quarter of an hour after the winner has weighed in, unless, under special circumstances, the Stewards are satisfied that it could not have been made within that time. (v) An objection on the ground—(*a*) That the horse which ran was not the horse which he was represented to be at the time of entry, or that he was not qualified under the conditions of the race; or (*b*) That he has run in contravention of the rules of partnership, may be received within fourteen days of the conclusion of a meeting. (vi) An objection on the ground that a horse is disqualified by reason of any default entered in the Forfeit List, may be received within six months after the race. (vii) In any other case an objection must be made within twenty-four hours of the race being run, exclusive of Sunday, save in the case of any fraud, or wilful misstatement, when there shall be no limit to the time for objecting, provided the Stewards are satisfied there has been no unnecessary delay on the part of the objector. 169. Every objection shall be in writing, and must be signed by the owner of some horse engaged in the race, or by his authorised agent, trainer, jockey, or groom, and must be made to one of the Stewards, to the Clerk of the Course, or Clerk of the Scales; the objector shall, at the time he makes the objection, deposit in the hands of the Stakeholder the sum of £5, and on an appeal an additional sum of £10 shall be lodged by the appellant; if the case be decided against the depositor, his deposit shall be forfeited to the Bentinck Benevolent or Rous Memorial Funds, unless the Stewards who heard the case, or the Stewards of the Jockey Club on the appeal, shall certify that there was good and reasonable ground for the objection or the appeal. 170. An objection may also be made without deposit by a Steward or licensed official of a meeting in his official capacity. 171. An objection cannot be withdrawn without leave of the Stewards. 172. No horse shall be disqualified on account of any error or violation of rule in the entry, which might have been corrected on payment of a fine, but the Stewards may inflict fines upon, or otherwise deal with, any persons responsible for such errors. 173. If an objection to a horse which has won, or been placed in a race, be declared valid, the horse shall be regarded as having been last in the race, and the other horses shall take positions accordingly. 174. All costs and expenses in relation to determining an objection or conducting an inquiry, and any reasonable compensation for outlay incurred, shall be paid by such person or persons, and in such proportions, as the Stewards shall direct. 175. Pending the determination of an objection, any prize which the horse objected to may have won or may win in the race, shall be withheld until the objection is determined, and any forfeit payable by the owner of any other horse shall be paid to and held by the Stakeholder for the person who may be entitled to it.

Corrupt Practices and Disqualifications of Persons.—176. (i) If any person corruptly give or offer, or promise directly or indirectly, any bribe in any form to any person having official duties in relation to a race or racehorse, or to any trainer, jockey, or agent, or to any other person having charge of or access to any racehorse; or (ii) If any person having official duties in relation to a race, or if any trainer, jockey, agent, or other person having charge of or access to any racehorse corruptly accept or offer to accept any bribe, in any form; or (iii) Wilfully enter or cause to be entered or to start for any race a horse which he knows or believes to be disqualified; or (iv) If any person be proved to the satisfaction of the Stewards of the Jockey Club to have surreptitiously obtained information respecting a trial from any person or persons engaged in it or in the service of the owner or trainer of the horses tried, or respecting any horse in training from any person in such service; or (v) If any person be guilty of or shall conspire with any other person for the commission of, or shall connive at any other person being guilty of any other corrupt or fraudulent practice in relation to racing in this or any other country: Every person so offending shall be warned off Newmarket Heath and other places where these Rules are in force. 177. If any person be reported by the Committee of the Subscription Rooms at Newmarket or at Tattersall's as being a defaulter in bets, he shall be warned off as in the last rule mentioned so long as his default continues. 178. When a person is warned off Newmarket Heath, and so long as his exclusion continues, he shall not be qualified, whether acting as an agent or otherwise, to subscribe for or to enter or run any horse for any race either in his own name or in that of any other person, and any horse of which he is the nominator, or is (or was at the time of entry) wholly or partly the owner, or which (after the fact of his being warned off has been twice published in the "Racing Calendar") shall be proved to the satisfaction of the Stewards to be, or to have been, directly or indirectly, under his care, training, management, or superintendence shall be disqualified.

Fees and Fines.—179. The Stakeholder shall be allowed to retain, out of the stakes in his hands, the following fees, viz.:—For every match, £1. For every subscription or sweepstakes where the lowest forfeit amounts to £20, ½ per cent. on the whole stake, and on all other races 1 per cent. 180. There shall also be payable the following *maximum fees*:—For every entry a Clerk's fee of 2*s.* 6*d.*; for weighing, a Clerk's fee of 2*s.* 6*d.*; for registration of a horse's name, a Clerk's fee of 2*s.* 6*d.*

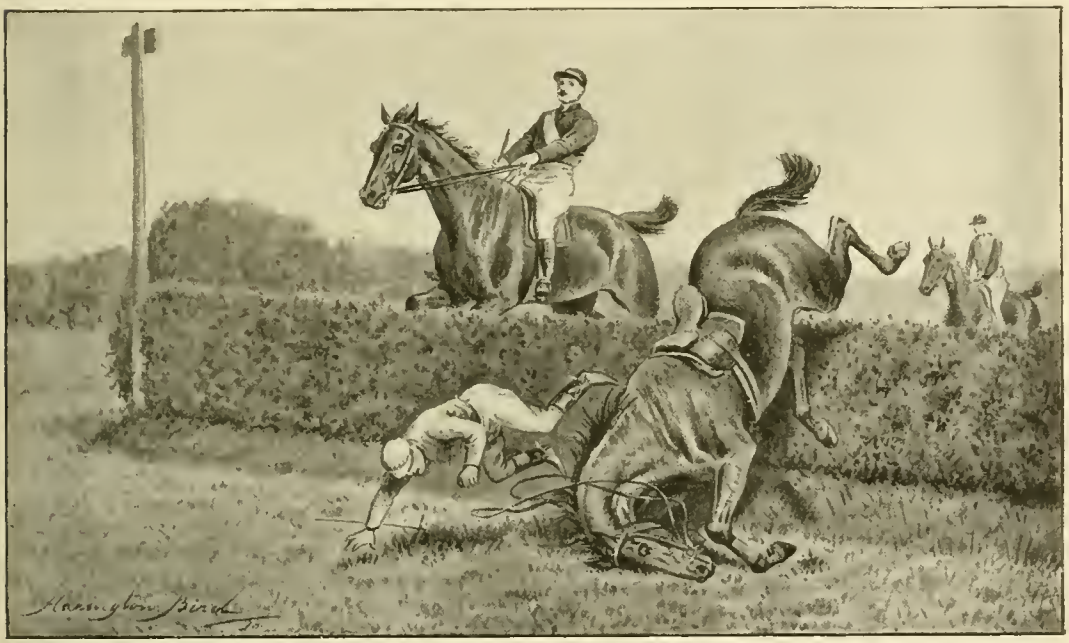
Registration Fees.—181. (i) For registration of authority to act generally on behalf of an owner, 5*s.*; (ii) for every registration or change of an assumed name, £30; (iii) for every registration of partnership, and on every change thereof, £1 for each horse; (iv) for every annual registration of colours, 5*s.*; (v) for every registration of colours for life, £5; (vi) for registration of foreign and veterinary certificates, 5*s.*; (vii) for registration of an agreement with a jockey, 5*s.*

Fines.—182. Except where otherwise provided, all fees and fines shall be paid to the credit of the Jockey Club, all fines to be

afterwards transferred, either wholly or in such proportions as the Stewards may direct, either to the Bentinck Benevolent Fund or the Rous Memorial Fund.

New Rules.—183. Every new rule (in which term is included the repeal or alteration of an existing rule) must be advertised three times in the Sheet Calendar, with the date of the meeting of the Jockey Club at which it is to be proposed, and be submitted to the Rules Committee, before it is brought up for discussion. 184. Every new rule must be confirmed at a meeting subsequent to that at which it is passed, and be then twice advertised in the Sheet Calendar, but shall not come into operation until the 1st of January following, unless urgency be declared by the Stewards on confirmation.

STEEPLECHASING AND HURDLE RACING—**The Development of Steeplechasing**—In writing of "steeplechasing," the first thing which strikes one is the absurdity of the name that has been accepted as descriptive of the sport. One cannot "chase" a thing that does not run away, and steeples are not itinerant. But the origin of the word is sufficiently clear. "Steeplechases" were first of all spins across country, and some prominent landmark had to be named as a goal. A steeple stood highest; and so, when men who desired to test the capacity of their hunters combined with their own skill came together to fight it out, their attention was directed to a steeple in the distant landscape, and they were told that in a certain field close to it posts had been placed, the first man who passed between which was to be accounted the winner. These were genuine hunting contests, especially when they were not set to be decided over an unmerciful distance. The hunters that ran were good jumpers, possessed of what their owners considered a turn of speed and sufficient stamina; riders had to pick their places at the fences, and one great requisite of the good man to hounds, an eye for a country, was a primary essential. There was an element of true sport about the early "steeplechases," and though it would be absurd to say that the modern 'chase contains nothing of the kind, the whole nature of the thing has completely altered. A good idea of the old-fashioned business may be gained from the description of the match between Mr. Flintoff and Jean Rougier in *Ask Mama*, by the author of *Handley Cross*, the creator of Jorrocks. Spectators there were told that they would be able to see everything from the road, and so would do well to save their own necks and the farmers' crops, by following the jockeys field by field, sticking to the highway. Here is the point which has so greatly tended to alter the character of the steeplechase. Spectators have increased in numbers immeasurably; they naturally desire to see as much as they can of the race, the whole contest, in fact; and so courses have had to be made so that the stands command a more or less complete view. The cry for natural fences is reasonable enough. The idea of the steeplechase course is that it should be a reproduction of a fairly difficult hunting country: but made-up fences are unavoidable, because as a very general rule some of the best riders will inevitably go the shortest way round; they will therefore jump the obstacles time after time in



THE FAVOURITE OUT OF IT.

the same places; a proportion of the horses will "chance" the fences, take liberties, "tear them up by the roots" in the florid phraseology one sometimes hears from the riders. The jumps consequently have to be mended, re-made in fact, and so the courses necessarily become artificial.

As the courses have altered, so have the animals that cross them. Hunters are still sometimes found competing, but one hears their owners excusing hopeless defeats by the remark, "I had no sort of chance, you know; mine was only a 'fox-catcher.'" This term as applied to the steeplechase horse is one of depreciation: the "fox-catcher" has not the speed requisite for the winning of 'chases, nor does he jump in the style of the well-schooled steeplechaser. A hunter dwells at his fences; he has to be steadied, his leap is a special effort, and he pauses when he lands. The 'chaser must fly his fences and "get away from them" without dwelling. The two animals do their work in different ways; the 'chaser, indeed, is quite a modern product. A little schooling in the hunting-field may be good for the steeplechase horse; if he has on his back a rider who is at once bold and judicious, he may possibly learn to be clever. But this is only one branch of his education; he must undergo another and a special course of preparation if he is to win credit "between the flags." The 'chaser when he has become too slow for this particular business may make an excellent hunter; but he is apt as a rule to rush his fences, to jump them in his old style, and is a comfortable mount only for a bold rider. At least one Grand National winner carried his master admirably to hounds in the season of 1897–8—Ilex, who won the greatest of cross-country events in 1890.

It is not in the hunting field that recruits are sought, for the reason above given. Hunters have not the speed to live with the rivals they are certain to meet in important races. A very few years back, indeed, when the entries for the Grand National were published, it was the custom to class them into "hunters" and "handicap steeplechasers," but in truth the distinction was purely technical and really meant nothing. Steeplechase horses are usually drawn from the flat, and, as a rule, they graduate through a course of hurdle racing, though it is by no means every hurdle racer that can, even if he tries, earn distinction "over a country," and there are good 'chasers who have not the speed to win over hurdles. The oddest fact about steeplechasing, however, is that very often horses which have not been able to stay for five furlongs on the flat can win races of four miles and more over a country. A really satisfactory explanation of this has still to be found, though that their fine speed enables them to hold their own with less speedy animals without exertion may tend to elucidate the mystery; but what makes the circumstance still more remarkable is that the chief steeplechases are run in time which stands out well when compared with that of flat races. The Derby has occupied as much as 3 min. 4 secs.—Ellington took this time—that is, at the rate of a mile in a shade under 2 min. 3 secs. Cloister only took 9 min. 42⅖ secs. to win the Grand National, and to win it in a canter by forty lengths; and there are these points to be borne in mind when the two things are compared: the Grand National course is thrice the length of the Derby course; there are thirty jumps, most of them of really formidable size; Cloister carried 12 st. 7 lb., nearly half as much weight again as is carried at Epsom. Nevertheless he took only between 6 and 7 secs. more per mile than had been taken by the Derby winner of 1856.

It is doubtful when the first steeplechase was run, but there is a record of a match in Ireland in 1752, over four miles and a half of country, between a Mr. O'Callaghan and Mr. Edmund Blake, the course being "from the Church of Buttevant to the spire of St. Leger Church." "The Druid," most charming of Turf historians, speaks of a 'chase in Lancashire in 1792, eight miles from Barkby Holt to the Coplow and back: Mr. Charles Meynell, son of the M.F.H., was first, Lord Forester second, Sir Gilbert Heathcote third. Over the same course there was a match in 1824, for £2,000 a side, between Captain Horatio Ross on a horse of his own, and Captain Douglas on a horse belonging to Lord Kennedy. The former won. These early contests seem to have been for only two or three starters, and I can find no reference to a regular field before March 1831, when the St. Albans steeplechase was run and won by Moonraker, "who had been bought, for £18, with his sinews quite calloused from hard work, out of a water-cart; but he could jump undeniably and cleared the Holloway Lane in the course of an exercise canter." There is mention of a steeplechase in France, in 1834, starting "down the Rabbit Mount, a short but steep declivity full of holes," over a river and down swampy meadows. The first Liverpool Steeplechase was run on Monday, February 29th, 1836, at Aintree. It was "a sweepstakes of 10 sovs. each, with 80 sovs. added, for horses of all denominations; 12 stones each; gentlemen riders. The winner to be sold for 200 sovs. if demanded." Captain Becher, who gave his name to "Becher's Brook," won on a horse called The Duke. "A strong recommendation to it was that nearly the whole of the performance could be seen from the Grand Stand" is noted by a writer who describes it. The distance was twice round a two mile course. The Grand National was started in 1839. This was at first a sweepstake of 20 sovs. each, 100 added; 12 stones each; gentlemen riders; four miles across country.

That the course was not marked out as it is now seems to be implied by the conditions: "No rider to open a gate, or ride through a gate-way, or more than 100 yards along any road, foot-path or drift-way." The famous Jem Mason won on Lottery, a perfect jumper. Two Irish horses, Rust and Naxon, were better favourites until just before the start, when Lottery passed them in the betting as he did presently in the race.

In 1860 was first run a steeplechase which seemed likely to become extremely popular, but has not fulfilled its promise. This was the National Hunt Steeplechase, to be contested over four miles at such different places as the Stewards of the National Hunt might annually select; the horses to be maidens and the jockeys gentlemen or qualified riders, that is to say, not (admittedly) professional. Owners of good horses were at first exceedingly keen about this race and put by animals expressly for it, but with the exception of Why Not it has rarely fallen to a notable 'chaser, and it is hampered by the clause which confines it to maidens. A four-year-old has rarely sufficient stamina to win—though Nord-Ouest, a French importation of that age, won at Newmarket in 1897—and men who own horses of capacity are as a general rule unwilling to forego the prospect of success elsewhere, and to keep them on purpose for this race. It nevertheless continues something of an attraction, and managers of steeplechase meetings bid for its inclusion in their programmes. They usually pay the National Hunt Committee something between £500 and £1,000. A National Hunt Juvenile Steeplechase for four-year-olds, about two and a half miles, is run on the day after the more important event. The two are worth about £800 and £300 respectively. It should be added that the National Hunt Committee came into existence in 1866, and not before it was very badly wanted. Cross-country meetings had previously been, it is said, the "recognised refuge of all outcasts, human or equine, from the legitimate Turf." There were Stewards, of course, but they had no power or authority; the most they could do was to suspend a rider for the rest of the meeting—if his offence were committed in the last race they could do nothing. The Jockey Club gave no countenance to "illegitimate" sport, for the whole business had become a scandal when the Grand National Hunt Committee was formed, to make rules—previously Clerks of Courses had done what they pleased—and to supervise proceedings. Lord Suffolk and Mr. W. G. Craven had much to do with inducing the Jockey Club to recognise the Grand National Hunt Committee, as it was at first called. The Duke of Beaufort and Lord Coventry soon gave their support, after a time the late George Payne and other influential members of the Jockey Club, who had at first opposed the delegation of authority to a new body, were won over; and the two institutions now work hand in hand, as is natural, seeing that not a few gentlemen are members of both.

Steeplechase and Hurdle Race Horses—Experience shows that some sires get jumpers and that others do not, that many which might be expected to succeed are failures, and that the reverse is equally the case. To some small extent breeding may thus be a guide; but one can never tell, and the broad rule is this, that if a man wants a jumper and has or knows of a horse which "looks like jumping," it will be judicious to have him schooled and note the results. That many horses which "look like jumping" will prove the deceptiveness of appearances is inevitable, and to a slighter extent the opposite is true. One searches specially for good shoulders, as without them a horse is likely to pitch on landing; he must have propelling power also, and depth through the heart is most desirable; but at the same time, it is astonishing how on occasions weedy little animals win big steeplechases, though they will generally be found on examination to possess good points which are likely to escape the casual observer. This was the case with Lord Coventry's famous mares Emblem and Emblematic.

Horses are usually put to jumping because for some reason or another their career on the flat has ceased to look promising, it having been so continually proved that failures under Jockey Club Rules were brilliant successes under the Rules of the National Hunt. There may be less money to be won over hurdles or fences, but there seems more chance of winning it. Sometimes a horse who retains his capacity to gallop, but becomes a rogue and refuses to try, is put to hurdle racing because an idea exists—an idea which appears well authenticated—that animals thus gain the confidence or courage which they lack. It was for this reason that Duke of Richmond—at one time, as set forth in a previous section of this work, regarded as a worthy rival of the great St. Simon—was schooled over hurdles. Another horse that may be instanced is Regret. As a three-year-old he won over £3,000 in stakes, and actually started favourite for the Princess of Wales's Stakes in a field which included St. Frusquin and Persimmon, the betting being 7 to 4 Regret, 5 to 2 St. Frusquin, 4 to 1 Persimmon, and he was third, beaten only a length from St. Frusquin, who won; though it should be noted that Regret had 7 lbs. advantage in the weights. His wilfulness was not at first cured by a course of hurdles, though he has been persuaded to win a couple of races, a fact which says much for his owner, Mr. Reginald Ward, who has ridden him. Red Heart, a very speedy animal, bought at auction for 5,100 guineas in 1897, was found a few months later running, and running badly, over hurdles—the almost inevit-

able preliminary to running over fences. As no hurdle race is ever contested over a shorter distance than two miles it might seem, when the question of selection arises, that horses must be able to stay; but strangely enough, as has been already noted, this is by no means the case.

Of recent winners over hurdles, to come to details, Priestholme's best distance was six furlongs, and his last race on the flat before he won over hurdles was over that course. Bayreuth ran a long series of five furlong races, as did the smart but desperately troublesome Mena; there was never any suggestion that Montauk stayed; Pardalo always ran over five furlongs when he did not attempt six; Sicily Queen and Athcliath were five furlong horses. Hawkwood ran over a mile and six furlongs, and though he certainly did manage to win a couple of mile races, they were on the easy courses at Epsom and Derby. Fossicker ran over a mile when the distance was not six furlongs; Amphidamas also usually ran over these distances, and on the two or three occasions when he attempted a little more it was without success; Jack the Dandy as a four year old ran ten times, eight of his races having been over five furlong courses. All these animals have no sort of difficulty about staying two miles over hurdles, and it will very likely be seen in course of time that they will stay a longer distance over steeplechase courses. Many more instances occur, but those which are given will probably prove sufficient; their speed carries them on. There are a few cases of stayers who win over hurdles, Soliman being a notable one, as he won the Great Metropolitan at Epsom, and ran prominently in the Cesarewitch; but he is one of those rare horses that are speedy and can also stay. Cornbury, a Metropolitan winner, has been running in hurdle races without success, for though he stayed on the flat, he has not sufficient speed to win jumping races. Golden Ring also stayed well in Ireland, but one does not know what were the value of her victories in that country. Going a little farther back the same thing is to be observed. Regal, who won the Grand National, was a short-distance runner on the flat, and only won two little races worth £100 whilst performing under Jockey Club Rules; but besides the Grand National he won numbers of other steeplechases. The point is a curious one, but the instances given, which might be added to indefinitely, will probably be enough amply to prove that speed is the first essential. Another thing to be observed in the selection of the 'chaser is that though he may not take kindly to his work at first, patience may effect a wonderful change. Congress, who was one of the most brilliant steeplechase horses ever known, framed so badly and showed such nervousness and hesitation that his owner, being convinced that he could jump if he would, adopted the violent expedient of having him pulled over his early jumps with cart ropes. This, however, leads one to the subject of

Schooling—Almost everything depends upon the ability of the rider who is put on the horse when first he begins his lessons. He must have "hands," which are exceedingly rare, and he must furthermore possess just that combination of patience and firmness which is so seldom found. Patience is usually emphasised as the first requisite, and perhaps it is so, but at the same time it is essential that the horse should be made to perceive that he has his master on his back. A few animals seem to take to jumping as if they delighted in it, but these are the exceptions; a few others resolutely refuse to do anything of the kind, and cannot be either forced or persuaded to cross even a hurdle. Two notable hunters of a former day—*quasi* hunters, that is to say, who ran in what were then called Hunters' Races—Quits and The Owl, could never be induced to jump. Quits would not look at a hurdle, and The Owl was almost as bad. As regards the teacher, he must carefully avoid frightening his horse, though the early experiences of Congress must surely have had a somewhat alarming effect. The thing to be done is to begin gradually, and to get on by degrees. A few faggots or a very low hurdle will be quite enough to start with, and it is a good thing to have a steady, trustworthy old horse to lead the young one in his early lessons. A leaping bar is not to be recommended, as it gives way when struck, and the horse will be apt to get an idea that he may take liberties, a notion which later on is apt to be forcibly dispelled. On some courses, indeed, horses can brush through their fences, and even when they are strongly made up, one not seldom sees huge pieces of them knocked out as some clumsy jumper plunges through, but at other times, if the fence is really stiff, a bad fall is the result, and the horse should be taught that he must clear what he is put to. Further reference is made to this in the section on "Steeplechase Courses." Very often, in his early lessons, the horse's fault will be that he will jump too high, and this is very detrimental, for he will, as the phrase goes, be apt to "beat himself jumping." Crossing hurdles is a business by itself, and differs from jumping fences. It may be added that hurdle racing is indefensible as a sport, being neither one thing nor the other—steeple-chasing nor flat-racing—though it is certainly picturesque and a pretty sight to watch a master of the business. The ideal hurdle jumper is a horse who clears the obstacles as if they were not there, taking them in his stride, and it is wonderful how the very best (there are extremely few of them) will contrive to do this. The jockey who rode Chandos in most of his races describes how, some strides from a flight, the horse would begin to measure his distance so

that he could take it in his stride without having to "put in a little one" when quite near. Anything like dwelling at a hurdle is fatal to success, but the worst of this business is that very often in a big field horses close in as they approach the jump, and an animal that is a little way behind cannot see what he has to do. It is a dangerous game for this reason, and a fall over a swinging hurdle is likely to be a very ugly one. At big fences a horse must be slightly steadied, but not at all in the fashion in which a man out hunting pulls his horse together before it jumps. Naturally the great object of steeplechasing is to lose no time, and therefore a horse must get away from his fences without dwelling—that indeed is one of the great secrets of success. Some riders adopt the practice of going at the last two jumps "as if they were not there," but awkward results often follow from chancing anything. The margin between success and failure is so small that pulling a horse together before the last jump may lose a length that can never be regained: on the other hand, it is very certain that by chancing the last fence many horses fall, and something that has seemed to be hopelessly beaten and is toiling on lengths behind may thus gain a victory which had seemed absolutely hopeless. At the same time, if a beaten horse is pulled out of his stride, he is apt to fall, and such a fall is usually a bad one.

The size of obstacles when a horse is being schooled will of course be gradually increased until they attain the dimensions of the course over which he will have to run in public, but it is a bad thing to jump a horse too much, so that he grows tired and disgusted: here as elsewhere there is a happy medium, and the most successful trainer is the man who hits it off. A few turns round a "jumping school" occasionally are no doubt desirable. This school should be made round four sides of a field, enclosed by stout timber partitions, so that the horses cannot run out when they have been put into it, and the bars through which they have gained admission replaced. In these schools there are fences of as varied a nature as can be devised, and the animals are introduced riderless, men being at hand to drive them over the jumps if they require it. A little practice in this has the effect of making a horse clever. A few years ago the water-jump used to be considered one of the chief features of a steeplechase, but this as now constructed is by no means a formidable obstacle, though for reasons presently explained it is an awkward jump. Some animals at first show a special dislike to water-jumping, and it is necessary therefore to accustom them to it. Any little brook, a stream even four or five feet wide, will be quite enough to begin with. It is wonderful how readily some horses take to the business, they being, no doubt, natural jumpers, and though it is advisable never to let a steeplechase horse get out of practice, as the muscles chiefly employed in leaping are likely to relax, it is a curious fact about the Grand National victory of Anatis in 1860, that before he won at Liverpool he had not jumped a single fence from the time that he ran there the year before. A bad rider will soon spoil an animal that has learnt to jump really well. If he pulls his horse about, or jerks his mouth on landing, the animal will soon get clumsy and lose time at his fences. Bitting is an important detail; not a few horses that pull hard against a severe bit will go kindly enough in something that suits them, and to which they do not object. A very astute gentleman rider some time since found that the only way in which he could hold one particularly hard puller was by putting a net over its nose, as is sometimes done with carriage horses; but after a time the horse that was thus treated got accustomed to the device and then it had no effect. Patience is essential in not going too fast until a horse has made some progress as a jumper; and then by degrees he can be taught to race over his fences in the style which is necessary to win.

Famous Chasers As was remarked in discussing past and present horses on the flat, opinions vary altogether about the relative merits of the animals of to-day and of former periods, though there are probably more eulogists of the chasers of thirty or forty years ago than there are of the flat race horses of the same epoch. There is, however, of course no means of proving the accuracy of the opinions that are held. It is absolutely impossible to say what would have happened, for instance, if Emblem, The Lamb, The Colonel, Disturbance and Cloister had gone to the post for the Grand National, supposing they had been contemporaries. The truth is that most people who are interested in the subject have their own private ideas as to the capacity of horses and are greatly governed by prejudices for and against.

It is certain that until 1893 a very general opinion was held by persons who had given a good deal of attention to the matter that anything over 12 stone was a prohibitive weight for the Grand National course. Cloister proved the fallacy of this. He carried 12 st. 7 lbs.; he made nearly the whole of the running, and he won in the easiest of canters by forty lengths—had it been worth while, his jockey could have absolutely walked him past the post, and this seems most emphatically to stamp him as a really good horse, as before his success the 11 st. 13 lbs. carried by Cortolvin in 1867 had been the record for this race, with Disturbance 11 st. 11 lbs. in 1873 second. Of course those who wish to depreciate Cloister ask what he beat, and make out that he beat nothing, but a good deal could be said in opposition to this view. It must not be forgotten that he had twice been

second, and the late "Roddy" Owen always maintained that had he not been hustled at the last fence in 1891 he would undoubtedly have beaten Come Away, who, there can be no doubt, was at that time a really good horse. It is worth note that there were no fewer than five Grand National winners behind the pair on this occasion; moreover, Cloister has another creditable second in his record. He may not have been an attractive horse to look at, but his exceptional merit is surely undeniable, and one of the excellent points about him was his temper. The writer of this article was taken to see him in his box two or three hours after his victory. His owner leaned against his back while Cloister placidly munched his oats; indeed, a more amiable horse never carried a saddle. It has already been remarked that horses which have run well on one occasion in the Grand National have frequently done the same afterwards; a very considerable proportion of the winners had been in the first three more than once, and Frigate, who won in 1889, occupied the unenviable position of second in three Nationals. Every one who has read anything about the great race has been acquainted with the fact that the sisters Emblem and Emblematic, who won in 1863 and 1864, were the reverse of handsome animals to look at. Emblem, probably the better of the pair, has been described as "all shoulders and quarters with no ribs," but both won cleverly in the hands of George Stevens, who carried off five Nationals altogether and was an admirable horseman, though it seems to have been the fashion in his day to blame him for laying out of his ground. The Colonel, who won in 1869 and 1870, was in appearance in very marked contrast to the famous sisters, having been a singularly handsome horse. Like so many other good 'chasers he was a failure on the flat.

In the Grand National one very excellent rule is to avoid the crowd, even if the rider has to go a little further round, for there is usually a good deal of hustling, especially at the first few fences, and the good horses that have been knocked over through no fault of their own would make a long list. Of course, in such a race as the Grand National luck has a vast deal to do with the result, and The Colonel would not have won the second time but that Surney, who evidently had the race in hand, as those that were left in jumped into the racecourse, twisted a plate at the last hurdle and injured himself. It has been remarked in a previous section that Moonraker was bought out of a water-cart for £18. Good steeplechasers are sometimes discovered in odd places, and Salamander, who beat a field of thirty in 1866, was found in a hovel in Ireland, and bought by Mr. Studd with a couple of others because he thought the horse was worth the very small sum asked for him, and might, with luck, make a decent hunter. Mention of the Grand National without The Lamb is of course impossible, as that good little horse was one of the four that have won the great race twice. If the question were asked which was the best horse that ever won the Liverpool, it is probable that a good many votes would be given to Disturbance, on whom Mr. J. M. Richardson gained the first of his two victories, the second being on Reugny, an inferior animal whose staying had been considered doubtful. Disturbance was an animal out of the common, and his giving 8lbs. to so good a 'chaser as Ryshworth says much for him, seeing that the next day Ryshworth won the Sefton Steeplechase with the greatest ease, giving weight to animals of reputation. As a general rule it may be said that the history of the Grand National is the history of the best steeplechase horses. There are a few famous ones, however, that have not distinguished themselves at Aintree. Disturbance notwithstanding, Mr. Richardson —and his ability and judgment can only be described as unsurpassable—believes that actually the best horse he ever rode was Schiedam, and he relates that he won a four mile 'chase from a notably good field at Warwick so easily, and was so fresh at the finish, that after jumping the last hurdle he playfully shied at a bit of white paper that was lying on the course near the post. It was only by a very narrow margin that The Doctor was not enrolled in the list of Grand National winners, as The Colonel, on the occasion of his first victory, only just managed to beat him. Brick, Pearl Diver, Chimney Sweep and other good horses have also failed at Aintree. The Irish have always been to the fore, and in the seventies, eighties, and early nineties the great question which always arose when the entries appeared was which seemed likely to prove the best of the Irish horses. The selected of the Brothers Beasley was certain, with fair luck, to go close. Liberator won in 1874, Empress, one of the four 5-year-olds that have carried off the race, in 1880, Woodbrook in 1881, and Cyrus was only just beaten in 1882 by Seaman, who cannot quite be reckoned as an "Irish horse" in the usual sense of representing Irish interests, as he finished his preparation in England, but he was Irish as regards breed and schooling. The next year, 1883, the field was one of the worst that ever competed, as well as absolutely the smallest, there having been only ten starters, and Zoedone won in the hands of her Hungarian owner, Count Kinsky.

One of the beliefs in regard to the race used to be that it was well-nigh impossible for a horse to win on his first essay over the Liverpool country; but this was disproved in 1884 by the success of Voluptuary. Roquefort, the winner in 1885, was one of the horses that was frequently what is called "there or thereabouts," and it is worthy

of note that chance only led to his appearance at Liverpool, for Colonel Fisher, now commanding the 10th Hussars, had at one time made up his mind to turn him out of training, as he had a confirmed habit of trying to bolt if run on a right-handed course. When he appeared at Sandown a detachment of boys from the Bishop's Sutton stable was accustomed to stand at the top of the hill and endeavour to induce Roquefort to keep in the track, his rooted disposition being to swing round to the left and bolt. Liverpool, however, is left-handed, and he ran third there in 1884, after which, however, Colonel Fisher had the bad luck to sell him for 1,250 guineas, so that he was in other ownership when he won the next year. Persons who are not experienced in turf affairs are usually convinced that trainers are well-nigh infallible guides as to the chances possessed by the horses in their stables, and an example of the fact that this is not so was furnished in 1880. Tom Cannon of Danebury had two horses in the race this year, Aladdin, belonging to Mr. Leopold de Rothschild, and Playfair, the property of Captain E. W. Baird. Which was the better of the two was purely a matter of opinion before the race; but Mr. C. W. Waller, who rode Aladdin, was so convinced he would beat the other, from what he had seen while riding gallops at Danebury, that a long time before the event he took a thousand to thirty about his mount, refusing to back Playfair at all; Playfair, however, won, and Aladdin could get no nearer than fifth. This was one of the years when Frigate was second as she had been to Roquefort and to Voluptuary, but she managed to get home in 1889. Why Not (Irish) was another horse that came near to success on several occasions before he ultimately attained it, which he did in 1894 with the respectable weight of 11 st. 13 lbs. on his back; but the 12 st. 7 lbs. which Cloister (Irish) had won with the year before made this tie with Cortolvin of less note than it otherwise would have been. It is remarkable how long some of these old steeplechase horses last. Come Away (Irish), who was an aged horse in 1891, and has long been forgotten, was found entered again in 1898. The success of The Soarer in 1896 was no doubt due to the number of accidents which took place during the struggle, Mr. D. G. M. Campbell, who rode, having laid to heart the advice as to keeping clear of the crowd and picking his own place at the fences, even if he did not go the shortest way. Manifesto (Irish again) was one of the victims of this occasion, and the ease with which he won the following year (1897) suggested that he must have been extremely dangerous had he not fallen or been knocked over. The proportion of accidents in the Grand National is, however, always very large; 16 horses, for instance, started in 1890 and only five of them stood up the whole way round, though Why Not, after giving his owner, Mr. C. J. Cunningham, a bad fall, was remounted and finished fifth. Three other winners were among the fallers, Frigate, Gamecock and Voluptuary. One never knows what may happen in a steeplechase. One of the starters that year was an extremely bad animal and a very uncertain jumper, named Pan, but on this occasion he managed, for a wonder, to stand up when so many of his superiors came to grief, and to the general astonishment finished second. Pan's price in the betting was 100 to 1 offered; he had been sold a few weeks before the race for 120 guineas, and if Ilex, who won this year, had followed the general example, Pan would actually have won, for M.P., who followed him, was a very long way behind, a bad third. Few persons besides his immediate friends ever believed that Father O'Flynn would win a Grand National, as he was a particularly uncertain and self-willed animal, but his name must not

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be omitted from this retrospect, mainly because he was persuaded to do his best by that successful horseman the late Major "Roddy" Owen, who, having gained the great object of his ambition by winning the chief of cross country races, finally abandoned the sport to which he had been so devoted, and entered with equal ardour upon the business of his profession in pursuance of which he came to his deeply lamented end.

Riders—Riding over a country is one of the very few sports at which a few of the best amateurs are not inferior to the best professionals. This, however, is perhaps natural, because these few amateurs who are really in the first flight—the number, of course, is exceedingly small—have as much practice at home and abroad as their professional opponents, and they need not ride unless they are really fond of the game. It is a melancholy thing for a steeplechase jockey if his nerve once goes; he has to make his living, and it is a most unpleasant business to ride over a country when nerve has gone and one has no other means of livelihood. A gentleman, when this misfortune happens to him—as in most cases it does sooner

or later—can cease to wear silk, or at any rate need not ride over hurdles or fences. One not seldom finds men who have held their own over a country giving it up and appearing only in races on the flat; but there is not this refuge for the professional when, in vulgar phraseology, he begins to "funk."

It is a rapid age, and riders of the last generation are very soon forgotten; comparatively few men now who "go racing" remember Mr. Ede, who earned a well-deserved reputation as Mr. "Edwards." He was one of twins, and learnt under the auspices of Ben Land, becoming extraordinarily accomplished at the business. It was only jockeyship that enabled Mr. Ede to win on The Lamb against Pearl Diver, who was ridden by a professional jockey. Mr. J. M. Richardson has already been mentioned, as indeed he must have been in any article that deals with steeplechasing. Mr. Arthur Yates was one of the busiest and most successful of riders in the seventies, though increasing weight long ago obliged him to give up the game he so dearly loved, and devote himself to training for his friends, which he has since done and is happily still doing with excellent results. Captain Coventry, the elder brother of Mr. Arthur Coventry, the present starter, was one of the best of his day; and as regards the younger of the brothers, though possibly he may have been a trifle better on the flat than over a country, it may be doubted whether, all things considered, a better amateur was ever seen. The late Fred Archer, against whom Mr. Arthur Coventry had not seldom ridden with success, humorously protested against having to give any allowance of weight to a gentleman rider such as he; for Mr. Coventry did the amplest justice to the instructions of his friend and teacher, Tom Cannon. Mr. Coventry carried off the Grand National Hunt Steeplechase of 1879 on Bell Ringer, on a course at Derby which was so severe that some of the other competitors protested against it as altogether unfair. He, however, declared it to be in his opinion admirable, and the result justified his estimate so far as he was concerned. Captain Arthur Smith and Mr. Brockton were great men at this time, and Mr. W. Hope Johnstone is notable as having held his own without loss of skill or nerve for a good thirty years. He is still seen in the saddle, though he was riding against men who have long been forgotten. Mr. E. P. Wilson, a "qualified rider," which is not quite the same as an amateur pure and simple, won innumerable races, including the Grand National on Roquefort; and a name which occurs in the seventies, not seldom with a "1" after it, is that of Lord Marcus Beresford, who is still prominent in Turf matters and held the post of starter before Mr. Coventry, the present occupant. Mr. Garrett Moore, who won the National on Liberator, and his brother, Mr. W. H. Moore, also bear notable names; and among the best riders of that period was Mr. W. B. Morris, unhappily killed out hunting a few years ago. The three brothers Beasley came constantly from Ireland and seldom returned without taking spoil with them. Captain Middleton, known so well as "Bay Middleton," was another very well-known rider of this day, if not quite in the first flight, and it will be remembered how he came to a melancholy end in a steeplechase a few years since. Lord Melgund, who rode as "Mr. Rolly," was a keen rider in the seventies, and devoted much of his time and energy to schooling Ledburn, with whom the late Baron Rothschild had set his heart on winning the Grand National Hunt Steeplechase of 1870; but Mr. Richardson and Schiedam were too much for them, though Schiedam at that time was by no means a perfect jumper. Thus early, too, the name of the Hon. George Lambton frequently occurs. He was the possessor of beautiful hands, which he retained till failing health obliged him to give up riding and devote himself to training—with what fortunate results the records of recent years decisively show. The stable over which he presides came out fourth in order of value of races won in 1896. Mr. Hugh Owen, the elder brother of "Roddy" Owen, was one of the most active horsemen of this day; and among soldiers, both in England and Ireland Mr. Lee Barber, the boldest, not to say most reckless, of riders did well. Among professional horsemen of this time, Robert I'Anson, the present Clerk of the Course at Sandown, was prominent, and he was certainly one of the most accomplished horsemen ever seen over a country. A number of Newmarket trainers now in the busy exercise of their calling were constantly found in the saddle at this period, including R. Marsh, James Jewitt, Joseph Cannon, who won the Grand National on Regal (the second string of the stable, Chandos, the better of the pair, having fallen just after Jewitt had shouted to his friend that he was going on to win); Tom Jennings, junior. Others who now have stables of horses under their charge away from headquarters, include Jem Adams, F. Lynham, &c. An amusing and interesting record of "Roddy" Owen's Turf career is fully given in the memoir of him published by his sister, Mrs. Bovill, in 1897.

Coming to more recent times one meets the name of Mr. Percy Bewicke, and it may be doubted whether a better all-round rider ever put his horse at a fence. An indifferent performer to begin with, he attained to absolutely the first rank by practice and experience; he was always in the right place, never lay out of his ground or made too much use of his horse; he could ride a well timed finish, and it was a delight to watch his perfect style over fences. The Grand National never fell to him, but that

Drawn by Harrington Bird

Line Etched Engraving &

The Grand National

is to a great extent a matter of luck, as there can be no sort of question that it has more than once or twice been won by completely inferior riders. Another gentleman who has taken the highest honours is Mr. Saunders Davies, who has ridden for a number of years with no loss of nerve, with constantly increasing skill, and ranks with the very best of his contemporaries. Mr. Atkinson must by no means be omitted as one who holds his own against all comers. Mr. H. Ripley should not be forgotten, nor Mr. Charles Beatty, son of Captain David Beatty, an ex-Hussar who has a training stable near Rugby; and from Mr. Arthur Yates's establishment at Bishops Sutton sound horsemen constantly appear, and prove in public the good effects of their constant practice over his course there. Colonel Fisher was one of the busiest of these until his military duties called him from the racecourse, and another was Mr. J. C. Dormer, who headed the list of gentlemen riders one year, and was frequently close up until an accident at Sandown, which led to the loss of an eye, obliged him to retire; the Hon. Reginald Ward is at present a successful exponent of Sutton training, as is Mr. Algernon Lawson. It is impossible to give anything like an exhaustive list of the best gentlemen riders of the day. If Mr. Lushington is not specially included, it is because his efforts are confined to the flat. Among the best professional riders now in practice Arthur Nightingall is prominent, one of three brothers, sons of a jockey father, who have won innumerable races on horses trained at Epsom. Robert is frequently found in opposition to his elder brother, though William has given up riding and turned his attention exclusively to training. Danebury steeplechase horses were for a long time specially dangerous, and this was in no small measure owing to the skill with which they were schooled and ridden by George Mawson, who won the Grand National on Playfair. Mawson was by no means an ideal horseman in appearance, being short and stumpy, but he was an excellent rider notwithstanding, and appearances in this respect are no doubt frequently deceptive—Jem Adams being another example of this fact. At Lewes, Escott trains with fine judgment, and rides with a full proportion of success. For many years Sensier did most notable service for Mr. Arthur Yates's stables; there was rarely a better judge and scarcely a better exponent of the art of cross-country riding. Dollery, his old companion, is still in the plenitude of his honours, and a bolder horseman never rode at a fence. Williamson is another of the leading jockeys of the day.

Qualification — A few years since, as already mentioned, an absurd distinction was drawn between "hunters" and "handicap steeplechase horses," and it may be interesting to trace the changes that have been made. Formerly there were steeplechases and hurdle races expressly for "hunters"; only hunters could run in flat races under National Hunt—or, as they were then called, Grand National Hunt—rules, and, if hunters ran out of their own class, they lost their certificates. Not seldom owners sacrificed whatever advantages were supposed to attach to the possession of these certificates, and the ridiculous nature of the distinction was rendered evident when they did so by running their horses in the Grand National. Old Joe was a hunter when he won that race, and he afterwards ran in the Cesarewitch. The idea was to keep apart the real hunter, the veritable "fox-catcher," and the racehorse that had been put to jumping; but as a very general rule the only actual difference between the two animals was that one had a certificate representing him to be what he was not. To be able to run in Hunters' Flat Races was the great desire of many owners, for then the speed of the thoroughbred would inevitably tell. A hunter was qualified by a certificate from a Master of Hounds saying that the horse had been hunted; and it was the custom to send racehorses to meets in order to qualify. Some Masters appreciated the responsibility; others, and the majority, were more lax. A fractious, excitable racehorse, totally unused to the surroundings of the hunting field, was apt to be a most unpleasant neighbour. If the boy rode him near the hounds—and not seldom the boy on the would-be hunter perfectly understood his mission—danger to them was imminent. The Master's great object usually was to get rid of the creature as soon as he possibly could. Sometimes a mere appearance at the meet was enough; sometimes the horse would be cantered across a few fields, through gates, along roads, and so would turn up at a check, where his rider would take care that he was seen. Then application for the certificate would be made, and the racehorse that had never jumped a fence became a "qualified hunter." How remote a chance legitimate bearers of the title had against these racecourse hunters need not be said. The best of the qualified animals had the business to themselves, to the exclusion of those for whom the stakes were supposed to be instituted; and, when an ex-racehorse appeared at a country hunt meeting where there had been hopes of genuine sport among local horses and their riders, the thing became a farce, for the quasi-hunter would almost inevitably be in the hands of a competent "sharp." If the animal had been schooled and could jump, hunters' steeplechases were equally destroyed, and still more so hunters' hurdle races—absurdities in themselves, for it is the business of a hunter to jump a country, not to fly hurdles—where speed was the first essential.

The first endeavour to amend this state of things was the introduction of a rule stating that no horse, though it had a hunting certificate.

should be qualified to run for hunters' races if during the twelve months prior to the day of starting it had run for a handicap, whether over a country or not, at home or abroad. In the early 'eighties this was supplemented by a further requisition that the hunter must not have run under the recognised Rules of Racing since the age of two, and must have jumped all the fences at a meeting under Grand National Hunt Rules to the satisfaction of two of the stewards. At present (1898), horses, to be qualified to run in the few National Hunt Flat Races still contested, must have been placed by the judge first, second, or third in a steeplechase in Great Britain or Ireland; and the Rule continues to declare that they must have jumped all the fences and completed the whole distance of the course. They must be ridden in these Flat Races also by qualified riders—that is to say, not by professional jockeys; and one of the matters which, at the time of writing, seems to demand the attention of the Stewards of the National Hunt, is whether the "qualified rider" might not most judiciously be abolished, as the "hunter" he usually bestrode has been, so much to the benefit of the sport. Those who may ride under National Hunt Rules, other than jockeys licensed by the Committee, are given under rules 92 and 93, p. 240.

Now, as a matter of fact, it is shrewdly suspected that, with very few exceptions, qualified riders are jockeys in disguise, who do not admittedly ride for hire, but do so indirectly; and it is the trickery of these men that lead to a great proportion of the scandals that come to light, or that often would come to light if suspicious circumstances were duly and successfully investigated. It will be seen how wide is the qualification for the gentleman-rider, and, considering that to have any chance of success a man must devote a great deal of time to the sport and ride frequently, there would be little hardship if it were demanded that riders must be qualified as gentlemen or farmers, or else obliged to obtain licenses as professional jockeys. Under the most favourable conditions it, of course, takes a long time for a young man to obtain election to some of the political or social clubs, membership of which is a qualification; but the right sort of man, the rider whose co-operation would be to the advantage of the sport, should surely have very little difficulty in gaining admission to the Bibury, Croxton Park, Ludlow, or Southdown Club, or to the Rooms at Newmarket. If he be a person who cannot find sponsors for and secure election to any of these, or if he is not a farmer or a farmer's son, in the vast majority of cases he ought to be forced to appear what he is—a man who makes a livelihood by riding. Some men who were practically jockeys used to take a hundred acres of land and pose as farmers, and the practice is not quite extinct in spite of amendments to the Rule that have been made, and are quoted in section (*b*) of rule 92.

STEEPLECHASE COURSES—Prior to the establishment of the National Hunt Committee, steeplechase courses were just what the managers of meetings chose to make them. There were temptations to err in both directions—in that of excessive ease and of excessive severity; in the former, because the owner of the half-schooled hurdle jumper might be, and often was, tempted to enter for steeplechases, there being really nothing that the creature could not easily jump; in the latter, because a dangerously big fence would attract a sensation-loving crowd. The Committee therefore decreed that courses should consist of so many fences of given dimensions, and though the comparative uniformity of the regulation course is somewhat to be regretted, the ground and gradients at different places do ensure a certain amount of variety, and, as will presently be noted in detail, courses are not by any means all the same. At first the tendency of the Committee was to make fences too easy, and as it is an axiom that the easiest course is the most dangerous—because horses are often run over them when half schooled, and not only beginners, but seasoned animals, will chance obstacles that do not seem worth really rising at—the "open ditch," which could scarcely be managed by an unschooled horse, was introduced. This was a fence 4 ft. 6 in. high, if of dead brushwood or gorse 2 ft. thick, with a ditch on the taking-off side 6 ft. wide and 3 ft. deep. It was nicknamed "the grave," and protests were raised by a section of those interested in the sport, some of whom, if riders, were not very bold, and if trainers, were men who did not care about taking very much trouble with their horses. There was, however, some risk of horses blundering into the cutting, either because they did not see just where it began or because, knowing there was a ditch, they took off too soon. A guard rail was therefore put before the ditch; and though a few complaints about it are still occasionally heard, it is for the most part approved. The obstacle which at present appears most open to criticism is the water jump—12 ft. of water with a fence before it only 2 ft. high. Many riders are of opinion that the fence should be raised. Horses that have had little practice see the 24 inches of brushwood in front of them and are apt to disregard it as a trifle to be covered in their stride. They may blunder in, or, what is more likely, may see the water suddenly, and, making a sudden effort, overjump themselves. Whether it is physically possible for a horse that has risen at a jump to make this effort when off the ground, with nothing to give him an impetus, is a disputed point; the only thing that can be said about it is that to the rider it feels as if the animal did so. A few words may be interpolated here as to the distances which jumpers habitually cover over fences. Some time since the writer was at Danebury watching horses being schooled over hurdles. One flight was placed just by the side of a broad road where two carts could easily pass each other. "Don't the horses hurt themselves by jumping on to the road when the ground is hard?" seemed a natural question. "Oh, they always clear that, and well beyond it," was Tom Cannon's reply. "You will see when they pass." Four of them approached. The animal in which we were particularly interested at the time was rather on the small side, about 15.2. They were not racing, but going a half-speed gallop. We noted where the little horse took off and where he landed, carefully measured the distance covered, and found it was as nearly as possible 28 feet. The 2 ft. fence and the 12 ft. of water make just half this, it will be seen; so that the water jump is far from formidable.

Best of all courses, in the opinion of those riders whose hearts are in the sport and never, on the contrary, in their boots is Liverpool. In walking round, and coming to the great black fences, which a man of medium height cannot see over, it appears wonderful that tired horses should ever get over them, for they have to be jumped, cannot be brushed through. And here it may be remarked

that thin straggling fences are the most dangerous, for this reason: a horse that is tolerably well accustomed to them will find that he need not clear them, that they can be chanced; he will rise less and less by degrees; but there is a point of resistance half way up or so, through which he cannot brush; this he will at length find, and will be turned over in consequence. A description of Liverpool is here given. There are two or three very awkward fences, one on the turn which requires to be done with care and consideration in order to avoid the necessity of suddenly wrenching the horse round to the left on landing, and another with a broadish ditch on the landing side into which a horse that jumps short is apt to drop his hind legs.

Description of the Fences constituting the Grand National Steeple Chase.

1 and 17.—Thorn fence, 5 ft. high and 2 ft. thick.

2 and 18.—Thorn fence, 5 ft. high, guard rail on take off side 2 ft. high, close up against fence.

3 and 19.—Thorn fence, 4 ft. 10 in. high, with ditch on take off side about 6 ft. wide and 4 ft. deep, and a rail in front of said ditch 2 ft. high.

4 and 20.—Rail and fence, the rail being 2 ft. 6 in. high and the fence 5 ft. high.

5 and 21.—Same as No. 1.

6 and 22.—Known as "Becher's Brook," a thick thorn fence 4 ft. 10 in. high, with rail 2 ft. in front and a natural brook about 8 ft. wide on the far side and 4 ft. deep.

7 and 23.—Thorn fence, 4 ft. 10 in. high, with rail in front 2 ft. 6 in. high.

8 and 24.—Thorn fence, 5 ft. high, ditch on take off side 5 or 6 ft. wide, and rail in front 2 ft. high.

9 and 25.—Known as "Valentine's Brook," a thorn fence 5 ft. high, with a rail in front 2 ft. high, and brook on far side.

10 and 26.—Thorn fence, 4 ft. 10 in. high, and 2 ft. thick.

11 and 27.—Rail 2 ft. high, a ditch about 7 ft. wide and 4 ft. deep, and a thorn fence on far side 4 ft. 6 in. high.

12 and 28.—Rail 2 ft. high, fence 5 ft. high, and ditch on far side 6 ft. wide.

13, 14, 29, and 30.—A thorn fence, 4 ft. 6 in. high.

15.—Thorn fence, 5 ft. high and 2 ft. in width, ditch on take off side 5 ft. wide and a rail in front 2 ft. high.

16.—The "Water Jump," 15 ft. in width.

Sandown is "a galloping course" as the term goes, but it requires jumping, especially the three fences near together at the foot of the hill. If a horse loses his balance and gets at all abroad at the first or second of these, the third is very likely to upset him, as it is stiff and he cannot go through. At Kempton a handy horse is wanted, one or two of the jumps being rather on the turn; and at Hurst Park, where the fences are on the big side, and for the most part well made up. Lingfield is not a very satisfactory course, as the hill which has to be descended is too steep, and there is a bad turn, where a horse that has got out of hand is not unlikely to fall over the rails. Gatwick is rather thin and "straggly," and in the new course there is—possibly by the time these pages are published it will be correct to say was—a fence rendered very dangerous by the way the ground slopes on the taking-off side. Manchester jumps are criticised by riders as too straight up; fences are thin and high, so that horses are likely to find the point of resistance to which reference has been made. Windsor is confusing, because of the twists; it is hard for a rider to keep his place, as he is first outside and then inside. Dunstall Park is small and easy; Hawthorn Hill too much up and down hill: Newmarket is a model of a galloping course, with fair fences of good size; riding over Aldershot has been described as "mountaineering."

Most of the Irish courses differ from the English, except Leopardstown, which was an exceedingly stiff and severe edition of Sandown. It used to be dangerously big, in fact; horses were killed and men badly hurt; but it has been modified. At Punchestown, Fairyhouse, and Navan the country is to a great extent natural. There are banks, some of which horses fly, others they double on. Walls, open brooks, and doubles are included. One of the best water jumps is at Auteuil, for a river crosses the course, and if a horse fails to clear it he goes right in; whereas in England water jumps are sloped away to nothing, so that not to get over usually means merely a little splash in a few inches of mud.

A. E. T. Watson.
(*Rapier.*)

National Hunt Rules.

As re-arranged and revised by the Committee appointed by the National Hunt Committee.—[These Rules apply to all meetings held under the sanction of the National Hunt Committee, and to all races run at such meetings. They so closely resemble the Rules of Racing that they need not be quoted in full. The few divergences are, however, given.]

Interpretation and Application of these Rules.—A "maiden" is a horse which has never won a steeple chase, hurdle race, or National Hunt flat race (other than a match or private sweepstakes) at any recognised meeting in the United Kingdom, or in any other country. A maiden means a maiden at the time of start. A horse which has "never started" is one that has never started for a steeple chase, hurdle race, or National Hunt flat race (other than a match or private sweepstakes) in any country. A "race" means plate, sweepstakes, cup, or match, but refers only, under these Rules, to steeple chases, hurdle races, or National Hunt flat races. (2) These Rules apply to all meetings held under the sanction of the National Hunt Committee, and to all races run at such meetings, but they do not apply to—(*a*) Yeomanry races confined to chargers and troop horses, and held during the time of the annual training, under the Stewardship of the Commanding Officer (*b*) Point-to-Point steeple chases held under the Stewardship of the Master of Foxhounds or Staghounds, or of a Master of Harriers (being a member of the Association of Masters of Harriers), of the country in which they are run, of which notice shall have been given at the Registry Office (on a form to be obtained therefrom) not less than seven days before the holding thereof, with a fee of 10*s.*, and for which a certificate in form 2 of the Appendix C to these Rules, and signed by such Master as aforesaid, shall be lodged at the Registry Office within fourteen days after the holding thereof. All other meetings, to which the public are admitted, not held under the sanction of the National Hunt Committee or other Turf authority of the country in which they are held, are "unrecognised meetings," and every horse which has run at such a meeting is disqualified for all races under these Rules.

Officials.—15. One or more Inspectors of Steeple Chase Courses shall be annually appointed by, and will receive their instructions from the Stewards of the National Hunt Committee.

Handicapper.—24. The top weight to be allotted in a handicap shall not be less than 12st 7lb, nor the lowest weight less than 10st, excepting handicap steeple chases of three miles and a half or upwards, when the lowest weight may be 9st 7lb.

Clerk of the Scales.—30. He shall always put 4lbs extra into the scale to prove that the horse has not carried too much weight.

Regulations for Race Meetings.—37. All meetings under these Rules must be sanctioned by the Stewards of the National Hunt Committee. 42. At every meeting advertised to take place solely under these Rules there shall be in each day's programme at least two steeple chases, one of which must be three miles or upwards; and, of the total amount guaranteed for prizes, one half at least shall be apportioned to steeple chases. But this rule shall not apply in the case of Yeomanry races held during the annual training, and conjointly under Regimental and National Hunt Rules, the programmes of which have been submitted to, and approved by, the Stewards of the National Hunt Committee. 43. There shall be no races less than two miles. 44. In all steeple chase courses there shall be at least twelve fences (exclusive of hurdles) in the first two miles, and at least six fences in each succeeding mile. There shall be a water jump at least 12 feet wide and 2 feet deep, to be left open, or guarded only by a perpendicular fence not exceeding 2 feet in height. There shall be in each mile at least one ditch 6 feet wide and 3 feet deep on the taking-off side of the fence, which ditch may be guarded by a single rail, or left open, and which fence must be 4 feet 6 inches in height, and, if of dead brushwood or gorse, 2 feet in width. 45. In all hurdle race courses there shall be not less than eight flights of hurdles in the first two miles, with an additional flight of hurdles for every quarter of a mile or part of one beyond that distance, the height of the hurdles being not less than 3 feet 6 inches from the bottom bar to the top bar. 46. No pony or Galloway race shall take place at any meeting held under these Rules. 47. There shall be no restrictions with regard to training stables in the conditions of any race.

Alterations of Dates and Postponements.—48. The following provisions apply to any alterations in the dates of holding a meeting and to postponements—(1) The date for holding a meeting cannot be altered without the sanction of the Stewards of the National Hunt Committee, unless the weather or ground be in an unfit state for running, when a meeting or race may be postponed by the Stewards of the meeting for any time not later than the end of the following week. (2) In the latter case a certificate must be drawn up, containing the reason for postponement, and stating the day and hour when such decision was arrived at, which shall not be before

noon on the day preceding that on which the meeting or race has been advertised to take place, or to which it may have been previously adjourned; such certificate must be signed by two of the Stewards, or by one Steward and the Clerk of the Course, and at once despatched to the Registry Office.

Omitted Conditions.—49. When the weights are omitted from the conditions of any race, the horses shall carry 12st 7lb each, subject to penalties and allowances. If the horses be of different age, the weights shall be fixed by the sanctioned scale given in Appendix B. 50. When no course is mentioned, it shall be as follows:—If three-year-olds, two miles. If four-year-olds, two miles and a half. If five-year-olds, three miles. If six-year-olds or upwards, four miles. And if the horses be of different age, the course shall be fixed by the age of the youngest. 51. When no day is fixed for a race, it shall be run on the last day of the meeting, unless otherwise agreed by all the parties engaged, and sanctioned by the Stewards.

Special Conditions applicable to Handicaps, Produce Races, and Selling Races.—Handicaps.—52. If in a handicap for which there is a minor forfeit declared by a fixed time the highest weight accepting was originally less than 12st 7lb, it shall be raised to that weight, and the other acceptances equally. 53. In handicaps there shall be no clause permitting an alteration of the weights after publication by the claim of a selling allowance.

Selling Races.—55. In a selling race the lowest selling price shall in no case be less than £50.

Age.—63. No horse shall run under four years of age for a steeple chase or National Hunt flat race, or for a hurdle race until September 1st of the year in which he was three years old.

Riders. Gentlemen Riders, Qualified Riders, Jockeys, &c.—92. (1) Persons who have never ridden for hire, and who are not otherwise disqualified under these Rules need no qualification to ride in steeple chases or hurdle races unless the conditions of any such steeple chase or hurdle race require a particular qualification. (2) Qualified riders under these Rules are persons who have never ridden for hire, and who are qualified either as:—(*a*) as Gentlemen, (*b*) as Farmers, (*c*) by Election, (*d*) Yeomen when riding at their own regimental meetings. (*a*) Riders qualified as gentlemen must be members of the National Hunt Committee, the Irish National Hunt Steeple Chase Committee, or of one of the following Clubs:—The Jockey Club, Turf Club of Ireland, Croxton Park, Bibury, Southdown and Ludlow Race Clubs, the New Rooms at Newmarket, the Jockey Clubs of Paris, Berlin, and Vienna, the Army and Navy, Junior Army and Navy, Arthur's, Turf, Boodle's, Brook's, Carlton, Junior Carlton, Guards', Pratt's, Travellers', United Service, Junior United Service, East India United Service, the Union, White's, the Conservative, the Oxford and Cambridge, the Naval and Military, the Oriental, the Badminton, the Devonshire, the New University, the Windham, the St. James's or the United University Club, the Kildare Street, Sackville Street, Hibernian United Service or Stephen's Green Clubs, in Dublin, the Western Meeting (Ayr), or the New Club, Edinburgh; or that they be officers on full pay in the Army or Navy, or persons holding commissions under the Crown, or bearing titles in their own right or by courtesy. (*b*) Riders qualified as farmers must be now farming at least 100 acres of land, and their sons if following the same occupation, and for the purposes of this rule a "farmer" shall be understood to mean one who resides permanently on his farm, working it himself, and deriving therefrom his principal and ostensible means of subsistence. (*c*) Persons not qualified as "gentleman riders" or "farmers," who are desirous of becoming "qualified riders," must send their names in for election, with the names of their proposer and seconder, who must be members of the National Hunt Committee, to the Registry Office for publication in at least one "Calendar" before the day of election. The names of persons elected must be submitted annually to the Committee at the general meeting on the second Monday in December for re-election. The fee to be paid on election or re-election is £1. 93. Should any qualified rider subsequently ride for hire or appear in the Forfeit List, or be reported by the Committee of the Subscription Rooms at Newmarket or at Tattersall's as being a defaulter for bets lost on horse-racing, he will lose his qualification, and if a qualified rider by election his name will be erased from the list of qualified riders.

Jockeys' Fees.—98. In the absence of special agreement to ride for a lower sum, the fee to a winning jockey shall be £10, and to a losing jockey £5, and no further charge shall be made, except when requested to leave home for the purpose of riding, in which case the cost of travelling expenses, and £1 a day for living, may be charged to the owner, or divided between the owners, at whose request he left home.

Weights.—112. (1) No horse shall carry less than 10st in a steeple chase or hurdle race (except in a handicap steeple chase of three miles and a half or upwards, when the lowest weight may be 9st 7lb), nor less than 11st in a National Hunt flat race. (2) Catch weights are only permissible for the matches, or private sweepstakes.

Running.—134. (i) In a National Hunt flat race a horse which crosses another in any part of the race is disqualified, unless it be proved that he was two clear lengths ahead of the other when he crossed. (ii) In a steeple chase or hurdle race a horse shall be disqualified if his rider, by foul riding, jeopardised the chance of success of any other horse in the race, and in a run home from the last hurdle or fence, section (i) of this rule shall apply; the Stewards have power to fine a rider for the above offence any sum not exceeding £50. In all cases the Stewards have power of suspending a rider until the expiration of the meeting, or, should they consider such punishment insufficient, until the case can be heard and decided by the Stewards of the National Hunt Committee. (iii) If a horse or his rider jostle another horse or rider, the aggressor is disqualified, unless it be proved that the jostle was wholly caused by the fault of some other rider, or that the jostled horse or his rider was partly in fault. (iv) If a horse run the wrong side of a post he must turn back and run the course from such post.

Prizes.—150. No plate or sweepstake shall be run for unless the clear value to the winner, in case the race be run by two or more horses, will amount to £20. But if the value would amount to £20, if the race were so run, a horse may walk over, although he thereby receives less than £20.

Corrupt Practices and Disqualification of Persons.—165. Any person riding or running a horse for any race whatever in Great Britain, not advertised to be run under the Rules of Racing, or the National Hunt Rules, and not specially exempted from the operation of these rules, shall be disqualified from riding or running a horse where the National Hunt Rules are in force for twelve months from the date of such offence, but this rule shall not apply to (*a*) Races at meetings confined to resident members of the Universities of Oxford and Cambridge; (*b*) Pony or Galloway races at meetings confined to pony or Galloway racing.

Qualifications for National Hunt Flat Races.—169. The following provisions apply to National Hunt flat races:—(1) A horse to qualify to run for a National Hunt flat race must have been placed by the Judge first, second, or third in a steeple chase in Great Britain or Ireland, after having jumped all the fences, and completed the whole distance of the race to the satisfaction of at least two of the Stewards, to whom previous notice shall have been given in writing through the Clerk of the Course. (2) Such Stewards shall give a certificate to the above effect in the form 2 of Appendix C. (3) Such certificate, or, in the case of a horse qualified in Ireland, a copy of such certificate, signed by the Secretary and countersigned by a Steward of the Irish National Hunt Steeple Chase Committee, must be lodged at the Registry Office one clear week before running, with a fee of 5s. for registration. (4) Any certificate is invalidated by the disqualification of the horse for the race in which it was obtained. (5) Horses for National Hunt flat races must be ridden by qualified riders. They cannot be handicapped, but shall not carry less than 11st. (6) The provisions of Rule 134 as to running shall be in force in National Hunt flat races so far as applicable.

Special Rules relating to Steeple Chases and Hurdle Races:—170. (i) In steeple chases and hurdle races, any horse getting away from his rider may be remounted in any part of the field or enclosure in which the occurrence took place, but should such horse not be caught until he shall have entered another field, then he shall be ridden or brought back to the one in which he parted from his rider. Any rider so losing his horse may be assisted in catching him and remounting him without risk of disqualification; and in the event of a rider being disabled, his horse may be ridden home by any person of sufficient weight, provided he be qualified according to the conditions of the race. No penalty shall be exacted for carrying over-weight in this instance. Note.—In artificially constructed steeple chase courses and in hurdle races the spaces between the fences or hurdles are considered as fields or enclosures for the purposes of this rule. (ii) If any flag, post, or boundary mark be placed in the course or altered after the riders have been shown over the ground, or had the course pointed out to them, it shall not be considered binding or of any effect unless such addition or alteration shall have been particularly named, previous to starting, to all the riders in the race, by one of the Stewards, the Clerk of the Course, or by their representatives. (iii) If a horse refuse any fence or hurdle in a race, and it can be proved to the satisfaction of the Stewards that he has been led over it by any of the bystanders, or has been given a lead over by any horseman not riding in the race, the horse shall be disqualified.

Appendix A.

List of Meetings referred to in the Rules:—[The Stewards of the National Hunt Committee have power from time to time to alter or extend this list.]—Derby, Dunstall Park, Gatwick, Hawthorn Hill, Hurst Park, Kempton Park, Leicester, Lingfield, Manchester, Nottingham, Plumpton, Sandown Park, Warwick, Windsor, Wye.

Appendix B.

Scale of Weight-for-Age (*see Part VI.*)

The Committee recommend the following scale of weight-for-age—

For Steeple Chases of 3 miles and upwards:—From the 1st of January to the 30th of June, both inclusive—4 yrs., 10st. 3lb.; 5 yrs., 11st. 8lb.; 6 and aged, 12st. 3lb.

From the 1st of July to the 31st of December, both inclusive:—4 yrs., 11st.; 5 yrs., 11st. 12lb.; 6 and aged, 12st. 3lb.

For Steeple Chases of less than 3 miles:—From the 1st of January to the 30th of June, both inclusive—4 yrs., 10st. 10lb.; 5 yrs., 11st. 10lb.; 6 and aged, 12st. 3lb.

From the 1st of July to the 31st of December, both inclusive:—4 yrs., 11st. 6lb.; 5 yrs., 12st.; 6 and aged, 12st. 3lb.

For Hurdle Races:—From the 1st of January to the 31st of August, inclusive—4 yrs., 11st.; 5 yrs., 11st. 10lb.; 6 and aged, 12st.

From the 1st of September to the 31st of December, inclusive:—3 yrs., 10st. 7lb.; 4 yrs., 11st. 12lb.; 5, 6 and aged, 12st. 3lb.

For National Hunt Flat Races:—From the 1st of January to the 30th of June, inclusive:—4 yrs., 11st. 7lb.; 5 yrs., 12st. 3lb.; 6 and aged, 12st. 7lb.

From the 1st of July to the 31st of December, inclusive:—4 yrs., 12st.; 5 yrs., 12st. 5lb.; 6 and aged, 12st. 7lb.

Appendix C.

Form 1.—Point to-Point Steeple Chase Certificate (see Part I). I hereby certify—1. That *bonâ fide* Point-to-Point Steeple Chase took place at on . 2. That not more than three steeple chases, and no other races of any description, took place there on that day. 3. That the course was not flagged, except at the turning and winning points. 4. That

no money was taken at any gate, or at any stand or enclosure in connection with the races. 5. That the winning flag was placed within the limits of the country hunted over by my hounds.

Signed,
Master of the Hounds and Steward.
Date, , 189

*** This certificate must be signed by a Master of Foxhounds or Staghounds or by a Master of Harriers (being a member of the Association of Masters of Harriers), and must be lodged with Messrs. Weatherby, 6, Old Burlington Street, London, W., within fourteen days of the day of the races, with a fee of 10*s*. for registration and publication in the "Racing Calendar."

Form 2. Certificate of Qualification for National Hunt Flat Races (see Part XXV).

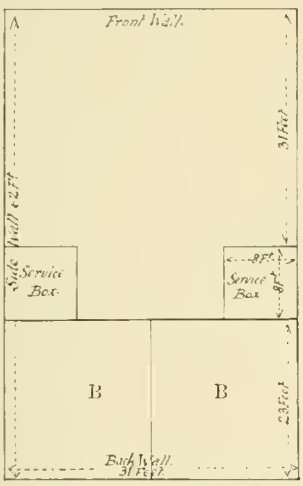
We, the undersigned, Stewards of the Meeting, hereby certify that Mr. 's has this day been placed in the Steeple Chase, and has jumped all the fences and completed the whole distance of the race to our satisfaction.

Signed,
Date, 189 , Address,
Signed,
Address,

*** This certificate must be lodged with Messrs. Weatherby, 6, Old Burlington Street, London, W., one clear week before the horse is to run, with a fee of 5*s*. for registration.

RACKETS—This game is played by four or a less number of players; two against two (a double game), one against one (a single game), or one against two. The **implements** of the game are a racket, a wooden hoop, of about 7 inches in diameter, tightly strung with catgut, the face with the handle being about $2\frac{1}{2}$ feet in length, and a white skin-covered ball of about $4\frac{1}{4}$ inches in circumference, made of very closely

RACKET.



Ground Plan of RACKET-COURT.

GROUND PLAN OF COURT.

compressed strips of cloth, the close compression giving a ball of extreme hardness.

The Court in which the game is at present played consists of a space, enclosed by four walls, at right angles to each other, of about 60 feet by 30. These walls are covered with asphalte of the greatest possible smoothness, as a rule coloured black, and the floor is either sheeted with that substance or laid with stone.

The front wall and both the side walls are usually about 30 feet high, and asphalted up to that height; the back wall is about half that height, the space between the back wall and the roof being utilised as a gallery, from which spectators can watch the game. On the front wall are two lines, one about 8 feet from the floor, running from side wall to side wall, called the service line, the other 2 feet 2 inches from the floor, always formed by a board running parallel to the service line, and called the play line or board. Adjoining the side walls, and half way down the court, are two squares, enclosed by lines painted on the floor, called the service boxes. The portion of the floor between the back wall and a line joining the hinder line of the two service boxes is bisected by a further line.

The Game—The game is thus played: one of the players, called the hand-in, standing partly within one of the service boxes, with his racket strikes the ball, dropped from his other hand, on to the front wall, without previously touching either of the side walls, above the service line, so as to make the ball pitch within that space marked *B*, which is farther from the service box in which he is. If the server fail to conform to these conditions his opponent is not obliged to take the service. If the server so fail twice in succession, if he hit a side wall before hitting the front wall, or if he hit the board, the roof, or into the gallery, he forfeits his right to serve.

The opponent, or hand-out, awaits the ball in the space marked *B*. His business is to hit the ball with his racket before it has touched the floor twice, so that the ball may hit the front wall above the board; but the fact of the ball hitting a side wall before reaching the front wall does not, as in the case of service, affect the competency of the stroke. The business thereafter of the server is to return in a similar manner his opponent's stroke, and thus the play is continued until failure to return the ball above the board by one player or the other, such failure counting against the person failing.

The Score—The game consists of 15 points. If the players should arrive at 13 points each, the game can be "set" at the option of him who first reaches 13, which means that a further 3 or 5 points may be played; if at 14 each, 3 points may be similarly played. It is only the server who can add to his score one for any failure on his opponent's part. If he fail to serve according to the rules, or fail to return a ball hit by his opponent, he loses his hand, as the phrase is, and his opponent becomes "hand-in" and is in a position to add points to his score.

The Spin, &c.—In any game the right to serve first is determined by the spin of the racket, which, falling on the floor, discloses a face in which the interlacing of the strings is apparent, called the "rough," or in which it is not, called the "smooth." One of the players spins, and the other calls "rough" or "smooth." The

winner of the spin is entitled to serve first. He may serve from either service box. If he wins a point or "ace" he must cross over and serve from the other box.

In a double game, the winner of the spin can only put one hand in at the start of the game. On his being put out, each of the opponents serves in turn. The hands-out agree as to which court each shall take, that is to say in which division of the court each shall await and endeavour to return the ball served by the opponent. A hand-out may change his court once in each game.

If one player oppose two, he is governed by the rules of a single game, while his opponents are governed by those of the double game. A game of this kind is often played under the tutelage of a school coach, he opposing the two school players; but it does not appear that any such match of any importance was ever played.

Handicaps—In a handicap the giver of odds concedes points in the game, coupled sometimes with the allowance to his opponent of two hands-in whenever he obtains the right to serve, subject, however, to the rule that, if the player to whom two hands-in are conceded wins the toss, he has only one hand-in on first presenting himself to serve.

The Marker—Most games at clubs, and all matches, are played under the eye and voice of a marker who is placed in the gallery. His duty is to judge as to each service and stroke; as to the service, whether it conforms to the above conditions; as to the stroke, whether the ball is hit before it has touched the floor twice, often a difficult matter to decide, and whether it strikes the front wall above the board, which is seldom doubtful. If he is of opinion that the service or stroke conforms to the rules of the game he calls "play," if not, he either calls "foul" or calls the score at which the players have arrived as the result of his then decision.

The marker's further duty is to call the game audibly from the start at "love all," assuming that there is no handicap. "Love," in the game of rackets, as in other games, signifies nothing. He continues to call the game as left at the close of each service, or service and subsequent "rally," as the alternate return of the ball by the players is called.

In a match, the marker's responsibility is diminished by the addition of two umpires and a referee, to whom either he or the players may appeal save on a question of service. These functionaries are held to have no right to interfere unless an appeal is made to them.

These observations are intended to explain the game to those who are entirely ignorant of it. The rules were adopted by the authorities about the year 1890, for it is worthy of remark that down to that date there were no written rules of the game, which, when played, was directed by the conventions of the various courts in which it happened to be proceeding. Such conventions, no doubt, only differed in minor points, the broad principles being naturally the same, and it is perhaps to be regretted that an authoritative issue of rules should have been delayed until a date when the game had to some extent lost its popularity. It will be observed that the code, which appears at the end of the article, consists partly of definitions which have to some extent been covered by the premises, and partly of rules.

History of the Game—There is but little to say of the historical aspect of the game, which, given a wall, a floor and a ball, but simple data, seems almost a natural one. To propel a ball against a wall for the pleasure of seeing it rebound, and thus to have a moving ball to meet without further effort or contrivance, are pleasures that have probably occurred to many before ever they heard or knew of anything in the nature of a game governed by rules. No doubt the addition of the racket is an artificial step, that of an opponent hardly so, but, thus equipped, the game of rackets requires but little further elaboration. Doubtless in some such form it has been played ever since balls have had existence, but it is difficult to say when anything with the elaboration of the modern game of rackets was first played.

The debtors' prisons, and the public houses, were the places in which it grew into vogue, and it is said that until the time of Mr. (now Sir William) Hart-Dyke's championship, all those who successfully competed for the position of champion racket player were born or brought up in one of the debtors' prisons.

Up to the end of the thirties, the game was an open court game, without side or back walls, which perhaps called forth to a greater extent the judgment and skill of the performers, testified by accuracy and strength of hitting, than the close court game. However that may be, the open court game is now obsolete, and there is probably hardly a trace to be found of any of the old open courts where the first championship matches were played. The game had attracted sufficient public attention in 1820 to put forward its champion in the person of one Robert Mackay, and ever since that date the championship has been held by some player, Sir William Hart-Dyke amongst others. Peter Latham, marker of the Queen's Club, having in 1887 defeated Joseph Gray, and in 1888 Walter Gray, is the present champion. In 1897 he had to defend his position against H. Standing, a player born in England, but now of the New York Racket Club. They played for £1000 a side at Queen's Club and at New York: in both matches Latham defeated his opponent.

Harrow was certainly one of the earliest, if not the earliest school to adopt the game, and from that time has been successful in training not merely Sir W. Hart-Dyke, but players of prominence in greater numbers than any other school. The reason in more recent times

has been obvious. Almost every boy at Harrow plays a game with a racket and a soft indiarubber ball, known there as "squash," wherever there is to be found an asphalt floor and a wall, and the result is that the tiro becomes familiar with the flight of a ball and the handling of a racket. Thereafter, to meet the vastly swifter flight of the hard racket ball becomes a comparatively simple affair. The contests which are held every year about Easter at the Queen's Club between the various public schools are probably those which attract the greatest interest and attention. Harrow has been more often successful than any other school.

The Universities of Oxford and Cambridge began to meet in the fifties, both in a double and, after the first year or two, a single game match ; but for one cause or another the game does not seem to keep its popularity, and quite recently the Oxford court has been closed. It may seem strange, to those who remember the position which the game once occupied, that the game should not be sufficiently played to keep a court at the University going. These matches used to excite a great amount of interest and were certainly often productive of excellent play and very close contests. Amongst those who have represented Oxford and Cambridge in the racket court, are found many of the greatest cricketers which their University has produced.

The game has also attained popularity outside England, for it has long been a favourite with officers in the army, who have introduced it where they have been quartered. In India, especially, it is much played, but on the whole it may generally be said that the game of rackets, whether from the cost or from its being played in a closed space, has not shared in the general "boom" which has been observable in the case of all other games and athletic pursuits. Nevertheless there is no reason to depart from the old dictum that it is a "fine manly game," and nobody who has seen a good game played by efficient players will deny that from its quickness and brightness, from the speediness with which the answer has to be given to a ball moving at a velocity greater than in any other ball game, from the accuracy and delicacy of touch of the first-rate performer, it gives much pleasure to the spectator.

General Style—As a general rule, the best, and certainly the prettiest, class of players use the racket with a very loose arm, each joint sharing in the stroke. The game is one in which the player may be summoned to take the ball in any position, and the greater number of joints he can call into his service, the greater will be the ease with which he can meet the unexpected. The beginner, however, if he start his rackets career with a hard ball, will probably find that to meet the ball with the full force of the racket, and to hit it above the board, will be a task of sufficient difficulty without his efforts being hampered by rules about style. The Harrow system of the indiarubber ball is the best for the beginner, but if he cannot pursue that, let him go into the court, stand about half way down the floor, and return the ball to himself, meeting it as best he can, and he will thereby become to some extent familiar with the speed of the ball and the manner in which it bounds from the floor. The racket should be held at length and firmly grasped, and when striking the player should, if possible, be in the position which enables him to meet the ball at the full length of the arm, as by this means he will obtain the greater swing. The ball should be met either before it has attained the full height of its bound (the half volley) or when it has nearly met the floor on the second bound. He will find the half volley incomparably the more difficult of the two, but as he progresses in his play he will find it a most useful stroke. If the ball be met by the full face, and in the middle of the racket, but little power is required from the arm to make an effective stroke. With regard to the volley, this stroke should not as a rule be used to balls passing above the height of the shoulder, as it is difficult to prevent such hits soaring to the roof. In all strokes of this game there should be no jerkiness ; the sweep of the racket should be long, regular and smooth, whether or no much force be put into the blow. No doubt, as in the case of most pursuits, the advice and criticism of a skilled player watching the efforts of the neophyte will be of greater advantage than the perusal of written instructions, however sound. Perhaps the more game-winning, though certainly the duller part of the game, is the *service*. In fact, it might be an improvement if it were the hand-out who could add to the score, and not the server. Many must remember cases in which the more accomplished player was beaten by the accurate server, for aces won by unreturned service count equally with those obtained after long and fatiguing rallies. The general object to be attained by the server is to cause the ball to drop into the corner of the court where its return will present the greatest difficulty to the hand-out. The server can cause the ball to come sharply off the floor and off the side and back walls by drawing the strings of the racket across the ball as he strikes. This is technically called "cut," and a player so striking is said to "put cut on" the ball. In some courts the server will find that "cut" applied by a stroke under the level of the shoulder renders the service more difficult, in others by a stroke above such level ; an experienced player will be prepared with a number of different styles of service, for it may well be that though "off his day" with one style, he may find himself "in form" with another. The player may of course

deliver the service without any cut at all, and very difficult service is often given in that way.

The chief thing for the hand-out (who takes the service) to bear in mind is that he must endeavour to return the ball without touching the side wall, whereby he places it as far as possible from the server, and if the return so made be of a good length, that is, roughly speaking, pitching in that section of the court in which the hand-out stands, it will always put the server in a difficulty.

It may here be said that this avoidance of the side walls should be the general rule, not merely on the first return, but in all other strokes of the rally, as the use of the side wall gives the striker's opponent further time to be in readiness for his stroke. The hand-out should also be prepared, in case of emergency, to volley or half volley the service before it reaches the back wall. This is by no means an easy stroke, but it is no uncommon occurrence for a skilled server to find his spot with such accuracy that the return of the service in the ordinary way on the rebound from the back wall is practically impossible. In a double game, the hand-out who is not taking the service stands just behind the server, his duty being to return the balls falling near the front wall, while his partner is responsible for the long strokes. The great secret, however, of successful partnership is for one of the players early to call "mine" or "yours" in the case of all strokes in which there is a possibility of a doubt, and to act accordingly. It is hardly necessary to say that those partners will do best together who are accustomed to each other's play, for there is always much to be learnt of the manner in which each player in a four-handed game regards his partner, his opponents and himself. It is also a commonplace of any game, that those who wish to improve should, if possible, find opponents who are better than themselves.

When great skill in rackets is reached and pitted against great skill, no game can be witnessed in which all the elements, except perhaps physical courage, which go to make up a first-rate game are present to a greater degree, the drawback being that owing to the necessities of the nature of the court's construction, such pleasure is limited to comparatively few spectators.

E. O. P. BOUVERIE.

DEFINITIONS AND LAWS.

DEFINITIONS.

Ace—A stroke won and scored.

Board—The wooden planks which cover the lower part of the front wall to the height of 2 feet 2 inches from the floor.

Box—*See* SERVICE-BOX.

Court—The whole building in which the game is played: *or*, one half of the floor between the short line and the back wall, as divided by the half-court line and called the *right* (or *fore-hand*) *court* or the *left* (or *back-hand*) *court*.

Cut—A ball served so that it strikes upon or below the *cut line* is called a *cut*.

Cut-line—(Sometimes called the *Service line*). A line painted on the front wall about the height of 8 feet from the floor.

Double—A ball struck after it has touched the floor a second time is called a *double*.

Fault—It is a *fault* (*a*) If the server in serving fail to stand as provided in Law 2; or (*b*) If he strike the ball in serving more than once; or (*c*) If the ball served by him strike upon or below the cut line, or (*d*) If the ball does not drop in the proper court. (*See* Law 4.)

Good—A service delivered, or a return made in conformity with the laws is called *good*.

Half-court line—The line on the floor drawn from the short-line to the back-walls, and dividing that portion of the floor into two equal spaces.

Hand-in—The player who has the right of serving the ball.

Hand-out—The player who has to receive the service.

In-play—The ball, after being served, is said to be *in-play* until it has touched the floor twice, or a player or the board, or has gone out of court.

Out-of-court—A ball served, or in-play, is said to go out-of-court when it touches the roof, posts or cushions, or is driven into the gallery.

Rally—The repeated return of the ball in-play; it is sometimes called a bully.

Rubber—A set of 3, 5, 7, or any other uneven number of games. The winner of the majority of games wins the rubber. *Note*—The usual number is five for a single, and seven for a double match.

Serve, to—To start the ball in play by striking it with the racket.

Service—The ball served.

Service-box—The square (marked out on each side of the floor) from which the service must be delivered.

Service-line—*See* CUT-LINE.

Short-line—The line on the floor at the distance of about 39 feet from the front wall and parallel to it.

Note—The distance is different in some courts.

Volley—A ball which is struck before it has touched the floor is said to be struck at, or on, the *volley*; the stroke is called a *volley*.

LAWS.

The Single Game.

1. The right to serve first shall be determined by the spin of the racket. The player who wins the spin shall have the right to serve first.

2. The server, in serving, must stand with at least one foot within the service-box and not touching any of the lines that bound it.

3. The server may begin serving from the right or the left service-box as he pleases; but after serving from the right he must serve from the left or *vice versâ*; and so on alternately as long as he remains hand-in.

4. The ball served must strike the front wall before touching any other part of the court, and must strike it above the cut-line, and must drop within the lines[1] which bound the court on the side opposite to the box from which the ball was served, and must not touch either of such lines.

5. Hand-out may declare that he was not ready for the service; and if the marker decides in favour of his claim, the service shall count for nothing, and the server shall serve again from the same box, but if he decide otherwise the server shall score an ace. If hand-out make any attempt to take the service, he cannot claim that he was not ready.

6. Hand-out may take a fault; but if he do so the rally must be played as if the service had been good.

7. Aces are scored by hand-in only.

[1] That is the short line and the half court line.

8. Hand-in wins and scores an ace; (*a*) If hand-out fail to return the ball served or in-play to the front wall, above the board, before the ball has touched the floor twice, *except in the case of a let* (*See* Law 10); or (*b*) If hand-out return the ball served or in-play so that it goes out-of-court; or (*c*) If the ball in-play touch hand-out, or anything that he wears or carries except his racket in the act of striking.

9. Hand-in becomes hand-out: (*a*) If he serve the ball so that it touches him before dropping in the proper court as provided by Law 4; or (*b*) If he serve the ball on the floor or out of court. (*c*) If the ball served touch any part of the court before striking the front wall, or (*d*) If he serve two consecutive faults. (*e*) If he fail to return the ball in-play to the front wall above the board, *except in the case of a let* (*see* Law 10); or (*f*) If he return the ball in-play so that it goes out of court, or (*g*) If the ball in-play touch him or anything that he wears or carries, except his racket in the act of striking. Then, in any of these cases, hand-out becomes hand-in and serves in his turn.

10. It shall be a let, and the service or rally shall count for nothing, and the server shall serve again from the same box: (*a*) If the ball in-play touch the striker's opponent on, or above the knee, and (in the marker's opinion) is thereby prevented from reaching the front wall above the board; or (*b*) If either player (in the marker's opinion) undesignedly prevent his opponent from returning the ball served or in-play.

11. The ball served or in-play may be returned by the striker's opponent at the volley, or after it has touched the floor once, but not after it has touched the floor a second time.

12. Each player must get out of his opponent's way as much as possible; if either player claim that his opponent prevented him from returning the ball served or in-play the marker shall decide whether it shall be a let or not. (Subject to provisions of Law 14.)

13. The game is 15 up; that is, the player who first scores 15 aces wins the game, provided that: (*a*) At the score of 13 all, hand-out may "set" the game to 5 or to 3, and (*b*) At the score of 14 all, hand-out may set the game to 3—that is, in the first case (*A*) The player who first scores 5 (or 3) aces according as the game was set wins the game, and in the second case (*B*) The player who first scores 3 aces wins the game. *Note*—In either case the claim to "set" must be made by hand-out before the next service shall have been delivered.

14. In all cases the marker's decision shall be final; but if he doubt which way to decide he shall direct that the ace be played over again. In matches when there are umpires and a referee appointed the marker's decision shall be final on all questions relating to the service; but (when in doubt) he shall refer all other questions to the umpires and referee: and either player may appeal to them from any decision of the marker except as to any service: and they shall decide each case by a majority o votes. All appeals must be made before another service shall have been delivered.

The Double, or Four-handed Game.

1. The laws of the Single Game (as above) shall apply to the Double, or Four-handed Game, except as set forth in the following laws.

2. Only one of the side which has won the spin shall serve at the first time of being hand-in, in any game; at all subsequent times, the players on each side shall serve in the same order in which they began serving.

3. One player on the hand-out side may stand where he pleases to receive the service; but his partner and the server's partner must stand behind the server until the service has been delivered.

4. If the ball served touch the server's partner before touching the floor twice, whether it was, or would have been, a fault or not, the server shall lose his right of service, and the next hand-in shall serve.

5. The players on the hand-out side may choose the order in which they shall receive the service and they shall adhere to that order, and shall only change it once in any game or at the end of any game of a rubber.

6. If the ball in-play touch the striker's partner.it shall count against them; that is if the striker was hand-out, the other side shall score an ace; if he was hand-in his side shall lose one hand-in; except in case the ball in-play touch the striker's partner after it has been hit at and missed by one of their opponents, when it shall count against such opponents; that is, if they were hand-out the other side shall score an ace; if they were hand-in, they shall lose one hand-in.

RATTING—Every sportsman has probably indulged in "ratting" at some time or other. The period of this indulgence is usually that which immediately precedes his "first gun"—in fact before he would be safe with that much-desired weapon. Having the right instinct, he usually cleaves to rat-catching because the possibilities are within his grasp. If he can command a blue-blooded terrier, a ferret warranted not to "lay up," and a cutting-tool, well and good: but if he cannot, he knows some one who has a "game," broken-bred, broken-haired terrier as hard as nails—the village poacher is always good for a ferret—and a discarded garden spade must take the place of the more artistic implement. For these three things are the essentials in ratting. The picturesque professional rat-catcher has gone out, and the gentleman amateur must take his place. If any one retort that ratting is not sport, I can only reply that one of the best sportsmen living has told me that he would prefer being a rat-catcher to being a bishop. Rats are often a veritable plague, and the only greater abomination than a live rat is a dead one—especially if in a house where it can neither be located nor got at. No doubt rats serve some good purpose, but from our present standpoint they exist to be got rid of. There are only three effective ways of doing this—by encouraging owls, by cats, and by ratting. Owls can be got about any dwelling or farmstead, and they are the best ratters that exist. They are effective and provide sport for themselves—but not for us. And for rats to be worthy of our attention they must provide sport.

They are usually found by the sides of rivers, among haystacks and in old buildings, in the rickyards, in drains, and especially on stubbles bordering streams. In summer and autumn they mainly patronise the open; but when the land is cleared, and the first frosts have cut down the cover, they make for the buildings. At least this is what the common Brown Rat (*Mus decumanus*) does, but the Water Vole (*Arvicola amphibius*), often called the Water Rat and hunted as such, sticks to its sylvan retreat the whole year round. (The Black rat —*Mus rattus*—is now practically extinct, so we need take no account of him.)

Ferrets are the most important part of the ratter's outfit, and to face a big day's ratting they should be strong and well nourished: and it is needless to say that they should not be fed

on the day they are to be taken out. Always carry your ferrets in a strong canvas bag, which, for protection, may in turn be carried in an old game-bag. For rats, as opposed to rabbits, bitch ferrets are preferable to dogs. The former are only about half the size of the latter, and can follow a rat anywhere. Imitate the poacher, and never run a dark polecat ferret when you can command a white one. Besides, an indiscreet terrier is much more likely to snap up the brown animal by mistake than a white one. Never, of course, muzzle a ferret when ratting, nor handicap it by running it with a line. And a ferret bell is equally useless. It has quite enough to do to defend itself and drive the vermin. Always have plenty of resource in ferrets. They get badly bitten, and it is unwise to allow them to get too much punished. Run them in turn, and not too long. The shorter they run, the harder they drive, and the more sport is provided. They should always be attended to when the day is done, and have their wounds dressed with sweet oil. A rat's bite is poisonous, and dressing will prevent festering.

The best kind of spade for ratting is one that is strong and light. The blade should be of the best tempered steel, so that it will cut easily through roots. It is a convenience if the spade has a spike at one end for following holes and finding the direction of runs in soft banks.

It is unnecessary to say much about dogs. For ratting, terriers are far the best, rough-coated fox-terriers for preference. To be worthy of the name, terriers should be small, compact, quick, "game," and have good noses. They should, of course, be able to *find* rats. Once a reliable dog has "marked," it is interesting to watch how cutely the rest find and mark the bolt-holes. A good terrier may, of course, be of any colour. I have known several which were splendid ratters, of very mixed hue and lineage.

The ideal day for ratting is one we invariably get during the last week in September or the first week in October. The crops have been gathered, and, owing to a night's frost, the bareness of the earth begins to peep through. Now that the grain has been carried, the rats have left the stubble for the hedges, and sport is to be had in plenty. As the vermin are driven, the dogs take their chance, each in its own fashion, with a nip here, a narrow escape there, until a dozen rats have been accounted for. A few hedgerow holes are found barren, but a soft bank yields enormously. A couple of bitten ferrets have been put into the bag, and "Nails" is philosophically licking the dripping blood from his nose. He took hold of a rat a little too far back, and this is the result.

Comparatively few rats have as yet taken to the stacks in the field corners, but even now these yield princely sport. They charge from the thatch like tigers, but once on the ground the dogs give none of them time to get back. They take them as they come, and every snap of the trap-like jaws accounts for a victim. In ferretting a stack or rick, it will invariably be found that the rats have made well defined runs, and unless these are stopped the sport will be poor, as the rats will not be forced to the ground. And until they are the dogs can do nothing. To compel the vermin to leave the stack, it is necessary to cut off their runs. This may be effectively done by placing pieces of board across them, and it is the only way to prevent the rats running in circles and thus baffling the ferrets. Shooting rats on a stack is not effective, and it is not strictly "ratting." Good sport may often be had with a single terrier along the banks of a stream or river where rats are accustomed to harbour in roots. I have had terriers, one in particular, which would bay them out, and once in the water their existence was short. In hunting rats in the water, often a good deal of time is lost in getting a dog to see the rat. When this is the case, instantly seize the dog and lift it well up. From this vantage it will immediately see the rat, and will dive after it in a moment.

Here is the record of probably the biggest bag of rats ever made. It took place in a Paris slaughter-house, several dead horses being left as bait overnight. Several workmen were employed in the assault. Having entered the yard and closed the door behind them, they commenced a general massacre. It was not necessary to take any aim, for no matter where the blow was directed, it was sure to immolate a rat; and those which endeavoured to escape by climbing up the walls were quickly knocked down. By a recurrence of this experiment at intervals of a few days, they killed in the space of a month 16,050 rats. After one night's massacre the dead amounted to 2,640, and the result of four hunts was 9,101.

This is not the place to mention the numerous ingenious traps which are used for circumventing rats, but I cannot resist the temptation to give a recipe "To find a dead rat." Go to the butcher's and catch a dozen blue-bottles. Slip them into a glass jar, tying a bit of rag over the mouth. Proceed to the room where the smell is, shut the door behind you, and let loose your pack of flies. They will go buzzing round and round, but after a time will all settle on the self-same spot. Under that particular spot—to an inch—is the dead rat.

JOHN WATSON.

RED DEER—(*Cervus elaphus*): A. S. *deor*; G. *thier*; Sw. *djur*; Dan. *ayr*; Gk. θήρ; Lat. *fera*, all of which names in their original sense signified a wild beast, and applied to all sorts of animals, those of the deer tribe being particularised as *stag* (of Scandinavian origin), Fr. *cerf*; It. *cerfo*; Sp. *cervo*; Lat. *cervus*. In modern German the red deer is known as *hirsch* or *edel hirsch*

(noble or royal stag), to distinguish it above all its fellows.

Classification—The red deer is the typical member of a group which comprises several species and varieties which are widely distributed over Europe, Asia, North Africa, and North America. All these representative forms agree in the general character of the antlers, which are cylindrical, rough, in this respect unlike the smooth horns of the reindeer and the palmated horns of the fallow deer—though a tendency to palmation is sometimes observable—having as a rule three anterior tines (*brow*, *bez* or *bay*, and *trez* or *tray*), with two, three or more points on top, in the adult animal. Sir William Flower has stated (*Introduction to Study of Mammals*, p. 321) that "the elaphine or typical group is at once characterised by the presence of a bez tine to the antlers"; but so many exceptions to this have been noted, particularly amongst the deer of the Scottish Highlands and the West of England, that this characteristic cannot be relied upon as diagnostic. Moreover, the red deer of different European countries (the British Islands, Norway, France, Spain, Germany, Hungary and the Carpathians), as well as those found in Asia Minor,[1] Transcaucasia and North China (*Cervus xanthopygius*, David),[2] and the so-called Barbary stag of North Africa, are all so closely allied, and are subject to such variation, that it is doubtful whether they can be regarded as anything more than mere geographical races of one widely distributed species, *Cervus elaphus*.[3] We need not here consider the Persian *Maral*, the *Shou* or great stag of Sikkim and Thibet (*Cervus affinis*), standing sometimes fifteen hands, and closely approaching the American Wapiti, the Indian Sambur (*Cervus aristotelis*), the Burmese stag (*Cervus eldi*), or Schomburgk's deer from the northern parts of Siam; because all these species, though closely related to the typical red deer in size, form and colour, may be differentiated almost at a glance by the peculiar shape of the antlers and disposition or arrangement of the tines; and although, possibly, sprung from one ancestral form, they have become by geographical separation in the lapse of ages sufficiently differentiated as to be easily recognisable.

Description—The familiar name Red-deer is of course derived from its colour, which during the breeding season is a rich rufous brown, turning grey at the approach of winter. A white or yellowish-white variety is known, of which there is a small herd in Welbeck Park, as described in *The Field*, 18th July, 1891. The male is called a *stag* (formerly a hart), the female a *hind*, and the young a *calf*.[4]

The young, spotted with white, are born in May or the first week of June, the rutting season taking place in September and October, and the period of gestation being eight months. Exceptionally during or immediately after a mild, open winter, hinds (and fallow does also) are sought by the stag, and calves and fawns are dropped in autumn. Several such instances have been reported in *The Field*, the dates being October 21st, November 4th, 18th, 26th, and 28th. Three instances are on record of fawns in December, namely, on the 7th, 8th, and 16th of that month.

Measurements—A full-grown stag will stand 4 feet high at the withers, and the antlers when fully developed will have *brow*, *bay*, and *tray* tines, with three on top. It is then known to deer-stalkers as a "royal," although this was not the original signification of the term, which has come to be misapplied by custom. Typical red deer antlers will measure about 32 inches in length, 6 inches in girth above the bay tine, and 32 inches in greatest inside width.

Weight—A good Scotch stag should weigh 20 stone, but at the present day this weight is seldom reached in the British Islands, so great has been the deterioration from various causes, the chief of which is want of sufficient food, and the injudicious practice among deer-stalkers of shooting the best stags immediately before the rutting season, and so leaving the perpetuation of the race to young and inferior animals.

In the Thuringian forest, one of the best in Germany, a good stag at the present day might weigh 30 stone. In the Hungarian subalpine hill country, according to Baillie Grohman, stags may still be obtained weighing 44 stone clean (*Sport in the Alps*, p. 172).

Antlers—A comparison of Scottish deerheads with those which have been dug up in British peat-beds or found in the cave deposits of England and the Continent will demonstrate how much larger, finer, and heavier were the antlers of former days, when the animals which bore them ranged over a larger tract of unenclosed country in which they found abundance of good grazing and browsing, and were not killed down in numbers with accurately sighted rifles as at the present day, instead of with the long-bow or cross-bow as in days of yore.

The splendid heads which are to be found at the present time in the forests of Germany and Hungary testify to the beneficial effects of abundant feeding and better management of the forests. (See an article by Mr. Baillie Grohman on "Continental Red Deer, past and present," with figures of German, Carpathian, Slavonian, Hungarian and Pomeranian deer heads, in *The Field*, December 2nd and 9th, 1893, and the same writer's volume on *Sport in the Alps*, appendix p. 335.) Wherever deer can get browsing on the leafy branches and shoots of forest trees as well as grazing on good pasture, they will always be in better condition and carry finer heads than on bare hill sides. A proof of this may be seen in our English park deer, which, when properly cared for, are much heavier than any to be met with in Scottish deer forests or even in the wild woodlands of the West of England, where greater variety of food is to be obtained. As a notable example, we may refer to the head of a park deer figured in *The Field* of May 7th, 1892, from a photograph of a nine-year-old red stage in Warnham Park, Horsham, the residence of Mr. J. Lucas. (See also *The Field* of February 20th, 1897, where several photos are reproduced.) This stag, reared in the park, carried 31 points in 1888, and the cast antlers weighed 9½ lbs.; in 1889, 33 points, 12½ lbs.; in 1890, 35 points, 13½ lbs.; in 1891, 39 points, 16 lbs.; in 1892, 48 points, 17 lbs. The abnormal size and weight of these horns were no doubt due to good feeding over 250 acres, and to the fact of the land having been dressed with bone-dust every second year. They are large horns even for park deer; but what they gain in massiveness they lose in beauty, having none of that elegance and graceful contour which are so characteristic of a wild head.

For the comparative weights of stags and hinds (as well as of bucks and does) in various English deer parks, see Mr. Whitaker's *List of the Deer Parks and Paddocks of England* (1892). In regard to the weight of wild stags in Scotland, the south-west of England, and south-west Ireland, see an article by the present writer in *The Field* of November 15th, 1884.

Growth of Antlers—The antlers are shed or cast as a rule about April or May, the oldest stags being the first to lose them. The exact time in fact depends upon the age of the stag and the temperature of the preceding winter and early spring. Should the winter be cold and spring protracted, the stags shed their horns as late as May; the old ones at the beginning, the young ones at the end of the month. It is very rarely, however, that an old stag is seen with his horns on after the beginning of May; but a two-year-old deer will carry his horns for a month or two later. Both horns are not always shed at the same time; one of them, perhaps, will be retained for a day or two after the other. In a few days after the

[1] Several important letters on the red deer and fallow deer of Asia Minor will be found in *The Field* of 1895, March 9 and 30, April 6 and 27, May 18 and June 1 and 29. See also E. N. Buxton, *Short Stalks*, 1892, pp. 279–322.

[2] For the remarks on the validity of this species see Lydekker, *Hoofs and Horns* (1893), p. 272.

[3] See important papers by the late Sir Victor Brooke on the classification of the *Cervidæ*, *Proc. Zool. Soc.*, 1878, pp. 883–928, and by Mr. A. Gordon Cameron on the value of antlers in the classification of deer, *The Field*, 1894–5.

[4] With fallow deer the male is a *buck*, the female a *doe*, and the young a *fawn*.

old horns have dropped, the new growth shows itself, and gradually the new antlers are developed. They are then covered with a thick "velvet," which preserves the point, as yet soft and tender, from injury. While in this soft condition they are very sensitive, and to avoid injury by striking them against trees, the deer leads a life of retirement. In about twelve weeks they are full-grown, and, as they gradually harden, the animals rub them against a tree to get rid of the "velvet." This can only be done gradually, and a stag may often be seen at this time of year with the "velvet" hanging in strips, being only partially detached from the horns. For fuller details concerning the growth of antlers see articles on "Deer Horns" in the *Zoologist* for September, 1884; *The Field* of December 4th, 1886, and Prof. Flower's lecture on horns and antlers, printed with illustrations in *Trans. Middlesex Nat. Hist. Soc.*, 1889.

The weight of the antlers in a full-grown stag varies, according to their size and massiveness, from 10 or 12 to 15 lbs. In Hungary they attain to and sometimes even exceed 20 lbs.

On the subject of abnormal antlers several pages might be written. One is accustomed to see from time to time some very curious and fantastic growths, usually the result of injury during the time the growing horns are in a sensitive condition, although this does not apply to a *switch-horn*—a long tapering horn with only one tine, namely the brow tine—an illustration of which may be found in Mr. Grimble's fine volume on *Deer-stalking*. The most remarkable of all are those which have but one horn, and those in which a supernumerary horn has grown up. Stags with one, three, and four horns have been reported; and heads of all these varieties will be found figured in *The Field* of March 10th, 1894.

Cast Horns—What becomes of the old horns is a question which is often asked. Foresters and park-keepers pick up all they can find and sell them as perquisites to the cutlers for knife-handles; many fall in out-of-the-way places, amongst heather and bracken, and are never discovered; and the deer themselves help to get rid of a great many by chewing and eating them. This last fact has been abundantly proved by the testimony of credible witnesses (see *The Field*, December 4th, 1886). Fallow deer, as well as red deer, have a similar propensity and liking, apparently for the saline flavour of the cast horn. Doubtless the habit is common to all deer and is not confined to horns which have been shed. Hinds have been observed chewing the horns of a stag while lying down, and marks of teeth have been noticed on the horns of stags killed late in the season in Uist.

The character of deer heads, as every stalker knows, varies in different forests; there are usually most points where there is most wood or good winter feeding and shelter. In hill deer, heads go on improving up to the age of twelve or fourteen years; on low ground, with more forcing food, they come to maturity sooner. The heads then remain about the same for some years, after which they gradually lose beam, get smoother from the blood-vessels being no longer so vigorous, the points taper more and are shorter, till finally the head dwindles to half its former size. On this subject see the remarks of Lord Lovat in the chapter on "Deer-Stalking" in the *Badminton Library*, and the articles by Mr. A. Gordon Cameron on "Deer and Stalking"—"Notes from an Island Forest"—published in *The Field* of January, 1891.

Hornless Stags are not unknown, especially in the German forests. By this expression is meant, not stags which have once carried antlers and have shed them, but stags which have never possessed any. In the Highlands they are termed *hummel* stags; to the German foresters they are known as *Plattkopfe* (flat-heads) or *Monche* (monks), in allusion to the bald head or tonsure. A long and interesting article on this subject by Herr Ludwig Beckmann, accompanied by illustrations, appeared in *The Field* of April 9th, 1887; supplementary remarks by the present writer, in *The Zoologist*, 1887, p. 381.

Haviers, or stags which have been gelded when young, have no horns, as is well known, and in the early part of the stalking season, when seen through a glass, might be mistaken for *hummels*: but as the season advances, the necks of the latter swell, and (except in the matter of horns) they assume all the characteristics, both in appearance and behaviour, of ordinary stags, and are thus easily distinguished from *haviers*.

The effects of castration on the growth of antlers is a very curious subject, and has been dealt with in considerable detail by Dr. G. H. Fowler in the *Proceedings of the Zoological Society* for 1894 (pp. 485-494), with illustrations.

Deer Leaps—For deer leaps see an article by the present writer in *The Field* of January 19th, 1884.

Diseases and Parasites—Parasitic lung disease from nematodes is a widespread affection, and its degree of virulence in particular years is dependent upon the conditions that are favourable or otherwise to the reproduction of the parasites. Excessive moisture and a mild winter are the most favouring conditions, the parasitic worms being *Strongylus micrurus*, *S. filaria*, and *S. rufescens*. The larvæ get taken up with the food and gain access to the lungs, where their presence causes the formation of miliary tubercles and small tumours, which latter contain, besides the parent worms, multitudes of free embryos. If the numbers be not excessive, a natural cure, according to Professor Spencer Cobbold, may occur by calcareous degeneration. We have notes of the prevalence of this disease at different times at Welbeck Park; Lyme Park, Stockport; Hoar Cross Park, Burton-on-Trent; Temple Newsham Park, Yorkshire; and of the remedies tried. Those recommended from experience are burning of the pasture (carried out as in heather-burning on grouse moors) and the administering of vegetable charcoal, by giving beans which are damped in order to make the powdered charcoal adhere to them.

An outbreak of *anthrax* amongst deer is occasionally reported, as at Ickworth Park, Suffolk, in the summer (June and July) of 1889 (see the report of Dr. Adami, *Brit. Med. Journ.*, October 12th, 1889, and *The Field*, October 26th, 1889), resulting in the loss of over 450 deer out of a herd of between 600 and 700. But careful *post-mortem* examination and experiment in other animals with the *bacilli* found, proved that the deer were suffering, not from *anthrax*, as supposed, but from *rabies*, as did the deer in Richmond Park in 1886-87 (see the Parliamentary Reports by Chief Inspector Cope and Professor Victor Horsley, published in 1888, and a Report to the Richmond Local Authority by Mr. Lupton, V.S.). In an instructive article on the parasites of deer (*The Field*, September 12th, 1896), Mr. P. H. Grimshaw has given an account of several dipterous insects prejudicial to deer, and describes the various stages or transformations through which they pass, and the characteristic features by which they may be recognised.

For further information the reader may refer to Scrope's *Days of Deer Stalking*, Shirley's *English Deer Parks*, Collyns' *Chase of the Wild Red Deer*, Fortescue's *Stag-Hunting on Exmoor*, Grimble's *Deer Stalking* and *Deer Forests of Scotland*, Buxton's *Short Stalks*, Baillie Grohman's *Sport in the Alps*, and Millais' recently published *British Deer and their Horns*.

[*See also* DEER STALKING and HUNTING.]

J. E. HARTING.

REINDEER — Habitat — The reindeer (*Rangifer tarandus*) inhabits the most northerly regions of Europe and Asia, from Spitsbergen on the west to the furthest boundaries of Eastern Siberia, where they are found as far south as the sixtieth parallel. In Nova Zembla they exist in considerable numbers, and have been lately re-introduced into Iceland. They abound also in the forests of the Government of Kazan in European Russia, where they are preserved and shot by the Czar and his friends in winter

battues. Formerly they were more abundant in a wild state in Scandinavia than at present, but the invention of breech-loading rifles, com-

REINDEER HEAD.
Ht. at shoulder, 54 *in.*

bined with the shortness of the close time, has much reduced their ranks. Now, however, since the extension of the close season, it is to be hoped they will increase in numbers. In Norway they are not found south of latitude 60, and south of 62 in Sweden, nor north of 63 in either country in a wild state, owing to the presence of the Lapps with their tame herds; if any are met with, they are mostly individuals which have strayed from the tame herds. Norway is preferable to Sweden for the sport of reindeer-hunting. The best places are on the Dovre-Fjeld, in the regions around Sne-Hatten, where good camping-ground can be found up to about 4,000 feet; the neighbourhood of Drivstuen,—Kongsvold-Hjærkin, and Fogstuen, the Lesje and Lom Fjelds, Sundal and Romsdal Fjelds; Rundane and the Fille Fjeld, and certain districts near Hardanger and Nord Fiords. They used to be found on the Fjelds of Övre-Rendal and the Sölen-Tinderne near Sölen Söen, and on the west side of Faemund Söen, but are becoming scarcer there every year. Excellent camping-ground under 3,000 feet is found at the various sæters on Aur Söen and Gaut-Söen, a day's journey for pack-horses; to the north and north-east of Lesje, Holsæt, Holaker, Molmen, &c., and also on the other side of the valley to the south and south-west. As many as 187 have been counted in one herd by the writer, near Sne-Hatten, and on one particular day some years ago, four large distinct herds were sighted; but such numbers are seldom now to be seen.

Characteristics—The *hoofs* are peculiar to the species, being broad and rounded, and having the two horny lateral projections larger than is the case with other deer: these are most useful to the animals when traversing the snowy slopes and descending steep hills at full speed: at such a time, the clicking together of the inner sides of hundreds of broad cloven hoofs, when a large herd, suddenly alarmed, rushes down a steep incline, is a most singular and astonishing sound to hear, and not easily forgotten.

The prevailing *colour* is mouse-grey tinged with brown, which becomes lighter towards winter, with white under, and at the sides of the belly; the bucks have a thick fringe under the throat and neck at this time.

The *horns* of both sexes are cast in March or early April, the females usually a little later: they are generally clear of the velvet by about the middle of September. The horns of the female, being much shorter and slenderer, are worth nothing as trophies. Those of the bucks, however, run to a considerable size, though there is great variation in them, no two being exactly alike. The two finest pairs of Norwegian antlers I ever saw had 54 and 47 points respectively. The largest buck I killed in Norway had antlers of the following dimensions: longest horn, 47 inches, straight across from point to point; greatest length from top point to end of snow shovel, following *inside* curve, 66½ inches, same from top point to base of horn.

A B A

A, HOOFS OF 10-YR.-OLD REINDEER.
B, HOOF OF 3-YR.-OLD RED DEER.

55⅛ inches along inside curve; greatest width of palmation, 4¼ inches; circumference above burr, 6½ inches; widest inside horns, 42½ inches;

between tips, 34 inches; number of points, 26; length of skull, 17 inches. I possess another head, not so large or broad, which has 44 points, of which 18 are on the two snow shovels, or snow-scrapers.

Size and Weight—A full-grown buck in first-rate condition should weigh from 350 to 400 lbs., sometimes as much as 450, or even more, whole; he would stand at from 4 feet to 4 feet 6 inches at the withers. The does seldom weigh more than 270 lbs., rarely standing higher than 3 feet 7 inches or 3 feet 8 inches.

Rutting Season—The rutting season commences about the middle of September, when

THE REINDEER'S HAUNTS.

severe fights take place for the mastery among the more powerful males. They make a grunting roar of defiance at this time, and climb up to the tops of the highest hills. The fawns are born about May, the period of gestation being eight months; they are of a light brown colour for some six months.

Habits—In summer, the reindeer retire high up the mountains amongst the snow fjelds to escape the attacks of the Gadfly (*Oestrus tarandi*, Linn), the female of which deposits her eggs in the reindeer's back, where they hatch, the larvæ remaining until the following summer, when they work out. The skins of animals thus attacked are so full of blisters and holes that they are of little value. Another of the Oestridæ deposits her eggs in the nostrils, where they become maggots, causing the animal great distress before expulsion. Reindeer are capable of great endurance, and can swim immense distances in the coldest water; they are also very inquisitive, often turning round to gaze for several seconds even after being shot at. Neither their sight nor hearing is on a par with their sense of smell, which is unusually acute; they generally feed up wind, which accounts for some fjelds being perfectly denuded of deer, should a particular wind prevail for a long period.

Food—In summer, different kinds of Ranunculus, especially *R. glacialis*, and the various coarse grasses, herbs, mosses, and lichens found on the fjelds form their diet; also *Anemone vernalis*, and the many kinds of dwarf willow growing about the snow-line, as *Salix glauca*, *S. polaris*, *S. lanata*, *S. herbacea*, &c.: also *Lichen rangiferinus* (Linn), which they feed upon both winter and summer. This latter, with various willow and birch buds, forms in winter their principal food. During a lemming migration they crush hundreds with their hoofs and will devour the vegetable matter in the stomachs and entrails, having by some means discovered that the herbaceous contents are good for food.

Precautions to be observed in Stalking—Reindeer are the wildest and most unsettled animals to stalk, and ever on the look-out. The sound of a distant waterfall, or of stones and grit rattling down a cliff, is sufficient to start them off, demoralising them for hours,

Drawn by C. Caldwell — Jean Clinton Engraving

Rhinoceros

thus spoiling a good stalk which promised to be successful; great care and caution are therefore absolutely necessary. Inspect frequently with telescope or field-glasses all the mountain sides, plains and large snow-fields, distant or near. Do not loiter too long near a herd if you cannot approach within shot, for fear that eddying gusts of wind may proclaim your presence, but retire to a safe distance to watch, and when you do get a chance take advantage of it in your best style, and as quickly as possible according to circumstances. Never shoot at deer lying on the ground or snow, unless close above them; it is best to wait until they rise. Be careful to calculate distances, which are most deceptive on the fjelds, especially on the snow braes. Take care before descending very steep, snowy ravines, to ascertain if the snow be hard or soft; launch a rounded boulder on the surface and watch its progress. If the snow is soft, the stone will make a small furrow and glide gradually down to the bottom, and the descent is safe, but if it descends in skips and bounds, it is too dangerous to attempt, if very steep. Be careful, if you do so, to balance yourself properly; take out your cartridges, keep the butt-end of your rifle stock in the snow to steady you and act as a brake, and look out that there is not a precipice at the bottom. Have your cartridges ready to load again quickly, in case you come suddenly on a solitary buck round a corner. Do not press a wounded buck too hard, unless you have a fast, powerful reindeer hound with you, which you can let slip, but keep him in sight and let him lie down; then stalk him *up-wind* very cautiously.

A good reindeer-dog is usually taken in harness to find the game, in which case you have two followers, the second holding the dog whilst you are stalking the quarry with the hunter, unless you prefer and are competent to stalk without him, in which case one man is sufficient. A ·450 Express, with half expanding bullet, is quite large enough. A ridgepole-tent, the size according to requirements, made of strong material, with a horse-cloth inner lining, is preferable to a bell tent. The guy rope pegs should be pointed with iron, the others need not. Plenty of warm clothing is required, in the event of remaining late in the season; snow often falls heavily in August. Thick woollen gloves and scarf should be taken when hunting the higher snow fjelds.

A license is required for reindeer hunting in Norway, price 200 kroner (£11).

GERARD FERRAND.

RHINOCEROS—SOUTH AFRICA—**Habitat**—From twelve to sixteen years ago, both species of rhinoceros were common in the country lying between the foothills of the Drakensberg Range in the Eastern Transvaal and the Libombo Mountains. The range of the **Black** or prehensile-lipped species extended throughout the Drakensberg foothills, the dense thorn thickets between the Oliphants, Letaba, and Limpopo, and the Sabi and Crocodile Rivers. At the present day, a few only linger in the Matamiri Bush near the Sabi Poort in the Libombo Range, and in the dense forests on the eastern slopes of the Libombo in the neighbourhood of the Singwetsi River.

The now almost extinct square-mouthed species, erroneously termed "**White**," was common enough in the open bush country along the courses of the Malumbakwane and other south-easterly flowing tributaries of the Crocodile River, and in the neighbourhood of the Sabi, but, since 1885, the writer has heard of no authenticated instance of its having been seen at all in those parts. A few specimens of the "white" variety undoubtedly roamed also about the slopes of the Libombo, for in 1893 I found two skulls of these animals near the Rooi Rand.

I have reason to believe that there are three "white" rhinoceroses still living in the Matamiri Bush, to the east of the Matawamba; and these creatures would appear to have thoroughly adapted themselves to their circumstances, and, fearing molestation in the open country, to have taken refuge in the dense thickets, where, amongst the occasional grass-covered clearings, one can suppose they eke out a bare subsistence. In 1893 I came across a cow and calf high up on the Matawamba, and notified the Transvaal Government of the fact, and, although no steps were taken to prevent their being shot either by the swarms of Portuguese Kaffirs who hunt there throughout the year, or by the gangs of impala-slayers which visit that district in the dry season, yet I again saw their spoor —that of a big bull and cow—so lately as May of 1897.

Shooting—The rhinoceros is perhaps the most easily killed of all great game. A bullet from an ordinary "sporting Martini" will drop them instantly either with the neck or head shot. In the former case, the spot to be aimed for is about halfway along and five inches above an imaginary line drawn along the middle of the neck from head to shoulder, while for the head shot the bullet must enter about three inches in front of the base of the ear. The latter is a certainty if the beast is standing motionless, but they frequently shift their heads about uneasily, which makes the shot difficult. The shoulder shot should not be attempted, unless one is carrying a large bore rifle. The beast succumbs quickly if shot through both lungs; if through one, it will often spin rapidly round, kicking up the hind legs, uttering loud vicious snorts, and generally behaving in a manner which is very trying to the nerves of a tiro. In fact, though I do not believe the rhinoceros to be as danger-

ous a beast as he is often depicted, yet his behaviour on most occasions when wounded, his blind furious charges, and loud snorts are likely to cause considerable embarrassment to any one whose acquaintance with these animals is small. If shot through one lung only, a rhinoceros of either species will travel till Doomsday, even though throwing blood copiously from mouth and nose; indeed, it is almost as unsatisfactory work as following up a wounded elephant when once he has got clear away.

Stalking—I do not consider the rhinoceros at all an easy beast to stalk, for it is almost invariably accompanied by "rhinoceros-birds" which follow it for the sake of the parasites which infest its hide, and give immediate warning of the sportsman's approach. When unaccompanied thus, however, the rhinoceros is a piggishly stupid beast, of very small intelligence, and will permit of a very near approach,—up-wind, of course, for if the attempt were made down-wind he would be away before one was within half a mile of him, so extraordinary is his sense of smell. When roused by the rhinoceros-birds, he jumps up and makes off at once, up-wind, without asking questions; when alarmed or wounded, he often starts off down-wind, but very soon comes round into the wind again, and so continues.

Habits—Rhinoceroses drink about an hour after sundown, often going and returning great distances; they seldom feed anywhere near their drinking places, but strike a bee-line through the forest for several miles before commencing. They then feed throughout the night, making their way again at earliest dawn to the water, where they drink and wallow, and afterwards retire to their mid-day retreat, so that they are seldom to be found moving about after 10 A.M. During the rains, however, the animals have been seen by the writer feeding at mid-day.

The dung of the prehensile-lipped rhinoceros is dark red-brown in colour, full of small chips of wood, sometimes taking a greenish tinge from the young sprouts upon which the beast has fed; it is deposited in a heap under a tree or in a hollow scooped out by the beast's horn and nose. These heaps are visited regularly on subsequent occasions, and the rhinoceros scatters the dung about in all directions, ploughing up great furrows in the ground with its horn. Similar furrows, semicircular in shape and on alternate sides, are often made by them as they walk along through the bush, the anterior portion of the horn frequently being thus much worn down. When disturbed, they move away at a slinging trot, but if alarmed suddenly, or closely pursued, they break into a quick gallop, a pace which in rough country gives a horse all he can do to hold his own, and which the rhinoceros can keep up for a great distance. They are extremely active beasts in rough hill country, clambering up and down the most precipitous places as expeditiously as elephants.

I have had some exciting experiences from time to time with these beasts, and, in proof of the contention that, though usually easily killed, the black rhinoceros often proves a very tough customer, only last year I wounded a big bull and followed it up, knocking it over in its charge with the right barrel of a double 12-bore rifle; it regained its feet, and again fell to the left barrel,—then, once more recovering itself, it charged down on the writer, who, with an empty rifle, had to make a bolt for it, and only escaped annihilation by running round a friendly boulder.

The so-called **White** rhinoceros is as easily killed as his smaller brother; but, though often spoken of as an inoffensive beast, is quite as prone to charge. In 1884 my friend, the late Mr. J. W. Glynn, was most determinedly charged by a cow in the Matamiri bush. It was wounded, and had retreated to a dense thicket with its calf, where my friend found himself entangled in the terrible "wait-a-bit" thorns, with a jammed cartridge in the breech of his rifle.

It is somewhat difficult to understand how this beast—which is of a dull brown-black colour, exactly similar to the black rhinoceros—ever came to be called "white," unless it was owing to the poverty of the Boer vocabulary (for the name has been adopted from the Boer "wit-rhenoster"), or because it was first seen after emerging from its mud bath. The square-mouthed rhinoceros is essentially a grass-feeder, hence its range is far more limited than that of the black, which finds subsistence over a vast extent of rough hill country covered with thorny bush, but where no grass is found.

In appearance, the square-mouthed rhinoceros is a far more ungainly beast than his congener. His bulk is enormous, and the huge head seems altogether out of proportion, and he has been known to attain a height of 6 feet 3 inches at the shoulder. His spoor is considerably larger than that of the black rhinoceros; that of the fore-foot of a bull of the latter, in damp sand, measures about 27 inches in circumference, while that of the white rhinoceros is 36 inches: and the difference in size between the spoor of the front and hind feet of the white rhinoceros is considerably less than between those of the black, while the hind feet leave a rounder spoor than those of the latter, which tend to an oval. Its habits are in many respects very similar to those of the black species; it feeds in the evening after visiting the water, and throughout the night and early morning, drinking again before lying up for the day. Its sight is equally dull, and its senses of hearing and smell as singularly acute. But it moves more sluggishly, and lacks the quick, nervous actions of the other. When alarmed, however, it can get away with surprising speed, at a swift trot, and only breaks into a

gallop if closely pursued. It is said that the white rhinoceros cannot travel with a broken hind leg, and this may be the case, but the writer has seen a black rhinoceros cow, with her leg broken above the knee, go at a pace that kept himself and his gun-carrier at a sharp run for over a mile to keep up with her; both beasts, however, will travel for over two miles without a halt with a broken shoulder. They are difficult to stop when charging, for, owing to the shortness of their legs, there is little chance of putting a bullet into the chest, especially if the grass is at all long. In the case of the white rhinoceros, the spine can be reached at the junction of the neck and shoulder, as he carries his head very low; but the black holds it high and jauntily. The square-mouthed species does not scatter its dung about, as is the custom of the prehensile-lipped, nor does it frequently revisit

WHITE RHINOCEROS.

Measurements—Av. height at shoulder, 66 in.; av. front horn meas., 36 in.; max. front horn meas., 56½ in.

these spots. It falls quickly to a bullet through the heart or both lungs, usually falling on its side, and not on its knees, as the other rhinoceros almost invariably does. The shot for the neck should be about 3 or 4 inches lower than in the case of the black rhinoceros.

Weapon and Ammunition—I have found a Metford rifle of ·461 bore, carrying a 540 or 570 gr. hardened projectile, excellent for the rhinoceros, but these beasts take a lot of stopping at times, so that, although this is a perfect weapon for a head or neck shot when the beast is quiescent, something heavier is required for a quickly moving or especially a charging beast. I consider a good 12-bore double rifle, with 6 or 7 drams of powder and a hardened conical projectile of 2¼ oz., quite heavy enough to account for any rhinoceros, and have done my best work with this handy weapon.

By far the most certain method of bagging rhinoceroses, and a much more sportsman-like and satisfactory one than watching for their return to their drinking places, is to be up at dawn, and walk up-wind along the course of any river at which they are accustomed to drink, and about a mile from it; water must be carried, and as soon as the spoor is cut the beast can be followed up. Even if disturbed once or twice, he will not go more than about two miles before halting again, when he will usually offer a broadside shot; but, if hunted about much, he is apt to become very petulant. If, on following a beast up, it is found that he has retreated into long grass or reeds, the hunter should post himself near the spot at which the rhinoceros entered the cover, a little to one side, and of course below wind, while the native attendants can be sent round in a wide circle above wind. The rhinoceros will soon move, and though there is a chance of his charging up-wind, he is far more likely to make his way out of the cover at the spot where he entered it, giving the hunter an easy shot. If possible, the latter should reserve his fire till the rhinoceros is broadside or a little past him. If the rhinoceros runs dead away from the rifle, unless the weapon be a heavy one, it is best to let him go, and follow up again leisurely, when he will surely be found again inside of two miles, probably halting under a tree, listening intently, and standing broadside at right angles to his spoor.

F. VAUGHAN KIRBY.

SOMALILAND—The common two-horned "black" rhinoceros (*R. bicornis*), which is very widely distributed over Africa, and seems to be in no immediate danger of becoming extinct, exists in moderate numbers, though nowhere so plentifully as in Equatorial Africa, in suitable country in parts of the Somali plateau, in the bush-covered wilderness of Ogaden, on the Webbe Shabeyli river, and in the Galla country beyond. So far, however, as the hinterland of the North Somali Coast has been up to the present explored, it has not been found to exist much nearer to the sea than a hundred and fifty to two hundred miles. Rhinoceroses may come nearer to the coast in the country to the east towards Cape Guardafui, but that portion of the horn of Africa has yet to be opened up.

This animal, although morose in disposition and sometimes capable of charging without provocation, to the confusion of caravans, when its hiding place is incautiously approached, does not seem to be gifted with great intelligence; having poor eye-sight, though keen powers of scent, it is not a difficult animal for the hunter to work up to if the wind is right. But in the course of a long hunt this condition of success cannot always be secured, and when the tracks lead down wind it is a very common experience to put up the same animal two or three times

before a shot can be obtained. The well-known warning snorts, followed by a crashing through the bushes, are heard in front, and then, if unwounded, the game will not travel for more than a mile or two before stopping again ; so the sportsman, by sticking to the track, may get another chance.

In the course of a march with the caravan, fresh rhinoceros tracks of the night before are

Black or Two-horned Rhinoceros.

Measurements—Av. height at shoulder, 60 *in.; av. front horn meas.,* 20 *in.; max. horn meas.,* 41½ *in.*

sometimes seen crossing the path, and, if it is early in the day, they may be worth following. But a more systematic way of hunting them is to go in the early morning, on foot, of course, as the ground is generally too broken for riding, accompanied by a couple of hunters, a guide, and a tiffin carrier—or perhaps a camel, for the head and shields of a rhinoceros make a full load—and examine the pools in the river beds. Rhinoceroses spend a good deal of the night wandering up and down the river channels, drinking or wallowing in every pool ; and in the soft mud the huge footsteps are very easily detected next morning. They travel a great deal, the jungles used by them as feeding grounds by day being often many miles from the favourite wallowing pools which are visited at night.

The fresh tracks of a good bull having been found—those of a cow or young one would generally be of little interest to the sportsman—they are not difficult to follow, the hard toes, at least, leaving a well-defined mark. The trail, after emerging from the last pool visited, will strike away from the river at right angles, and lead straight through the bush to the distant feeding ground. The great tracks are made still plainer by furrows, about a yard long and six inches deep, looking like the work of a plough, for it is the habit of the rhinoceros to kick and root up the ground as he travels. The trail, leading up the thorny bush-choked ravines and broken ground which form the approaches to the river-beds, involves a great deal of walking, and with the sun rising higher and getting hotter every moment it is tiring work. The trail will probably after some time begin to wind about a good deal among thorn trees festooned with creepers, forming fantastic bowers of vegetation ; here and there it will become a maze of tracks in one place, difficult to unravel, where the rhinoceros has lingered to feed about. By about eleven o'clock he will probably have stopped feeding and halted to rest, and will, if approached up the wind, be first seen standing dozing under a thorn bush or lying down. There is in Africa a bird whose special mission it is to attach itself to the rhinoceros, clinging to or hopping about over the great body, feeding upon the parasites which infest the skin. It is the bird called Shimbir-Loh, which in Somali Land attacks the sore backs of camels, enlarging the wounds by digging in its beak.

If the privacy of the rhinoceros is intruded upon, the rhinoceros-birds rise screaming from its back and warn it of danger. In the absence of these birds, and with the wind favourable, there should be no difficulty in creeping up to within fifty yards or less of the game and putting in an immediately fatal shot in front of and somewhat below the ear. If only wounded, the rhino will, if it does not charge, rush snorting away and probably go for a considerable distance, making for some well-known sanctuary, probably the thickest and most thorny bush. In Somali Land that called the "Billeil" is the worst : once the clothes are caught in this, only time and patience will get one clear.

His probable course when next discovered, after a mile or two of further tracking, will be to stand broadside on and listen, preparatory to charging, and this may be a good opportunity for putting in a steady shot. If he does charge, the horn and muzzle will probably protect his forehead and chest, so he is difficult to stop. The overpowering size and speed of the rhinoceros, and the impenetrable walls of crooked "billeil" thorns, which catch the clothes and among which there is little elbow room, make the charge a somewhat dangerous experience. But the rush is blindly made, and is heralded by quick successive snorts, more like the puffs of a locomotive than anything else, which give full warning, and, if the bush is not too thick and the hunter can keep cool, by dodging a few yards to one side, and then remaining perfectly still, he may get a good opportunity for a shoulder shot as the rhino passes.

It has come within the writer's experience to be charged by two rhinos at once, but one followed straight behind the other. The one in front was allowed to pass on and the second one was knocked over by a shoulder shot as it passed.

The writer has tried, with some success, watching over water in the dry season, forming a "zeriba" with an opening commanding the

pool. The construction of such a shelter is of importance, because a rhino will charge through brushwood easily; the writer has a lively recollection of part of a night spent in a flimsy zeriba in close proximity to a wounded rhino, whose breathing could be heard distinctly through the screen of thorns. A strong thorn tree should be chosen, with a thick stem, which should form the back of the shelter. The overhanging branches may be pulled down in front and at the sides as a screen, and it is an advantage to have it so situated that the ground falls away steeply in front to the pool.

Rhinoceroses go at a great pace, and it requires a good horse to overtake one. Sir Samuel Baker, in his *Nile Tributaries of Abyssinia*, gives a graphic description of a rhinoceros hunt in which he took part, he and his companions, who were Arab elephant-hunters, being mounted and armed with swords.

Somalis kill the rhinoceros with the Midgan bow and poisoned arrows. The hide is valuable for shields, as many as from fifteen to twenty being cut from the skin of a single bull. It is also made into whips, and Abyssinians make the horns into cups, about which there is a superstition that any poison placed therein is neutralised. The flesh is fairly eatable and makes good soup.

As the track may have to be followed for hours, by the time the hide has been removed —which is done in large slabs, these having been previously marked out on the body—and the return journey to camp accomplished, it may be already sunset; so it is advisable, when starting on such a hunt, to take an attendant with water and food, and, if it is intended to bring in the head and shields, a camel should also accompany the party. A good plan, after killing one or more rhinos, if water can be found not far off, is to send for the caravan and camp by the carcases, when they can be cut up at leisure. Among Somalis, who, about food, are even more fastidious than other Mohammedan races, most of the meat is wasted.

A good pair of horns will measure about 20 inches for the front and 6 for the back horn. The skin of the head is very difficult to remove without damage at the point where it fits over the lumps which form the support to the horns. The horns themselves come off in one piece with the skin.

Authorities on the subject seem to agree that there is little in the colour of the so-called "black" rhinoceros to distinguish it from the "white." The natural colour is a dark brownish-grey, and over this is generally superimposed the colour of the last mud pool in which the beast has bathed.

The most suitable weapons for this sport are perhaps a Lee-Metford rifle with the ordinary military bullet, used in conjunction with a double 8-bore "Paradox" gun, the Lee-Metford being excellent for a quiet head shot if backed up by the larger weapon when the animal is on the move. The writer does not advise attacking this animal with the small-bore alone. The chest and shoulder are good places to aim at under ordinary circumstances when the animal is moving. The writer has used together a double 4-bore rifle firing 14 drs. of powder and a spherical bullet, and an 8-bore "Paradox" gun firing 10 drs. and a conical steel-core bullet, and prefers the latter, being quite as effective, more accurate, lighter to carry, and handier to use. Some writers, however, have depended entirely on much smaller and lighter weapons with successful results.

H. G. C. Swayne.

INDIA—In British India there are three varieties of rhinoceros. In the Sunderbund is found the lesser only. In Assam and the Dooars are *R. indicus* and also the lesser (*R. sondaicus*). In Burma there are certainly two, if not three varieties. I know the lesser is found as well as the two-horned, and it is reported that the larger also exists, but of that I am not sure. The two-horned variety, of which I only killed one, extends from Chittagong southwards, and is also found in Sumatra, Java, and some of the larger islands. Its skin is as smooth as a buffalo's, but in habits and customs it much resembles the other species of the family. A curious variety of this rhinoceros was secured by Captain Hood and is now, I believe, in the Zoological Gardens. Its ears are somewhat tesselated. The larger rhinoceros has only one horn,

Indian Rhinoceros.

Measurements—Av. height at shoulder, 69 in.; av. horn meas., 15 in.: max. horn meas., 24 in.

seldom eighteen inches long, generally a good deal less. This so-called horn is but a conglomeration of hairs, and is liable to be detached either through injury or disease, when another grows in its place. The skin is very thick, with a deep fold at the setting on the head, another

behind the shoulder, and a third in front of the thighs. Two large incisors are in each jaw, with two smaller intermediate ones below, and two still smaller outside the upper incisors, the last not always present. The general colour is dusky black. The dimensions of one I killed were as follows. Extreme length of body 12½ feet; tail 2 feet; height 6 feet 2 inches; horn 14 inches. These animals delight in swamps, lie up in mud holes, and frequent even running rivers. The lesser rhinoceros, *R. sondaicus*, I have shot on the left bank of the Brahmapootra river, but never came across it on the right bank, though doubtless it exists there too, as they are wandering beasts. In appearance it somewhat resembles the larger, but the folds are not so pronounced, and the shields are covered with tubercles. It is said to be attracted by fire; the Burmese assert that it even devours it.

Although in their wild state I have seen elephants and rhinoceros feeding not far apart, yet these domestic slaves, when in captivity, fear the rhinoceros far more than they do a tiger. I have seen rhinoceros and buffaloes lying down in the same mud hole, with only a few yards between them.

These animals live in such remote localities that they are only disturbed now and then by some enterprising hunter. To find them in fairly open ground, the sportsman must be in their preserves at daybreak, for they soon retire into impenetrable thickets and lie up during the day. They are naturally timid, more anxious to escape than fight, and are far easier to kill than many other wild beasts, notwithstanding their hide. This, whilst on the animal, is easily penetrated, but, if removed and dried in the sun, it becomes very hard. Though the living hide is anything but impenetrable, to reach a vital spot a bullet has to pass through a mass of blubber, muscle and bone. To hunt them successfully, large bores, hardened bullets, and fully five or six drachms of powder are requisite. If driven to bay after being wounded, a rhinoceros will charge savagely. He does not use the horn for offensive purposes, but his incisors, which much resemble the tushes of a boar, though far thicker. If one of them can close, he will leave his marks for ever. I have seen an elephant's foot cut to the bone. The horns are but poor trophies, but the Assamese, Chinese, and Tibetans prize them greatly, and will give as much as forty-five rupees a *seer* (2 lbs.) for them. Although many castes of Brahmins, Hindoos and Mawarries eschew all flesh, living on grain only, some of them make an exception in favour of the flesh of this pachyderm. I have been asked to dry the tongues for them, and these they pulverise, bottle, and indulge in a pinch or two if unwell. The Assamese prefer its flesh to all other, and used to follow me about like so many vultures. No sooner was the life of one extinct, than they would rush knife in hand and not leave a scrap on the skeleton. Even the hide they roast and eat as we do the crackling of pig.

F. T. Pollok.

RIDING—As this is hardly the place for any attempt to give details, I shall here limit myself to general principles, with the advice to readers, who wish to study the subject thoroughly, to consult the Bibliography at the end of the article.

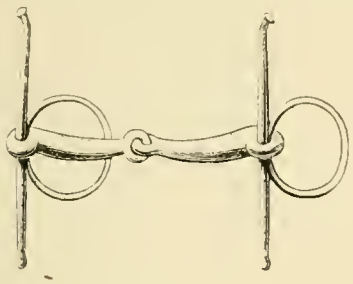
As there are several kinds of riding which widely differ from each other in principles and practice, I shall consider the chief of them separately; but, before doing so, I wish to advance a plea for tolerance. We are all so enamoured of our own methods that, naturally, we are prone unduly to depreciate those of others. Hence the average English hunting man regards a French exponent of *l'équitation savante* with a self-satisfied air of superiority, if not of contempt, which is fully reciprocated; while a broncho buster, with equally bad reason, would look upon them both as duffers. Most men who have hunted much in the Shires know that the fact of a man being a brilliant steeplechase rider is not sufficient to enable him to get into the first flight out hunting, no matter how well he may be mounted. Again, very few of the best Australian steeplechase jockeys can sit a bad buckjumper successfully.

Different systems of riding—The chief systems of riding practised in different parts of the world may be roughly enumerated as follows: (1) Ordinary riding; (2) rough riding; (3) high school riding; (4) military riding; and (5) ladies' riding.

General principles—The chief principle which governs all kinds of good riding is that the rider should as a rule ride by balance, and should reserve his or her powers of grip for those supreme moments when grip is indispensable for security of seat. This maxim is founded on the fact that grip can be obtained only by muscular contraction, and that muscles which continue in a state of contraction become very soon tired. The principle here enunciated has been followed from time immemorial by persons who, although they did not reason it out, recognise the fact that good horsemanship was incompatible with stiffness, which, in the rider, is obtained by muscular contraction. Another great principle is that the rider, when he wants to get the weight back, should do so by the play of the hip joints—thus bringing the upper part of the body to the rear—and not by sitting back in the saddle. In fact, one should always sit well forward in the saddle, and, if necessary, lean back. In all kinds of riding, the reins should be held fairly long, so as to allow full freedom to the horse's head and neck without any risk of the rider being pulled forward. A great number

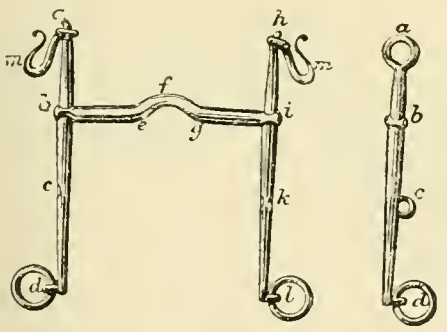
of bad riders have their reins far too short, with the object of holding on by the reins; the result being that they get pulled on to the horse's neck if the animal plays up. I need hardly say that the attainment of such a position is the usual preliminary to a fall. A lady's seat is generally so strong that many ladies, probably acting on the advice of their male friends, ride with too long reins.

Ordinary riding—The only kind of riding practised to any extent by civilians in England



Snaffle Bit.

at present is that of the hunting field. Park riding is a thing of the past, and riding at polo may be classed as military riding, under which heading I shall consider it. In mounting, if a man is sufficiently tall, he should as a rule stand alongside the horse's near shoulder, should take hold of the mane about midway between the withers and the ears, face inwards and to the rear, take the near stirrup in the right hand,



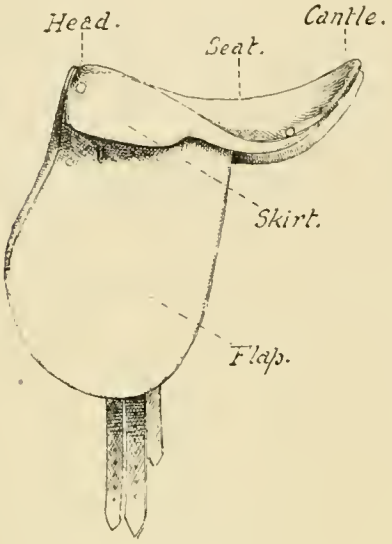
Curb Bit.

a d and *h l*, cheeks of bit. *a b* and *h i*, upper arms of bit. *b d* and *i l*, lower arms of bit. *b i*, mouthpiece. *e f g*, port. *b c* and *g i*, cannons. *c* and *k*, lip-strap rings.

place the left foot in the stirrup, then put the right hand on the cantle and as far to the off side as he can reach; he should then raise himself by the spring of the right leg, pressure of the hands on respectively the crest and saddle, and as little as possible by the pressure of the foot on the stirrup, so that the saddle may not be displaced. The right leg is now swung over the animal's back, while the knee is kept straight; the right hand quits its hold of the cantle, the rider sinks lightly into the saddle and takes the off stirrup with the right foot. The reason for placing oneself at the horse's shoulder when preparing to mount is that, if the animal moves forward while the left foot is in the stirrup and while the right foot is on the ground, the rider can easily swing himself into the saddle, which he could not do with anything like the same facility if he stood, as many do, behind the girths and facing inwards and forwards. Besides, when standing at or a little in front of the shoulder, he will be more out of danger from a cow-kick than he would be when standing further back. By bringing the left hand well up on the crest, the base of support formed by the two hands is increased, and the rider's stability when mounting proportionately increased. For the sake of security the feet should always be placed "home" in the stirrups. The stock argument in favour of placing only the ball of the foot in the stirrup, at least when hacking, is that, by doing so, the rider is enabled to utilise the play of the ankle joints in rising in the stirrups at the trot. This argument is, however, untenable; for the position of the knees against the flaps of the saddle should under all circumstances remain unchanged, so that the knees may be able to grip the saddle at any moment in the best possible manner, which they would evidently not be capable of doing if they were sliding up and down on the flaps. It is evident that, to attain strength of seat, a man should adopt a position in the saddle that will enable him, if necessary, to bring the centre of gravity of his body as much as possible to the rear of that point of the saddle upon which his weight rests. He should therefore sit forward in the saddle and get his rump under him. In other words, he should rest his weight on the lower portion of his pelvis, and not on the upper part of his thighs. In this attempt the rider should obviously avoid supporting his weight on the stirrups and hanging on to the reins. The stirrups should, as far as possible, be employed only to prevent the legs from suffering undue fatigue from their dependent position; and the reins only to restrain, to collect and to guide the horse.

This ability to get well into the saddle is best acquired by long continued bare-backed practice, while striving to avoid holding on to the reins in order to keep one's balance. In riding, practice is not necessary only to teach one "how to do it," but also to develop those muscles which draw the knees inward. These muscles, which are very little used in pedestrian exercise, are those by which we attain grip in the saddle. Again, the circumstances under which good riding is needed are so full of the unexpected, that it must be as nearly automatic as possible. Hence the learner should practise

on as many different horses as he can get. As the perfect working of automatic action should be free from the disturbing element of reflection, nothing should be done to disturb the

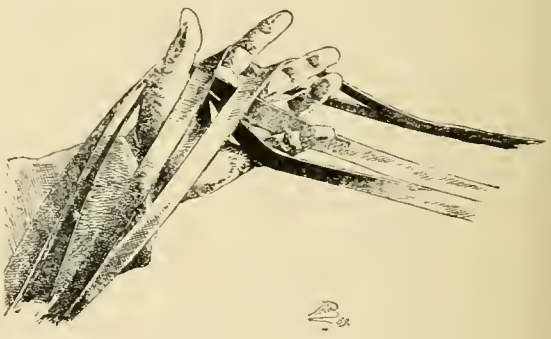


GENTLEMAN'S SADDLE.

learner's confidence. He should therefore begin on a thoroughly trustworthy animal, and should proceed to more lively and difficult ones only when he is capable of mastering them. Horses are so different from each other in their ways and paces that, no matter how good a man may be on one horse, he may make but a very poor show on another that is in no way harder to ride by other men. The mechanical part of riding is of little use in forming a horseman, if the man does not possess sympathy with his mount. This sympathy, tact, or sentiment, is mainly a matter of long and intimate acquaintance with horses of good temper, and of judicious firmness. I cannot speak further on this subject here than to say that we shall get on best with horses if we treat them like children.

So much is spoken about "hands" with reference to riding, that we are apt to overlook the fact that no matter how good a man's manipulation of the reins may be, he will make but a poor horseman unless he also knows how to use his legs in order to make the horse go up to his bridle and to turn collectedly, when required. Many hunters which have been ridden for a few seasons by capable men acquire such a sound knowledge of their work that, during a run, all the rider has as a rule to do is to sit tight and interfere with his mount as little as possible. Such a confidential conveyance is evidently not the kind to test the riding abilities of the man it carries.

The legs (the drawn-back foot, calf of the leg, and spur if needed) have not only to stimulate and collect the horse, but are also essential in getting him to turn with precision. The man who rides a horse only with his hands acts as if he were ignorant of the fact that the horse has two ends and not one only. All fine jockeys understand the art of using the legs to collect their mount at a finish. Custance, in his *Racing Recollections*, lays special stress on it. I may briefly point out that the horse, when standing in the ordinary manner, bears more weight on his fore-legs than on his hind ones, a difference which in movement is increased in proportion to the speed. Hence a horse, like all other horizontally placed objects that have one end heavier than the other end, can be turned, especially during movement, more readily on his heavier end (his fore-hand) than on his hind-quarters. As the position of the rider augments the proportion of weight borne by the fore-hand, the rider, particularly when he is going fast, should when turning, try to check any undue tendency the hind quarters of the animal may have to swing round; the preventive means being to lean back and to draw back the foot opposite to the side to which the turn is being made. If the horse purposely keeps his hind-quarters from coming round (*e.g.*, when he runs out at a fence, while yielding his head to the pull of the rein), we should of course draw back the other foot. It is almost needless to say that the horse will not obey the pressure of the leg, or at least to a very im-

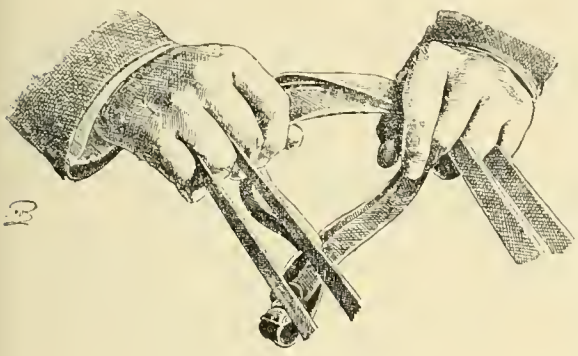


REINS IN ONE HAND.

perfect extent, when turning, unless he has been previously taught to obey this indication.

The system of holding the reins "crossed" in the hands, in the manner practised by all jockeys, is the one which gives the firmest hold and allows the reins to be manipulated and changed from one hand to another with more facility and precision than can be attained in any other way. In all ordinary riding, the reins should be held in both hands; for then the power on the reins is stronger, the reins can be held longer and if necessary, lower, and

the indications in turning can be given in a more direct manner than when only one hand is employed. As an exception to this general rule, I may cite the practice of the Boers, who



Double Reins in Both Hands.

always ride with one hand; their riding is usually restricted to going out after game, in which case they hold the reins in the left hand and their rifle on the right thigh in the right hand.

No man can be looked upon as a fine horseman, in the English acceptation of the term, unless he has a good seat over the fences; for, even if he is never called upon to negotiate an obstacle, his horse, from light-heartedness or from terror at some unexpected occurrence, may make as big a jump into the air as he might ever be called upon to perform when crossing a stiff country. In *jumping*, the chief points to be attended to as regards seat are: to sit well down in the saddle; to lean the head and shoulders back; to draw the feet back so as to avoid, on landing, the shock that is likely to be transmitted from the stirrup irons to the body through the legs; and to grip tightly with the knees. In taking off, the animal's forehand requires to be light, so that it may be easily raised; and in landing, so that the fore feet may get out of the way of the hind ones. Unless a horse makes an effort to run out or stop, it is always best to follow Mr. John Hubert Moore's advice, which I have quoted in *Riding on the Flat and Across Country*, never to interfere with him within the last 40 yards when coming up to a fence. Before that limit is reached, we may collect him or bustle him along as we may deem needful, but not after we have passed it. Above all things we should avoid the detestable habit of throwing up the hands when nearing a fence; for if we do so, we shall more or less distract the attention of our mount from his work, and shall also prevent him to a greater or less extent from seeing the spot upon which he is going to land. As a last piece of advice about riding at fences, I would counsel my readers never to go at a fence unless they are determined to get to the other side: for by changing their mind at the last moment, they, in nine cases out of ten, run not only a greater risk of accident than if they allowed their animal to go straight, but they also do the thing best calculated to render their horse reluctant and cunning. As there is no obligation on men and ladies out hunting to jump or to try to jump, there is no excuse for going at a fence and then pulling the horse off at the last moment, as many do. This vile habit, which is practised by hard funkers who are generally mean enough to put the blame on their mount, is the chief means by which horses are taught to become obstinate refusers.

The riding part of flat race and steeplechase riding differs in no way from that of, say, hunting; the respective tactics of these three forms of sport are outside the compass of this article.

In **rough-riding** (apart from breaking) the chief thing is to stick on. In England, horses are brought up under such civilised conditions that there is little demand for the practice of this art. Rough-riding is principally practised by the American cow-boys, the Kalmucks of the Don country, and by the buck-jumping riders of Australia. All three greatly depend for security of seat on the peculiar construction of their respective saddles; in fact they ride the saddle more than the horse. Even in Australia, where the finest of all rough-riders are to be found, very few of them can stick on a bad buck-jumper in an ordinary English saddle. As a brilliant exception I may mention the name of my friend Steve Margarett, who, though famous as an Australian rough-rider, comes from Gloucestershire.

When riding a buck-jumper, the chief point to observe is to avoid being pulled forward on the horse's neck by the sudden and downward swing of the animal's head; for then a "twist off the breast" given by the Cumberland wrestler is a trifle compared to the side wrench effected by an animal who knows how to "go to market" in proper style. Owing to improved methods of breaking and management, the supply of buck-jumpers in Australia is becoming less every year—and a good thing too. There are still plenty to be found in the remount depôts of Little Russia, which I visited this winter on horse-breaking duty. The colonial buck-jumping saddle, which is admirably suited for its purpose, has its knee rolls placed so as to come over the rider's thighs, and thus keeps him back in the best possible manner.

High school riding is what I might call the classical form of military riding, and is carried out with great precision and attention to detail. It is very useful as a means of breaking, but has no claims to be considered, outside a circus, as an end. Its great principle is that the horse should absolutely resign the initiative to his rider. In order to keep up the necessary touch with the horse, the rider must have his spurs

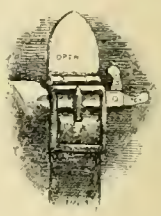
close to the animal's sides; in fact, to use the French expression, he should *effleurer les poils avec les éperons*, to do which he has to turn his toes outwards and consequently his knees away from the flaps of the saddle. If long in the leg, he will have to regulate the length of his stirrup leathers, not to obtain security of seat, but to enable him to get his heels close to the sides of his horse. In this kind of riding, the snaffle of the double bridle is used to keep up the horse's head and the curb to lower it. James Fillis, who is a Londoner, is undoubtedly the finest exponent of *l'équitation savante* in the world. The chief legitimate *airs de manège* are the *passage* (a high, short and well cadenced trot); the *piaffer* (a trot without gaining ground); the rein back; the striking off from the halt, walk, or trot, into the canter with either the near or the off fore leg leading as may be required; changing the leg in the canter; cantering purposely with the outward foreleg leading when working on a circle (cantering "false" purposely); executing a side movement with the fore feet on one track and the hind feet on another track (the "passage" of the English military riding schools, and the *traverser à deux pistes* of the French *manège*); and the turns on the forehand (*pirouette renversée*) and on the hindquarters (*pirouette ordinaire*).

Military riding should be of a composite nature, so that the troop horse may be as handy as a high school performer when his rider has to encounter a hostile cavalry soldier, and as clever over a rough country as a fair hunter when, for instance, on reconnaissance duty. For this double part, the horse has not alone to be specially broken, but his rider must be also specially trained. As the first requirement in the cavalryman is to be able to keep his place in the ranks, he must be thoroughly grounded in the principles and practice of legitimate high school riding, at which he will have almost exclusively to employ the curb, although the snaffle will be principally used when he is called to act independently over broken ground. As cavalry has often to manœuvre on a surface that is far from even, our cavalry regulations wisely enact that the trooper should turn his toes in and consequently keep his spurs away from the sides of his horse, which, under the high school principle of constantly brushing the hairs of that part with the points of the rowels, would run the risk of being ripped every time the animal, owing to the rough nature of the ground, made an unexpected movement. As a cavalryman or artillery-driver is supposed, when on horseback, to have his right hand engaged with sword, lance or whip, as the case may be, he should be practised to rely entirely on his left hand for guiding his mount when in the ranks or in face of an enemy. At the same time, two-handed riding is so greatly superior to one-handed riding for crossing a country, and the exigencies of service are so varied, that the hussar or lancer who knew only how to ride with one hand could not be regarded as thoroughly efficient.

Polo is a form of one-handed riding in which quickness at starting, pulling up, turning, and getting under way are specially sought for. Besides, the player should be able to make his pony passage at the gallop when riding an opponent out.

Ladies' riding.—As a man cannot be expected to know more about ladies' riding than a lady knows about men's riding (which is not much), I have referred to my wife as the best authority I could consult on this subject, and will now give her ideas pure and simple. As riding by ladies in England is principally confined to hunting, the following observations will be made with special reference to that sport.

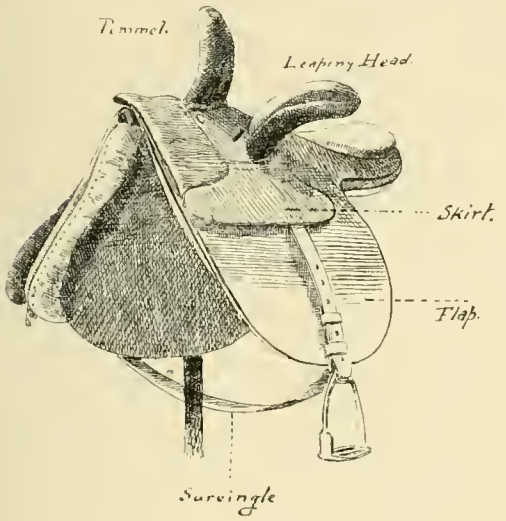
Ladies having, from the nature of their seat, to ride the saddle more than the horse, and being specially exposed to the awful danger of being "dragged," a preliminary word or two about their gear and riding things may not be out of place. First and foremost, the lady will require a habit which, while being smart and decent, will eliminate all possibility of her being "hung up." The building of the modern jacket, which is open in the front and comes down over the hips, should be entrusted only to a first-class tailor. The skirt, to keep in its place, should be of the stoutest obtainable Melton; and although the cloth of the jacket should match in appearance that of the skirt it should be thinner and more elastic, so as to permit of free play to the arms. The best arrangement for the stirrup is that afforded by Champion and Wilton's safety bar. Safety stirrups are in themselves simply death traps. One day when out hunting, my wife's horse cannoned against a tree on his near side, with the result that the so-called "safety" stirrup got crushed on to her foot so tightly that after the run the stirrup had to be cut through with a file before it could be removed from the foot. Had the horse fallen, she would certainly have been dragged.



Safety Bar.

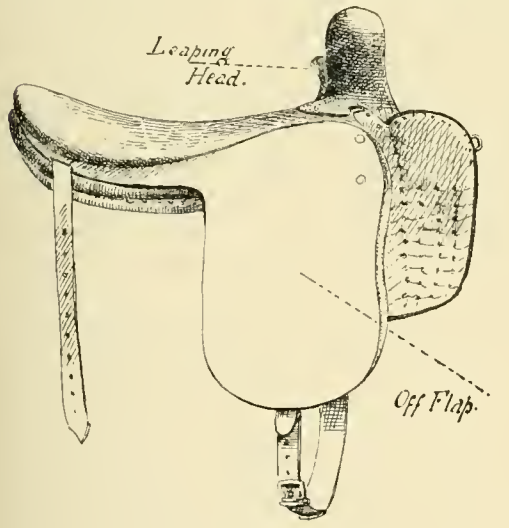
The squarer a lady sits—that is, the more nearly the line of her shoulders is at right angles to the direction in which the horse is proceeding—the better will she look, the firmer will be her seat, and the more command will she have over her horse. Again, as the power of leaning back (not sitting back) in the saddle by the play of the hip joints is essential to strength and flexibility of seat, the feet should not be drawn back; because the more that is done, the greater tendency will the rider have

to lean forward. These considerations will show that the weight should be borne by the right thigh ; that the right foot should be allowed to hang downwards and forwards without any stiffness ; and that the left foot should on no



Lady's Saddle.

account be drawn back. By placing the outside right foot and ankle against the near side of the horse, where the neck runs into the shoulder, the rider will not only be able to lean back and sit square, but she will also be able to keep in



Lady's Saddle.

constant touch with her mount, and will consequently know better how he is going, than she could do if she had her right foot drawn back on the flap or "safe" of the saddle.

One of the most common faults ladies commit in riding is to clutch on to the upper crutch with the right leg, and then they wonder why that member gets tired and cut under the knee, and why their too candid father or brother tells them that they should keep their right shoulder back and not crane forward so much. While balance is attained by the action of the right leg and play of the hip joints, grip is got by pressing the left leg, just above the knee, against the leaping head. As this pressure can be effected in the best possible manner by the play of the ankle joint with the "tread" of the stirrup iron as a fixed point, the stirrup leather should be of such a length as to enable this to be done without in any way causing that limb to be held stiffly. Practically speaking, the right length will allow of the flat of the right hand being placed easily between the leaping head and that part of the leg which will be pressed against it, when required. It stands to reason that the more the flap of the left knee is brought close to the flap of the saddle, the squarer will be the seat and the firmer will be the grip. Ordinary leaping heads are, however, constructed in such a manner that when the leg is pressed against them, they cause the knee to be carried outwards. I have devised a leaping head which obviates this undesirable tendency, and consequently greatly adds to the rider's strength of seat. It is evident that with the length of stirrup I have advocated, the lady cannot use a spur, which being on only one side, would in any case be out of place in cross country work. As high school *écuyères* are obliged to use the spur as well as the whip to perform their various *airs*, they are consequently forced to have a leaping head that almost entirely surrounds the leg, in order to admit of the knee being carried outwards when using the spur. Such an arrangement is obviously applicable only to a riding school or circus. Even ladies who ride with a long stirrup in an ordinary side saddle are unable to use the spur on the only place to which it should be applied, namely, just behind the girths ; hence, when they employ the spur, they usually content themselves by ripping the horse's near flank. The remarks made about two-handed riding apply to ladies even better than they do to men ; for it gives ladies the additional advantage of helping them to sit square.

M. H. Hayes.

Bibliography. — *Riding on the Flat and Across Country*, for riding as it is practised in England, India, and the Colonies ; Fillis's *Principes de Dressage et d'Equitation*, and Barroil's *Art Equestre* for high school and military riding ; and *The Horsewoman* for ladies' riding. As the subject of riding is intimately connected with that of breaking, I may mention that many useful hints on horsemanship may be obtained from *Illustrated Horsebreaking*. In Mr. E. D. Miller's *Modern Polo* there is a special section on "Riding at Polo." Colonel Greenwood's *Hints on Horsemanship* is an excellent work, but unfortunately it has long been out of print. Whyte Melville's *Riding Recollections* is a book dear to every horseman.

RINGOAL—This is a game for two players, and shares with quoits the distinction of being almost the only out-door game of skill in which no ball of any kind is used. The plan of the ground is shown in Fig. 1. Each player

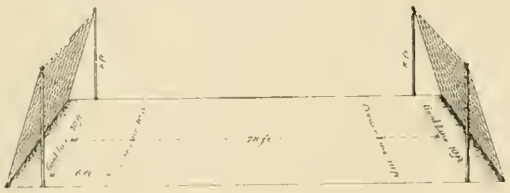


FIG. 1.

takes his stand in the court in front of one of the goals, armed with two sticks, resembling miniature billiard cues, with which he alternately throws and catches (or tries to catch) the ring, which is made of coiled cane, covered with leather.

The position in which the ring should be held for throwing is shown in Fig. 2. It will be seen

FIG. 2.

that both sticks are put into the ring from the *same side*; not from opposite sides as beginners always imagine. The sticks are then brought parallel, with the hands at opposite ends, about two-thirds of the left stick, and one-third of the right being in the ring. Held in this manner, level with the ground, the ring is swung off with a back-handed sweep of the right stick, and directed towards the other goal with the left stick. The thrower's object is to send the ring so fast, and at such a height, that his opponent is unable to catch it. The latter, owing to what may be called a comprehensive L. B. W. rule, may only stop the ring from going into his goal by catching it on one or both sticks. As the goals are only 26 yards apart, and the record throw, according to the *Field*, is 126 yards 2 feet, it will be seen that with good players the pace at which the ring comes in is very severe, and the catching is consequently very difficult; especially when the ring is thrown so ow that the point of the stick has to enter it from above.

Ringoal was first introduced in Oxford in the year 1887, and was at once taken up by various athletes, who recognised its merits as hard exercise with even a spice of danger, requiring great skill both in the throwing and catching. It has the advantage of being essentially a "both-ends" game, (which even the "Royal and Ancient" game is not!) and it can be played on almost any sort of ground, though turf is of course the best. So far, however, the game has suffered from one fatal drawback, which has prevented its becoming really popular. Owing to the peculiar construction of the coiled cane rings, the manufacturers have found it quite impossible to make them uniform, and so what looks like a perfect ring is often found to be perfectly useless for practical purposes. If once this difficulty could be overcome there is very little doubt that Ringoal, which, in addition to being splendid exercise, is an extremely pretty game to watch, would soon win a prominent place in popular favour.

The following are the rules:—

1.—There shall be two goals, each 8 feet in height, and 10 feet in width, with or without stop nets, but connected by webbing from post to post, if stop nets are not used.

2.—There shall be two courts formed by a line or crease in front of each goal, and parallel with it, at a distance of 6 feet from it, and completed by parallel lines drawn from the extremities of each crease to the adjoining goal posts, and by the goal itself.

3.—The two goals shall be 78 feet apart, facing each other, and the creases will then be 66 feet apart.

4.—The rings shall be made of split cane, covered with leather, and shall not be less than 7 inches nor more than 8 inches in diameter, measured from the inside, and not less than 3½ ounces, nor more than 4 ounces in weight.

5.—Each player shall alternately serve and receive, and, both in serving and receiving, must have at least one foot inside the court.

6.—The game shall consist of eleven points.

7.—The server shall score one point by sending the ring past the receiver, through his goal, provided that the ring do not touch the ground before reaching the receiver's crease.

8.—The server shall score one point if the receiver deliberately or inadvertently prevent the ring from going through the goal by stopping it with any part of his person or clothing, or by stopping it with the sticks, or turning it aside so as to miss the goal, without actually catching it.

9.—The receiver shall score one point if the ring, before it is touched by him, shall hit the ground between the two creases, or outside of the court, or shall altogether miss the goal, either by passing above the net, or by passing outside of the goal.

10.—If the ring hit the goal-post and glance off it through the goal, it shall score a point to the server.

W. JOHNSON.

RIPARIAN RIGHTS—*See* SPORTING RIGHTS.

ROACH—MEASUREMENTS, ETC.—Length of head 5 to 5⅝, of caudal fin 5¼ to 5½, height of body 3⅜ to 4½ in the total length. *Eyes*—situated very slightly above the centre of the height of the head, the diameter of each 3½ to 4 times in the length of the head, 1 to 1¼ diameters from the end of the snout, and 1½ apart. Body somewhat elevated and compressed. Mouth anterior, the jaws of nearly equal length, and the cleft of the mouth a little oblique; the maxilla reaches to beneath the posterior nostril. *Teeth*—pharyngeal teeth in a single row of 5 or 6—6 or 5 (only 4 are said to be present in some examples), in some the left side has one more than the right. They are somewhat hooked and pointed at their extremities, but become ground down with age. *Fins*—dorsal, commences midway between the end of the snout and the base of the caudal fin, its height anteriorly being one-fifth more than the length of its base. Pectoral as long as the head, excluding the snout. Ventrals inserted on a vertical line beneath the first ray of the dorsal fin; they are slightly longer than the pectorals, but do not reach to the anal, the length of the anterior rays of which latter fin are a little longer than the extent of its base. Caudal

deeply lobed, the length of the central rays being about two-fifths of that of the longest outer one. *Scales*—4 rows between the lateral line and the base of the ventral fin; about 17 rows anterior to the base of the dorsal fin. The abdominal edge, between the base of the ventral and the insertion of the anal, somewhat compressed, but not sharp. *Lateral line*—slightly concave anteriorly above the base of the ventral fin, and situated between the middle and lower third of the depth of the body. Pseudobranchiæ moderately developed. *Colours*—superiorly bluish or greenish, becoming lighter on the sides and beneath. Lower fins reddish-yellow, in some localities red; dorsal and caudal dusky, with blackish outer margins. (Day's *Fishes of Great Britain and Ireland*, vol. ii., p. 176.)

ROEDEER (*Capreolus caprea*)—Probably derived from ancient Celtic, Ro.

Colour—Summer, red-brown (in the sunlight a bright red); winter, general appearance brown, the tints of the under parts being yellowish-grey.

The young at first are reddish-brown with white spots, but attain a coat similar to the adults during the first winter.

Distribution—The common roe is indigenous to England and Scotland, but not to Ireland, where, however, it has recently been introduced with great success in Sligo by Sir Henry Gore Booth.

In England a few are still left in Cumberland and Northumberland, and the species is flourishing in the Blackmore Vale in Dorsetshire, where it was reintroduced at Milton Abbey at the beginning of this century. There are also now from 15 to 20 head in Epping Forest—the result of a recent introduction (1884)—as well as a few in the New Forest in Hampshire. The species became extinct in Wales in the reign of Queen Elizabeth.

In Scotland they are to be found in every suitable locality north of the Clyde and Forth. South of those rivers they were reintroduced also at the beginning of the century, and have greatly increased, especially in the Western counties.

The range of the common roe, on the Continent, extends southward to Italy, westward to Spain, northward to Southern Sweden, and eastward as far as Persia. In Russia it is found in the region of the Caucasus. Going further north and east its place is taken by the closely allied "pygargus," whose range I have recently ascertained to extend as far south as the Volga. This latter is a larger and more heavily coated animal with much finer antlers, and ranges east as far as Vladivostock, whilst another species, the Chinese roe, very similar to our own, but redder in coat, is found throughout Manchuria and Northern China.

ROE DEER.

Measurements—Av. height at shoulder, 25 in.; av. horn meas., 8 in.; max. horn meas., 15 in.

Habits—The roe, during the winter months, is essentially a wood-loving animal. There it dwells in small family parties, consisting generally of an old male and female and the two calves of the year. Sometimes two family parties go about together; but as spring comes on these break up, and, if open ground is near at hand, they wander far afield. This is especially noticeable in the case of the old bucks.

Unless the weather in summer is excessively hot, roe feed at regular intervals, from early morning till dark. In open ground it is a common thing to see a roe rise from the shade of a bush, feed for an hour (covering during that time a very small space of ground), and then suddenly plump down behind another bush and lie for another hour. I have seen roe do this during an entire day from dawn till dark, without moving a distance of more than twenty yards in any direction.

Fawns are born generally about the 25th of May; and two are usually produced at a birth.

At the beginning of July roe are seen to have paired; but it is not before the second week of August that the rut actually takes place. At this season the male utters a loud hoarse bark, whilst the female makes an amorous cry when wishing to attract his attention. Then, too, the males fight, though it is a rare thing to see them do so.

During five seasons, in which I spent the

months of July and August principally roe-stalking in the Highlands, twice only did I see them actually come to blows, although I watched them most of the early morning and evening, and in places where there were many bucks barking and on the move. I have seen them have quite amicable sparring matches, with the doe belonging to one of them feeding close by. However, when they really mean business they fight desperately, both at this season and in the spring, when their horns are just clean.

One of the puzzles of natural history is the extraordinary fact that, although the pairing season takes place in August, and the young are not produced till the following May, yet the period of gestation is only five months. A partial explanation of this, as demonstrated by Prof. Bischoff, of Goesen, is that the ovum lies dormant until the middle of December, after which it develops in the ordinary manner.

The summer coat is cast in September and the winter coat in May. The latter is of that wonderfully thick yet light nature which we notice in the hair of the pronghorn antelope and the klipspringer—a marvellous provision of nature which enables them to stand both heat and cold.

If roe are undisturbed, they will keep to the same woods for centuries. They do not seem to sour ground to the same extent as do red or fallow deer, and the playing grounds of this species at Cawdor, which have been protected for ages, are interesting as exhibiting the habits of these wild creatures. It is curious that this interesting habit has not been noted in this country elsewhere, nor on the Continent. The commencement of "rings" I have seen elsewhere, but on no estate properly formed circles.

The roe in these Cawdor woods have formed rings in which they play at dawn. To these they resort every morning and chase each other round and round—a veritable fairy ring.

Shooting—There are two ways of killing roe in this country, namely, by driving them to the shot-gun in the winter, and stalking them in June, July, and August with the rifle. Between these two methods there is no comparison, for, unless the former is conducted scientifically, it is not to be named in the same breath with the latter. There are many excellent "open land" roe grounds in Scotland where the owners or tenants, principally from the fact that they are not on the spot when the stalking is at its best, or have a larger quarry to pursue, generally neglect the chase of the roe-buck with the rifle for what is often a very inferior sport in the true sense of the term. If some of these who are really fond of the chase would turn their attention to stalking the roe-buck for a season or two instead of allowing the unfortunate does and young ones to be wounded and slaughtered, as is too often the case, by the keepers and farmers at a later date, they would find the roe in time not only well worth the trouble of pursuing, but in many points quite the rival of the better-horned stag, and but little inferior to that animal in point of cunning.

The great charm of roe-stalking is that it can be followed at a time of year when there is little going on except fishing; and from that sport it forms a pleasant change. The devotee, however, must be a genuine sportsman—that is, one who does not mind some of the lesser hardships of the chase, if one may so term them, for it is absolutely essential to be up and out on your ground before daybreak. Sleep at the stalker's house for preference, and get his guid wife to leave out for you a tumbler of milk and a slab of oat-cake, for that is good fare with which to begin the morning. Never go out on an empty stomach.

Your companion, that is to say if you take the stalker with you, as is generally the case in the north, will have seen a buck whose head is worth a shot, so make for some point commanding a view of the hillside; sit there and take a good spy of all the ground in your vicinity as soon as it is light.

To be a good spyer is almost the most important thing in roe-stalking, as they are very difficult to see unless the sun is shining on them. They just move from the shadow of one bush to the shadow of another, and are seldom in sight for long unless you have a perfectly bare hillside, which is not often the case; moreover, they are not large.

If a good buck is found in absolutely open ground, he is not so difficult to get a shot at as a stag, but should he be in broken ground, scattered with rocks, clumps of firs and birch trees, you will find it sometimes extremely difficult to approach the quarry without being heard or seen. The chase then begins to assume all the difficulties of wood-stalking, which, as every sportsman knows, is about three times as complicated as open ground work. The crack of a twig, or even the sound of your passage through deep heather, is quickly detected by a roe—whilst the slightest sign of movement is observed more quickly by him than by a stag; and he does not stop to gaze and give you the same chance that the larger animal does. It is a shot at once, with perhaps but a small mark to aim at, and, if he has been stalked before, you probably will not get even that. Still—should this be the case—there is no need to feel disappointed. Notice the line he has taken, go back to your spying point, smoke your pipe, and in an hour or two it is not at all unlikely that he will be back again in exactly the same place. If he does not return to that bit of ground, go and spy another likely place; but do not move about from wood to wood and hill to hill as you would if looking for red deer—but spy, spy continually where you

have once seen a good buck, and sooner or later your patience is sure to be rewarded.

When an old roe-buck has been repeatedly stalked, he becomes more cunning than any hill stag. Sometimes these sharp old fellows get right out into the open deer forest, where they become a most emphatic nuisance and a target for all the choicest invectives of the Gaelic vocabulary. One buck that I know of inhabited a particular corrie in a Rosshire forest for three seasons, and every time the stalkers tried that bit of the ground he successfully managed to "pick them up" without a single shot being fired at himself or at any stag there during the whole of that time. His vision within a certain distance was infinitely sharper than that of any red deer on the ground.

At the season of roe-stalking, it is often nearly as important to find the doe as the buck, for the latter is sure to be close at hand, and, if he has not been shot at previously, he will soon come out into the open and feed near her, or perhaps disclose his whereabouts by barking. One of the best bucks I ever shot puzzled me for three days before I could even spy him properly; but I found that in the evening he always worked into a clump of spruces, near a timber road, along which people occasionally passed. He was so cunning that my one beater could not drive him out, but when he heard any one simply walking along the road he gave the alarm to the doe, who always fed on a small hill above the wood in the evening. He would then come out of the valley, pick her up *en route*, and both would disappear over a hill to another wood without giving one a chance. Twice this happened. The third time, however, I sent my henchman to walk along the road and not to attempt to drive him. The buck gave the alarm and bolted out as usual towards the doe, but I was waiting for him above, and when he joined her I got my shot.

In Germany and Hungary, where the chase of the roe with the rifle has been followed for centuries, a call, exactly resembling the amorous cry of the female, is much used. Immediately the buck hears this, he puts his neck out straight and comes full tilt in the direction of the sound. Usually he apprehends danger when within twenty or thirty paces, whereupon he stands for an instant, just time for a shot, or bounds straight on.

Each has his individual taste as regards rifles; personally, I used to prefer a ·400 single Fraser express; but now nothing to my mind is better than the ·256 Mannlicher with Fraser's patent cartridges. The hole in the nose of the bullet should be slightly deeper for roe.

The method usually employed in Scotland for shooting roe with a shot-gun leaves but few chances for individual woodcraft. The shooter is placed in one of the passes frequented by the roe and there he waits for the game to be driven to him like a rabbit or hare. This is literally roe-driving or forcing to a pass—and seldom succeeds in bringing to bag aught save the does and the yearlings.

As a rule, the more noise, guns, and beaters there are employed in the chase, the fewer bucks or even does are killed, unless the game is entirely surrounded. Two or three beaters and a couple of good guns will obtain better sport; and few people who shoot roe have any idea of how essential it is to keep out of sight and absolutely still when roe are being "moved," for that is the proper term. The little deer, as they come forward, see the posted guns in nine cases out of ten before they have themselves been seen, and that is why those with the line of beaters will always get the largest number of shots. The best bucks, that is to say if they have not moved off at once, nearly always detect danger as soon as the drive commences, and they lie, ready to break back when the line comes up to them.

Excellent sport can be had with a couple of spaniels or a slow-going hound that will not press the buck too much. The dog follows the roe, who goes quietly along his favourite passes, and a shot can generally be thus obtained by any one who knows the ground. This sport is well described by Colquhoun, who used fox-hounds with success; but almost any small dog that is not too fast will do.

Though roe may be killed at quite a distance with ordinary game cartridges, it is of course most unsportsmanlike to fire with these unless you are sure of killing them. The best size of shot to use is No. 1 or B.B., with 45 to 48 grains of Schultze, according to what you and your gun can stand. With a very first-class weapon you can use 48 grains with perfect comfort and safety; and this charge will kill a roe-buck at a great distance with certainty.

Measurements and Weights The roe-buck stands about 26 inches at the shoulder, and is 48 inches in length from the tip of the nose to the end of the tail. At first sight it appears that the roe has no tail; but on close examination you will find that there is one about an inch in length.

Weights vary according to district. In woods bordering low ground bucks vary from 40 to 55 lbs., but I have known a Scotch buck to reach 65 lbs. In Scotland the animals attain their best within fifteen miles of Beauly, Perth, and Forres. Does weigh from 30 to 42 lbs. Roe are always weighed whole without gralloching.

In Germany the roe weigh as a rule 5 lbs. heavier than ours; and in East Prussia, where they are at their best, some 10 lbs. more.

Horns Average length in British Islands: 7 to 9 inches. I have measured three Scotch heads over 11 inches and one over 12. There is also one known Scotch head and one Irish

of 12 points each. This is of course remarkable, as six is the usual number. In Austria a head of 15 inches has been recorded; but perhaps the most extraordinary example in German collections is that now in the Museum of Cassel. It is of fine shape and thickness; horns respectively 12 and 13 inches, and they carry no less than 16 good points. This head was obtained near Marburg in Hessen in January 1588.

A good roe head is much more difficult to obtain than a good stag's head. There are several reasons for this, the principal being that the period of *good* horn growth in roe is very short, only lasting for a year or two, and also that the percentage of bucks which grow good heads is extremely small.

J. G. MILLAIS.

EXTINCTION IN ENGLAND AND REINTRODUCTION—There was a time when the roedeer must have been common in English woodlands, for there is abundant evidence, both geological and historical, to show that it existed in widely separated localities in many different counties. Amongst these may be mentioned Northumberland, Cumberland (whence Charles I. stocked the royal park at Wimbledon in 1633), Durham, Yorkshire, Lancashire, Leicestershire, Norfolk, Cambridge, Surrey, Hants, Dorset and Devon. In Northumberland the last native roe is said to have been killed at Whitfield in the reign of George I., and there is no record of its reintroduction there. In the neighbouring counties of Cumberland and Durham, however, where the old stock had died out, measures were taken to restore the species, and its reappearance in Northumberland was reported. Bewick, in 1807, made mention of a roe which, hunted out of Scotland through Cumberland and various parts of the north of England, took refuge in the woods bordering the Tyne between Prudhoe Castle and Wylam. It was repeatedly seen and hunted, and eventually killed.

In Cumberland, as pointed out by the Rev. H. A. Macpherson (*Trans. Cumb. and Westm. Assoc. Lit. and Sci.* 1887), a limited number of roe were then re-established in the north of the county near Wigton, where they wander through the border plantations, occasionally making their appearance in new and unexpected localities. They were reported as maintaining their numbers steadily, but showing no marked increase. In January, 1892, one was shot in north-west Durham, having probably wandered out of Cumberland. In Yorkshire at one time there were plenty of roe in the ancient forest of Pickering, in the North West Riding, but they have long since disappeared, and no record has been found of the precise date of extinction. As regards Surrey, in January, 1639, six years after a number of roe had been transported to Wimbledon from Cumberland, a royal warrant was issued to Sir Henry Hungate for "the preservation of His Majesty's game of roedeer broken out of Half Moon Park, Wimbledon, and now lying in the woods adjoining thereto." In Sussex, as the writer was informed some years since by Lord Leconfield, there were roedeer at Petworth, but, according to tradition in the neighbourhood, they had been introduced many years previously, and were not the descendants of an ancient stock. About the year 1853 some roedeer were sent from Petworth as a present to Prince Albert, and were turned out at Windsor, where a few are still preserved in the neighbourhood of Virginia Water. Those which still survive at Petworth are kept in the park, which, being surrounded by a wall fourteen miles in length, affords them unusual security and yet abundant liberty. In Dorsetshire, in 1800, Lord Dorchester turned some out in the woods at Milton Abbey, whence their descendants dispersed in a very short space of time, especially in a south-western direction. They were frequently hunted, and afforded excellent sport (see the *Sporting Magazine*, 1831, p. 168). About 1829, when the Master of the Hounds, Mr. Pleydell, gave us his pack, after hunting roedeer exclusively for sixteen years, he permitted Mr. Drax, of Charboro' Park, to capture several of these deer and turn them out in the Charboro' woods. From this second centre they increased in numbers and wandered far and wide—from Moreton to Warmwell in the valley of the Frome, and from Hyde to Houghton in that of the Puddle. Their extreme eastern extension is believed to be Lychett, and they have been met with as far west as Hook Park.

In 1883 a roebuck was found in Somersetshire and hunted by the Seavington hounds, which came upon him in the chain of large coverts lying to the south of the Vale of Taunton. They ran him 8 miles with a burning scent, and killed him near Otterford. No doubt he had strayed from South Dorsetshire, perhaps from the Hook Park coverts on Lord Sandwich's estate, which would be about 20 miles from the place where he was found.

It was estimated by Mr. J. C. Mansel Pleydell, of Whatcombe, who resides in the heart of the roedeer country in Dorsetshire, that there were probably about 120 head, so far as could be ascertained, in the Milton, Whatcombe, and Houghton woods, which fringe the southern side of the Vale of Brackmore, from Stoke Wake to Melcombe Park and the Grange Wood westward, the number being merely a question of preservation or non-preservation. In that part of the country hunted by Lord Portman's hounds, the roe is not preserved on account of its being too distracting to foxhounds when drawing a covert.

It was in Dorsetshire in the spring of 1884,

that the present writer, at the request of the verderers of Epping Forest, and acting in concert with Mr. E. N. Buxton, took measures to capture a number of roedeer and transport them by cart and rail into Essex, where they were liberated in Epping Forest to restock the glades in which their species had formerly roamed, but where they had long been extinct. The capture was effected by noting the passes by which the deer left and re-entered the woods, and hanging up nets into which the deer with some management were driven. In this way eleven were captured; three of them (does) were restored to liberty, and eight were brought to London, the writer travelling all night with them to save time and to ensure their speedy liberation. By half past nine the following morning they were turned out in Essex within twenty-four hours of their capture in Dorsetshire. They soon settled down in their new quarters, and have ever since continued to thrive, although they have not unduly increased, for reasons best known to those who dwell in the neighbourhood of their haunts. The following year, through the exertions of Mr. E. N. Buxton, one of the verderers of Epping Forest, a few more were obtained from Dorsetshire and turned out in the Forest, where, being well looked after by the keepers, the maintenance of the stock is now assured.

Since this experiment was carried out, roedeer have been introduced in other counties. Sir Edmund Loder has liberated some in the coverts at Leonardslea, near Horsham, Sussex, and Mr. Assheton Smith has turned out others in Vaynol Wood, Carnarvonshire. They are always remarkably shy, apparently never able to overcome the fear of man, nor to put off any of their wild nature, as happens with red deer and fallow deer when roaming more or less at liberty under man's supervision.

J. E. Harting.

ROLLER SKATING—*See* Skating.

ROOK—As a subject of property the Rook (*Corvus frugilegus*), the most familiar of all the *Corvidæ*, holds a peculiar and unsatisfactory position. Unlike other animals *feræ naturæ*, it is unprotected by any statute, and at the mercy of every one who would compass its life. The law in fact, has always regarded these birds, not only as unfit for human food, but as destructive in their habits, and therefore to be destroyed. So far from assisting in their preservation, as many would do nowadays by seeking to establish rookeries, our ancestors made laws for their total extermination.

In the year 1533, a statute was passed, the title whereof is "An Act to destroy Choughs, Crows, and Rooks." The preamble to this Act recited—such was the ignorance of the times in regard to the habits of birds—that their numbers daily increased so that they yearly destroyed "a marvellous great quantity of corn and grain of all kinds, as well in the sowing as in the ripening and kernelling of the same," and that "if suffered to breed and continue, great destruction of grain would result, to the great prejudice, damage, and undoing of the tillers, husbanders, and sowers of the earth." This statute, accordingly, enacted measures for the extirpation of rooks, old and young, by the inhabitants of every parish, and set a price upon their heads.

By a later statute of Elizabeth, passed in 1566, provision was made for raising money in every parish for the destruction of these "noyful fowl." As these statutes, however obsolete, do not seem to have been repealed, the rook still remains, in the eye of the law, a trespasser and an outlaw. The statute of Elizabeth was cited as late as the year 1824, in the case of Hannam *v.* Mockett, then tried in the Court of King's Bench. It was an action for damages for firing guns near a rookery and frightening and driving away the rooks. The plantiff obtained a verdict, but the decision on appeal was reversed, the judges declaring, on the strength of the last-mentioned statute, that rooks were considered by the legislature as a nuisance to the neighbourhood where they were, and that therefore no one could be held to suffer damage by being deprived of them. As these birds are not maintained at the expense of any individual or individuals, no one can have any property in a rookery built in his trees, or in the bodies of the rooks themselves, if shot by a neighbour. And since they cannot be reduced into possession, they are not a subject of larceny. In other words, respecting rooks which have their liberty (except when too young to obtain it, and then they are the property of the occupier) it has been decided in the case above cited that no action at the suit of the owner of the rookery will lie for shooting them, whether they are within or outside the rookery, since they are protected neither by the common law nor by statute. Such would appear to be still the case, except so far as provisions of the "Wild Birds Protection Acts" may have modified this view. Under these statutes, the shooting or taking of any wild birds, (which include rooks) between March 1st and August 1st, is a punishable offence, and the taking of their eggs may be made so by an order of a Secretary of State. The rook is therefore so far protected by the legislature.

Opinions in regard to its utility have changed with the times. John Aubrey, the antiquary, in his *Natural History of Wiltshire*, written between 1656 and 1691, and edited by John Britton in 1847, remarked that although "in the peaceful reign of King James I., the parliament made an Act for provision of Rooke-netts and

catching Crowes, to be given in charge of Court barons, which was by the stewards observed," he "never knew the execution of it." "Parliaments," he added, "are not infallible, and some think they were out in this Bill."

From this observation, it would seem that the truth was then beginning to dawn upon agriculturists that the rook, instead of being an enemy to crops, might be a useful ally in extirpating the larvæ of destructive insects, weeds, and field mice, and that it is so has since been fully established, although it must be admitted that in the egging season game preservers have just cause for complaint against the rook for harrying the nests of pheasants, partridges, and wild ducks. As to the nature of the rook's food at different seasons, see a report by Sir John Gilmour and Professor M'Alpine on the contents of the crops of 350 rooks shot during one year in Fifeshire, where these birds are very numerous. *Trans. Highland and Agric. Soc. Scotland*, 1896.

At the present day many persons, instead of devising means for getting rid of the rooks, take measures for the formation of rookeries, and only shoot some of the birds for the purpose of keeping their numbers within proper limits, as well as to derive recreation from the exercise of their own skill with gun or rifle, and to provide "rook-pies," which, in spite of ancient prejudice, are reckoned by many to be extremely palatable.[1]

Formation of a Rookery—Those who have paid much attention to the habits of rooks are aware that these birds are extremely eccentric and wayward in the choice of a nesting site. They display some judgment in the choice of sound trees, and evince a preference for those in the neighbourhood of old houses, seldom selecting trees in proximity to new buildings. It is difficult to induce them to take up their abode in any trees save those of their own selection; but one or two expedients may be mentioned which, by experiment, have been proved to be successful.

There was formerly a considerable rookery in the Temple Gardens, in the elms in the King's Bench Walk. In Goldsmith's time (1774) it was a flourishing colony. Messrs. Everest and Pownall, in their *History of Epsom* (1825) write of it as then existing, but Rennie, only six years later, in his *Architecture of Birds*, referred to it as being then "long abandoned." When it ceased to exist, therefore, is doubtful. But the history of this rookery is curious. It is stated by Mr. Everest that it was founded in the time of Queen Anne by Sir William Northey (son of Sir Edward Northey, the Queen's Secretary) who colonised the place with birds from his estate at Epsom. Mr. Everest informed the present writer in April, 1876, that "a bough was cut from a tree with a nest containing two young rooks, and taken in an open wagon from Epsom to the Temple, and fixed to a tree in the gardens. The old birds followed their young and fed them. They remained and bred there. The following year a magpie was observed to build in the gardens. Her eggs were changed for those of a rook, and were hatched there." Since this story was circulated (*Zoologist*, 1878, pp. 196, 443), the present writer came across a passage in Aubrey's *Natural History of Wiltshire*, which, although very brief, distinctly indicates that the rookery in question was of much older date than is to be inferred from the work above quoted. Aubrey's words are:—"'Tis certain that the Rookes of the Inner Temple did not build their nests in the garden to breed in the spring before the plague, 1665, but in the spring following they did." Probably, therefore, all that Sir William Northey did was to re-introduce some rooks in the gardens after a previous colony had ceased to dwell there. His example has since been imitated with success, and that in recent times, by Mr. Walsh, a gentleman resident in Essex, as related by the late Dr. Bree of Colchester. A branch, holding a nest which contained young rooks, was carried two miles to a spot where it was desired to establish a rookery, and fastened to a tree. In this case the parent rooks did not follow the young, but one of the latter being eventually tamed, paired with a wild rook. A nest was built, a brood reared, and from this pair (wrote Dr. Bree) a large rookery descended, and became so numerous that the owner (Mr. Walsh) was compelled to destroy a great number annually.

The establishment of a rookery, by placing artificial nests in elm trees, and putting down food and water for the wild rooks has been successfully carried out by other experimenters. (See *The Field*, March 23rd, 1895.) In all probability that success might have been sooner achieved if there had been a neighbouring rookery close at hand, and young birds had been taken from it and placed in the artificial nests; for their cries would have attracted the parent-birds to feed them, who, having reared them there and got accustomed to the trees, would probably have returned the following spring.

A modification of this plan was successfully adopted in the garden of St. John's Church, opposite Waterloo Bridge Station in 1885, and by the owners of an old house near Dudley in Worcestershire in 1892. In the latter case some young rooks were obtained and placed in a pen on the lawn. They were regularly fed, became very tame, and as soon as they were able to fly, were given their liberty. They remained about the house and grounds, and eventually served as decoys to wild rooks which, with some hesitation, after having fed with the tame ones, took up their abode in the neigh-

[1] Only the young birds, of course, are eaten, and these should be skinned and steeped in milk for some time before being placed in the pie.

bouring trees, and established what is now a flourishing colony.

Desertion of a Rookery.—It sometimes happens that for some reason not apparent at the time, rooks will desert their rookery. This may arise from various causes, (1) expulsion by herons, as in the well-known case at Dallam Tower, Westmorland, (2) expulsion by carrion crows, which plunder the nests, and should never be tolerated in the neighbourhood of a rookery; (3) death or material decay of the trees in which the nests are placed, rendering the topmost branches unsafe, and (4) from too many birds being killed in the rook-shooting season. By ascertaining the particular cause of desertion, and taking measures to remedy it, the rooks may be induced to return to the trees they have forsaken, or a new colony may take the place of an old one, should the trees be sound. (See *The Zoologist*, 1876, p. 4,926.)

Destruction of a Rookery.—Some persons object to having rooks too near the house, not only on account of the noise they make, but because of the injury to shrubs and plants beneath the nesting trees, caused by the droppings of the birds. There are various ways of getting rid of them. They may be shot at repeatedly during the time they are engaged in repairing their nests, and so be frightened away; or a tree may be felled so as to fall across the principal cluster of nests; or again, a fire of green wood may be lighted in such a position to windward of the rookery, as to cause the smoke to blow through the nests. Those, however, who are desirous to get rid of an old-established rookery, with all its pleasant associations, are probably but a small minority amongst lovers of country sights and sounds.

Rook Shooting.—Whether the object be to reduce the number of birds, or merely to provide amusement by making living targets for small-bore rifles, rook-shooting with many people affords an agreeable occupation at a time of year when no other kind of shooting is defensible.

Rooks build usually in tall trees, although instances are on record of their nesting occasionally in laurels and holly. (See *The Zoologist*, 1896, p. 258.) The height at which they commonly fly and perch makes the shooting of them with a small-bore rifle sufficiently difficult, and a test of skill. No longer ago than the first quarter of the present century it was the fashion to practice rook-shooting with the cross-bow, and even with bow and arrow. Jackson's patent steel cross-bow, and a bow made by Bragg of Holborn were then in some repute for this form of sport. The latter weapon is figured in Blaine's *Encyclopædia of Rural Sports*, and the Rev. W. B. Daniel has printed directions for the use of the cross-bow for rook-shooting. (*Rural Sports*, vol. iii. p. 381.)

The air-gun, though troublesome to load, was at one time a favourite weapon for rook-shooting, being comparatively noiseless and without recoil, and the present writer can well remember killing several rooks with an air-gun at an old country-house in Somersetshire in 1868, since which date he has not seen one in use. Daniel has a paragraph on the use of the air-gun "for the shooting of rooks and rabbits," but his comments are not in its favour, and he relates an accident which happened to Mr. Tyssen, while using one at Donyland Park, in Essex, which might well deter others from following his example. All these weapons have naturally given way to the use of the shot-gun and small-bore rifle. Farmers who are invited to enjoy a day's rook-shooting naturally bring with them the guns which they are ordinarily accustomed to use, but in these days of improved precision in fire-arms, and skill in shooting flying game, no one would think of aspiring to reputation as a rook-shooter unless the birds were killed with a bullet.

Of rook-rifles there are several patterns, those of Messrs. Holland and Holland being amongst the most perfect of their kind. In March, 1889, the present writer made trial of their hammerless ·250 at card targets with 1½ inch bull's eye. Fifty shots were fired consecutively at these targets, then thirty at random to test the fouling, thirty more at targets, and ten at tin boxes on the ground as a test for rabbits, making a total of 120 shots without the barrel being wiped out. Twenty-nine bull's eyes were made out of thirty shots at fifty yards, and out of the first fifty shots fired, forty-six would have struck a half-crown piece, and this with open V sporting sights, which were used throughout the trial. Three of the targets were published in the *Field* of April 13th, 1889, together with figures of three sizes of bullets (·220, ·250, and ·295, for comparison) and of the rifle itself, which is sighted to 50, 100, and 150 yards. Compared with a rifle of this pattern, all other weapons for rook-shooting are obsolete.

J. E. Harting.

ROUNDERS—This game is played upon a ground in the shape of a more or less regular pentagon, the "bases" at the angles being from 15 to 20 yards apart.

In the centre of the ground the server stands to toss the ball to the one who has the bat, and who stands opposite to him. Two sides are chosen, one of which goes in to bat, the other out to field, this being decided by tossing. There should not be less than ten, nor more than thirty players in all. One of the "in side" takes the bat—which is often a cricket stump—while the feeder, who is one of the outs, tosses (not throws) the ball towards the player, calling out "play." One of the "outs" stands behind the batter and returns the ball to the server. The rest of the out party are

distributed over the field round the outside of the pentagon. When the ball is served, the batsman's object is to hit it as far as possible, but if the ball is caught before reaching the ground, he is out. He is allowed either one trial or three; if all are failures, he is out. If he hits or tips the ball, he must run to the next base, and as much farther as he can reach without being hit by the fieldsmen with the ball, but if he is hit between any two points he is out.

The score is made by the "in" party as follows:—Each player, after striking the ball, runs from his base to another or to a second, third or more, or all round, according to the distance he had driven the ball, and scores one for each complete circuit. If "lost ball" be cried by the "out" party—from the ball not being recoverable easily or by going over bounds—only four can be scored. After one of the "in" party has hit the ball and dropped the bat, another takes his place, and the rule applicable to the first player holds good for each in turn. If the striker hits the ball, he must run to No. 2, the one who preceded him—if there—moving on to 3 and so on. Any player of the "ins" whilst running, on being hit by the ball before reaching a base, is out.

The feeder is allowed to feign a toss of the ball, in the hope of touching some one of the players, who may be induced to leave his base or point before the hit.

When only one of the "in" side is left in, he may call for "three fair hits for the rounder." He obtains another innings for his side if he can hit the ball sufficiently far to allow him to complete the circuit of the pentagon; but if he fail in his three attempts, he and his party are finally out, and the other side go in. As a rule, this chance is allowed once only, but this may be altered by mutual consent at the beginning of the game. The "field" is arranged much as at cricket—some near for slight tips, and the others well out, so as to be able to throw back to the "feeder" as quickly as possible. Any one of the fieldsmen may put the runner out by hitting him with the ball before he reaches a base.

F. T. Pollok.

[*See also* Baseball.]

ROWING—A more correct title for this article would be "Boat-racing," for there are branches of pleasure rowing with which it does not profess to deal. I would still further limit it to "Boat-racing on the river," for I cannot profess to have any knowledge of sea-rowing.

Historical—The early history of boat-racing on the Thames is almost entirely lost. We know that, before the beginning of this century, all passenger traffic on the river in the neighbourhood of London was carried on by means of watermen's wherries: there were very few bridges, and consequently there were many watermen with their boats ready to remedy the deficiency. From a very early date these watermen must have had races amongst themselves: the earliest record of such races dates from 1715, when Mr. Thomas Doggett, an actor, instituted a race for young watermen who had just served their apprenticeship; the prize was a livery and badge. The names of the winners before 1791 have not been preserved in their entirety, but since that date the record is complete.

Somewhere about this same date, 1791, boat-racing amongst amateurs must have begun; at least, at this date there must have been some amateur rowing in the neighbourhood of London, as we find that very early in the nineteenth century rowing was fully recognised as a form of sport, both at Eton and Westminster, and in London. The list of captains of the boats at Eton dates from 1812, which points to the existence of unorganised rowing for some years before this date. The Leander Club is referred to, in 1825, as an old-established club, and we know that before it there existed clubs called the Star and the Arrow. In 1822 we know that bumping races were going on at Oxford—Christ Church was head of the river, and there was a dispute between Jesus and Brasenose. The first record of races at Cambridge dates from 1826. How long before these respective dates boat-racing was carried on in an unorganised condition it is impossible to say. In 1829 the Cambridge University Boat Club was formed, and in February of that year the secretary was instructed to take steps towards a match with Oxford. The result was the first University Boat-race, rowed on June 10th, 1829, at Henley, and this seems to have been followed by various matches between the head boats of the river at each University: there is no record of these matches, but there is oral tradition, which is borne out by the recorded match between Queen's College, Oxford, and St. John's College, Cambridge, in 1837 (won by Queen's), and by the fact that in 1839 Henley Regatta was founded. The good citizens of Henley saw that there was a demand which they could meet by establishing a Regatta. In this same year, 1839, the Oxford University Boat Club was formed, and the third University Boat-race was rowed (the second was in 1836).

Before leaving the early days of boat-racing, it is well to notice that the first Eton and Westminster match was rowed in 1829, the second in 1831, the third in 1836, and the fourth in 1837. The schools found it easier than the universities to make arrangements for a friendly trial of skill.

For many years after the establishment of Henley Regatta, competition there was mainly

confined to the Universities, and the different colleges of the Universities. There were occasional entries from King's College, London, Leander Club, St. George's Club, Thames Club, the Argonauts, Royal Chester, down to 1857, when the London Rowing Club made its first appearance and established a third great factor at the Regatta.

The year before this, 1856, is also a landmark in the history of rowing, with which the names of Littledale and Mat Taylor must always be connected. Mr. Littledale was a gentleman of Liverpool, a member of the Royal Chester Rowing Club: he commissioned Mat Taylor, a ship's carpenter, to build an eight oared boat for his club crew to use at Henley. The result was the first keel-less, smooth-skinned light ship, in which Royal Chester easily won the Grand Challenge Cup, their first and only victory in this event. Boat building was revolutionised: the invention of outriggers by Clasper in 1845 had made the boats of the period much faster than formerly, but had not necessitated the learning of a new style of rowing. These new boats of Mat Taylor required more skill to keep them balanced, and a new style in order to get the best pace out of them. It is from this year that the modern school of rowing dates; the method that was correct then is correct now, with such slight modifications as have been introduced by the sliding seat. Sculling was equally affected with rowing.

There is still another thing that marks this year 1856 as very important in the history of boat racing: it is that from this year the University match becomes an annual one. Thus 1857 finds the rowing world in practically the same condition as it is to-day; annual competition between the Universities on the tideway, annual competition between the amateurs of the two Universities and of London at Henley, with other competitors either from at home or abroad occasionally intervening. Nor were the interests of the watermen, the professional oarsmen, forgotten: in 1843 a regatta was instituted on the tideway at which they were invited to compete for substantial money prizes, and in most subsequent years a similar regatta has been held. There have been gaps in the sequence of these regattas: there were none in the years 1851–53, 1867 (though in this year there was a regatta at Paris in which several of our professionals took part), or 1879–89 (though for two or three years in the middle of the eighties the Messrs. Chinnery gave a prize for scullers), and 1896 once more finds no regatta for professionals, owing to the want of competition which has been experienced in the latest series of regattas and has deterred its promoters from continuing their patronage. From some of these regattas, however, there have sprung several interesting matches, and some few good men have come to light who would otherwise have had no opportunity of showing their merits.

The invention of sliding-seats, which came into general use at Henley Regatta of 1872, is another step in the development of modern oarsmanship, but it introduced no radical change of style, only a slight modification.

Foreign Oarsmen—It is impossible in such a short sketch of the history of rowing to give a detailed account of the foreign competitors who have tried to wrest our laurels from us on the river. The first visitor from abroad was an Australian, Green by name, who was beaten by Chambers in a match for the championship in 1863; the first amateur crew to visit England was a Harvard University Four, which challenged, and was defeated by, an Oxford University Four in 1869. In 1876 the Australian, Trickett, won the championship, and since that date no Englishman has been able to regain the title; but on the other hand, though there have been many competitors from abroad at Henley Regatta, they have failed to win either the Grand Challenge Cup for eights, or the Steward's Cup for fours, which are the two principal events.

OARSMANSHIP—If it were not for the fact that oarsmen of the very first class are extremely rare, it would appear that the art of rowing ought not to be a difficult one to acquire: there is only the one stroke to learn, and when that is learned, it only has to be constantly repeated, now at a faster, and now at a slower rate: there are not the same difficulties as there are, for instance, at cricket, where the beginner has to learn a number of different strokes, and where he has to deal with circumstances which are constantly changing.

But this one stroke in rowing consists of many separate actions, carried out by different sets of muscles, which must harmonize together, and run into each other, so that the whole appears to be one smooth and easy action. Any failure in one of the points leads to a derangement of the whole, and also tends to the acquisition of some bad habit in the individual oarsman which can never be altogether lost.

I propose first to describe what the stroke ought to be, and the more usual faults in performing it, and then, in the light of that knowledge, to consider what methods the beginner ought to adopt in order to acquire the art of rowing.

The Stroke—[*Note.* In rowing phraseology, "forward," when applied to an individual in a boat, means the direction in which he is looking; when applied to a boat, means the direction in which it is pointing. It is easy from the context to see which is meant.]

For the purpose of description I divide the stroke into five main headings, (i) the swing forward, (ii) the beginning, (iii) the stroke in the water, (iv) the finish, (v) the recovery, and I select, to begin my description, that point when, after the stroke has been rowed in the water, and the arms straightened in the recovery, the body has begun to swing up and forward from the almost recumbent position which it had assumed. Observe that though two of the headings are named respectively the "beginning" and the "finish," there is no dead point at either place; the motions that lead into the beginning are "continuous"; the "finish" is merged into the recovery.

(i) *The swing forward.*—The body must be swung forward from the hips with a perfectly easy and regular motion, the spinal column as straight as possible, the stomach and chest well forward, the shoulders braced back in their natural position, the wrists flat, with the oar-blade feathered. As soon as the body has passed the perpendicular the slide is started; from that moment the feet must feel the stretcher and so balance and regulate the slide with the swing, that as the swing forward comes to its full extent, the slide will just touch the front stop. Nearing the end of the swing forward, the feet feel the stretcher a little more firmly, the oar is turned sharply off the feather, and, as the swing forward stops, all weight is taken off the handle of the oar, and the blade is allowed to drop into the water to its full depth.

(ii) *The beginning.*—At that moment, without the loss of a thousandth part of a second, the whole weight of the body is thrown on to the handle of the oar from the hips, the feet pressing very strongly on the stretcher, the slide not moving until the weight of the body is firmly established, but immediately following it. The whole power of the oarsman must be applied at this point.

(iii) *The swing back.*—Then, by flattening down the knees with a very firm and even pressure on the stretcher, the swing back is so combined with the slide that as the swing comes to its extreme point back, so does the slide arrive at its back stop, the oar-blade having been carried through the water without wavering, without any relaxation or increase of pressure.

(iv) *The finish.*—During the last part of the swing back, after the body has passed the perpendicular, the arms begin to be bent by use of the muscles behind the shoulders, the elbows kept close past the ribs, so that as the swing and the slide end, so do the hands touch the chest.

(v) *The recovery.*—At once the oar-blade is disengaged from the water by a sharp drop of the forearm from the elbow, followed immediately by a sharp drop and push away of the wrists, which turns the blade on to the feather and straightens the arms. These three motions must be so smooth and so merged into each other that they appear to be one motion. Directly the body has ceased to swing back, it begins to swing forward again.

This brings us back to the point from which we started, and completes the cycle of the stroke.

Now let us take these different parts, or rather headings, of the stroke a little more in detail, inquiring into the reason of the described actions, and the causes of the more common faults in carrying them out.

(i) *The swing forward—The body must be swung forward from the hips with a perfectly easy and regular motion*—This, with the described position of the spinal column, chest, and shoulders is fairly obvious. A rigid bar swinging from one end will obviously have a longer swing, and its free end will swing through a bigger arc than will result if a bar of the same length has one end fixed and a hinge put somewhere down it. An additional reason for preserving the described position is that it enables the oarsman to give his lungs free play at a time when his muscles are doing comparatively nothing, when he is taking his holiday, and gathering himself for the effort of the next stroke in the water.

It is, however, not unusual to find two different faults of body position during the swing forward. One is using as the pivot on which to base the swing, not the hip bones, but one of the vertebræ of the spine; the other is to let the body swing across the boat towards the oar, as the end of the swing forward is neared. The first fault is usually acquired in the early stages of rowing, and is caused by the beginner sitting on his tail bone instead of more fairly on those other bones which nature has plentifully supplied with padding. The second fault is one into which the oarsman insensibly falls; it is frequently found in No. 7 in an eight and No. 3 of a four. It is to be cured by keeping the eyes fixed on the inside shoulder of the man in front, and by feeling the stretcher with the inside foot a little more firmly during the last part of the swing.

The wrists flat, with the oar-blade feathered—The blade is feathered, or turned parallel with the water, because in this position it only offers its edge as a resistance to any wind or waves. When the blade is in this position, with the arms straight, the wrists must be as low compared with the knuckles of the fist as possible, so that when the oar is turned square by raising the wrists above the knuckles, the arch of the wrists is not so great as to cramp their free play. The oar-handle must not be gripped in the fist, but held firmly in the fingers, with the thumbs coming round underneath. The hold of the

inside hand must never shift ; in the outside hand the handle may be allowed to turn a little.

As soon as the body has passed the perpendicular the slide is started—The function of the slide is to enable the swing of the body to cover a greater distance, and to bring into use those strong muscles of the legs which were not properly exploited on fixed seats. Hence the slide is the servant of the swing, and must be used in conjunction with it. The swing and slide forward must be even and balanced. Personally I prefer to see the body swing *well* past the perpendicular before the slide moves, as this gives greater steadiness and balance to the swing forward. It tends to keeping the feet more firmly on the stretcher, and the stretcher is the bed of the spring into which the body is now transforming itself. The slide must not touch the front stop before the body has finished swinging ; if it does, the balance of the swing forward upon the feet and stretcher is destroyed, and the oarsman is rendered incapable of getting hold of the beginning with the necessary quickness. This is a very common fault ; it is often possible to hear the slide hit the front stop hard, and to see the oarsman's body tumble forward instead of swinging steadily ; this can only be cured by letting the body swing well past the perpendicular before the slide is allowed to move, and, directly the slide does begin to move, by feeling the pressure of the feet on the stretcher ; when once the slide begins, there must be no more pulling at the straps of the stretcher.

Nearing the end of the swing forward, the oar is turned sharply off the feather—The oar ought to be kept "on the feather" as long as possible, for two reasons, first, because in this position it offers less resistance ; and second, because the merging of the rise of the wrists, which turns the blade square, into the rise of the hands, which allows the blade to drop into the water, (which is very difficult to get with the necessary quickness and freedom), tends to make the latter motion quicker and freer. A rather common fault is what is known as "skying the feather." I cannot call to remembrance any occurrence of this fault when the blade has been kept on the feather ; it occurs only when the blade has been turned square early in the swing forward. In my experience, it is an absolute cure for a skied blade to keep the blade on the feather until there is danger of the loom of the oar "locking" in the rowlock.

As the swing forward stops, all weight is taken off the handle of the oar and the blade is allowed to drop into the water to its full depth—Theoretically, the body must never stop swinging ; directly it ceases to swing forward it must begin to swing back. Practically, there is a pause, a dead point, at the end of the swing forward and at the end of the swing back, but these pauses must be made as short as possible. It is during these pauses that, on the one occasion the blade is dropped into the water, on the other it is disengaged from the water. The blade must be dropped into the water, because it is the easiest and quickest method of getting it there, and because the balance of the oar is such that it will of itself immerse the blade to exactly the right depth. Many oarsmen, in trying to cover the blade quickly, fall into the error of jerking up the handle of the oar ; the mere fact of employing force (where it is not wanted) causes a tension of the muscles and a slight pause as that tension takes place. Hence, though the motion of the blade into the water may be quicker, yet there will have been a slight delay in starting it, and the blade will be covered more deeply than is necessary, and further, this unnecessary effort will have to be checked before the oarsman can bring all his power to bear on the "beginning."

(ii) *The Beginning*—Now that the oarsman has swung forward to his full extent and is ready to begin his stroke in the water, it is very important to remember, and always to bear in mind, that what the oar does in the water is the only thing that gives pace to a boat, and is the only test of an oarsman's value ; the only importance of all that I have been discussing up to this point is to enable a man to apply the whole of his strength to the best advantage when his blade is covered. This sounds, and is, a truism. But it is very necessary to emphasize it ; many coaches and many of their pupils entirely lose sight of this important point while endeavouring to cure particular faults of style.

The beginning must be caught with full power (it is a grip rather than a catch, certainly not a snatch), and for the following reason :—

The oar is a lever of the second order ; the oarsman of course supplies the power at the oar-handle ; the weight to be moved is at the rowlock ; the fulcrum is the blade covered in the water. But this fulcrum is not stable, it gives to the pressure. The broader the blade, the more stable the fulcrum, but the discussion of this point will come more appropriately with the discussion of dimensions. If, when the blade is first covered, the power is applied gradually, the molecules of water begin to move away in front of the blade, and when the power is fully applied, it necessarily does not meet with so much resistance, as the water is moving away from it. Consequently the oarsman devotes much of his power to merely moving the water in front of his blade, instead of lifting the boat past it. If, on the other hand, the beginning is gripped at once with full power, the molecules of water are at rest, and the lever is of the greatest effect as far as the stability of the fulcrum is concerned.

[*Note*—The greatest mechanical advantage of

the lever is undoubtedly obtained when the oar is at right angles to the boat; but the instability of the fulcrum, which results if the full power is only applied at that moment, leads to a greater loss of power than the mechanical disadvantage of the "beginning." Further, the more stable fulcrum enables a slower stroke to be rowed, since the same power, acting through the same space, will take longer to travel through that space when it meets with a firm resistance than when it has less resistance to overcome.]

The pause which an oarsman frequently makes before letting his blade drop into the water is to grip the beginning sharply and firmly will defeat his own object, because he makes an effort at this point, and in this effort grips his oar-handle too tightly.

The beginning is often made less effective, even when there is no hang, by the blade being brought towards the water in a slanting direction, instead of being covered up to its full depth when the oarsman is at his full reach forward. There is no object whatever in a long swing, unless that swing is used effectively, unless the blade is covered up *all* the time that the body is swinging back; if the blade is rowed

WELL AWAY. (*Taunt and Co.*)

called a "hang"; it is a bad fault, not only because it makes the keeping of time more difficult for a member of a crew, but also because it invariably causes the beginning to be missed. The chief causes of hang are as follows: a hurry of the swing forward, which brings the oarsman to the end of his reach before the rest of the crew, for whom he has to wait; finish of the slide forward before the swing, which upsets the balance of the oarsman on his stretcher, which must be regained before he can begin his stroke in the water; and a faulty hold of the handle of the oar in the fists instead of the fingers, which stiffens the wrists and arms, and makes their action slow. It very often happens that a man who is trying his hardest through the air at the beginning (or at the finish) there is so much swing completely wasted.

Another fault which makes the beginning less effective is over-reaching with the shoulders, *i.e.*, when the body is full forward, the muscles of the shoulders are relaxed and the arms are allowed to move forward in the sockets of the shoulders out of their natural position. The idea is to increase the reach forward; but it leads to two bad results: (i) the extra weight of the arms is thrown upon the handle of the oar, its balance is disturbed, and it becomes impossible to cover the blade at the correct moment; and (ii) the shoulders are in the worst position for withstanding the strain which has immediately to come upon them. One of two

things must follow: either valuable time must be lost in re-bracing the shoulders before the blade is put into the water (the more common result, another form of "hang"), or, the blade being covered, full power is not applied until the shoulders are in position again.

It has been said above that the beginning must be gripped by throwing the whole weight of the body from the hips on the oar-handle, the feet pressing strongly on the stretcher, but the slide not moving until the weight of the body is firmly established, but immediately following it. This requires explanation. Every man, in addition to the power which his muscular development gives him, has a body which weighs something, and by the proper use of that bodily weight he can add appreciably to the power of his muscles. Dr. Warre, in his "Notes on the Stroke," puts this very concisely: "Strength misapplied soon evaporates; your weight is always in the boat with you." Now, if the slide is allowed to move before the weight of the body is applied, it is impossible for the oarsman to make efficient use of his weight, and he consequently loses once and for all part of his effective power. He can get a tremendously hard shove with his legs, but he has lost, or rather never acquired, a reserve of power on which he could rely when his muscular powers are failing him in a hard race.

It is by no means uncommon, however, to see a man slide on to his work instead of swinging on to it: with professional oarsmen it is the rule rather than the exception.

There follows the question, How soon ought the slide to move after the weight has been established? Modern practice gives the answer. As soon as possible. The two motions ought to be almost simultaneous.

At this point it is perhaps as well to observe that one of the most famous eights that ever rowed—the Oxford University eight of 1878—as a crew swung their bodies up to, and even past, the perpendicular before allowing their slides to move. The pace of this crew was undoubted, and to this day it is quoted as being one of the finest examples of eight-oared rowing ever witnessed. There is this great example against modern practice. My reason for preferring the latter is derived from personal experience. When I went up to Oxford in the early eighties it was considered correct to swing past the perpendicular if possible before sliding, and in this school I was carefully instructed. But increasing experience and observation of other rowing men led me to favour an earlier use of the slide, since the old system induced a separation of swing from slide. Almost the whole swing came first, then came the action of the slide; the two were not used in combination. Certainly full use was made of the bodily weight, but the leg and back muscles were not properly used, especially at the beginning. This was seen at Cambridge before it was seen at Oxford: the run of Cambridge victories—in 1886, 1887, 1888, and 1889—was mainly owing to their more correct use of the slide, but then the Oxford men learned their lesson from the enemy and turned the tables.

(iii) *The swing back.*—It has been explained that the oar is a lever of the second order, and that the object of the oarsman is to lift the boat past the spot where his blade was covered in the water. Yet it is invariably assumed in rowing phraseology that the oarsman has to "row his blade through," a confusion of ideas which is owing to the fact that the water gives an unstable fulcrum and runs away in front of the pressure of the blade with increasing rapidity. It is owing to this, too, that though the same power be applied at the oar handle with unvarying pressure during the whole time that the blade is covered, yet the blade will appear to "come through" with ever increasing rapidity. And this fact has caused many good judges of rowing to advocate and teach a constant increase of power after the beginning has once been gripped. I think they are wrong, and are misled by appearances. There is a "slip" of the oar in the water, the blade does "come through," and it is only by watching what the blade of each individual oarsman does in the water that the coach can estimate the value of his work. It is very important to remember that the most valuable oarsman is not he who moves the greatest quantity of water or "rows his blade through" the greatest distance, but he who does most to carry the boat past the spot where his blade was first covered.

If the beginning has been properly gripped, and the slide begun at the right time, the swing back and the stroke in the water are also properly carried out; they follow naturally, and the next difficulty only begins with the bending of the arms for the finish.

(iv) *The Finish.*—The finish is that part of the stroke in the water during which the arms, which must be regarded as mere attachments between the shoulders and the oar-handle, are bent to allow the oar to come home to the chest. While this coupling up of the attachments is going on, the pressure on the water must be still held on by the steady swing back of the body and extension of the slide; there must be no addition to, or substitution for, this pressure by any use of the biceps. All that is required from the muscles of the arms, and more particularly from those behind the shoulders, is to couple up the connections. But this is one of the most difficult points in rowing for an oarsman to get correctly; and most men even of good class fall into one of two errors: either they use their arms too much, or too little. If they use their arms too much, the body is pulled up to the handle of the oar (this fault is called "meeting the oar"), which involves a shortening of the

swing, and consequently of the stroke in the water; the over-use of the arms, too, always disturbs the position of the oar in the water and makes the oarsman row his finish either "light" (*i.e.* with the blade more or less uncovered), or "deep" (*i.e.*, with the blade too much covered). This last fault of finishing deep is caused by the extra strain on the arms, affecting the wrists and flattening their arch. This causes the blade to be slightly turned in the water, and by its mere change of position to run down deeper. It must be remembered that as the arms are bending, the arch of the wrists must be gradually increasing.

If the arms are used too little, the grip of the blade in the water is relaxed, the hole in the water which it has made is filled up, and the whole finish is weakened.

(v) *The Recovery*.—Faults of the finish are very intimately connected with faults of the recovery, and more especially with the difficulty of disengaging the blade from the water at exactly the right time. Consider the position of a beginner when his arms begin to bend for the finish. He has been told to keep his blade fully covered until his hands touch his chest, but he knows full well that if he does this, and fails to disengage his oar exactly at the right time, the oar-handle will hit his body with considerable violence, and he will catch a crab. The consequence is that he either shirks the difficulty by letting his blade get lighter and lighter as the hands come into the chest until, as the hands touch the chest, the blade is completely uncovered, or else, keeping the blade better covered, he makes a violent wrench with any muscles of his arms or shoulders; sometimes he even throws his body on the oar-handle, in order to get his blade out before it can do mischief. In either case bad habits are formed which it is almost impossible to cure. A really good finish and recovery is hardly ever seen even amongst the very best and most finished oarsmen—they nearly all have some trick acquired in their early days which they have found impossible to cure. And yet the disengagement of the oar from the water is a perfectly simple and easy matter—all that is required is a sharp drop of the hands and forearms working from the elbows as on a pivot; no other muscles should be allowed to come into play. This is the first motion of the recovery; then comes the drop of the wrists, which turns the oar on to the feather, followed immediately by the pushing away of the wrists, which straightens the arms. These are three separate and distinct motions, but the value of a good recovery lies in making them form one continuous motion. The use of the wrists is to be particularly noted—the usual instruction at this point of the stroke is "sharp with your *hands* in the recovery"; but the *wrists* play a far more important part in the recovery than do the hands. The excessive use of the arms in the finish cramps the wrists, and consequently makes the recovery slow and awkward. As the arms are being straightened in the recovery, just sufficient weight must be put on the handle of the oar to keep the blade balanced at the right height—two or three inches above the surface of the water. The oarsman must feel as if he had nothing more to do with his oar until it is time to turn it square and drop it into the water for the beginning—his arms during the swing forward must be quite straight, but not in the least stiff or rigid.

Directly the oar has been disengaged from the water, all pressure on the stretcher ceases, and the strain of the recovery of the body is eased by a slight pull with the feet on the straps of the stretcher. This comes only too naturally to the oarsman, and the pull on the straps is apt to be continued too long—it must cease directly the slide forward is started.

Let me summarise as concisely as possible the most important points of the stroke.

The action of the blade in the water is the only factor that counts towards pace-making.

The stroke in the water cannot be of full value unless the beginning is gripped with full power.

The beginning cannot be gripped unless the body is perfectly balanced when it is at the end of its swing forward.

How to teach a beginner—The beginner should always take his first lessons on a fixed seat, because it will give him one thing less to think about, and also because it is only on a fixed seat that he can learn and appreciate the value of swing—of using his weight properly. It is important that his oar should be true in the rowlock, with unworn leather on the button, and that the rowing pin of the rowlock should be a little "proud" rather than the reverse. When he gets into the boat, show him how to sit—exactly opposite to his feet, and with his body erect; before he takes an oar into his hands show him how to swing his body, and explain that all work must be done by body swing supported from the stretcher, that the stretcher is the point from which he must get all his power, and that he must not depend on the strength of his arms. Now let him take hold of his oar, and show him how to hold it in his fingers—with his thumbs underneath and round the handle; with the blade flat on the water, his wrists will be as low as is convenient—well below his knuckles. Explain to him that the grasp of the oar must not be shifted, so that, when the oar is turned square, the wrists, especially the inside one, will be well arched; the hands on the oar ought to be a handsbreadth apart. Let him turn his oar on and off the feather several times, until he understands the use of his wrists.

Now show him that if he lets his oar drop into the water with a square blade, letting go

of the handle altogether, the balance of the oar will immerse the blade to the right depth, and explain to him that he must try to produce the same effect without letting go of his oar. Let him swing a little forward several times with straight arms and try this exercise, at first entirely letting go of his oar, and afterwards keeping hold of it.

Now show him how to disengage his oar from the water—by a simple drop of the forearm from the elbow—and explain to him the motions of the recovery which follow, and see that he performs them in proper sequence.

Up to this point all instruction can be carried on without the boat being moved from the landing stage or the bank; but now it is necessary to let the boat go, and to get your pupil to connect the putting of the blade into the water with its disengagement from the water. Do not at first let him exercise any pressure on the water or swing his body more than a very little; direct his attention towards dropping his blade into the water properly, letting it float through the water quite evenly while his arms are bending, and the proper performance of the motions of the recovery. When he has got some idea of performing all these motions in a proper manner, let him swing a little more and exercise a little pressure on the water; let him watch his blade occasionally for a few strokes, and direct his attention towards bringing it through with a perfectly even motion, and without varying the depth to which it has been covered. It will take several days before he grasps all these details; until he has grasped them and has got into the habit of performing them with some approach to correctness, it is important that he should not be allowed to attempt to lay out his strength. But when his muscles begin to acquire the habit of performing the motions without constant commands and messages from the brain, you can encourage him for a few strokes occasionally to do more work and to swing his body more; this is the time to insist on the value of body swing and pressure on the stretcher; do not allow him to use his arms, and do not allow him to continue this extra pressure for more than ten strokes at a time, but continue to impress upon him the necessity of keeping his blade even and regular in the water when he increases the pressure. Do not allow him to exert anything like his full power until he has got a fair idea of how he ought to use his hands and wrists without making frequent mistakes.

When he has reached this stage, transfer your attention and his to the use of his body. Make him swing his body forward right down between his knees (watch that his knees keep rigid and that they neither close in nor fall further apart at any part of the stroke; they ought to be just wide enough apart to allow his stomach to come well down between his thighs). Then make him swing back well past the perpendicular, making his hips the pivot on which to swing.

When he begins to swing properly, transfer your attention more to his stretcher; make him think of keeping his feet firmly planted on the stretcher during his swing forward, and of using his stretcher sharply in conjunction with a sharp spring up of the body in order to grip the beginning. Now is the time to encourage him to exert all the pressure in the water that he can command during those few occasional strokes when you ask him to lay out his strength, but you must keep an eye on his blade in the water, and it is always advisable to let him, too, look at his blade for two or three strokes at a time.

To summarise. First teach your pupil how to use his hands, wrists, and arms; then how to use his body; and lastly, how to use his legs.

When you put him on a slide, make him swing his body well before he slides forward, and, to begin with, make him swing his body up to the perpendicular before he slides back. Begin on a 5- or 6-inch slide.

Dimensions of boat—Any one wishing to have a racing boat built will go to a builder, give him the weights of the crew for which the boat is wanted, and leave him unfettered by instructions about length, width, or depth, or shape of hull. About other matters, such as the height of the seats above the heels, the length of slide, the distance of the rowing pin at right angles to the centre of the seat, and so on, every one is not quite agreed, so that instructions may be necessary. For purposes of reference, here follow the dimensions of a modern eight :—

	ft.	ins.
Greatest length over all	62	4
Greatest breadth	1	$10\frac{3}{4}$
Greatest depth, measured from skin to top of seat		$9\frac{1}{2}$
Depth forward		$6\frac{1}{4}$
Depth aft		$5\frac{3}{4}$
Height of seat above heels		$8\frac{1}{4}$
Height of work (rowlock sill above seat)		$6\frac{7}{8}$
Length of slide	1	4
Distance of rowing pin from centre of seat	2	$6\frac{1}{2}$

Front of slide when full forward exactly opposite the rowing pin.

This was a good and fast boat, which carried a crew averaging 12st. 5lbs. For a lighter crew a boat of less length, breadth, and depth would suffice; but the capacity of a boat for carrying weight depends far more on the shape of the hull than on these actual dimensions. The dimensions of the boat built by Mat Taylor for Oxford University in 1857 were: length 54 feet, breadth 2 feet $2\frac{1}{2}$ inches, and the average weight of the crew was a trifle over 11 stone 9 lbs.

The greatest beam ought to come somewhere about No. 4 seat, or even a little further for-

ward, and the floor ought to be carried well aft.

Measurements of a modern Four.	ft.	ins.	Of a Pair. ft.	ins.
Length over all	44	8	36	10
Greatest breadth	1	8½	1	4
Depth, amidships		8¾		8½
Depth, stem		6		4¼
Depth, stern		5¼		3½

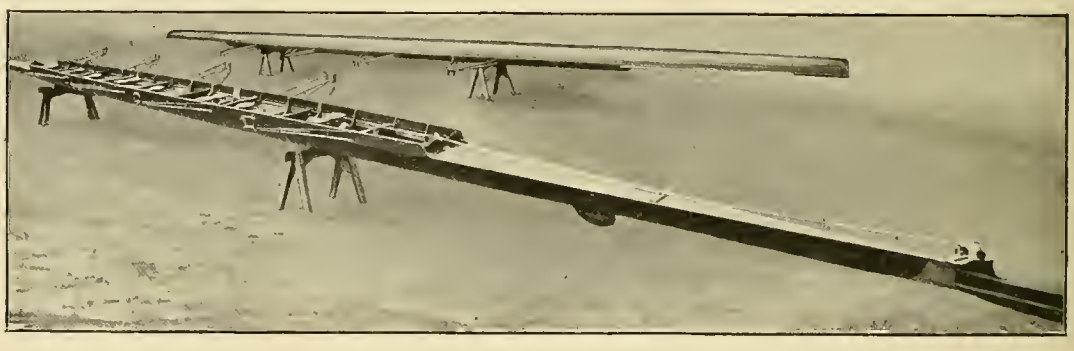
The other measurements would be the same as in the eight, but they require a few words of explanation. The height of the seat above the heels, which is now generally 8¼ inches, is in my opinion too much. Though the oarsman, by increasing the height of his seat, can swing with more comfort and more freedom, yet he places himself more out of the plane of his work, and so loses mechanical advantage, and further requires a more sloping stretcher, which prevents him from keeping on the necessary pressure at the finish. I think 7¾ inches is quite high enough except in a few individual cases, where a man is handicapped by an abnormally short body, or by exceptionally stiff thigh joints.

The height of "work," *i.e.*, of rowlock sill above seat, varies, according to the floatability of the boat, from 6½ inches to 7¼ inches. It ought to be set as low as possible consistent with the comfort of the crew and the probable conditions of the weather: for instance, in winter, when the water is frequently rough, it is advisable to have the work ¼ inch higher than in summer. Some individuals require their work to be set either higher or lower than the average on account of some peculiarity of build, sometimes even of style.

Experience has proved that a slide of sixteen inches is as much as can be used with advantage. With the seat raised 7¾ inches above the heels, the oarsman cannot slide more than 16 inches away from his work (in this case "work" means a point exactly opposite to the rowing pin of his rowlock) without catching the calves of his legs against the front of the thwart; and an extension of the slide in front of the work causes a great loss of swing. It is argued that a man would swing more if his slide did not come up to his work but was stopped some inches away from it—he probably would, but he would also lose in leg work. There must be a compromise between swing and leg work: where the point of compromise comes must be a matter of opinion. Modern practice sanctions a 16-inch slide coming up level with the work: with this I quite agree.

The distance of the rowing pin from the centre of the seat measured horizontally and at right angles varies from 30 inches to 32 inches. It depends a good deal on the length of oar inboard (the leverage) which it is desired that the crew should use. With a leverage of 3 feet 8½ inches I have found 30½ inches a very good distance to choose for this.

Now as to the dimensions of the oar. On this point there has lately been a good deal of dissension in the rowing world, some authorities declaring for a 12-foot oar, others for a 12-foot 6-inch oar, with the leverage in both cases at 3 feet 8 inches, and in the latter case with a slightly smaller blade, 5¼ inches as against 5⅞ inches. There is not a great deal of advantage on either side; the longer oar gives the longer stride in the water, and enables the oarsman to row a slightly slower stroke to get the same pace as with a shorter oar; but, on the other hand, the longer oar is rather more unwieldy. The size of the blade is perhaps rather more important. As has been before remarked, the oar is a lever of the second order, the blade covered in the water is the fulcrum, and in order to get the greatest mechanical advantage it is necessary that the fulcrum should be as stable as possible. The bigger the blade of the oar, the more stable the fulcrum. But human nature refuses to keep on making supreme efforts against an unyielding resistance; it is impossible to get a man to keep on putting out his greatest strength when he feels little response to his efforts, much less is it possible to get him to put forth that quickness and dash which is so necessary in the formation



RACING EIGHT AND PRACTICE BOAT.

of a good crew. Hence it follows that it is not possible to lay down the size of the blade on mathematical principles, but only from experience. In the days of fixed seats, the consensus of opinion fixed the width of the blade at 5 inches. The introduction of slides necessitated the use of longer leverage inboard, and the button of the oar was shifted 4 or 5 inches further away from the handle; to counterbalance this alteration in the leverage the width of the blade was increased ultimately to $6\frac{1}{2}$ and in a few cases even to 7 inches. Experience showed that this was too much, and of late years the width of the blade has been gradually cut down without any loss of power to the oarsman, but rather with considerable gain. My own experience points to a $5\frac{1}{2}$-inch blade giving better results than a 6-inch blade, whether the total length of the oar be 12 feet or 12 feet 6 inches, and I rather suspect that a 5-inch blade would give still better results. With the small blade, there is very little loss of mechanical advantage, but there is immense gain in life and dash to the crew. My preference is for an oar 12 feet 6 inches over all, buttoned at 3 feet 8 inches, with a blade $5\frac{1}{4}$ inches wide.

COACHING—To coach an eight or a four or any combination of men in a boat requires certain qualities in a man, chief of which, after a practical and theoretical knowledge of rowing, are unbounded patience and good temper, coupled with continuous and close observation. It is essential that the men who are rowing should have supreme confidence in their coach, and on his side it is equally necessary that he should do nothing to forfeit this confidence. Thus he should never make a hurried criticism on any individual lest he should by chance bestow blame where the individual addressed, or, what is perhaps worse, his comrades in the boat, know that it is not deserved. It is very unwise, too, on the part of a coach to tell his crew to do a certain piece of work, having the intention of not stopping them at the distance named, but of keeping them on for some further distance; very likely the crew has not been rowing hard enough during the early stages of a practice row, and for that one particular row the trick will be successful; but the success is gained at the expense of the loss of all confidence in the coach, and a great unwillingness on the part of the men to extend themselves in future rows. During practice the coach ought always to tell his crew what their hard work is going to be, and he must always keep his word, unless something unforeseen crops up to stop the work.

It is important to keep the attention of the crew fixed upon the instructions of the coach; therefore he must often vary the tones of his voice, and, as men's minds are differently constituted, and explanations which will satisfy one man will fail with another, so he must vary the terms of his instructions.

It is bad policy to keep on talking to one individual, even though his faults be many and glaring; it will either make him extremely angry, or else extremely despondent and hopeless of improving himself, neither of which frames of mind is conducive to good rowing. It does occasionally occur, however, that the very best results are obtained by continuous coaching of one individual during a practice row, but the coach must be very certain of the temper of his man before he tries this dangerous experiment.

There are men who have a thorough knowledge of the theory of rowing and a wide experience in its practice, but who, in coaching an eight or a four, devote all their time towards endeavouring to make each individual oarsman row in the best possible form, without really paying much attention towards combining the individuals into a crew. This is a fatal mistake. Granted that if eight individuals are coached on exactly the same lines and brought to the utmost perfection of style, they will naturally row perfectly together; but in this imperfect world it is impossible to produce perfection, and as each individual fails, even though it be by but a little, to reach this necessary point, so will the crew, coached on this system, fail to attain combination.

The chief duty of a coach is to form individuals into a crew, to make them row as nearly as possible absolutely together; it is really subsidiary to teach each man to row in the best style; this ought to have been done before the men are put together in an eight, though a good deal may still be taught to individuals in a tub boat during the early stages of practice. While the men are out in the eight, the attention of the coach must be given entirely towards correcting those faults which interfere with the uniformity of the crew, and towards making the crew acquire those points of swing, rhythm, beginning, which he considers necessary to give them pace.

No one has yet attempted to lay down any principles to guide the coach in getting his crew together, and it is difficult to lay down any such principles, since no two crews ever have exactly the same faults, but I think that it is possible to do it to a limited extent.

Every crew in its earliest stages presents the following characteristics—shortness of finish, slowness of recovery, hurry of bodies and slides forward, hang over the stretcher, missing of the beginning, oars in and out of the water at different times—a formidable catalogue. Where is the coach to begin? The rattle of the oar in the rowlock presents itself as the easiest point at which to begin to rally the crew together; the ear assists the eye.

Therefore let the coach's first instruction be, "Listen for the finish, get the sound of it together, and be quick with the wrists in the

recovery." Following on this point, the coach must try to steady the swing forward: "Get the bodies well down before the slides are started, and feel the feet on the stretcher."

These two points can be impressed upon the crew at the same time, and it is best to let them practise these for some little time without attempting to proceed further; but it is very useful to make the crew break from a paddling stroke (which ought not to exceed 30 per minute, nor go below 28 per minute) into a row for some six to ten strokes, during which the coach must insist on the swing forward being still slower and longer, while the blades are brought faster through the water (I use this expression, though it is quite wrong, because it is the usual one employed by rowing men), and upon the men putting all their strength into each stroke, and keeping the blades well covered right to the finish. After rowing these few strokes, the crew ought to be allowed to drop to the paddle again, and instructed to get the recovery sharper and the hands quicker away; they will improve more quickly if they understand that the coach wants them to improve in one definite point at a time; and this sharpness of recovery is perhaps the most important step towards getting the crew together.

Along with this practice in the eight, all the men composing the crew must be taken out in pairs in a tub and carefully taught the correct use of the slide (very few even of the best oarsmen slide properly), and the proper sequence of the motions of the recovery, in addition to the correction of any other faults which they may have acquired.

The early practice of a crew is generally carried on in a clinker-built boat; it is advisable to discard this as soon as possible; a racing ship is a little more difficult to balance and keep on a level keel, but is much more likely to have the work put correctly for each man, and it is impossible for a crew to make much progress in a heavy ship towards that life and briskness which is so very necessary.

The mention of work reminds me of one very important duty of the coach. It is really astonishing to see how seldom the work is put correctly in a boat even when fresh from a boat-builder; more often than not many alterations have to be made before the boat can be used; heel traps have to be moved opposite to the slides, or slides have to be moved in order to put a man opposite to his feet, the outriggers have to be lengthened or cut down in order to get the leverage equal all through the boat. All these things ought to be looked to, and measurements taken, by the coach himself before the boat is used; it is not fair to the crew to ask them to improve themselves as long as they are handicapped by their tools. The coach ought never to allow any individual to alter the height of his own work (*i.e.*, the height of the sill of his rowlock above the seat); if he does, he will very soon find that every other man wants to alter his work, and the result will be startling. I have found one man with his work at $5\frac{1}{2}$ inches, and the next man to him with his work at $7\frac{1}{2}$ inches, and they both wished to alter it further. Every man ought to have his work at the same height, unless he has some peculiarity of build or figure.

When the crew have begun to get the recovery smartly and fairly well together, while showing length and steadiness of swing in their short pieces of rowing, it is time to make them do some more extended pieces of rowing for some six or seven minutes, during which they must be made to row really hard. This is necessary, not only for purposes of training, but also because men must be taught to row hard. No man naturally rows quite as hard as he can; he must be forced to the utmost of his power during the early stages of practice, or he will not properly develop his rowing muscles. During these short hard rows the crew will not exhibit any life or dash; the coach must be satisfied if he gets real hard work and a long swing. He must alternate these hard rows with long stretches of paddling, breaking occasionally into few strokes of rowing; it is during these few strokes of rowing that he must now try to infuse life and dash into the men. "Sharp with the hands over the stretcher, get all the weight and work on at the beginning, feel the feet on the stretcher, and swing the finish well out. Drive with the legs." "Sharper on to it."

These are all the general instructions that I feel able to give. Every crew has its own peculiar characteristics, and require more attention to be given to some particular point.

As the day of the race for which the crew is preparing draws near, the attention of the coach must be given entirely towards getting the crew absolutely together; and it may sometimes be necessary for him to teach a man to do something quite opposed to all the principles of good rowing in order to get him into more uniformity with the rest of the crew. At this point individual form may have to be sacrificed for the benefit of the crew. The sacrifice ought not to be made for a crew of juniors; but in more important contests it sometimes has to be made.

The coach ought not to put off raising the slow practice stroke of 30 per minute too long. At least three weeks before the race the crew ought to be accustomed to rowing 32 for periods of seven or eight minutes, and 34 for one minute; and every third day another stroke should be added on. If the race is a long one of three or four miles, the crew ought to be able to row 34 to 36 all the way, with the command of a spurt of 38. Over a course of a mile to a mile and a-half, the racing stroke will be 38, with the power of spurting to 40 or 42.

The crew must be well practised in starting. It does not matter very much whether they start with two short strokes and then a long one, a short stroke, a three-quarter stroke and then a long one, or a long stroke, a half-stroke and then a long one, all of which are used by different crews. The pace of the start depends on the steadiness of the men and the cleanness with which the blades leave the water for the first few strokes, and, most of all, on how soon the men settle down together to their own style. The start is always a scramble; the crew that scrambles least is generally ahead at the fifth stroke.

I do not propose to say much on training. As long as the food is plain and simple, it does not make much difference what is eaten, though the more variety the better. The most important matter in training is absolute regularity of habit. Drink must be restricted, especially during the early stages of training, when the wasting of fat calls for more liquid. Absolutely no smoking. Here are the regulations for the training of most modern crews.

7.0 A.M.	Called. Dress in flannels.
7.15 ,,	Half-glass of milk and a biscuit. Go for walk of about two miles. Sharp sprint for 200 yards. On return, tub and dress.
8.30 ,,	Breakfast—1½ cups of tea, fish, eggs, cutlets, &c.
11.0 ,,	Work on the river.
1.0 P.M.	Lunch—½-pint beer, cold meat, salad.
3 0 ,,	Work on the river.
6.30 ,,	Dinner—Fish, entrée, joint, milk pudding and fruit. 1 pint of beer. Dessert, 1 glass of port.
9.55 ,,	A cup of water gruel or barley water, and biscuit.
10.0 to 10.30 P.M.	Bed.

SCULLING—The principles which guide the oarsman in learning how to row are also applicable to the man who wishes to learn how to scull. He must learn how to slide, how to swing, and how to use the blades of his sculls in the water on exactly the same lines as if he were rowing. But between the oarsman and the sculler there is a great gulf fixed: a good oarsman, even of the very highest class, is by no means necessarily a good sculler; he might, and probably would, with a large amount of practice, become one; but he would require a long and carefully conducted course of training before he could approach the front rank as a sculler. The converse too is true; a first rate sculler is not necessarily even a moderately good oar. Probably the reason is that he is so accustomed to row at his own pace and in his own style that he cannot accommodate himself to the stroke and style set by somebody else. Men who have both rowed and sculled with success at the same regatta complain that their sculling powers have been much hampered by the necessity of having also to row—that their rowing practice has stiffened their muscles and thrown them out of gear for sculling. I do not think this complaint is well founded. The man who goes in for one event as a sculler has a sufficiently great advantage over his rival, who also competes in some other event as an oarsman, in the fact that, given they each spend an equal amount of time in practice on the water, the latter will only get half as much practice in his sculling boat as the former—his practice as an oarsman is of little use to him as a sculler except as a means of getting him into condition. Sculling requires a great deal of practice.

To attain even moderate success as a sculler, a man must acquire a greater knowledge of watermanship and a greater delicacy of touch in handling his sculls than would be required from an oarsman of the same calibre. The secret of success in sculling lies perhaps more in doing nothing to stop the progress of the boat than in actually applying strength to propel it. Thus it is essential that the two hands should work perfectly together, that the blades should enter and leave the water exactly together, and that the power should be applied evenly and at exactly the same moment from both feet, not only because in this way the power is applied to the best advantage, but also because any failure in this perfect combination and unison means that the boat does not run straight during the pressure of the stroke, and that part of the power is more than wasted—is actually applied to forcing the boat out of its direct course and necessitating the use of further power in order to correct this error. Let a beginner watch the stern of his boat as he sculls and try to keep it straight on some landmark. Let him try as diligently as he may to get both sculls into the water exactly together and to apply his power equally to both, yet he will find that the stern of his boat immediately wanders off that mark and that he must give extra pressure to one hand or the other before the stroke ends in order to get it back on the mark again. If he keeps on practising in this manner till the stern does keep true on the mark without any conscious volition on his part, he is on the high road to being a good sculler—all his power is going towards the propulsion of his boat.

A sculling boat must not be forced by any jerk either at the beginning or finish of the stroke; she resents it and shows her resentment by jumping up and down instead of adding to her speed. So that any power applied without smoothness and firmness is practically wasted.

But the most fatal factor in stopping a boat is feather under water; this fault comes partly from a weak finish, but mainly from slow wrist action.

The first points, then, which a beginner must try to acquire are perfect evenness with his hands and work, and cleanness of feather.

His swing and stroke in the water are guided by the principles which I have already laid down, but there is an additional point on which I wish

to lay some stress. The professional sculler, during his swing forward, keeps his sculls feathered till he has all but reached the furthest extent of his swing forward; then he turns them square with great rapidity and covers them in the water with what appears to be the same motion—it is done so quickly that the eye can hardly see the blades squared. The amateur as a rule does not imitate the professionals in this matter, and in my opinion is wrong, since the great failing of all amateurs who do not imitate the professionals in this, is that they clip a great part of the stroke and miss the beginning owing to their heaviness of hands over the stretcher. Even a third rate professional gets a better and a quicker grip of the water than most of our best amateur scullers, and it is owing to this quickness off the feather and into the water that he gains the advantage. In other respects the modern professional compares badly with the amateur (except, perhaps, that his finish is rather cleaner), but the advantage he gains from this one point is sufficient to make his stroke in the water longer and more effective than that of the amateur.

The finish of a sculler ought to be rather different from that of an oarsman. In an oarsman, it is a fault to meet the oar: the sculler can, and ought, to swing further back than he would if he were rowing, and after he has finished both slide and swing, he can still use his weight by pulling his body up to meet his sculls as they come home to him—this not only helps his recovery, but prevents the long swing back from burying the bows of his boat.

To a sculler, a long swing both forward and back is very important. In a race, a long swing will often carry a tired man past a stronger, but equally tired opponent. A sculler ought to be very careful about the arrangement of the work of his boat, the height of the work, and the length of leverage. What is right for one man is seldom right for another. If he cannot get advice from some experienced friend or a professional on this point, he must try experiments for himself. The work in an ordinary boat is often set too high. The ordinary measurement from thowl to thowl is 4 feet 9 inches, with sculls measuring 2 feet 8 inches to 2 feet 9 inches inboard—this is perhaps enough for a man of 5 feet 10 inches, or thereabouts; but for a taller man or for a man with longer arms than usual it is not enough; when he is full forward, his sculls form such an acute angle with the boat that a great part of his power is lost in pinching the boat instead of going towards its propulsion. I am inclined to think that 5 feet from thowl to thowl, with increased inboard measurement of sculls, would suit the sculler of average height better than the present arrangement.

The following are the dimensions of a sculling boat which would carry a man of about 11st. 7lbs.

Length over all	31	feet.
Greatest breadth	11	inches.
Depth forward	$3\frac{1}{4}$	,,
Depth aft	$2\frac{1}{2}$	,,
Depth amidship	$5\frac{1}{2}$	,,
Weight	28	lbs.

The sculls ought to be as light as possible, so long as they are stiff; when at right angles with the boat, they ought to overlap at least so much that the hands are well clear of each other. The common measurements for sculls are, total length, 9 feet 8 inches to 9 feet $9\frac{1}{2}$ inches, length inboard, 2 feet 8 inches to 2 feet 9 inches, breadth of blade, $5\frac{3}{4}$ inches to $6\frac{1}{4}$ inches.

STEERING—**The Coxswain**—The coxswain occupies a very responsible and a very ungrateful position: he can do nothing to add to the pace of the boat, and he can only expect to be praised for having done nothing unnecessary to hinder it.

In addition to his actual duties as steersman, he is expected, when in the boat, to keep an eye not only on his course, but also on each individual oarsman, to correct anyone who is out of time, and to rebuke any one who commits the crime of looking out of the boat. In a word, the discipline of the crew is put into his hands from the time that the boat is put into the water till she is taken out again; even when he is out of the boat he has to superintend the crew while they get into or get out of the boat.

The coxswain must sit quite upright on his seat with his legs crossed, his body giving slightly from the hips with the motion of the boat, his hands resting on the thwarts by his sides. He ought to tie the ends of his rudder lines in front of him so that he cannot drop them overboard; the places where he ought to hold his lines are generally marked by pieces of wood. The coxswain must not shift about on his seat while the crew are rowing.

Few coxswains understand that, when the rudder is applied, the boat swings as if pivoted on a point somewhere between Nos. 4 and 5, that as the bow of the boat swings in one direction so does the stern (with the coxswain in it) swing in the other. Many coxswains seem to think that when they put the rudder on, the body of the boat will follow the bows like the body of a snake after its head.

The coxswain ought to make as little use of his rudder as possible; he ought to steer on some landmark, and keep the bows of the boat as it were balanced on it by gentle touches of his rudder. No boat ever runs quite straight for many strokes consecutively, either owing to uneven rowing or to a beam wind or to some other cause, and the coxswain must be on the

look out for the slightest deviation, ready to check it before it becomes serious.

Light hands and very gentle touches of the rudder are necessary; racing boats have no keels and make leeway when the rudder is applied; it is difficult to get them to run straight again after a severe application of the rudder.

On a narrow river, with big corners, the coxswain is rather severely tried. He ought to take as much room as he can before he comes to a corner, and must not begin to shape his course for it too soon. The rudder must be applied gradually and between the strokes. In a race the coxswain should not watch the other crew; if he does, he insensibly steers towards them.

In a bumping race he should steer his own course, and not attempt to follow the boat ahead if that should go out of its proper course. He should not attempt to make a bump unless he is sure that he will not miss. If his boat is in danger of being bumped, he may be able to wash off the pursuer, but only if the latter is badly steered; he is more likely to commit some fatal error in his own course owing to his attention being entirely taken up by what is happening behind him.

A coxswain requires a cool head and a ready judgment; not infrequently some sudden emergency arises when the coxswain has to make up his mind what to do. He must not look for advice from any one rowing in the boat; rather than do that, he must rebuke with strong language any one who offers advice from the boat; it is the coxswain's duty to settle what ought to be done, and he alone must do it. He must never allow any one rowing, not even the captain or president of the club, to tell him what to do.

D. H. McLEAN.

ROWING AT OXFORD—**Early History**—College rowing appears to have been in existence at Oxford very early in the century, but inter-college racing was not then a regular institution as it is now, and records on the subject are very fragmentary. In 1815 we learn that Brasenose were head of the river, Jesus being their chief and perhaps only opponents. For many years onwards these two seem to have been the principal rowing colleges, the rivalry between them being very keen, as shown especially in the many four-oared matches they contested. At the same time eight-oared bumping races took place with some regularity, although very few colleges were represented. Up to 1825 the crews competing in these eight-oared races were started in a very curious manner out of Iffley Lock; the lock-gates

DOWN THE BARGES. THE EIGHTS AT OXFORD. (*Taunt and Co.*)

were opened when the word to "go" was given, and the boats scrambled out as best they could. The usual method seems to have been for stroke to stand in the bows with a boat-hook and push out against the lock-gate, running down the gangway. He then jumped into his seat and exchanged boat-hook for oar. As Iffley Lock would only hold four boats at a time, this system of starting was doomed on any considerable increase in the number of entries, and in 1825, several new eights having put on, a new method was resorted to, the boats taking stations 100 feet apart, the lowest just above the Lasher. No further change in, or addition to, this system was made till 1839 when, at the start, the coxswain of each crew was made to hold a rope, the other end of which was held or fastened on shore, and the firing of two guns—one preparatory and one final—was substituted for the single pistol shot which had hitherto been the starting signal.

JUST BEFORE THE BUMP.

In 1839 the Oxford University Boat Club was formed, and two challenge races—the University Fours and the University Pairs—were instituted. The Sculls were added two years later. The Pairs as well as the Fours were originally rowed in the October term, while the race for the Sculls took place in the Lent term. In 1852 and 1857 respectively, the Sculls and Pairs were transferred to the summer term, in which they have been held ever since. Originally the races in all three events were rowed level, but the Berkshire side proving much the better, and fouls continually taking place, the system was eventually abandoned in 1857 and the present system of time racing substituted. In 1839 the first mention is made of Torpid races, which were then rowed a few days after the Eights. They were not transferred to the Lent term till 1852. There is little more to record as to the history of the various rowing institutions that exist at Oxford to-day. Their growth has been steady and continuous, and the changes and additions made from time to time have been chiefly in matters of detail. The Eights were originally rowed for a more or less indefinite number of nights, the earliest idea being that "every boat must have its night"; that is to say that the evenings on which racing should be held must be equal in number to the boats competing; so that the bottom boat should have its chance of rowing head of the river. When the crews had found their level, however, the races appear usually to have been stopped by common consent. In these early times the races did not take place on consecutive nights, but at somewhat irregular intervals. Subsequently the number of nights

Drawn by Lauren Davis

Lauren Ambrose Engraving Co

Rowing

was limited to eight and finally to six, and the racing evenings—except where Sunday intervened—were made consecutive.

College Rowing at Modern Oxford—The rowing year at Oxford of to-day may be said to begin in October and end with the close of the summer term in the following June. This is true at any rate from the point of view of the colleges. From the point of view of the University Boat Club the division is a different one, but this is a matter that will be referred to later. At the beginning of the October term each college devotes itself largely to the coaching of its freshmen and junior oarsmen. At the same time, if it is a prominent rowing college and can put on a sufficiently good crew, it will enter a four for the Coxswainless Fours, an event which takes place early in November. Very few colleges are, as a rule, represented in this race, and the majority can devote themselves exclusively to fashioning their raw material with a view to future use. To this end, after an adequate period of coaching in pair-oared gigs, each college arranges its freshmen and other beginners in four-oared crews, and, after a further period of instruction, races these against one another. After this, eights are taken out consisting as a rule partly of freshmen and partly of men who rowed in the previous Torpids, but failed to get into their college eight. Practice of this kind continues till the end of the term in view of the coming Torpids. But before dealing with the next term's racing something more must be said of the University Fours.

The Coxswainless Fours—This race, whose institution has already been recorded, is open to four-oared crews representing the various colleges. It is rowed in light coxswainless boats, and is a time race. It may be well to explain the meaning of this term. As has already been shown, the course at Oxford is in places too narrow to admit fairly of two boats racing abreast. All races at Oxford, therefore, are either time races or bumping races. In a time race the boats, which start in heats of two at a time, are stationed one behind the other, a considerable distance apart, and row to different finishing posts, the same distance separating the finishing as the starting posts. At each finishing post a man (who must not be a member of either of the colleges interested) is stationed, whose duty it is to drop a signal when the crew for which he is acting reaches its post. A judge, who is stationed in a punt below, whence he can see both signals, decides which of these was the first to fall, and thus declares the winner. On this principle the Coxswainless Fours are rowed, and although, as has been said, the entry is small, considerable trouble is taken in the preparation of the crews competing, which are usually of good quality.

The Torpids—In January, at the beginning of the Lent term, each college arranges its available material, in one, two, or three eights—as the case may be—for the Torpid races, which take place about the middle of the term. In these races a college may be represented only by oarsmen who have not rowed in the eights of the previous summer, and may put on one or more crews. Some colleges are represented by as many as three Torpids, but the majority by either one or two. The boats rowed in must be clinker-built, and the races are bumping races. They begin on a Thursday, and conclude on the following Wednesday, being rowed on each afternoon of this period, with the exception of Sunday. As the meaning of "bumping race" will not be known to everybody, it will be well to describe here the system as applied to the Torpids. The boats, in these races, start from posts which are set 160 feet apart, the coxswain in each case holding the end of a rope, 50 feet long, attached to one of these posts, until the starting signal is given. The object of each crew is to catch the crew in front of it, a bump being effected when the pursuing boat has touched any part of the boat pursued. The actual distance, it will be noticed, which a crew has to gain in order to make a bump is that which separates the nose of one boat from the stern of the one in front of it; that is to say about 104 feet, or a little under two lengths. In racing, however, the boat pursuing is at a somewhat greater disadvantage than this would imply, for it must overlap its opponent by some 4 or 5 feet to be reasonably certain of making its bump, and when a bump is imminent the crew that is behind is hampered to some extent by rowing in the other's wash. When a bump has been made, and acknowledged by the defeated coxswain holding up his hand, the two boats concerned, having finished their race, draw aside to let those behind pass them. As the whole course available is not a very long one, and the distance for the upper boats would be too short if all the crews raced at the same time, they are separated into three divisions, the lowest of which rows first, the middle second, and the highest last; about an hour separating each in point of time. The object of rowing them in this order is to make practicable the passage of a rising boat from a lower to a superior division. This is effected by allowing the crew that has finished head of a lower division to compete later on in the same afternoon as bottom of the next division. A boat that is in this position is called the Sandwich boat. It will thus be seen that a crew which starts second in one of the two lower divisions, can make two bumps on the same night. The Torpid races are very keenly contested, and every night a great crowd accompanies the boats, each crew having its band of supporters, who run from start to finish applauding and exhorting.

The Clinker Fours—The other event of

the Lent term for college clubs is the Clinker Fours. In this race, which takes place near the end of the term, a college may be represented only by men who have not rowed in the upper division of the preceding summer Eights; "trials' men" being also excluded. It is intended, in fact, as a race for the lower colleges, whose crews are not likely to be good enough to make it worth their while to enter for the Coxswainless Fours. Few entries, however, are as a rule received. The boats used must be clinker-built, and have slides of not more than 12 inches in length.

The Eights—The next inter-college races in order of time, and the greatest of all in importance, are the Eights. These take place about the middle of the summer term; so that unless a crew come up before term begins, little more than three weeks of preparation are possible. Practice, therefore, begins directly the men are up, and strict training very soon afterwards. The "Eights" are bumping races, the system being identical with that used in the Torpids. The starting-posts, however, are only 130 feet apart (the distance actually separating the boats being little over a length); the crews row in two divisions instead of three; and the boats used are of the lightest class instead of being clinker-built. The Eights are the great event of the rowing year at Oxford, and the greatest honour a college can attain is the headship of the river.

Other Races—Various other races take place in the summer term. About a fortnight after the Eights, the University Pairs and the University Sculls are contested. These events are open to all who have not exceeded 18 terms from the date of their matriculation. For the Pairs, any two who choose to compete together may enter, irrespective of college. Like the Coxswainless and the Clinker Fours, both the above are time races. In addition to these there are usually College Pairs and College Sculls for competition among the members of each college. College regattas (in which the rowing is not of a serious character) also take place about the end of the summer term.

Trial Eights—The University Crew—Thus far all reference to the making of the University Crew has been avoided. The University rowing year, as opposed to the College rowing year, begins at the commencement of the summer term. The President of the Oxford University Boat Club for the ensuing year is then elected by the representatives of the colleges assembled at a Captains' Meeting. The selection of the University eight rests entirely with the President, whose labours begin in the summer term with the self-imposed duty of watching the various college crews in the hope of discovering promising material. Throughout the October term that follows, men from every college in the University are tried in Trial Eights—each college sending in to the President the names of two or more of its best oars. By this means all with any pretensions to merit are given a trial. At the beginning of the term one eight is taken out daily, and a little later two crews—coached respectively by the President and the Secretary of the University Boat Club—row twice every afternoon. The least promising oars are only given a very short trial, but the better men are tried longer. Eventually, the process ends in the survival of the fittest, and the two eights finally chosen are matched against each other over a two-mile course at Moulsford, in order to test the capacity of the men in a race. From these sixteen "trials' men," with the addition of the President and Secretary of the University Boat Club and possibly one or two old blues who may have been excused from rowing in trials, the University eight which is to row against Cambridge is chosen in the following term.

R. P. P. Rowe.

ROWING AT CAMBRIDGE—There is an old joke at Cambridge that the man who first rowed on the Cam must have been a lineal descendant of the hero who first swallowed an oyster. Uninviting the narrow stream has always appeared, and despite the fact that a new drainage system has partially cleansed its muddy waters, it is still far from a thing of beauty. Yet, as if in defiance of nature and municipal sanitation, the river for over seventy years has been one of the most famous in the rowing world. There is probably not an athlete amongst English-speaking people who is not to-day perfectly familiar with the name of the Cam.

The University Boat Club—On February 20th, 1829, it was resolved, "That Mr. Snow, St. John's, be requested to write immediately to Mr. Staniforth, Christ Church, Oxford, proposing to make up a university match." The challenge was accepted, and thus was the first race between the two universities brought about, and, as a natural consequence, the C.U.B.C. sprang into existence. At first it was decided that the representatives of university rowing should pay their own expenses. But gradually the increased cost of materials and the more elaborate training rendered it necessary for the colleges to be called upon for financial assistance. Each college now pays to the common fund a sum which varies according to its income derived from undergraduate subscriptions of the previous year. A meeting is annually held in the university boat house, at which the captains of the various college boats are present. At this meeting the president and secretary for the ensuing year are elected, the accounts are passed, the dates of the various races are decided,

and all matters connected with university rowing as a whole are discussed. The selection of the university crew is entirely in the hands of the president thus elected: though, of course, he will probably seek advice from the coach of the eight when he is himself in any doubt.

The College Clubs—The records of the college boat clubs begin in 1826, so presumably rowing flourished for some time before that date. The "Laws of the Monarch Boat Club," the members of which were Trinity College men, still exist. The rules were very strict, fines being inflicted on any member who absented himself "from his appointed crew and did not provide a substitute for his oar;" or again an oarsman might incur penalties for "giving orders or speaking on a racing day or on any other day after silence had been called" and for neglecting to wear his "proper uniform." A touch of humour was added to this Draconian code by a clause enacting "that the treasurer be chastised twice a week for not keeping his books in proper order." In 1827 we find that there were six boats on the river—a ten oar and an eight oar from Trinity, an eight oar from St. John's, and four six oars from Jesus, Caius, Trinity, and Westminster respectively. Crews were, however, as often known by the name of their racing boat as by that of their college. Thus there was a Privateer, a Corsair, a Dolphin, a Black Prince, and the like, all of which contained at times famous combinations. In 1831 the number of boats entered for the races appears to have been thirteen. Bumping was then, as now, the method adopted for deciding the respective merits of the crews. The starting distance between each boat was fixed at 20 yards. From this date college rowing may be considered to have taken the position that it has ever since maintained as the first of university sports. It was keenly pursued by the undergraduates and recognised by the authorities. On the river the number of boats gradually increased until it became necessary to split them up into two divisions. The headship of the river became a post of no small honour and glory. The longest period for which it has been held by one college is eleven years, Jesus maintaining that honourable position from 1874 to 1884. Other excellent records of recent years are those made by Trinity Hall from 1885 to 1888 and 1890 to 1897 inclusive.

A Bump. (*H. W. Taunt and Co.*)

The Racing River—The course used for racing at Cambridge has altered from time to time. In its early days the racing commenced in the stretch of water which is now the finish of the course. A little above "Charon's" ferry were the Chesterton locks, and above these locks the boats were stationed in order. The

leading boat stopped rowing at the Jesus locks, which were then situated in the position now occupied by the Caius boat-house. After the abolition of the Chesterton locks the course was changed. The boats in both the Lent and May races now lie before the start in a long line between Baitsbite and a point but little short of First Post corner. The corners in the course are its great disadvantage, although the oarsman may learn some watermanship thereby. At First Post corner the river turns sharply to the right, at "Grassy" a long bend to the left takes us to Ditton; there another corner carries us into the Long Reach, where the hardest struggles frequently take place. Above the railway bridge are two more slight curves, and the leading boats stop rowing by the ferry known as the "Big Horse Grind."

The Races of the Rowing Year—There are no lack of events at Cambridge for the enthusiastic oarsman to try his mettle. Arriving as a freshman, he will enter his name on the college boat club, and will then receive a notice from one of the college captains to appear at a certain hour at the boat-house. There, arrayed in the rowing uniform of his college, he will be placed in a gig pair or "tub," and taught, if he knows them not already, the rudiments of oarsmanship. He will next be placed in one of the numerous freshman's eights, from the crews of which the Lent boats that are to represent the college will be selected. Then come the Lent races, to be followed, if he has acquitted himself well, by practice for the May races. Possibly, if he still progresses rapidly in the art, he may find himself in October included in one of the two trial eight crews from which the university eight is chosen. That a novice, without experience previously acquired at a boating school, will obtain his "blue" his first year is of course unlikely, though by no means impossible.

The Lents—The Lent races take place about the last week in February. The races are bumping races and the starting posts are 175 feet apart. No oarsman is allowed to compete who has rowed in the May races. The boats are clinker built, with fixed seats. Thirty-one boats, divided into two divisions, take part in them. Every college must be represented by at least one boat, though after that there is no restriction as to the number of boats from any particular college club. The races last four days.

The Mays—The May races take place at the commencement of June. The races are bumping races, and the starting posts are 175 feet apart. They are rowed in keelless "light" ships with sliding seats. No club can have more than three or less than one crew in these races. Thirty boats take part in two divisions. The races last four days.

The Trial Eights—Two picked crews, selected from the whole of the college crews by the president of the university, meet at the end of the October term near Ely. The race is 3 miles long, over what is known as the Adelaide course.

The Fours—These races take place in the end of October. They are rowed in light ships without coxswains. They are "time" races, *i.e.*, two or three boats row together one behind the other, but at the distance of 100 yards apart: the moment that they arrive at their respective winning posts is signalled, both by flag and pistol, and the result of the race thus known.

The Clinker Fours—These races take place in the Lent term. No competing oarsman must have rowed in the first division of the May races. The boats are clinker built, with coxswains. The race is a "time" race.

The Magdalene Silver Pair-oars and University Presentation Cups—These races are decided in the May term. They are rowed in light pairs without coxswains. The crews need not consist of members of one club. The race is open to all oarsmen of the university.

The Colquhoun Silver Sculls or University Sculls—These races are rowed in the October term. A competing oarsman must not have exceeded five years from the date of first commencing residence.

Various College Races—Many of the colleges have various challenge cups and trophies for sculling, pair and four oars, for which its members may compete.

B. FLETCHER ROBINSON.

ROWING IN THE UNITED STATES—The earliest obtainable record of boat-racing in America is of college making, and goes back to 1833, when Yale attained local fame at the fairs and at Fourth of July festivities in the rural districts of Connecticut, Massachusetts and New York. College archives fail to deal specifically with these first aquatic conquests, but time and collegiate fancy have jointly cast a glamour of romance over those primitive athletic days, when training was an unexplored mystery and desultory practice the order of the day. At all events, tradition eloquently expounds the prowess of Yale oarsmen in those ancient days. For ten years there was no boat-racing at Yale other than these annual descents on the country fairs, and rowing was neither a recognised nor an organised college sport.

At Harvard, with splendid facilities offered by the Charles River, an incipient spirit marked the year '39, or thereabouts, but, according to an ancient oarsman of my acquaintance, there was no organisation, and while Yale humbled the pride of the country "Bumpkins" at Fourth of July regattas, Harvard was no less victorious in winning admiration from the fair ones who lined the banks of the Charles whenever the college

boys went out for a pull. Meantime there was the same kind of pleasure rowing on the Harlem River at New York, on the Schuylkill at Philadelphia and on the Detroit River at Detroit; but at none of these points was there organised boating. The Detroit Boat Club—in flourishing existence at the present time, and with one of the handsomest club-houses in the country—has the honour of being the first boat club of America. It was organised February 18th, 1839, and held the first boat-race of which there is any record on May 24th, 1842, the contestants being confined to the members of the club.

The next association of the kind to be formed was the Yale Boat Club, organised in 1843 by seven members of the class of '44. The Yale Club had a four-oared Whitehall boat 19 feet long, about 4 feet wide, and manned by 12-foot oars. Later in the same year a lapstreak gig for eight oars was purchased, and became the pride of the University; it was long and narrow, and so fast that the extraordinary tales of earlier boats were in great danger of being effaced altogether from collegiate memory.

At about this time Harvard too had displayed an inclination for some racing and several inter-club meets were held. In '44 the Harvard class of '46 had the distinction of organising the first boat club of the University, and purchased an eight-oared boat "Oneida," that had been built for a race between Boston mechanics. It was a heavy lapstreak, 37 feet long, $3\frac{1}{2}$ feet in its widest part, and tapered gradually to bow and stern: it sat low in the water, had no sheer, was floored half way up to the gunwale with wooden strips, and had hard-wood gratings at either end, that were the crew's absolute delight. On every state occasion these gratings were rubbed, oiled and polished until they shone again: plain, flat, wooden thole pins fitted into the gunwale. The "Oneida" stands out prominently and gallantly in the first days of college boating. She won the first race with Yale in '52, and in fact was not beaten until '56, when racing boats pure and simple were introduced. The Yale contemporary of "Oneida" was the "Shawmut," which had room for six, with the captain's seat at the extreme stern, and elevated so that he could look over the heads of the crew. These were the days when college boats were constructed more for pleasure than for racing, and accommodation was invariably made for guests. There was no "training"; rowing was a recreation, first, last and always; crews were chosen on account of their popularity as well as for their strength and general fitness, and when they rowed, the remainder of the university turned out to watch and to cheer. About the only system observed was one conveying absolute control of the boats in the evening to the best oarsmen, that is, the likely candidates for the 'Varsity boat; while the beginners or the second graders were permitted to take their boating in the morning.

Beginning with the establishment of rowing clubs in '43 at Yale, and followed by Harvard in '44, rowing took an impetus that carried it along merrily for a few years, but rather left it to shift for itself at about '49.

The first Harvard-Yale boat race was rowed in '52, on Lake Winnipiseogee in New Hampshire, in eight-oared barges over a two mile course. The curious feature of this race was a trial in the morning and the final in the afternoon over the same course and by the same crews, Harvard winning both with the famous "Oneida." Another curious feature was that the stroke oar in both boats sat on the starboard side.

From the very beginning, the faculties at both Harvard and Yale had merely tolerated boating. In '51 a students' row at Harvard resulted in a faculty order prohibiting the construction of new boats. Yale boating, although not actually frowned upon by the faculty, had by no means received either a helping word or hand. Meantime the boating spirit had been spreading throughout the country, though, as at the Universities, it remained devoted almost entirely to pleasure rowing in barges.

Perhaps there was more interest displayed at Philadelphia, on the Schuylkill, than elsewhere, but the next club to be formed was the Atlanta in New York, organised in 1848 and followed in 1853 by the Bachelors' Club, which still thrives as the oldest boat club in Philadelphia.

The second race between Harvard and Yale was in 1855, rowed at Springfield, a mile and a half and return, and again won by Harvard in an eight-oared barge, Yale rowing a six-oared barge. Yale's boat, with wooden outriggers, was considered to be the superior, but the crew pulled a short, jerky stroke—60 to the minute, old-timers declare. This victory gave rowing at Harvard great impetus, pacifying the faculty and resulting in the building of the first 'Varsity boat, which was a rudderless 51-foot lapstreak, with out-riggers and spruce oars, then seen for the first time at Cambridge.

There was no race with Yale the next year, nor indeed the following one, but the latter year—1857—marked an epoch in American rowing, for it was signalised by the construction at Harvard of a six-oared shell—the first one in America—40 feet long (made short in order to turn a stake easily) 26 inches wide amidship, and weighing 150 pounds. The shell was made of white pine and fitted with iron outriggers similar to those now in use, except for the swivel row-lock. Added to this were spoon oars. It was a great stride in rowing and the Harvard crew of '58, it may be well imagined, were a rather proud lot. In May 1858 the Harvard Magazine proposed the establishment of an annual inter-collegiate regatta and circulars

were forthwith sent to Brown, Yale, and Trinity, which resulted in a meeting of delegates at New Haven, May 26th, and in the arrangement of a three mile race, July 23rd, at Springfield. Considerable preparation was made by both Harvard and Yale for this event, but the drowning of the Yale stroke a few days before the regatta put an end to all thought of racing for that year.

The rowing movement continued, however, and in the following year — '59 — both the Harvard and Yale crews settled more earnestly to their work. For the first time training was instituted. It will be amusing reading for athletes of to-day to quote a leaf from the daily work of those college oarsmen: "arose at six, walked and ran before breakfast, on an absolutely empty stomach, between three and five miles, running in heavy flannels more than half the distance and part of that at full speed. After breakfast and recitation rowed about four miles at speed, and again in the afternoon the same distance . . . . much of the rowing being on time. Beef, mutton, bacon, chicken, toasted bread, boiled rice, and weak tea constituted the menu; no wine or beer and but a few vegetables were permitted."

The race of '59 was rowed on Lake Quinsigamond, near Worcester, Mass., a mile and a half and return in six-oared shells, and was won by Harvard, Brown also competing.

The following year, '60, was a repetition in entries and results of '59, Harvard rowing in a new shell, longer and narrower than any she had yet used. From 1860 to 1864 there were no races between Harvard and Yale; both colleges, however, organised crews each year which did some training and were continually seeking improvement in their methods. The stroke had been very short, both of the universities averaging from 46 to 50—and even, it is creditably reported, attaining on spurts as high a figure as 60.

In '64—the next race between the two—Yale, captained by Mr. Wilbur Bacon, had her first victory over Harvard. A second victory was achieved in '65, Yale making the remarkable time of 17 min. 41½ sec. The form of the men was not good; they rowed a quick, jerky stroke, but their time was excellent, and they had the great advantage of long practice together. Yale's work in both these years in fact was the direct result of indefatigable effort generously applied.

In 1866 Yale began a series of experiments with strokes that lasted—with more or less disaster—for about ten years. Not content with the good material (of its kind) which Mr. Bacon had succeeded after his several years of hard work in developing, new men came into control, and a stroke rowed principally with the arms was introduced.

Meantime club rowing was growing apace. During the absence of races between Harvard and Yale from 1860 to 1864 there had been a marked increase in the boating spirit at Philadelphia and particularly around New York. A number of boat clubs had been formed and inter-club racing became quite a feature of the season. The desire for organisation followed as a natural sequence, and in 1866, on November 25th, the Hudson River Amateur Rowing Association was organised by the Atalanta, Atlantic, Gulick, Waverly, Columbia, Mutual, Hudson, Vesper and La Favorita clubs. That the social element figured largely in the rowing club life may be judged by the published object of this Association, which was "to perpetuate the healthful exercise of rowing and to cultivate friendly intercourse among members of various rowing clubs." The organisation of an official body and the holding of regattas naturally boomed the sport, especially at Philadelphia, where the number of boat clubs multiplied rapidly, and the Schuylkill Navy assumed the lead it has always maintained. A stretch of the Schuylkill River bank bordering Fairmount Park was secured by about a dozen clubs and a beginning made that has resulted in the building of club houses not equalled anywhere in the world. There are now a good dozen of these houses, usually occupied by two clubs, built of stone, thoroughly equipped and costing on an average about $10,000 each. The oldest of the Philadelphia clubs are the Undine, University, Crescent, Philadelphia, West Philadelphia, Pennsylvania, Malta, Quaker City, Bachelor, Vesper, Pacific and College.

From New York and Philadelphia the rowing interest spread West and South and in 1874, when the present National Association of Amateur Oarsmen succeeded the old Hudson River Association and became the national body of the United States, there were, besides the Detroit Boat Club, clubs at Cincinnati, Ohio, Alleghany, Pa., Albany, New York, Washington and Baltimore, New Orleans, La., and San Francisco, Cal. There were of course many others, but these are mentioned to indicate the extent of area covered by the growing boating spirit.

The defeats administered to Harvard by Yale in 1864 and 1865 carried with them severe lessons that were learned silently and thoroughly. Harvard kept closely to the style that had served her so well, and repeated her victory over Yale in 1866, 1867, 1868 and 1869. As early as 1867 a desire to try their skill with the English Universities became manifest at Harvard, and in 1868 a challenge for a four-oared race was sent to Oxford and accepted. This was the first of the seven occasions on which English and American crews have met, of which a record follows:—

1869.—Harvard 'Varsity four rowed Oxford over the regular Oxford-Cambridge Thames course and was defeated by 6 seconds.

1876.—A Yale four met a four of the London

Rowing Club on the Schuylkill River course, at the United States Centennial Regatta, Philadelphia, and was defeated. Subsequently in September of the same year First Trinity College of Cambridge University entered a four-oared collegiate regatta, but withdrew without racing.

1878.—Columbia sent a four-oared crew to Henley, which was fouled in a heat for the Stewards' Cup, but succeeded subsequently in winning the Visitors' Challenge Cup. The Sho-wae-cae-mettes (American) won the heat of the Stewards' Cup in which Columbia had been fouled, but in the final for the Stewards' cup one of the Sho-wae-cae-mettes crew was taken ill and the crew did not finish.

1881.—Cornell sent to Henley a four-oared crew that had the previous year won the American Inter-collegiate Regatta at Lake George. It lost at Henley and also in races on the Continent.

1895.—Cornell entered an eight-oared crew at Henley for the Grand Challenge Cup, which won its first heat from Leander. The signal to start was given when Leander were not ready, and they did not therefore race, but Cornell was defeated in the second heat by Trinity Hall.

1896.—Yale entered an eight-oared crew for the Grand Challenge Cup at Henley, and was defeated by Leander.

Harvard's cup of bitterness was filled to overflowing when in the year following her defeat at Putney, her crew was also beaten by Yale, but as Yale had fouled on the turn, the race was awarded to Harvard.

This year, 1870, marked another epoch in American boat-racing, for Yale introduced the sliding seat, which was immediately taken up by all American rowing clubs. The sliding seats of those days, however, were primitive affairs, and consisted of a pine board 4 × 12 with grooved box-wood runners sliding on steel bars, with nothing to regulate the slide or to keep it from jumping off the runners.

No race was arranged between Harvard and Yale in 1871, but an association of American colleges was formed by Amherst, Bowdoin, Brown, Harvard and the Agricultural College of Massachusetts, and the race of that year was won by the last named with Harvard second; in 1872 Yale also joined the Association and in that year produced the worst crew in her history. The race was at Springfield, three miles straightaway, with six colleges entered. Amherst won and Yale finished last. The consultation of Yale men that followed this disastrous event decided that they were working on a wrong basis. They had tried short, jerky strokes and long slow ones. Professional coaching had been tried since 1864 and the foundation of a strong, winning stroke seemed as far off as ever. So Robert J. Cook, a Yale undergraduate, made his historical trip to England and when he returned he brought with him the fundamental principles of rowing, which have ever since been followed at Yale. He brought to America the long sweep and the slow recover of the Englishmen and he left behind the short slide. That year at Springfield, in a three mile straightaway, was made the first practical test of the new stroke. Yale turned out the best crew she had had for years, and won in a field that included Harvard (which finished third to Wesleyan's second) Amherst, Agricultural College, Williams, Dartmouth, Trinity, Columbia, Bowdoin and Cornell. In 1874 Yale and Harvard became entangled in a foul. In 1875 Cornell, won with Yale sixth, notwithstanding her crew being captained and stroked by R. J. Cook. In the winter of this year Yale withdrew from the Association of Colleges and challenged Harvard to an eight-oared 4 mile race, which was promptly accepted, and thus began the annual Harvard-Yale contests that are continued to this day. Harvard entered a six-oared crew in the 1876 Association's regatta, but was defeated by Cornell and withdrew. The Association dissolved in a few years and Cornell, Columbia and Pennsylvania are now the only other rowing colleges of any consequence on the Atlantic coast.

Yale forsook her good rowing principles in 1880–1883 and entered upon another era of experiments which resulted disastrously. But in 1884 she again returned to the principles Mr. Cook had inculcated, and has since never departed from them, although the crew's Henley experience in 1896 made it plain that the stroke had unconsciously grown shorter from year to year. Yale profited by her 1896 Henley experience just as Cornell had profited by hers in 1895, and there is now no fear of Harvard, Yale or Cornell again falling into the old, short, rapid-fire stroke.

At the time when Yale had ceased experimenting and settled down to sound principles, Harvard began a series of experiments which continued up to last year, when, on invitation, Mr. R. C. Lehmann came from England and established the system employed at Oxford and Cambridge. Since 1886 Harvard has won but a single race from Yale, and that was in 1891. Of the other American rowing colleges Cornell is of course the most illustrious. The first trace of any interest in boating at Cornell was the formation of the Undine Boat Club in 1869, by half a dozen students. This was merely a social club with an aquatic name, and boating was really first instituted in the Fall of 1870, through the visit of Mr. Thomas Hughes, M.P., the famous author of *Tom Brown's Schooldays*, who, realising the boating opportunities at Cornell, created some enthusiasm by offering a silver cup.

Columbia's rowing history records many victories in its earlier years, but in late years its successes have been few. Columbia, like Harvard, has suffered somewhat from vacillating coaching policies.

The University of Pennsylvania is the only prominent eastern boating university which has never attained an important place in American boating, because (with the exception of one or two years) it has persisted in teaching its crews the professional sculler's stroke.

In the West, the Universities of Minnesota and of Wisconsin put out crews every year, and on the Pacific coast the University of California has made an attempt to do likewise. American colleges labour under great disadvantage in the development of crews. The fact of their water courses being not at hand, as they are at Oxford and Cambridge, operates against the spread of a boating spirit. There is in fact no general boating spirit at our universities. The practice of the crew cannot be viewed by the student body conveniently, and the result is a lack of enthusiasm. There is no following of boats such as one sees at Oxford and Cambridge. Class crews pretend to develop candidates for the 'Varsity, but with no very happy result, and the American college captain very frequently finds himself compelled to put men in his boat who have never before rowed. Nor is the boating spirit among our clubs so great as in England, and, although there are available courses in profusion throughout the country, somehow the boating spirit in America is wanting. This is not to say that the National Association has not prospered, for, as a matter of fact, it has, and so too, have boat clubs increased throughout the country until there are now some 70 members of the National Association, to which the New England district contributes 33; the Harlem River (New York) 13; the Middle States 21; the North-western 22; the Mississippi River Valley 29; Schuylkill Navy (Philadelphia) 11; Potomac River (Washington and Baltimore) 4; Metropolitan Association (Boston) 10; Passaic River Association (New Jersey) 4; Minnesota and Winnipeg 4; New Orleans 6; and there are besides about half-a-dozen clubs in and around San Francisco and Oakland, California. Each one of these Associations holds an annual regatta, and most of them send entries to the regatta of the National Association. Nevertheless, rowing has never attained in America the position or success it enjoys in England, and this for two reasons:—the lack of boating spirit at the colleges, because of the reasons already given, and the absolute non-participation of college oarsmen in boat club racing.

Last year (1896) an effort was made at Philadelphia to encourage rowing at the college preparatory schools, and with such excellent results that an Inter-scholastic Rowing Association was formed and held its first regatta last June. If this movement progresses, as there is every indication that it will, the boating spirit in America is certain to increase as it never has before. Hitherto only one of our college preparatory schools has supported rowing.

With all these handicaps, there is great satisfaction in reviewing the history of American boat racing to find that the National Association has kept its skirts clear of scandal. Although the oarsmen are of the non-collegiate class, the clubs have as a rule steered free of semi-professionalism. The stroke predominating in club boating is dissimilar to that at the universities, being in fact the professional sculler's stroke.

While much experimenting has been done at both Harvard and Columbia, and before '86 also at Yale, there has always been a pretence to the English stroke. Cornell has been singularly successful since her advent in boating, and yet, until her visit to Henley in '95, her crews pulled a much shorter stroke than Harvard, Yale, or Columbia. Cornell, however, profited by her experience in '95, and in '96 and '97 produced a stroke which appears to combine in a masterful way the maximum of power with the minimum of effort. It combines the best of the English with the best elements of the American, discarding the extremes of each; it lacks the extreme swing back of the typical English, and the extreme slide and arm work of what has been called the typical American. There is no wasted energy or misdirected effort. The Cornell oars are 12 feet long, with a 7-inch blade,—and an inboard length of 42 inches; length of slide *used* 16 inches.

Until the last two years paper boats have been used almost exclusively in American colleges; last year Cornell used paper and Harvard and Yale cedar. The seats in American boats are directly over the keel, and the row-locks, swivel. The river club crews enter upon no very serious training, but the college crews undergo a long period of rigorous training which begins in rowing tanks in December, and continues to race day, the last of June.

CASPAR WHITNEY.

REGATTAS—Regattas have been popular from the earliest times. Though the word itself comes from Venice, Virgil has given so vivid an account of a prehistoric regatta which took place before the foundation of Rome that we can only regret that he was not spared to describe the University boat race for the sporting Press. Since the day of the unfortunate Menœtes, regattas have increased so much in favour that it is impossible even to enumerate them within the limits of a short article. Regattas may be classed under two headings (1) salt-water, (2) fresh-water. The queen of the first division would be Cowes, and the queen of the second, Henley. Regattas are also held on both salt water and fresh for the encouragement of specific branches of aquatic sport, such as sailing, rowing,

punting and canoeing, and it is hardly too much to say that where in England there exists a suitable piece of water in the neighbourhood of a centre of population, there will be found a regatta of some sort. We shall not, however, deal here with sailing, punting, and canoeing regattas, but only with those which are confined to rowing. Among these Henley has the pride of place, not only because it is the first important regatta in point of time, but because it possesses historic associations which

FINAL FOR THE GRAND CHALLENGE: NEW COLLEGE V. LEANDER (1897)

are revered throughout the aquatic world at home and abroad. Henley Regatta was founded on March 26th, 1839, when a public meeting was held in the Town Hall, Henley, with Thomas Stonor, afterwards Lord Camoys, in the chair. From the first resolution, which ran as follows, the object seems rather to have been to promote the interests of the town and trade of Henley, than the craft of oarsmanship—"That from the lively interest which has been manifested at the various boat races which have taken place on the Henley Reach during the last few years, and the great influx of visitors on several occasions: This meeting is of opinion that the establishing of an Annual Regatta under judicious and respectable management would not only be productive of the most beneficial results to the town of Henley, but from its peculiar attractions would also be a source of amusement and gratification to the neighbourhood and the public in general." The next resolution referred to the purchase of the Town Challenge Cup, to be competed for by Henley amateur crews in four-oared boats, and a Challenge Cup, since known as the most famous rowing cup in the world, the Grand Challenge Cup, to be rowed for by amateur crews in eight-oared boats, open to all. Thus was the prototype of English rowing regattas founded. Before this time there had been rowing races at Henley and elsewhere, but they had been of the nature of matches. In 1829 the earliest Inter-University contest took place from Hambledon Lock to Henley, when Oxford, assisted by a No. 5 who weighed 14 st. 10 lbs., defeated Cambridge for the first time. The Wingfield Sculls had been founded in 1830, and in 1837

Queen's College, Oxford, rowed against and beat St. John's College, Cambridge; but March 26th, 1839, is the first we hear of the definite founding of a rowing regatta. At first there were only the two challenge cups above alluded to to be competed for; in 1840 the District Cup for four-oars was added, but withdrawn in 1848; in 1841, the Stewards Cup, for four-oars; in 1844, the "Diamonds," for scullers; in 1845, the Pairs; in 1847, the Wyfold Cup; in 1847, the Visitors Cup; in 1868, the Thames Cup. In 1872, the Regatta assumed an International aspect, as the first foreign entry was then made in the person of E. Smith, of the New York Atlanta Boat Club, who competed for the Diamond Sculls, and his example was followed in 1878 by the Sho-wae-cae-mettes crew and the Columbia College crew, besides two American scullers, and since that date foreign entries have been numerous. Although Henley is ready to extend a welcome to all, it may be doubted whether the International character which it is now assuming is a benefit to it, and whether the intense feeling which these International contests give rise to, do really promote the good understanding which they are supposed to encourage, or whether in the result they do not produce the exactly opposite effect. In amateur races, where the conditions vary so much in different countries, it is not easy to satisfy all that the regulations are fair to all.

Henley Regatta has grown and prospered, and has been the precursor, and to a great extent the model, of innumerable other regattas which have equally grown and prospered; its classic course has been the scene of many a hard fought fight, but it is doubtful whether excitement has ever reached the pitch it rose to in 1843, when the only sufficient outlet the youth of Oxford of the day could find to express their exultation at the victory of their seven-oared boat was by dropping the Henley turnpike gate over the old Henley bridge. Indeed, its popularity may be its undoing, for the regatta has now become one vast picnic; the classic reach is invaded by innumerable craft dangerous to the competing boats, and by a public who gladly obey the summons of the House-boat

After the Grand Challenge.

luncheon gong, while the final for the Grand Challenge Cup is passing up the reach. Since the old days, the course has been altered and improved, and so far no serious accident has happened; but it is not outside the bounds of possibility that increasing crowds may make the reach impracticable for such important contests, a result which old rowing men would bitterly regret.

Next to Henley comes the Metropolitan Amateur Regatta, established in 1866, which still flourishes, while other once famous London regattas, such as the Royal Thames Regatta established at Putney in 1843, the Thames National Regatta established in 1854, the Thames Regatta established in 1868, and the Thames International Regatta established in 1876, have been discontinued. The National Regatta was instituted in 1890 to bring out professional rowing and sculling talent, but came to an end in 1895.

While the interest in metropolitan regattas may have somewhat fallen off, the increase in the number and importance of provincial regattas has been surprising. The following is a short list of some of the better known courses, together with the official rules for regattas.

Length of Racing Courses.

Agecroft (Manchester), 1 mile.
Bedford Regatta, 1 mile.
Belfast, River Lagan Course, 1¼ miles.
Bewdley, 1 mile.
Blyth, Blanker to Cowpen Gut, 2 miles.
Bridgnorth, 1 mile.
Bristol, from Hotwells to Bristol, 1½ miles.
Burton-on-Trent, 1 mile.
Cambridge, 1½ miles.
Cardiff, ¾ mile.
Chester, 1 mile 480 yards.
Cork, 2 miles.
Derby, 1 mile.
Dublin, 1½ miles.
Durham, 1 mile 300 yards.
Ely, Littleport, to Adelaide Bridge, 3 miles.
Eton, 3 miles and under.
Exeter, 2½ miles.
Henley-on-Thames, 1 mile 550 yards.
Hereford, 1 mile 536 yards.
Huntingdon, 1½ miles.
Ipswich, 2½ miles.
Ironbridge, 1 mile.
Kings Lynn Champion Course, 2 miles; Prince of Wales' Course, 1½ miles.
Kingston-on-Thames, Seething Wells to Kingston Bridge, 1¼ miles.
Lincoln, sc. and p–o. ¾ mile, 4–o. 1½ miles.
London Bridge to Old Swan, Chelsea, 4 miles 3 fur.
Manchester, 2 miles.
Marlow, 1 mile.
Molesey, 1 mile.
Moulsford Bridge to Cleeve Lock, 2 miles.
Newark, Farndon Ferry to Aversham Weir, 1 mile.
Oxford, Iffley to the Barges, 1⅝ miles.
Oxford, Abingdon Lasher to Nuneham Cottage, 1½ miles.
Putney to Barnes B., 3 m. 5 f.
,, Chiswick, 2 m. 5½ fur.
,, Hammersmith, 1 m. 6½ f.
,, Mortlake, 4 m. 2 fur.
Reading, 1¼ miles.
Richmond, Twickenham Eyot to Richmond Stone Bridge, 1 m 4½ fur.
Shrewsbury, ⅞ mile.
Stockton-on-Tees, Portrack Course, 4 miles; above Bridges, 1½ miles.
Southampton, Cadland Beacon to Royal Pier, 4½ miles.
Stourport, 1¼ miles.
Sunderland, North Hylton to Spa Well, 1 mile.
Sydney, N.S.W., Champion Course, 2 miles 1560 yards on Parramatta River.
Tyne, High Level Bridge to Waterson's Gates, 1 mile; to Meadows House, 1¾ miles; to Armstrong's Crane, 2 miles; to West Point of Paradise Quay, 2½ miles; to Scotswood Suspension Bridge, 3 miles 713 yards; to Leamington Point, 4½ miles.
Tewkesbury, 1 mile.
Walton, 1 mile.
Warwick, 1½ miles.
Windsor, short mile.
Worcester, 1 mile.

W. H. Grenfell.

Rules.

1. The Laws of Boatracing adopted by the Association shall be observed, and the Association's definition of an amateur shall govern the qualifications of each competitor.

2. The Regatta Committee shall state on their programmes, and all other official notices and advertisements, that their regatta is held in accordance with the rules of the A.R.A.

3. No money or "value prize" (*i.e.*, a cheque on a tradesman) shall be offered for competition, nor shall a prize and money be offered as alternatives.

4. Entries shall close at least three clear days before the date of the regatta.

5. No assumed name shall be given to the secretary of the regatta unless accompanied by the real name of the competitor.

6. No one shall enter twice for the same race.

7. No official of the regatta shall divulge any entry, or report the state of the entrance list, until such list be closed.

8. The Regatta Committee shall investigate any questionable entry irrespective of protest, and shall have power to refuse or return any entry up to the time of starting, without being bound to assign a reason.

9. The captain or secretary of each club or crew entered shall, at least three clear days before the regatta, deliver to the secretary of the regatta a list containing the names of the actual crew appointed to compete, to which list the names of not more than four other members for an eight-oar, and two for a four-oar, may be added as substitutes.

10. No person may be substituted for another who has already rowed or steered in a heat.

11. The secretary of the regatta, after receiving the list of the crews entered, and of the substitutes, shall, if required, furnish a copy of the same, with the names, real and assumed, to the captain or secretary of each club or crew entered, and, in the case of pairs or scullers, to each competitor entered.

12. Objections to the qualification of a competitor must be made in writing to the secretary of the regatta at the earliest moment practicable. No protest shall be entertained unless lodged before the prizes are distributed.

13. The whole course must be completed by a competitor before he can be held to have won a trial or final heat.

14. In the event of there being but one boat entered for any prize, or if more than one enter and all withdraw but one, the crew of the remaining boat must row over the course to be entitled to such prize.

15. In the event of a dead heat taking place, any competitor refusing to row again, as may be directed by the Regatta Committee, shall be adjudged to have lost.

16. Every competitor must wear complete clothing from the shoulders to the knees—including a sleeved jersey.

17. The Regatta Committee shall appoint one or more umpires.

18. The Regatta Committee shall appoint one or more judges, whose decision as to the order in which the boats pass the post shall be final.

19. A Maiden Oarsman is an oarsman (A) who has never won a race with oars at a regatta; (B) who has never been a competitor in any International or Inter-University rowing match.

A Maiden Sculler is a sculler (A) who has never won a sculling race at a regatta; (B) who has never competed for the Diamond Sculls at Henley or for the Amateur Championship of any country.

20. A Junior Oarsman is an oarsman (A) who has never won a race with oars at a regatta other than a school race; a race in which the construction of the boats was restricted; or a race limited to members of one club; (B) who has never been a competitor in any International or Inter-University match. No oarsman who has won a race at a regatta in which the construction of the boats was restricted shall compete as Junior in any such race after the end of the current year.

A Junior Sculler is a sculler (A) who has never won a sculling race at a regatta other than a race in which the construction of the boats was restricted; or a race limited to members of one club; (B) who has never competed

or the Diamond Sculls at Henley or for the Amateur Championship of any country.

N.B. The qualification shall in every case relate to the day of the regatta.

21. All questions not specially provided for shall be decided by the Regatta Committee.

Results of Inter-University Boat-Race.

Year.	Place of rowing.	Winner.	M.	S.	Won by
1829	Henley	Oxford . .	14	30	Won easily.
1830	to 1835, not rowed .	—	—		
1836	Westmr. to Putney	Cambridge	36	0	1 min.
1837	and 1838 not rowed	—	—		
1839	Westmr. to Putney	Cambridge	31	0	1 min. 45 sec.
1840	Westmr. to Putney	Cambridge	29	30	2-3rds length.
1841	Westmr. to Putney	Cambridge	32	30	1 min. 4 sec.
1842	Westmr. to Putney	Oxford . .	30	45	13 sec.
1843	and 1844 not rowed	—	—		
1845	Putney to Mortlake	Cambridge	23	30	36 sec.
1846	Mortlake to Putney	Cambridge	21	5	Two lengths.[1]
1847	and 1848 not rowed	—	—		
1849	Putney to Mortlake	Cambridge	22	0	Many lengths.[2]
	Putney to Mortlake	Oxford . .	Foul.		Foul.[2]
1852	Putney to Mortlake	Oxford . .	21	36	27 sec.
1854	Putney to Mortlake	Oxford . .	25	29	11 strokes.
1856	Mortlake to Putney	Cambridge	25	50	Half length.
1857	Putney to Mortlake	Oxford . .	22	50	35 sec.[3]
1858	Putney to Mortlake	Cambridge	21	23	22 sec.
1859	Putney to Mortlake	Oxford . .	24	40	Cambridge sank.
1860	Putney to Mortlake	Cambridge	26	0	One length.
1861	Putney to Mortlake	Oxford . .	23	27	48 sec.
1862	Putney to Mortlake	Oxford . .	24	40	30 sec.
1863	Mortlake to Putney	Oxford . .	23	5	43 sec.
1864	Putney to Mortlake	Oxford . .	21	40	26 sec.
1865	Putney to Mortlake	Oxford . .	21	0	Four lengths.
1866	Putney to Mortlake	Oxford . .	25	48	15 sec.
1867	Putney to Mortlake	Oxford . .	22	39	Half length.
1868	Putney to Mortlake	Oxford . .	20	56	Six lengths.
1869	Putney to Mortlake	Oxford . .	20	4	Three lengths.[4]
1870	Putney to Mortlake	Cambridge	22	6	1½ length.
1871	Putney to Mortlake	Cambridge	23	5	One length.
1872	Putney to Mortlake	Cambridge	21	14	Two lengths.[5]
1873	Putney to Mortlake	Cambridge	19	35	3¼ lengths.[6]
1874	Putney to Mortlake	Cambridge	22	35	2½ lengths.
1875	Putney to Mortlake	Oxford . .	22	2	Ten lengths.
1876	Putney to Mortlake	Cambridge	20	20	Eight lengths.
1877	Putney to Mortlake	Dead heat.	24	8	Dead heat.[7]
1878	Putney to Mortlake	Oxford .	22	13	Ten lengths.
1879	Putney to Mortlake	Cambridge	21	20	2½ lengths.
1880	Putney to Mortlake	Oxford . .	21	23	Three lengths.[8]
1881	Putney to Mortlake	Oxford . .	21	54	Three lengths [9]
1882	Putney to Mortlake	Oxford . .	20	12	Seven lengths.
1883	Putney to Mortlake	Oxford . .	21	8	Four lengths.[10]
1884	Putney to Mortlake	Cambridge	21	39	2¼ lengths [8]
1885	Putney to Mortlake	Oxford . .	21	37	Three lengths.
1886	Putney to Mortlake	Cambridge	22	29	2-3rds length.
1887	Putney to Mortlake	Cambridge	20	52	3⅘ lengths
1888	Putney to Mortlake	Cambridge	20	48	Five lengths.
1889	Putney to Mortlake	Cambridge	20	14	Three lengths.
1890	Putney to Mortlake	Oxford . .	22	3	One length.[4]
1891	Putney to Mortlake	Oxford . .	21	48	Half length.
1892	Putney to Mortlake	Oxford . .	19	21	2¼ lengths.
1893	Putney to Mortlake	Oxford . .	18	47	One length, 4ft.[4]
1894	Putney to Mortlake	Oxford . .	21	39	3½ lengths.
1895	Putney to Mortlake	Oxford . .	22	50	2¼ lengths.
1896	Putney to Mortlake	Oxford . .	20	2	2-5ths length.
1897	Putney to Mortlake	Oxford . .	19	12	2½ lengths.
1898	Putney to Mortlake	Oxford . .	22	15	9 lengths.

1 First race rowed in outriggers.
2 Two races this year.
3 First race in present style boats without keels.
4 Rowed on a Wednesday.
5 Rowed in a snowstorm.
6 Sliding seats used for first time.
7 The Oxford bowsman caught a crab and sprung his oar when leading.
8 Rowed on a Monday.
9 Rowed on a Friday.
10 Rowed on a Thursday.

Oxford have now won 31 and Cambridge 22 races—the 1877 contest being a dead heat.

Glossary.

A.R.A.—The initials of the Amateur Rowing Association, which was founded in 1879, and controls generally all the concerns of amateur rowing. Its definition of an amateur is as follows :—"No person shall be considered an amateur oarsman, sculler, or coxswain (1) who has ever taken part in any open competition for a stake, money, or entrance fee; (2) who has ever knowingly competed with or against a professional for any prize; (3) who has ever taught, pursued, or assisted in athletic exercises of any kind for profit; (4) who has ever been employed in or about boats, or in manual labour for money or wages; (5) who is or has been by trade or employment for wages, a mechanic, artisan, or labourer, or engaged in any menial duty."

Backwater—To turn the blade of the oar so that the inside of the curve is towards the bows of the boat, and to effect the stroke by pushing when the blade is in the water instead of pulling, thus drawing the boat stern foremost. The usual form of the command is "Back her down," addressed to special members of the crew, or generally "Back her down all."

Bow—(1) The foremost extremity of the boat, sometimes extended to the forward half of the boat, *e.g.* "the bow oars are too heavy." (2) The oarsman who sits furthest forward. The side upon which his oar comes is termed "bow side" all down the boat.

Breast-race—A race in which the boats start level, and make it their aim to reach a given point in the shortest possible time. [*See also* Bumping Races.]

Bucket—A plunge forward with the body when the stroke is concluded before the arms have been straightened out, and the hands at least passed the knees.

Bumping Races—Races in which, owing to the number of competitors, or to the narrowness of the course, it is impossible for all to start abreast, and in which therefore all the boats start at a fixed distance behind one another, and endeavour so to gain upon the one in advance as to touch it with their bows, or one of the oars. Such success, or a rowing completely past the one in advance, is termed a "bump."

Burdens—The loose boards at the bottom of a boat which cover the outer skin. More commonly called "Bottom-boards."

Button—The projecting leather boss upon the oar which presses upon the pins of the rowlock and prevents the oar from slipping through.

Caravel or Carvel—[*See* Smooth-skin.]

Catch—The instant application of the weight and muscles of legs and body to the oar at the moment it enters the water.

Chop—To use force in putting the blade of the oar into the water, instead of letting it drop in.

Clasper—A boat built by the old established firm of that name.

Clinker-built—A boat built up of thin planks, which are nailed to one another, overlapping slightly at the edges, and provided with a keel. Such boats are called lapstreak boats. [*See also* Smooth Skin Boats.]

Come forward—The order to get ready for rowing or paddling, by reaching the body forward and turning the blade at right angles to the water.

Course—Amongst famous courses are (1) the championship course from Putney Bridge to the Ship Inn at Mortlake; (2) The Oxford course, from Iffley Lasher to Salter's Barge by Folly Bridge; (3) The Cambridge course, from just above Baitsbite Lock to Big Horse Grind; (4) the Henley course, from just below the Island to just below Webbs' Wharf.

Cover the Water—A crew is said to cover or clear its water, when stroke dips his oar into the river at a point nearer the winning post than the eddy which was created by No. 2's oar in the previous stroke.

Cox or Coxswain—That member of the crew who usually sits at the stern of the boat and attends to the steering by means of a rudder.

Coxswainless boats—Racing boats which do not carry a coxswain, but are steered by means of wires attached to the feet of that member of the crew who best knows the course, or is the best steersman.

Crab—To catch a crab is to get the oar so deep and the blade at such an angle that at the close of the stroke it is found impossible to get it from the water.

Cut the beginning or Finish—To begin or finish

the stroke in the water with the blade either entirely or partly uncovered.

Dig—To plunge the blade unnecessarily deep and thereby to miss the beginning and cut the finish owing to the extra labour employed in attending to the blade.

Doggett's Coat and Badge—The bequest of an actor in the time of George I. of a badge and livery to be rowed for by young watermen out of their time within the year past, every summer, in commemoration of the accession of the House of Hanover.

Easy—The order to cease rowing.

Eights—The name of the bumping races at Oxford in May, lasting for six days, between the members of the various colleges in eight-oared boats with slides and without keels.

Eyes in the Boat—The order to the crew to watch the stroke in place of watching incidents on the bank or elsewhere in the river.

Feather—To turn the oar blade as it comes out of the water to a direction parallel with the surface in order to oppose less resistance to the wind when coming forward. *Feathering under water* is the term applied to the habit of turning the blade on to the feather before clearing it from the water.

Fin—A thin plate of metal vertically attached to the base of a keelless boat under the cox's seat, in order to keep the boat's head from running up into the wind in stormy weather. It also incidentally helps to steady the boat. Sometimes applied to an extra plate put upon the bottom of the rudder, when, owing to the arrangement of the weights, it is ordinarily too high out of the water.

Finish—The end of the stroke in the water.

Fixed Seats—As opposed to sliding seats.

Foul—In breast races, a collision between two boats, one of which must be out of its course. In bumping races there can be no fouls.

Galley—A boat on a warship appropriated to the captain's use.

Gig—A pair-oared boat with a seat for a cox.

Gunwale—The top edge of the sides of a boat.

Half-outrigged—A boat in which the *outriggers* (*q.v.*) are considerably short of their usual length.

Handle—[*See* OAR.]

Hang—A momentary hesitation after the swing forward is completed and before dropping the blade into the water.

Heat—A subdivision of a race in which the competitors are too many for them to row at once. The winners of the heats meet again in fresh heats until there are only two left, and they join issue in the final.

Heel-Traps—Frames of metal or wood, shaped to fit the heels, and to keep them against the stretcher.

Henley—The premier regatta, held every July at Henley-on-Thames. The events are (1) the Grand Challenge Cup; (2) the Ladies' Plate; (3) the Thames Cup, for eights; (4) the Stewards' Cup; (5) the Visitors' Cup; (6) the Wyfold Cup, for fours; (7) the Silver Goblets and the Nickalls' Cup, for pairs; (8) the Diamond Sculls, for scullers.

Hoick—A jerk with the arms at the beginning or end of the stroke, which prevents a steady leg drive from the stretcher.

Hold—To stop the progress of the boat by dropping the oar blades flat into the water and opposing the resistance of the shank of the oar.

Hurry—To swing the body forward more rapidly than the stroke oar, and to get the blade into the water before him.

Inrigged boats—A boat whose rowlocks are set directly upon the gunwale.

Keel—The main timber running from stem to stern along the bottom of a boat outside, giving a grip of the water and supporting the frame.

Keelson—The line of timber within the boat just over the keel.

Knees—Crooked pieces of timber supporting the sides of the boat and the seats.

Lapstreak—[*See* CLINKER BUILT].

Late—Descriptive of a member of the crew whose blade reaches the water a little after the stroke oar's.

Lents—The eight-oared races at Cambridge, rowed in February or March in clinker-built boats without slides. Men who rowed in the preceding Mays are ineligible.

Light boats—Light smooth skin racing boats as distinct from the heavier clinker-built boats.

Lines—The cords by which the cox pulls the rudder and steers the boat.

Loom—[*See* OAR].

Mays—The eight-oared races at Cambridge, usually rowed in June, between the members of the various colleges. Rowed with slides and without keels.

Meeting the oar—Bringing the body up to the oar at the close of the stroke in place of bringing the hands strongly up into the chest.

Oar—The wooden implement of a boat's propulsion. Usually constructed of lance wood. Its chief parts are—the *blade*, broad and thin, which is dipped in the water, the *loom* or *shank*, and the *handle*, which the oarsman grips.

Outrigger—A frame of iron rods attached to the side of a boat on which is set the rowlock at a considerable distance from the side. By this means the body of the boat can be made much lighter and smaller, without cramping the oarsman. Generally called *rigger*.

Over-reach—To *over-reach* is, when the body has reached the end of its swing forward, to push the shoulders forward out of their natural position with the idea of thus extending the reach.

Paddle—To row without putting on full power into every stroke, but paying especial attention to form.

Pull—To row.

Randan—A boat with three seats for rowers. A sculler sits amidships with a pair of sculls, bow and stroke having each an oar.

Reach forward—The outstretching of arms and the bending forward of body necessary in order to get the blade into the water as far behind the rigger as possible.

Recovery—Includes (i.) the action of the wrists in disengaging the oar from the water and in turning the oar on to the feather; (ii.) the straightening of the arms; (iii.) the commencement of the swing up of the body, after the conclusion of the stroke.

Rigger—[*See* OUTRIGGER.]

Roll—Of the boat or any member of the crew; to swing from side to side during or between the strokes.

Row over—If in a heat or race a boat has no opponent to meet, it is compelled to row over the course in order to claim a victory. Hence, a row over is used of a heat in which there is no opposition.

Rowlock—The frame in which the oar is placed in order to do its work. It consists of a base, or *sill*, on which the oar rests, and two *thole-pins*, called the *rowing-pin* and the *stopping-pin*.

Rudder—A piece of metal or very thin wood, depending from the stern, by which the boat is steered.

Rule of the river—The general rule of the Thames is that up stream boats keep to the sides and down stream boats to the middle of the river. This, however, may be modified in special places, as at Oxford and Eton, where down stream boats have to cross from side to side at particular places.

Scratch crew—A crew got together for temporary purposes, without training or practice.

Screw—To swing the body from one side to the other during the stroke, instead of swinging straight backward and forward. If the man swings towards his oar during the stroke he is said to screw "into the boat"; if away from it "out of the boat."

Scull—(1) An oar which is wielded by one hand, and of which there is one for each hand.

(2) To use such oars.

Shank—[*See* OAR.]

Ship—To lift the handle of the oar when the blade is

on the water, and then to allow it to float, with the motion of the boat, alongside.

Shorten oars—To draw the handle of the oar in-board, in order to avoid an obstacle in the river, or to pass through a narrow place such as a lock.

Skiff—In some places means a racing boat with no keel, propelled by one man who sculls in it; but more generally a *skiff* is an in-rigged pleasure boat, to carry a pair of oarsmen or two scullers, with room for two sitters in the stern and one in the bow.

Slice—To put the oar in the water out of the perpendicular, so that the force exerted at the beginning, instead of driving it on a level course through the water, tends to drive it deeper.

Sliding Seat or **Slide**—The movable top of a rowing seat which runs backwards and forwards with the swing of the body, either in grooves or on rollers.

Smooth skin boats—Boats which are built of thin planks accurately fitting together, not overlapping, but carefully caulked. Also called *Caravel* or *Carvel* boats.

Steer—To guide the course of a boat.

Stem—The bows of a boat.

Stern—The rearmost extremity of a boat.

Strake—One of the planks of which a boat is constructed. Also called *Streak*.

Straps—The leather bands looped through holes in the stretcher (*q.v.*), between which and the stretcher itself the oarsman's feet are placed.

Stretcher—A board placed slopingly at a right angle across the boat in front of the oarsman, upon which he braces his feet.

Stroke—(1) The number of dips of the oar in the water within a given time.

(2) The oarsman who sits nearest the stern of the boat and sets the work to the men behind him. The side upon which his oar projects is called "*stroke side*" all the way up the boat.

Swing—The motion of the oarsmen's bodies backward and forward over their seats, especially as regard its extent and regularity.

Taking a boat's water—To steer one's course in front of another boat, in order to give them extra wash.

Thole pins—The pins of the rowlock against which the oar presses.

Thwart—The oarsman's seat.

Time—The regularity with which all the members of the crew coincide with stroke in the dipping of their oars in the water.

Time race—A race in which the competitors start at such a distance from another as to make any interference improbable, and row to winning posts placed an exactly similar distance apart.

Torpids—The eight-oared races held at Oxford in February between members of the various colleges, rowed on fixed seats in clinker-built boats. Men who have rowed in the previous eights are not eligible.

Tossing oars—The salutation formerly delivered to the head boat of the river at Oxford and Cambridge, in delivering which all the members of the crew stood up in the boat and lifted their oars straight into the air.

University Boat Race—The annual eight-oared race between Oxford and Cambridge, usually rowed on the last Saturday in Lent, from Putney Bridge to the "Ship" at Mortlake.

Wash—The rough water left behind the boat, created by the swirl of the oars and the cleavage of the water.

Wingfield sculls—The trophy held by the amateur sculling champion of the Thames, obtained annually by victory in a sculling race from Putney to Mortlake.

Yoke—The cross piece attached to the top of the rudder to either end of which the yoke or rudder lines are attached, the other extremities being held by the steersman.

RUFF—Ruff and Reeve, the male and female of an aberrant species of sandpiper (*Machetes pugnax*), distinguished from its fellows by a marked difference of size in the sexes (the male being one-third larger) and also by a sexual difference of plumage—an unusual thing with sandpipers. The curious frill which is peculiar to the male bird, and from which he derives his name, is assumed only during the breeding season, and is put forth in about five weeks from the beginning of April. The variety in the colour and markings of the frill is very striking, scarcely two birds being alike in this respect; and from the observation of moulting birds in confinement it has been ascertained that the same individual will annually produce the same coloured frill. After the breeding season the ruff and reeve are so much alike as to differ only in size, and in the more robust character of the bill and legs in the male.

RUFF IN SUMMER PLUMAGE.

The colour of the legs and feet varies in different individuals, being in some orange, in others grey, in others again yellowish brown. Like other sandpipers, the ruff is gregarious; but, unlike them, is polygamous. In the spring of the year, when resorting to the marshes for the purpose of nesting, the ruffs congregate like black-cocks, and challenge and spar at each other, contending for possession of the reeves. (Stonehouse, *Hist. and Topog. Isle of Axholme*, 1839.) This trait in their character has suggested the generic name *Machetes* (a warrior) and the specific name *pugnax*, which is equally appropriate.

There was a time when ruffs and reeves were amongst the most characteristic of English fen birds, and were much esteemed for the table, being taken in Lincolnshire in nets, and in Norfolk in horsehair snares. They annually nested in several of the Eastern counties; but drainage and the increased cultivation of waste lands, combined with the greed of poulterers seeking the birds and collectors the eggs, have com-

bined to banish it from its natural haunts in this country, except as a periodical migrant in spring and autumn.

The Rev. Richard Lubbock, about 1845, in conversation with an old man who had set horsehair snares for ruffs and reeves during many seasons, learnt that he once took six couple of these birds in a morning. This is nothing compared to what has been done with the net in Lincolnshire—forty-four birds at a haul, and altogether six dozen in the course of a morning. (*Fauna of Norfolk*, 2nd ed., p. 102.)

When the late Henry Stevenson, of Norwich, published the second volume of his *Birds of Norfolk* in 1870 he remarked, "Norfolk, so far as I can ascertain, is now the last resort of this species in the Eastern counties." Pennant described it as frequenting, in his time, various localities in Lincolnshire, the Isle of Ely, and the East Riding of Yorkshire (see Clarke and Roebuck, *Handbook of Yorkshire Vertebrata*, 1881, p. 76); but Col. Montagu, when making a tour in Lincolnshire with special reference to these birds, at the commencement of the present century, found that they had then become much more scarce than they were before a large tract of the fens was drained and enclosed. The late Mr. A. G. More, in a paper "On the Distribution of Birds in Great Britain during the Nesting Season" (printed in *The Ibis* for 1865), wrote of the ruff as having ceased from breeding in Durham and Yorkshire (though reported to have nested near Beverley in 1864), in Huntingdon, Cambridge, Northampton, and probably also in Lincolnshire. He mentioned only East Norfolk as an annual breeding haunt, with Northumberland occasionally.

Ruff in Winter Plumage.

As a matter of fact, a few pairs continued to linger about their ancient nesting haunts, and in a few instances the eggs were discovered many years after the birds were supposed to have deserted the sites referred to. Thus, in Norfolk, according to Stevenson in 1870, they were still nesting near Hickling Broad, in which neighbourhood a nest with eggs was found in June, 1878. According to Mr. Cordeaux (*Zoologist*, 1890, p. 204), a few were still breeding in Lincolnshire in 1873, in which county, in 1882, a reeve was inconsiderately shot from the nest.

Owing probably to the beneficial operation of the Wild Birds' Protection Acts, and to the measures adopted by landowners to prevent trespassing in the marshes during the breeding season, an old haunt in Norfolk was revisited by a pair of these birds in 1889, and a nest containing four eggs was found in May of that year. When visited on June 28th by Mr. J. H. Gurney, who has described the incident (*Zoologist*, 1889, p. 336), there were only the broken egg-shells; but, as he was leaving the place, he stumbled on another nest with four eggs, beautifully hidden in green rush grass, nowhere more than a foot high. The diameter of the nest was 3·3 inches, which is less than that of a redshank. It was constructed of dead bents of the spike-rush (*Eleocharis multicaulis*) mixed with the marsh arrow-grass (*Triglochia palustre*). A "run" made by the old bird led almost up to the nest from a distance of twelve yards, and on the other side there was another "run" not so long. The bird was seen to return to the nest, and, it is satisfactory to know, was not molested.

Until within the last few years there used to be a considerable traffic in these birds with London poulterers, who imported numbers of them in the spring from Holland, whence they were consigned with godwits, redshanks, peewits, and, occasionally, dotterel. This traffic, however, has now been stopped, and if English owners of marsh-lands would follow the good example set in Holland, and enforce an observance of the close time in their respective neighbourhoods, it is not too much to expect that some at least of these birds might return to occupy such of their former nesting-haunts as still remain secluded.

J. E. Harting.

RYPE (pl. Ryper, Norsk.) RIPA (pl. Ripor, Swedish). *Lagopus subalpina*, willow-grouse; *Lagopus alpina*, ptarmigan.

Classification—It will be understood from the above heading that two of the five species of the grouse tribe found in Scandinavia are termed "Rype." The first, *Lagopus subalpina*, generally known to English sportsmen as the "willow-grouse," is called the "Skov- or Dal rype," the wood or dale grouse; the second, *Lagopus alpina*, which seems to be identical with the ptarmigan of Scotland and the Alps of central Europe (*Lagopus mutus*), the "Fjeld-rype" or

fell-grouse. Inasmuch as the skov-rype is found in large numbers at a considerable altitude on the fjeld, the terms do not at first sight seem altogether distinctive, but they are justified by the fact that the skov-rype, habitually fond as it is of high land, is also at home on the wooded slopes and in the coppices of the valley, and *never* frequents the highest solitudes of barren stone and snowdrift which are the favourite haunts of its half-brother, the fjeld-rype; whilst the latter, even when driven by hard weather to seek the lower hills, never, or very rarely descends into or below the zone of the birch or pine.

Ryper, of one type or another, are found in Russia, Finland, Greenland, Spitzbergen, Iceland, Novaya Zembla, Newfoundland, and all along the northern coast of Asia and Canada. Some doubt appears to exist among naturalists as to the exact number of separate species. Thus, according to Prof. Faber, the rype of Iceland, which he terms *Lagopus islandorum*, is distinct from the several other species found in the rest of Europe; but Mr. Baring Gould doubts whether this bird is not identical with that of Greenland, *Lagopus reinharti*; while Mr. Lock affirms that Iceland produces in limited numbers both the true skov-rype or willow-grouse, and the true fjeld-rype or ptarmigan, besides an abundance of hybrids between these two species. The fact seems to be that in the most northern regions, where bitter winters are often succeeded by cold summers, the ptarmigan are driven to the same shelter and feeding-grounds as the willow-grouse, and occasionally remain there during the breeding-season, with the result that varieties are produced by intermixture, and become more or less constant.

It has been affirmed by naturalists that the Scandinavian willow-grouse and the red-grouse of the British Isles are one and the same bird, the difference in plumage being simply due to climatic influences, and, moreover, that were an interchange of habitat effected, the shifted birds would in due time respectively assimilate their whole colouring to that of the indigenous species or variety. This is clearly a question that can be proved only by experiment.

Description—There are few game birds more handsome than a cock willow-grouse in full autumn plumage. His head, back, neck, breast and tail are of the true red-grouse colour, sharply contrasted with the white of the belly, legs, and pinion feathers, the latter being lined with delicate black shafts. Both kinds of ryper become pure white in winter, and at that season immense numbers are snared by the peasants and exported in a frozen state to the great markets of mid-Europe, when the willow-grouse may readily be distinguished by his being nearly a third larger than the ptarmigan.

Habitat—Although the willow-grouse is undoubtedly partial, especially in hot weather, to the patches of dwarf willow which, however locally extensive, form but a small percentage of the covert on lower Scandinavian fjelds, it has always seemed to the writer that the appellation of "birch-grouse" would be more truly indicative of its habits, for, to quote his own words written elsewhere: "however capable the bird may be of accommodating itself cheerfully to circumstances, or however capricious at times in the choice of a residence, the birch covert, whether in the form of a wood, or, higher up, of a thicket, or, higher still, of knee-deep scrub, is emphatically its favourite haunt and chosen home." There is therefore no phase of willow-grouse shooting more enjoyable than the beat where these conditions of vegetation exist, namely, along the slopes and over the rolling plateau of the lower fjeld—as opposed to the true "high fjeld," which is far above the limit of tree or shrub. But, as has been suggested above, the bird will thrive more or less wherever the ground at all suits it, which means in various localities altogether dissimilar in character of soil and vegetation. The elevation at which it is found is dependent in some degree on latitude; thus, in the extreme south of Norway, where it is, however, comparatively rare, it must be sought for at a height of not less than several hundred feet, whilst, on approaching the Arctic circle, it is as much at home on tracts a few feet above sea-level as on the crest of the fjeld. It abounds on some of the islands of the west coast which are all but treeless, and covered with deep heather, affording sport identical with that of a flat Scotch moor.

Shooting—In the Lofodens, magnificent ryper shooting is obtained. On Ulfo, otherwise called Hadsel, for example, which is strictly preserved by Englishmen, from 1,500 to 2,000 brace can be bagged annually over dogs by two guns. But this, although it rises to barren summits and crags, is essentially a birch island, with in some parts unusually extensive willow swamps and thickets. Nor is the mainland of Scandinavia wanting in excellent ryper tracts, but, as a rule, the sportsman in pursuit of the bird must be moderate in his expectations, and be more than satisfied if, after a hard day's work, the bag contains twenty or twenty-five brace, and with even half that he should not be discontented. Much depends on the breeding seasons: really good ones are few and far between. Considerable disappointment is often caused to lessees of shootings by the habit willow-grouse have of migrating in a mass from one range to another. As regards forest shooting, it may be said that these birds are never found in the depth of the pine forest pure and simple, but where there is a fair admixture of birch among the pines, a few coveys may be hoped for. In heavy rain and storm they are

Drawn by A. Thorburn.

Swan Electric Engraving

Ryper

apt to take shelter in the thickest covert, but in hot, dry weather they work up to the scrub of the open fjeld. For the woods, steady close-hunting dogs, such as well-trained spaniels, are desirable, and for the fjeld wide-ranging but staunch pointers or setters. Scandinavian dogs are often trained to break their point when repeatedly whistled after, and return to the shooter to report game found: they will then lead him back to it. Dogs perfect in this respect are rare and real treasures.

HENRY POTTINGER.

SALMON (*Salmo salar*)—The salmon is an inhabitant of the temperate and Arctic portions of the Atlantic Ocean, being represented in the Pacific by the Quinnat (*S. onchorhynchus*) and Steelhead salmons (*S. gairdnerii*). The quinnat and allied species are to be distinguished from the true salmons, amongst other structural differences, by the greater number of rays in the anal fin. Both the Pacific and Atlantic salmons deposit their ova in fresh water, making periodical excursions up rivers, past apparently insurmountable obstacles for this purpose, while some forms have permanently taken up their residence in fresh water.

SALMON.

The view that the salmon is a sea-fish is that held by the most profound thinkers and investigators of the century, of whom it is only necessary to mention Fleming, 1828; Agassiz, 1834; Buckland, 1880; and Day, 1887. Professor F. A. Smitt, of Stockholm, the greatest living authority on the family, who has collected the views of the many able Scandinavian workers who preceded him, and added to them himself from his own researches, speaks as follows:—"The evolution of the salmon family, we might hence conclude, began with marine fishes of the smelt and capelin type."

The evidence in support is too voluminous to be given here, but is briefly as follows:—

(1) The early fossil forms were all marine.

(2) The sea-going forms degenerate if debarred from the sea, and the degenerate forms closely resemble the fresh-water forms.

(3) Many marine fishes spawn in fresh-water; but no purely fresh-water fish spawns in the sea. (The eel, for reasons that it is impossible to give here, is undoubtedly a sea-fish which has taken up its residence mainly in fresh water.)

Classification—Of the salmonidæ known in this country as salmon, sea trout, lake trout, river trout, brook trout, &c., the modern line of scientific thought has reduced the many so-called species of trout to the position of varieties of one very variable type. It has been generally concluded that the salmon (*S. salar*) is a somewhat definite form subject to but few variations. Several authorities, such as Fatio, Nillson, and Sundeval, have pointed out that this is not the case, and that the border line between *S. salar* and *S. trutta* only requires to be rendered still further indefinite by the addition of anomalous specimens, to sweep away entirely the so-called scientific barrier between these forms. That this had already happened was the view advanced by Professor Smitt of Stockholm in 1894. In this country, the present writer in the same year independently arrived at a similar conclusion by a totally different method of reasoning.

The structural differences between *S. salar* and the migratory trout *S. trutta* are few in number, and may be briefly put as follows:—

(1) The elongation of the form, together with the proportion between the least diameter of the wrist or peduncle of the tail and the total length of the body and head. This in the salmon is usually less than 8 per cent. of the total body length, whereas, in the trout, it is usually more.

(2) The scales in salmon are usually larger than in trout; the best method of reckoning is to count the row of scales from the hind border of the adipose or mort fin downwards and forwards to the lateral-line. The number in salmon is twelve or less; in trout twelve or more,

(3) Yarrell, years ago, stated that a line drawn from the tip of the snout to the greatest convexity of the posterior margin of the gill-cover passed *through* the eye in the salmon and *below* in the trout. This point was considered of the greatest value by Day.

(4) The length of the maxillary or upper-jaw bones. In the salmon these bones are *less* and in the trout *more* than 36 per cent. of the total length of the head as measured by the line drawn in (3).

(5) The number of gill-rakers on the outer row of the first right gill-arch; in salmon there are *more*, in trout *less*, than seventeen.

Attention was first drawn to this point by Smitt, and it appears to be the most reliable test. All these differences are subject to variation, and do not seem to be present in the young to the same extent, while anomalous specimens are continually being brought forward to confuse the student. Many of these are forwarded to scientists under the title of "Bull-trout," which name, so far, has not been applied to any one known variety.

The Life History of the Salmon, as far as it is at present known, is as follows:—

The mature fish enter our rivers for the purpose of depositing their spawn, at various periods of the year, the first ascent commencing as early as December and January in some rivers, and as late as July or August in others. It has been thought that some rivers are never without clean (*i.e.*, non-spawning) fish.

The temperature of sea and river, together with the high or low river level, are the chief factors which influence the time of migration.

On entering fresh water, the fish make their way up stream in shoals, consisting, as a rule, each of one sex, surmounting apparently impossible obstacles, such as weirs, cascades, &c., by leaps and plunges rarely exceeding six feet in height, and negotiating greater obstacles as an Irish hunter does an earth bank. The speed with which the fish travels depends entirely on the level and temperature of the water. Arrived at the upper portion of the tributaries, especially those consisting of gravelly shallows with deep pools, they await the approach of winter. With the first breath of frost the fish mate, each female being henceforth provided with a male who maintains his position by force of arms. Most authorities state that the *kyp* (a gristly prolongation upwards of the lower jaw, interlocking with the upper jaw bones) grows in the male in order to serve as a weapon in those encounters, as it connects the slender, widely separated jaws, and makes a good semblance of the human fist.[1] Many accounts are given of the actual spawning of the salmon, but all agree in three essentials: first, a trough is made in the gravel; second, a few eggs are deposited at a time, fertilised, and then covered over; third, the eggs, when deposited, are sticky and adhere to the gravel.

These points are of great value, for the reason that from their great size and relative specific gravity, if the ova were not deposited in a trough, to the bottom and sides of which they adhere, and if they were not covered over after fertilisation, they would fall an easy prey to birds and fishes, which, whenever they get the opportunity, devour them greedily.

The reason of burying the ova in gravel is simply that, if covered over with any finer material, such as clay, sand or mud, the contents would be injured and the free play of oxygenated water prevented. To the writer it has always appeared that the reason the salmon seek the rivers is two-fold: first, to protect their large eggs, which, owing to their weight, must lie on the bottom; second, to provide efficiently aerated water such as is only found in gravelly shallows. As has been stated, the period during which salmon spawn varies with the temperature, extending on various rivers from October to February.

By the state of the thermometer the incubation of the eggs is also affected, lasting as a rule from about 90 to 114 days; by the use of cold or heat in artificial hatching, this period can be still further shortened or protracted.

The eggs are, when deposited, soft semi-transparent bodies which adhere to everything they touch (Day's *British and Irish Salmonidæ*, p. 31). From the moment of their deposition, they begin to absorb water, and unless fertilisation at once proceeds, will quickly pass into such a condition that this process can no longer be carried out. The average ovum is from ·22 to ·3 of an inch in diameter, and of a pinky-green hue: should the developing egg die, it becomes opaque, while non-fertilised eggs usually remain clear. When first hatched, the fish are minute tadpole-like creatures, called *alevins*, each with a large sac depending from the under surface behind the gill-opening. This contains the nourishment that serves for support till they can fend for themselves, a period varying from three to eight weeks according to temperature. When this sac has been absorbed and the fish is able to feed itself, it passes into the *fry* stage, being about 1·25 of an inch in length at two months, and growing to 3·75 inches at six months, when it becomes what is known as a *parr*. The salmon parr is distinguished roughly from the young trout by the tip of the mort fin not being coloured.

While in the larval condition, the young fish lie quietly among the interstices of the gravel in the shallows, hiding away from their enemies. It may be mentioned parenthetically that of the enemies of both eggs and alevins, the chief are the dabchicks, ducks, and swans, which are placed in the order of greatest destructiveness; next come the water-vole and the common rat. In the insect world, the larvæ of the may flies (Ephemeridæ) the caddises (Phryganidæ), and specially the larva of the dragon fly require

[1] The writer's own opinion is that the lower jaw of the male is used in ploughing the trough in the redd, and hence is turned up like the runner of a sleigh, and interlocked with the upper jaw to give it strength.

mention. It is now generally allowed that few fertile ova are destroyed by fish, for the reason that they are so deeply buried that they cannot be got at by them. Some few, however, are disturbed by sudden floods or the up-rooting of the redds by late spawning salmon, in which case they are carried away down stream and are then devoured with avidity by nearly every fish that swims. Both the so-called "bull-trout" and the chub have acquired a most unenviable and usually undeserved notoriety in this respect. The fry, on the other hand, are a *bonne bouche* to birds, beasts, reptiles (frogs and newts), and fish of many kinds. In the parr stage they are the favourite food of the adult spawned fish. The latter are known as *Kelts* and are at first scarcely to be recognised as salmon at all: the silver colour which is so characteristic of the fresh-run fish is replaced in the growing fish, the male being yellowish red, and the female black. This change has been gradually taking place since the fish left the sea, but it is not so markedly noticeable till the spawning is taking place.

The weight of evidence at present goes to prove that the salmon on entering fresh water eats but little, but certainly makes up for lost time after it has spawned.

On its way to the sea the kelt feeds voraciously, and is especially fond of the young of its own and allied species. The lanky, out-of-condition fish will fill out, and to a certain extent recover its colour and condition, to such a degree that the inexperienced will mistake frequently a "well-mended kelt" for a fresh-run fish.

No structural differences exist between the parr stage of salmon and sea-trout, and both possess a similar number of parr marks: the only practical method of distinguishing the one from the other is that given under No. 5. of the points of difference above, namely, the number of gill-rakers. The salmon remains in this stage for one or two years; that is to say, some pass into the next stage in the spring of the next year, while others remain as parrs until the corresponding season twelve months later.

At the end of one or two seasons, as the case may be, the salmon parr, by this time grown to between 5 and 7 inches in length, becomes somewhat silvery all over, owing to a deposit in the skin, which covers the head and gills, and lines the scales. This change in appearance is accompanied by change of habit; instead of lying in wait in the shallows for every floating object, the little fishes, which are now called *smolts*, gather together in small parties and rapidly proceed seawards. During the succeeding summer these fish again enter our rivers; they are now small salmon called *grilse*, of from 3 to 8 lbs. in weight, distinguished from the adult fish by the more forked shaped of the tail and the thinner scale, which, when the grilse is fresh captured, curls a little at the edges, and gives the so-called diamond-scaled appearance.

These fish continue to run up till late autumn. It has been suggested that the early grilse are the smolts of the preceding year, but practical experiments have shown that the smolts can grow into a grilse in the course of a few weeks (Day, *British and Irish Salmonidæ*, p 93).

Some of the grilse spawn, others again appear to visit the river and return to the sea without performing that function.

TAKING THE SALMON. 1.

The adult fish may remain months in the fresh water before spawning, and the general impression amongst competent observers is that salmon reproduce their young every alternate year, and that many rivers contain non-gravid fish all the year round.

Nomenclature—The salmon *parr* is also known as :—

Samlet, pink, skeggar, gravelling, laspring, fingerling and black fin.

The salmon *smolt* as :—

Mort, smelt, and sprod (although this term is also applied to the young of sea-trout).

The salmon *grilse* as :—

Fork tail and peal (Ireland, *not* Cornwall).

The term *botcher* is used in the Severn, but usually is applied not to grilse, but to small salmon.

TAKING THE SALMON. 2.

The adult male *before* spawning as :—
Red-fish, summer cock, gib fish, gilling.
The adult female *before* spawning as :—
Baggit, simen, and gilling.
The adult male *after* spawning as :—
Kypper, kelt, spent fish, gled and moffatman.
The adult female *after* spawning as :—
Shedder, mack, shrag, and *sometimes* baggit.

The term *laurel* is used by some as meaning a "well-mended kelt," and by others as a fish which has been in fresh water all summer.

CHARLES S. PATTERSON.

SALMON-FISHING—The salmon (*Salmo salar*) is the chief of what are known as game fish, in distinction from coarse fish. The rivers of Great Britain are naturally extremely prolific in this noble creature; but pollution, artificial obstructions and excessive netting in the sea, the estuaries, and especially in the rivers themselves, have sadly reduced the opportunities of the angler. The consequence is that salmon fishing has become one of the most costly sports, and none but men of ample means can afford to rent good angling waters. The remedy for this state of things can be found only in the adoption by the legislature of the unanimous recommendation of the Royal Commission on Tweed and Solway salmon fishings, which reported in 1896 to the effect that rivers, being at once the sole breeding grounds of salmon and the only place (except inland lakes) where they can be taken with the rod, should be reserved exclusively for rod fishing, and that net fishing in tidal waters should be so regulated as to permit the ascent of a proportion of every run of salmon at all seasons. In very many rivers netting is carried on now to such an extent that practically spring and summer angling, which afford the cream of the sport, have ceased to exist, and few or no fish reach the angling waters till the autumn floods, when they have begun to deteriorate in condition.

Rivers vary very much in the season at which salmon begin to enter them. Many theories have been propounded to account for this, among which that which assigns a high temperature of water as essential to an early stream, perhaps meets with most general acceptance. But this cannot be supported by the observation of facts. The rivers of Sutherland and Caithness, comparatively small streams, depend for their volume entirely on melted snow, but are among the earliest rivers in Scotland.

Salmon run into them throughout the winter, and are taken with the fly in January, sometimes after breaking the ice to enable a line to be cast. On the other hand, some of the rivers on the south-west coast of Scotland never contain salmon till August. In Ireland a perplexing contrast may be noted between the Bush and the Bann. The latter is a fine sweeping river, flowing from broad Lough Neagh, and draws no salmon till May or June. Very few miles to the east the Bush enters the sea, a dirty black ditch compared to the Bann; but it gives excellent early sport, of which the best is past before angling on the Bann has begun. The Tweed is naturally an early river, and a noble one; but in ordinary seasons there is little sport to be had until the close of net-fishing on September 14th. Practically, the men care to persevere with it; yet it is sometimes practised with effect in places which, though known to contain salmon, are not suitable for the higher art.

The boiled prawn is certainly a deadly bait, and will take fish, not only under circumstances favourable for the fly, but when they are distinctly the reverse—in still pools unruffled by the wind and in bright sunshine. Unfortunately, the use of the prawn in certain rivers is not confined to such emergencies. Lazy or greedy fishermen, perhaps after fishing a pool once over with the fly, clap on a prawn and ransack every recess where a salmon may lie. It is well that there are others who hold that the right object of a sportsman is to catch fish in the most sportsmanlike way, and will not permit in their waters the use of any bait but the artificial fly.

TAKING THE SALMON. 3.

whole spring and summer run of fish is swallowed up in the nets.

Lures—The favourite and most sportsmanlike way of taking salmon is with the artificial fly, though, of recent years, spinning with the artificial minnow or with some small natural fish has come into common vogue in certain waters. Fly-fishing, however, is a much more fascinating art, much more graceful and exhilarating, and, above all, one which neither disturbs the water nor scares the fish, so that other modes should be employed, if at all, at most very sparingly, in rivers where salmon will take the fly. The only places where minnow-fishing is excusable as the rule are deep lakes, like Loch Tay, where the fish lie far out of sight of any lure near the surface.

Worm-fishing presents so few attractions, and calls for so low a degree of skill, that few sportsmen care to persevere with it; yet it is sometimes practised with effect in places which, though known to contain salmon, are not suitable for the higher art.

The Rod—Of the rods and tackle requisite for salmon fishing, general mention has been made already (*see* ANGLING). Much, however, of the angler's success, and still more of his comfort, depends on the adaptation of his rod to the size and swiftness of the river he intends to fish. In northern streams, early in the season, when the water is cold, salmon will not stir at any but flies of the largest size; hooks of three and even four inches long must be used, and the weight of these, with a line heavy in proportion, makes it necessary to use a far more powerful rod than at other times. Weight, moreover, is specially required in the top joint, to give the strength proper for the recovery of a heavy line from the water, and this makes the strain on the angler's back and arms very severe. So soon, therefore, as the advancing season prescribes the use of smaller flies and lighter

tackle, advantage will be found in a rod considerably lighter in the top. Eighteen feet is a usual length for a salmon rod; none but men of extraordinary stature and strength gain anything by using a longer one, and many good fishers prefer one of seventeen feet. One thing is quite certain: it is unwise to employ any tradesman except those of established reputation, even if their prices run high. Rod-making has been brought to such perfection that, while you *may* get a good article in a cheap shop, you are *certain* to get it from any first-class maker. The man who gets among fish is sure to have his gear rudely tested, and it is the worst economy to try and save a few pounds in outfit. Spliced fastenings for joints are preferred by some people, but they cannot be recommended except for those who live close to the river, and vaseline to prevent sticking; and the same applies to the various ingenious modifications of the slip ferrule which find favour with those who have adopted them. When not in use, rods should be kept in some cool place, such as a cellar or coach-house; if kept in a room artificially heated, the wood is apt to get brittle, or shrink away from the fittings. They should not be tied too tightly into their covers; they should either be laid flat or placed erect in racks; and before being laid by for the season they should be rubbed well over with vaseline. The varnish on them should be renewed from time to time, preferably by the maker.

The Reel is second in importance only to the rod; and here again let the angler beware of the cheap article. It may look as well when new as an expensive one, but sooner or later

TAKING THE SALMON. 4.

are not obliged to take them to pieces at the close of every day. They are slightly lighter than rods with metal fastenings, but it is difficult to detect their alleged superiority in casting power.

While on this subject it may be observed that much chagrin may be avoided by invariably taking two rods to the water-side. The force exerted in lifting a long line from the water is so considerable that any check from fish or sunken rock may cause a fracture, which will take some valuable time to repair, or a bent ferrule, which is practically irreparable. Again, the soundest greenheart will sometimes snap in a high wind without any fault on the part of the angler, who, however, must bear the punishment if his spare rod has been left at home—perhaps miles away. If the ordinary slip ferrules are used, it is well to anoint them regularly with it will betray him at a critical moment. No design is better than the ordinary deep-barrelled, bronzed pattern, with revolving plate and a plain check, the pressure of the check being capable of regulation by a screw on the reverse side to the handle. In adjusting the reel to the rod, let the handle be on the left when the reel is *below* the rod; then, when a fish is hooked, the reel should be turned uppermost, bringing the handle to the right hand. The line then rests along the rod, instead of on the rings, while the fish is being played.

The Line—Reel-lines were formerly made of horsehair, or horsehair mixed with flax or silk. Happily, such material has been discarded generally in favour of silk alone, with waterproof dressing. Only experience will enable the angler to choose a line proportioned in weight to the rod that is to cast it. For early spring

fishing and in stormy weather a heavy tapered line is desirable. Forty yards of this expensive material is enough, backed with sixty or eighty yards of the light, but exceedingly strong, line used in tarpon fishing. Silk lines readily rot if left wet on the reel; they should be pulled out and hung to dry immediately after use. With due care a good line will last several seasons, but it should be tested at intervals from end to end.

Gut—Between the reel line and the fly comes the gut casting-line, which may be attached to the line either by a hitch knot or, preferably, by a loop. Fracture is more frequent in gut than in any other part of the gear; not because there is any lack of good gut in the market, but because it is a peculiarly perishable material, liable to become brittle after lying by some months. It is better to get small quantities from time to time and burn old stuff at the end of each season than to lay in a large stock. Treble twisted gut is less treacherous than single gut, and may be used in all but the finest waters. Most anglers, however, prefer single gut next the fly, except in spring and late autumn fishing; but seeing that salmon are generally fished for in swollen waters, it is very doubtful whether nicely tapered treble gut, made into casts *without knots*, is more visible to the fish than single. A fine-pointed stiletto, such as may be got for a few pence at any sewing-machine shop, is simply invaluable for undoing knots in gut or opening the loops of flies.

Flies—Of salmon-flies, and recipes for composing them, many volumes have been written. Local fishers are often very dogmatic about the precise pattern indispensable to success in their rivers; but those men who have cast angle in many waters generally come to the cold conclusion that, while size and movement are all-important, colour and material are of greater concern to the fisher than to the fish. A salmon-fly is not a "fly" in the sense that a trout-fly is an imitation of a certain insect: it is an object which simulates no particular animal, but by receiving a life-like motion in the water, is intended to rouse the curiosity, irritation or appetite of the salmon. Even if salmon possess the faculty of distinguishing between *colours* (as distinct from light and dark *shades*), which has never been proved, the fly is usually presented to them in a position which prevents colour being seen, namely, between the eye and strong light. Consequently it is no matter of surprise that on many rivers, where thirty or forty years ago none but sober greys and browns were held of any avail, fishermen now use the gaudiest compounds of fur and feather with equal success. Such was the case on the Tweed, where, fifty years ago, bright Irish flies used to be regarded with the utmost aversion; yet at the present time, if Tweed boatmen were asked to vote in support of what they considered the most killing fly, taking one day with another, it is probable that the "Wilkinson" would be found at the top of the poll—a creature with body of burnished silver, crimson throat hackle, and with jungle-fowl and blue chatterer in the wings. Mr. Dunbar's favourite colour for the Thurso in spring used to be green; now nothing will please the gillies, let alone the fish, but yellow and scarlet. Nobody can fish for salmon long without acquiring a preference for certain flies, which may be indulged with perfect confidence in any river he visits. He may find it necessary, in order to keep his attendant in good humour on bad rising days, to allow him to attach a fly of local reputation to his line; but if he is prudent, he will never fail to test the temper of the hook before encountering a fish.

Hooks—Much of the care bestowed on flies would be applied more profitably to the study of hooks (*see* ANGLING). The Limerick bend is the general favourite among salmon fishers, and a very good hook it is, provided the barb is not exaggerated as in some English imitations. Very large hooks should be of the long-shanked Dee pattern, for nothing is gained by increasing the bend and barb beyond a certain size. Hooks of an inferior make generally have been filed away behind the barb; and such should be avoided, as certain to snap if they strike on a bone. Fishermen are divided as to the merits of double hooks; but comparatively few deny that they are of great advantage in the smaller sizes of flies.

Casting the Fly—Abundant directions how to cast the fly may be found in most works on angling, but it is an art which it is as vain to try and impart on paper as it is simple to acquire from the example of a skilled companion. Unlike the trout-fisher, the salmon-fisher always works down stream, casting his fly more or less across the current according to its swiftness. If the rod is powerful, it will be found easier to cast a moderately long line—say twenty yards from the reel—than a shorter one. The presence of an attendant who knows the lodges of salmon is indispensable to one fishing any stream for the first time. Salmon are very constant to their haunts; but the places most attractive to the eye are often such as no fish frequent, while others which on the surface look unpromising may be the surest casts in the water. There is one device, however, which may be recommended for every good salmon cast. Supposing the angler to have fished down a piece of water where he has good reason to suspect the presence of fish, even though he has not had a rise, let him pull out three or four yards more of line, and, casting the fly more directly across the stream than he did in descending, retrace his footsteps up the stream, repeating the cast as soon as the fly hangs straight below him. This method of "backing it up" has proved successful times beyond reckoning: partly because the upward movement of the fisherman

straightens the slack of the line and gives the fly a truer play, and partly, it is probable, because a fish that may refuse a fly brought down facing him, may be induced to rise at one coming up suddenly from behind him. The varieties of casting—the overhand and underhand cast, the switch, the Spey cast and its modification, the figure of eight cast, and the Helmsdale wind cast—cannot be imparted by written instruction, but must be acquired by watching an expert.

Hooking the Fish.—In many cases a salmon will take the fly without showing himself or breaking the surface. The angler feels the fish before he sees it, and all he must do is to raise the rod smartly to a position which brings its pliability into play. But at other times the salmon breaks the surface with a splash or a boil, or dashes wholly or partly out of the water at the fly. At such times the angler, especially if he is accustomed to trout fishing, must train himself not to alter the movement of the fly till he actually feels the line tighten. If he is fishing with a small or medium-sized hook, the act of raising the rod into play is quite enough "strike" to fix it in the fish: but with a very large hook with heavy barb it is advisable to drive it home with a smart pull.

Playing a Salmon.—In playing a salmon, it is a good rule never to let a fish take a yard of line without fighting for it; keep opposite your fish or below him; many a good salmon has been lost from over anxiety to prevent him disturbing the water below where he was hooked. Except in fine water, where the angler may be seen by fish in the stream, the play of a hooked fish does not seem to communicate alarm to his fellows. Sometimes a fish is hooked immediately above a fall or a bridge, where inconvenience or disaster must ensue if he were to descend. In such circumstances, if the fish is gently handled at first, he may be induced to move upwards from the dangerous spot into water where he may be dealt with securely. Under all ordinary circumstances the utmost strain the tackle will warrant should be kept on a fish from first to last; much time and many fish are lost by timid or inexperienced anglers who deal over tenderly with their quarry. As a rule, no fish hooked in a place where the angler can keep opposite to him with a short line ought to take more than fifteen minutes in play; and the average time in practised hands is probably considerably less. When a fish "sulks" or lies down in a place where the rod cannot be brought into full play, "hand-lining" (*i.e.* taking hold of the line between the fish and the point of the rod and working it as in sea fishing) may be resorted to with advantage. In spring, "kelts" (unseasonable fish descending to the sea) should always be handled in this way, both because it is more expeditious and because it avoids uselessly straining the rod.

Landing a Salmon—If your attendant is a practised hand, he should carry a gaff on a shaft of hazel or male bamboo about five feet long; but if you are fishing alone, a jointed gaff carried in a sheath slung from the shoulder will be found most convenient. So soon as the fish lies quiet within reach, let the gaff be put over the middle of his back, and fixed smartly but steadily. The only exceptional circumstances under which the gaff should be put under the fish is when he has to be struck from a boat in deep water, as in the Shannon or on a lake. The use of the gaff is prohibited in the Tweed after the close of the net fishing, and in the Helmsdale while kelts are in the water, and a large landing-net is employed. But this is a heavy and clumsy article, and the

Jointed Gaff.

Landing Noose.

landing-noose in use on some rivers in Norway would probably supersede it if more generally known. Failing gaff, net or noose, salmon may be landed by "tailing" them (*i.e.* seizing them by the small of the tail), provided the shore is shelving; but a little more time and patience is necessary to finish the struggle in this way.

Sea-Trout Fishing—The fish most commonly known as the sea-trout is *Salmo trutta*, which in general appearance, habits, and the mode in which it is angled for, resembles the salmon in miniature and is a delicious fish on the table. Though it often takes the salmon or grilse fly, it is usually fished for with the larger sizes of loch-trout flies, the particular pattern being immaterial, though local fishermen usually have their favourite. As a general

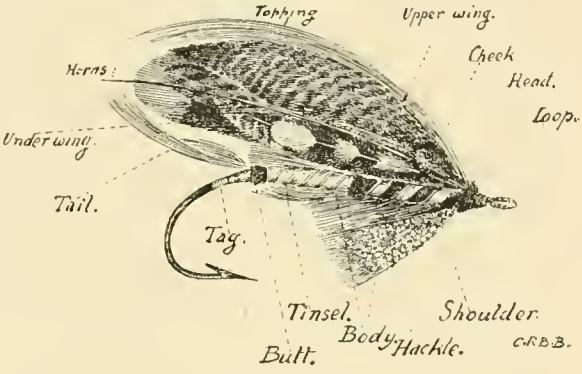
rule, bright colours are preferred, but nothing is better than the red palmer, the red-and-teal or the Wickham Fancy. Sea-trout ascend some streams in great numbers and afford the liveliest kind of sport, being free risers, and fighting most gamely when hooked. It is, however, a marked feature in the sea-trout that, having risen once and missed the fly, he can very seldom be tempted to rise again. The heaviest fish generally run in June and July, when they may be taken from 3 lbs. to 6 lbs. in weight and even heavier. These are followed by a run of smaller fish in August and September. By the beginning of October, nearly all have passed up to the spawning grounds, where they soon become unseasonable. In certain rivers it often happens that some tributary attracts the main run of sea-trout, while the salmon keep to the main stream. They are fond of congregating in lakes, where excellent sport is often obtained among them, notably in the lakes of Galway and Connemara, where they are known as white trout. They are called sewin in Wales, peal in Devon and Cornwall, and in Scotland the smaller fish are termed finnocks and herling. Sea-trout fishing in rivers is generally practised when a flood is running down; but these fish will take a small bright fly readily in low water, under a bright sun, provided there is a breeze. Night fishing with fly is very deadly in a low water. If the angler takes his stand at late dusk beside the first pool above the tide, he may fill a good basket before midnight, for, unlike the salmon, sea-trout take the fly as readily by night as by day. But it must be confessed that this is not a very refined art, and much of the charm is lost by not seeing the fish rise. Sea-trout will take a worm or minnow very freely, but it is an inferior sport, and cannot be recommended in pursuit of a fish of such a free rising habit.

In the Tweed, the term sea-trout is applied to another of the migratory *Salmonidæ*, viz. *Salmo cambricux* or *eriot*, known in most northern salmon rivers as the bull trout. It is a fish of thicker and coarser proportions than either salmon or trout, and although it runs to a large size, 10 lbs. to 12 lbs. being by no means extraordinary, it holds a very evil reputation among anglers. Not only is its flesh much less palatable than that of *Salmo trutta*, but it is a very bad riser at the fly. In fact it is only as it were accidentally that it is taken with fly by those fishing for better game. In such cases it fights strongly, a common device when hooked being to roll and splash about on the surface in a manner most trying to the nerves. The presence of this fish should be discouraged in salmon rivers, for although it has a good commercial value when taken in nets, it probably devours a quantity of salmon fry, being very voracious in the kelt state. The bull trout has taken possession of some streams, such as the Coquet and the Aln in Northumberland, almost to the exclusion of other sea fish.

HERBERT MAXWELL.

[*The Editors desire to express their sincere thanks to Mr. H. Anderson, of Gt. Crosby, for the photographs illustrating this article.*]

SALMON FLY TYING.—Salmon flies, although similar materials, such as feathers, furs, silks, and tinsels, are employed for their manufacture, bear no resemblance to trout flies. The latter are, in nearly all cases, tied to imitate living insects. It would be difficult to select from hundreds of patterns of salmon flies a dozen intended to imitate anything in nature. They are, generally speaking, a combination of feathers and furs of the gaudiest or richest hues, arranged on the hook in diverse ways in order to produce different effects. It is here that the methods employed for the manufacture of trout and salmon flies differ so much. One trout fly is a repetition of another as regards shape and manipulation of materials, and may be dressed upon three or four sizes of hooks. The materials used for salmon flies are far more numerous, each and all different in texture and behaviour; some are fine, some coarse; some easy, some difficult to manage;



SALMON FLY.

sometimes arranged one way, sometimes another, and on hooks that vary in size from half an inch up to four inches in length. It is, therefore, after long practice only, that the dresser can be sure of tying a well-proportioned salmon fly, of any size or description. Accuracy in fixing the different materials in the right place is necessary from the commencement, otherwise it is impossible to complete the fly satisfactorily.

Materials.—The following list comprises most of the materials employed:—*Feathers* from the golden pheasant, bustard, light blue chatterer, red-breasted crow, jungle-cock, blue and yellow, scarlet, blue and red macaws, Amazon parrot, toucan, peacock, guinea-fowl, ibis, summer duck, Mandarin drake, wigeon, teal, mallard, heron, English jay, ostrich, swan, and turkey; *hackles*, natural and dyed, from cocks' necks; gold and silver twist, lace, flat and oval tinsels (all especially made for the purpose); floss silks of all colours; dyed seals' fur and pigs' wool; Pearsall's gossamer fly tying silk, chenilles; embroidery scissors, stiletto, hackle pliers; varnish, shoemakers' wax, hooks of all sizes, treble twisted gut, and strands of the thickest salmon gut.

Some dressers use a vice, in which the hook is held during the process of tying; others hold the hook between the left thumb and forefinger, the second finger helping where necessary. The illustration shows the names of the several parts of a salmon fly.

SOME STANDARD PATTERNS.

Jock Scott.

A fly with built wings and "floss silk" body.

Tag—Silver twist and light yellow floss silk. *Tail*—A topping and Indian crow feather (flat). *Butt*—Black herl. *Body*—In two equal parts: first, light yellow floss, ribbed with fine silver tinsel; above and below, at the centre of body, two or three orange toucan feathers, followed by two or three turns of black herl. The second half of body black floss, with a black hackle down it, and ribbed with silver tinsel. *Shoulder hackle*—Guinea fowl. *Wings*—Two strips of black turkey with black bars and white tips for underwings; strips of bustard, grey mallard, golden pheasant tail, swan dyed yellow, red and blue strands of green peacock, with two strips of mallard and a topping on top. *Cheeks*—Jungle cock and chatterer. *Horns*—Blue macaw. *Head*—Black herl.

Silver Doctor.

A fly with "mixed" wings and "tinsel" body.

Tag—Silver twist and yellow floss. *Tail*—A topping with one chatterer feather on each side. *Butt*—Scarlet wool. *Ribs*—Oval silver tinsel. *Body*—Flat silver tinsel. *Hackle*—Light blue. *Shoulder hackle*—Guinea fowl. *Wings*—Single strands, mixed, of golden pheasant tail and tippet, bustard, summer duck, silver-grey turkey, swan dyed yellow, blue and red, with a topping above. *Horns*—Blue macaw. *Head*—Scarlet wool.

The Dunt.

A fly with "single strip flat" wings and "fur" body.

Tag—Silver twist and light blue floss. *Tail*—A topping, with strands of pintail. *Body*—Orange seal's fur, shading gradually to fiery brown. *Ribs*—Gold twist and silver tinsel. *Hackle*—Black beron half way down the body. *Shoulder hackle*—Teal. *Wings*—Two strips of brown turkey with black bar and white tips, tied flat. *Cheeks*—Jungle cock. *Head*—Black.

The Durham Ranger.

A fly with "whole feather" wings, and body "part silk floss, part fur."

Tag—Silver twist and yellow floss silk. *Tail*—A topping and Indian crow feather tied on flat. *Butt*—Black herl. *Body*—Two turns orange floss, two turns of dark orange seal's fur; the remainder black seal's fur. *Ribs*—Silver lace and tinsel. *Hackle*—From orange floss, a white cock's hackle, with black centre and tips, dyed orange. *Shoulder hackle*—Light blue. *Wings*—Two golden pheasant tippet feathers on each side; between them two jungle-cock feathers, extending to the tip of the tail. Topping on top, *Cheeks*—Chatterer. *Horns*—Blue macaw. *Head*—Black.

Method of Tying.—As with trout flies, the gut has to be tied on first; but instead of a single strand of it, a salmon fly is dressed with a gut loop, as it is stronger and the fly not so liable to be flipped off.

Loop.—The loop is made of stout single salmon gut for a small fly—and of treble twisted gut for a larger one. Careful preparation of the loop, before fixing, is necessary. A length of treble gut having been selected, it is doubled so as to form a loop; the ends are then untwisted slightly, each strand is cut to a different length, and tapered or pointed with a knife. If the loop is of single gut, the ends are similarly cut to a different length and tapered. The gut should be long enough for the loop to extend about one eighth of an inch beyond the head end of the hook shank, and for the longest end to reach nearly to a line drawn through the point of the hook, at right angles to the shank. The tying silk, doubled and waxed, is applied about the centre of the hook, and wound in open coils towards the head end; the loop is placed underneath, and the silk wound in close coils back over the hook and gut towards the bend, just far enough to cover the longest end. There it is finished off with a half hitch and the end cut off. About one eighth of an inch of the head end of the hook and the gut is always left bare until the wings are tied on. When hooks with metal eyes or loops are used, a layer of tying silk, commenced close to the eye, is wound closely down the shank, as far as a line drawn through the point of the hook at right angles to the shank, and finished off.

A fresh piece of silk is next fastened in at a spot above the root of the barb, and two or three turns of it are wound towards the bend of the hook. One end of a length of gold or silver twist is then stripped of its tinsel, between the finger nails, so that its silk core is exposed; the stripped end is tied in with two or three turns of silk, which is wound towards the bend. Four or five turns of the twist are next wound on, the first turn round the bare hook, the remaining coils towards the head end. One turn of tying silk fastens off the twist, the waste end of which is then stripped as before and cut off. Another turn of silk ties in a length of floss, three or four turns of which are wound on. The turns of tying silk which then fasten off the waste end of floss, form the foundation for the tail, which comes next.

Tail.—This may be a golden pheasant's topping, with perhaps a chatterer feather on each side, or a red crow's feather placed flat over it. The width of four turns of silk is as much as should be allowed for tying on any combination.

Butt.—The butt, which hides these turns, follows. For a herl butt, a strand of an ostrich feather is wound on so that its fibres point towards the tail; three or four turns of it are enough. Wool butts should look like a ring, oval in outline, round the hook. A piece of Berlin wool is torn into shreds, and rolled into the form of a "tip cat"; one end of this is held close to the hook, while the other end and tying silk, after being twisted together, are wound round the hook; the coils are then pressed close together.

The last coil of the butt should be just over the point of the hook, supposing that a line were drawn from one to the other, at right angles to the shank; a short length of the hook is then bare between the butt and the silk which tied on the gut loop; this length is filled up with the ends of herl, floss, tail stumps, ribbing tinsel and body material, so as to form a level, tapering surface for the body material to cover. On completion of the butt, one end of the ribbing tinsel (stripped so as to expose the silk core) is tied in close to the butt.

Body.—The body comes next. To look well, it should taper evenly from butt to head. It may be of floss, tinsel, or fur, or a combination of them. For the first, a length of floss is tied in at the head end of the hook, wound to the butt and back again, careful smoothing between the fingers at each turn being necessary in order to produce a glossy surface. A tinsel body is made as follows: the edge at one end of a piece of flat tinsel is cut to a point; this point is tied in close to the butt with one turn of silk; the extreme point is then turned back over the silk. Floss silk is next fastened in, and wound over the whole body, so as to give a true surface for the tinsel to rest upon; finally the tinsel is wound on so that each coil is close up to, but never overlaps, the last.

For a fur body, the material is spun or twisted with the tying silk, after being evenly distributed along it; a taper is obtained either by a previous layer of floss, or by increasing the quantity of fur gradually towards the head.

Body hackle.—The body hackle is the next item. The point is generally tied in at the spot where the second turn of ribbing tinsel will pass over the top of the body. When the body is of tinsel or floss, tying silk need not be used to fix it, as these materials will hold the feather sufficiently firm. Cocks' hackles are always "doubled" before being tied on; that is, the fibres on one side of the stem are turned or bent over, so as to bring them close to the fibres on the other side of the stem. This enables the dresser to wind the feather round the hook with all fibres pointing in one direction, towards the tail. The point of the hackle is held between the right thumb and forefinger, best or bright side uppermost; hackle pliers, held in the palm of the left hand, grip the butt end of the feather, which must be kept taut, while the left thumb and forefinger press gently downwards on each side of the stem and towards the palm of the left hand, or against the run of the fibres. If a coarse-fibred feather, macaw's for instance, is employed as a hackle, one side is usually stripped off; the left, where the feather is wound from the dresser, is the side to remove. (The right and left of a feather are always determined by holding it best side up, point

away from, and butt towards the dresser.) When a jay's feather is required as a hackle, it is not sufficient to strip off one side. The stem is so thick that neat work would be impossible; the quill is therefore cut lengthways with a knife, and the pith scraped away. On completion of the body, which may extend up to about one-eighth of an inch from the bare hook and gut, at head end, the ribbing tinsel is wound on and fixed, care being taken that the second turn of it passes immediately in front of the hackle; the latter—held in the pliers—is then wound on its side, close behind the tinsel, and, on reaching the end of the ribbing, straight round, and at right angles to the hook shank, for two or three turns, the stump being fastened under the hook with a couple of turns of silk.

Shoulder hackle.—The shoulder hackle, previously doubled, is then tied in, close to the last one, wound round, and finished off under the hook. The coils of silk which fasten off the shoulder hackle, bind together that part of the hook and gut which have hitherto been bare. These coils must be close together and tight, so that they afford a firm surface for the wings to rest upon.

Wings and underwings.—Wings are of several kinds: built, mixed, single strip, and whole feather. Built wings always have underwings, generally of strips of feather, which are the first to be tied on. (Strips from right sides of feathers are always used for the wing nearest the dresser, and strips from left sides for the wing furthest from him; rights from one feather will unite with rights from other feathers, and lefts with lefts.) To fix the underwings, equal strips are cut from the right and left side of the feather required; they are placed back to back, exactly coinciding, on the top of the hook and tied on in the following manner: the left thumb and forefinger grip the hook and strips at the point of tie; the silk, passed up under the thumb over the strips, and down under the forefinger, is gradually drawn tight, the fingers keeping the strips upright, and on the top of the hook. Three or four turns of silk are sufficient; the stumps are then cut off so as to form a taper. A broad strip, made by uniting "right" strips from different feathers, is next tied on at the side nearest the dresser. The strip is placed against the side, with the butt ends down the side of the hook shank, and held there between the right thumb and forefinger; the left thumb and forefinger. Then, from above, take hold of the strip and hook, just behind the point of tie; the left thumb slides forward and grips the butt to the side, taking the place of the right thumb; the silk is next passed up under the thumb, over the strip, down under the forefinger, and gradually pulled down, while the thumb presses the strip away from the dresser; a second turn is wound in the same way. All the fibres should be drawn down, one on top of the other, and not *round* the hook. A similar strip is next tied on the far side of the hook. Another strip, made up from differently coloured feathers, is tied on at each side in the same manner. The stumps are then collected, and cut off to a taper.

Mixed wings are made of single strands of different feathers; "right" strands are laid down one by one, on any flat surface, until a broad strip has been formed; a "left" strip is made up similarly; the two wings are placed back to back and tied on the top of the hook.

Single strip wings are tied on upright, as in built wings, or, horizontally, standing out from the sides of the hook; for these, the grip of the thumb and forefinger is above and below the hook and strip, while the silk is being drawn tight.

Whenever whole feathers are employed for wings, the centre quills should be dented with the thumb nail before they are tied in, and in the case of toppings tied on the top of a built or mixed wing, the stem should be bent up against the thumb nail, otherwise these feathers press down, and prevent free play of the wings.

When all the wing materials have been fixed, the stumps should be cut off so that, when they are bound down, a tapered head can be made; varnish is next applied to them. The tying silk is then wound evenly towards the end of the hook shank and back again for three or four turns. Herl for the head is then tied in. The fibres may face either way, and the silk be finished off with a half hitch, behind or in front of the herl. If behind, a short length of the tying silk must be varnished before the half hitch is drawn tight; if in front, the whole of the exposed coils of tying silk must be varnished.

W. HALE.

SALMON MEASUREMENTS, &c.—Body rather elongate, with the abdominal profile more curved than that of the back. The proportions of one part of the body to the remainder vary considerably in this fish, thus in the young we find a comparatively large head and eyes, a short snout and rounded body, &c.: but as the adult stage is attained there is greater depth of the body due to a more prominent abdomen. After breeding, the kelts are recognisable by low, lanky bodies and long heads. The length of the head varies with age and sex, being comparatively slightly longer in the parr than in the female grilse or salmon, while in the male salmon it is longer than in the female. Length of head from $4\frac{1}{4}$ to $4\frac{3}{4}$ or even 5 in the parr and male salmon to 5 or $5\frac{1}{4}$ in the female salmon and grilse, while in barren males it is similar to what is seen in females, of caudal fin from 6 in the parr to $7\frac{1}{2}$ in the salmon, height of body, which is greatest beneath the origin of the dorsal fin, $4\frac{1}{2}$ to 5 in the total length. *Eye*—situated slightly in front of the middle of the length of the head (or in the middle of that length in breeding males) and comparatively much smaller in adult than in young fish: interorbital space convex and equal to about $\frac{2}{3}$ the length of the postorbital portion of the head. Snout much produced in the male, and during the breeding season the extremities of the lower jaw is provided with a strongly curved prominence which precludes the closure of the two jaws. The posterior extremity of the maxilla reaches to beneath the middle of the eye in the parr but beyond its posterior extremity in the adult: while it is comparatively wider in the young than in the adult. Opercle higher than wide, from about $\frac{1}{5}$ more in the parr, or $\frac{1}{4}$ in the grilse or young salmon, and $\frac{1}{3}$ in large salmon: subopercle from $\frac{1}{2}$ to $\frac{1}{3}$ of the height of the opercle, while its posterior margin forms a semicircular curve along with that of the opercle.[1] Preopercle with its angle rounded and having a rather distinct lower limb. *Teeth*—in a single row in the jaws and palatines, the pre-maxillary one being rather stouter than those in the mandibles, while the maxillary and palatine ones are still smaller. In adults the teeth are often found to be larger in the jaws of males than in those of females. Head of the vomer without teeth, which are mostly in a single row along its body, and which are gradually lost at an early age, commencing from behind forwards, so that in a half-grown or adult salmon only 1 to 4 are present, the anterior 2 of which are occasionally in a double row: in the parr and smolt a double row exists along the body of the vomer which anteriorly is usually armed with 4 teeth placed in a single row. Three to six sharp curved teeth on each side of the tongue. *Fins*—mature fish have the fins shorter and more rounded than is seen in sterile ones. The rayed dorsal fin is a little longer at its base than is its highest ray. Pectoral in adults as long as the head excluding the snout, and does not reach half-way to the ventral, whereas in the parr it extends $\frac{2}{3}$ of the distance. Ventral in adults reaches half-way to the base of the anal in the parr $\frac{2}{3}$, anal one-fourth higher than its base is long. The form of the caudal alters with sexual development: in the young parr it is deeply cleft up to 2 or $2\frac{1}{2}$ feet in length, it is as a rule truncated, while with advancing age it becomes more square. *Scales*—in the caudal portion of the body they are larger in this than any other British species of the genus, there

[1] In Yarrell it is correctly observed that what distinguishes the *Salmo salar* from all other species is the form of the opercular bones, which show a rounded outline to the posterior edge of the gill-covers, the longest diameter of which to the nose would be in a line *through the eye*, while in all other British migratory species the same line would pass below the eye.

being from 11 to 12 rows in an oblique line running from behind the adipose dorsal fin downwards and forwards to the lateral-line. The skin on the back of old males both during and subsequent to the spawning season becomes thickened and spongy, causing the scales to be imbedded. Cœcal appendages varying from about 50 to 80. *Colours* —in adults superiorly of a steel blue, becoming lighter on the sides and beneath. Mostly a few rounded or x-shaped spots scattered over the body above the lateral-line and upper half of the head, being more numerous in the female than in the male. Dorsal, caudal, and pectoral fins dusky black: ventral and anal white, the former grayish internally. Prior to entering fresh waters these fish are of a brilliant steel blue along the back which becomes changed to a muddy tinge when they enter rivers. After these fish have passed into fresh waters for the purpose of breeding, numerous orange streaks appear in the cheeks of the male, and also spots, or even marks of the same, and likewise of a red colour on the body. It is now termed a "red-fish." The female, however, is dark in colour and known as a "black-fish." (Day's *Fishes of Great Britain and Ireland*, vol. ii., p. 67.)

SAMBUR (*Cervus* [*unicolor*)—*Sambar* in Central and Southern India; *Maha* in the Terai and the foot hills of the Central Himalayas abutting on it; *Gerrow* on the middle and higher ranges of the Himalayas, and sundry other local appellations.

Habitat—This deer is one of the largest members of its tribe in South-Eastern Asia. It is common in the more or less hilly jungles of Central and Southern India and Ceylon, and as far east as the Malayan Peninsula and some of the islands; also on the Himalayas, from the province of Sirmoor eastwards, up to an altitude of about 10,000 feet, in fact as high as the limit of forest. It may be met with either in small batches or singly, and, during the rutting season, in larger herds. Although essentially a woodland animal, it may often be seen out feeding in the early morning and in the evening on open slopes and glades where the grass is green, but never far from its forest retreat, in the shady depths of which it lies up all day. At night it makes raids on patches of cultivation in the vicinity of, or even at considerable distances from, its regular haunts.

Description—The average height of full-grown stags is about 13½ hands. Hair coarse generally, longish and wiry, particularly about the neck and chest, where it forms a kind of ruff, which is erected when excited or angry. In general colour it varies from darkish to paler slaty-brown, according to season and locality. In the higher Himalayan regions its coat is darker, thicker and furnished with an undergrowth of very short and soft pile known as "*pushum*," which, in winter, is common to almost all the quadrupeds, even to the horses and dogs, as a natural protection from the excessive cold. On the buttocks and underparts the hair is yellowish. The tail is unusually long for a deer, the ears very big and wide, the eye-pits very large and capable of being much protruded. Hinds and fawns are generally lighter coloured than the stags. The alarm note is a loud and deep single bellow, which it emits at short intervals.

The horns are in best condition from October until March or April, after which time they are shed. Those of an adult stag are often very massive and lengthy, but with only one long brow antler, pointing well upwards, and two terminal tines on each horn, and occasionally a short posterior snag at the bifurcation of the terminal tines. The writer possesses a gerrow head with horns 42 inches long, average beam girth 8 inches, and spread of a yard; but such a trophy as this never fell to his rifle, and not often, he imagines, to that of any one else.

SAMBUR.

Measurements—Av. height at shoulder, 54 in.; av. horn meas. 30 in.; max. horn meas., 46½ in.

Methods of Hunting—In the Terai and such-like forest localities, where the undergrowth is thick and tangled, it cannot be easily hunted on foot, owing to its acute powers of hearing and smelling, but is generally shot from elephant-back. On hilly and more open ground it is stalked. In Ceylon it is often hunted down with dogs trained to such work. The stags are harmless unless, perhaps, when a wounded one is brought to bay.

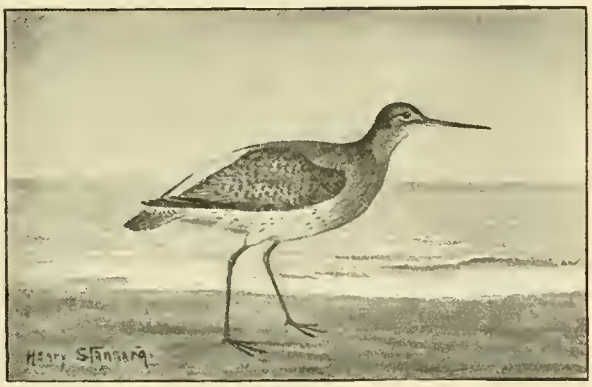
Weapon—These deer are tenacious of life; but a ·500 or even ·450 bore double express rifle with a hollow-pointed projectile of soft lead, plugged either with copper tube or bit of wood, is quite capable, if the shot be properly placed, of bringing down a Sambur stag, however large he may be.

DONALD MACINTYRE.

SANDPIPER—A general term applied to such of the smaller wading birds (*Limicolæ*) as frequent the sandy shores, sea ooze, and mud flats of tidal rivers, in search of the small mollusca, crustacea and sand worms upon which they feed.

Classification—In a restricted sense the "sandpiper" would exclude the ringed plovers (locally known as "sand-plovers" and "sand-larks") the turnstones and oyster-catchers, as well as the curlews, godwits, and snipes, whose divergent structure correlated with habits has caused them to be placed in different sub-families.

Roughly speaking, and to facilitate recognition, the sandpipers proper may be divided into two typical groups: one (*Tringa*) comprising species characterised by possessing a short sensitive bill, short legs with toes cleft to the base (as in the plovers) and with the tail feathers plain, *i.e.*, not barred; the other (*Totanus*) including such as have a harder or more horny bill, the toes either wholly or partially connected by a web at the base, and tail feathers more or less barred. Within and around these two groups we find several species showing modifications of structure, or seasonal peculiarities of plumage, which have induced ornithologists to place them in distinct genera under such names, *Actitis*, *Actodromas*, *Ancylochilus*, *Arquatella*, *Bartramia*, *Calidris*, *Ereunetes*, *Limonites*, *Pelidna*, *Symphemia*, *Tringoides*, *Tringites*, &c. The points of difference, however, on which some of these genera have been separated from the above-mentioned types are slight in character and of doubtful importance, the multiplicity of names serving only to create confusion and obscure relationships. These names, however, having found their way into the literature of the subject, cannot be wholly disregarded.



REDSHANK.

Geographical Distribution—Sandpipers are amongst the most cosmopolitan of birds, many of them being found in almost every quarter of the globe. Thus the dunlin (*Tringa alpina*), locally known as stint and ox-bird, the commonest sandpiper which is found in this country, ranges from Iceland and the Faroe Islands throughout Europe far into Africa, where it spends the winter; from Siberia in Asia to India and China (where also it is a winter visitor); and in North America from California to the West Indies; it sojourns also in Greenland.

The curlew sandpiper (*Tringa subarquata*) which visits us in spring and autumn, often in considerable flocks at the latter season, is even a greater wanderer than the dunlin; for although it has not yet been met with quite so far north, that is, in Iceland, Greenland, or Spitzbergen, it is found from Archangel throughout Europe and Africa down to Cape Colony; throughout the Indian region, Ceylon, the Andamans, Java, Australia, and Tasmania, and on the American continent has been found as far to the south as East Patagonia.

Species Breeding in Great Britain—The sandpipers which breed in the British Islands are comparatively few in number. They are the greenshank, redshank, ruff and reeve (formerly; see **Ruff**), common sandpiper, purple sandpiper (probably), dunlin, and red-necked phalarope.

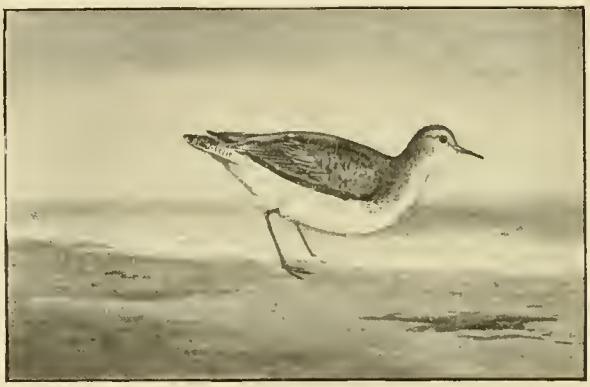
Distinguishing Characters. Greenshank (*Totanus glottis*)—Entire length, 12 inches; bill, somewhat recurved, 2; wing, 7; tarsus, 2·25. General colour, in summer, grey mottled with black; rump, white; wings, black; the shaft of the first primary, white; chin, throat, and breast, white, longitudinally streaked with black; belly, pure white; bill, slate-colour; legs and toes, pale green. In winter all trace of black disappears from the upper portion of the plumage, and the whole of the under parts, from chin to vent, are pure white.

Redshank (*Totanus calidris*)—Entire length, 11 inches; bill, 1·6; wing, 6·5; tarsus, 1·75; bare part of tibia, ·9. General colour, in summer, above, hair-brown, transversely barred with a darker shade; below, white, streaked longitudinally with dark brown; tail, white, barred with dark brown; bill, horn-colour, orange at base; legs and toes, orange. In winter the plumage is more or less of a uniform grey above, throat dusky, under parts pure white; legs and toes paler than in summer. The birds of the year are intermediate in colour between the summer and winter plumages of their parents.

Ruff and Reeve (*Machetes pugnax*)—Entire length, male, 12 inches; female, 9; bill, 1·25; wing, male, 7·25; female, 6; tarsus, 1·5. The colour of this species varies so much in individuals that it is impossible to describe it in a few words. In summer the males have the dorsal plumage of all shades of brown, buff,

chestnut, and purple: on the neck a large frill or ruff (hence the bird's name), of a different colour to the back. Sometimes this frill is of a uniform colour, as chestnut, purplish-black, or white: sometimes it is variegated. It is assumed only during the breeding season, and has entirely disappeared before the shooting season has commenced. In the autumn and winter the plumage resembles that of the godwits at the same season; but its smaller size, short and straight bill, and dark rump will always distinguish it. The female, or reeve, never assumes the frill, but retains much the same colours throughout the year, except that they are much more intense in summer. The colour of the legs and toes varies very much. As a rule they are lemon colour or orange. But occasionally one sees a bird with pale green or grey legs.

Common Sandpiper (*Totanus hypoleucus*)—Entire length, 7·5 inches; bill, 1; wing, 4·25; tarsus, ·9. General colour, above, bronze; throat, longitudinally streaked with hair-brown; breast and belly, pure white; bill, horn-colour, the base flesh-colour; legs and toes, greyish-green.



SANDPIPER.

Purple Sandpiper (*Tringa maritima*)—Entire length, 8·50 inches; bill, 1·4; wing, 5·3; tarsus, 1 inch. The dorsal plumage is purple only in winter. In summer it is variegated with black, brown and buff, the breast at the same season being spotted. The legs and toes at all seasons are of a yellowish-clay colour. The colour of the legs (which are very short) will distinguish this bird at all times from any of its congeners.

Dunlin (*Tringa alpina*)—Entire length, 8 inches: bill, male, 1·3; female, 1·5; wing, 4·5: tarsus, 1. General colour, in summer, head, back and wing-coverts mottled with various shades of brown, black and rufous; on the belly a patch of black. In winter the dorsal plumage is, more or less, light brown or grey; the whole of the underparts pure white. Young birds, in autumn, have the breast and flanks spotted with black. Bill, legs and toes, at all seasons, black.

Red-necked Phalarope (*Phalaropus hyperboreus*)—Entire length, 7 inches; bill, ·8; wing, 4·5; tarsus, ·8. General colour, in summer, black and grey above; on the throat and neck a patch of bright chestnut; under parts pure white. In winter the rufous colour on the neck disappears, the dorsal plumage becomes much lighter, and the whole of the under parts, from chin to vent, are pure white. The bill is much more slender and pointed than in the grey phalarope. The feet are lobed. This little bird nests regularly in Scotland and the Hebrides, and visits England in autumn on its way southwards for the winter.

Periodical Migrants—In addition to the above-named species, we have as passing visitors in spring and autumn, on their way to and from their breeding haunts, the dusky redshank, green sandpiper, wood sandpiper, knot, curlew sandpiper, little stint, Temminck's stint, sanderling and grey phalarope.

Distinguishing Characters. Dusky Redshank (*Totanus fuscus*)—Entire length, 12·5 inches; bill, 2·3; wing, 6·75; tarsus, 2·25; bare part of tibia, 1·5. General colour, in summer, sooty black, with a few of the feathers margined and spotted with white; belly and rump, more or less white; tail, closely barred; bill, horn-colour, the base orange; legs and toes, vinous. In winter the plumage above is more or less uniformly grey, the throat faintly spotted, and the breast and belly pure white. Legs and toes, lemon-colour. Birds of the year have the upper portion of the plumage sooty brown, minutely freckled with white; the whole of the under parts, from chin to vent, white, closely freckled with light ash. The tarsus and tibia are much longer than in the common redshank, and the bill is not only much longer, but also more attenuated towards the extremity, and the upper mandible curves downwards at the tip.

Green Sandpiper (*Totanus ochropus*)—Entire length, 9·5 inches; bill, 1·2; wing, 5·5; tarsus, 1·25; bare part of tibia, ·7 inches. General colour, above, greenish-brown, in summer minutely freckled with white, in winter almost uniform: below, throat white, longitudinally streaked with dark brown; breast and belly, white; rump, white; tail, with outer feathers, white, centre feathers broadly barred with black; bill, slate colour; legs and toes, greyish-green. This bird has a very peculiar musky odour, akin to that of the petrels.

Wood Sandpiper (*Totanus glareola*)—Entire length, 9 inches; bill, 1 inch; wing, 5 inches: tarsus, 1·4; bare part of tibia, ·8. General

colour, similar to the last-named, from which it differs in having a shorter bill and longer legs: all the feathers in the tail barred, and the shaft of the first primary white. In the green sandpiper all the quills are black.

Knot (*Tringa canutus*)—Entire length, 10 inches; bill, 1·2; wing, 6·5; tarsus, 1·1. General colour, chestnut in summer and grey and white in winter, like the curlew sandpiper and godwits at the same seasons, except that the rump is variegated, and not white. In summer the legs and toes are olive, the soles of the feet yellow; in winter they are entirely black.

Curlew Sandpiper (*Tringa subarquata*)—Entire length, 8·25 inches; bill, 1·5; wing, 5; tarsus, 1·2. General colour, in summer, chestnut, variegated above with black, below with white; bill, black, slightly curved downwards like that of a curlew; legs and toes, black. In winter the general colour above is grey and buff; the rump, white; under parts, pure white. Young birds, in autumn, have a tinge of buff on the breast, as remarked in the case of the godwits.

DUNLIN.

Little Stint (*Tringa minuta*)—Entire length, 6 inches; bill, ·8; wing, 3·75; tarsus, ·9. Resembles a miniature dunlin, except that there is never any black on the under parts. In summer the neck and breast are spotted with rufous, and the dorsal plumage has a large admixture of the same colour. In winter the spots on the neck and breast disappear, and the dorsal plumage becomes considerably lighter in colour. Bill, legs, and toes at all seasons black.

Temminck's Stint (*Tringa temminckii*)—Entire length, 5·75 inches; bill, ·6; wing, 3·75; tarsus, ·6. Resembles a miniature common sandpiper, and may be distinguished from the little stint by its shorter and more slender bill, shorter legs (which are greyish-green instead of black), by its white outer tail feathers, and by having the shaft of only the first primary white, whereas in the little stint all the shafts are white.

Sanderling (*Calidris arenaria*)—Entire length, 8 inches; bill, ·9; wing, 5 inches; tarsus, 1 inch. General colour, in summer, reddish-brown, black, and grey above; chin and breast, ditto; from breast downwards, pure white. In winter, grey and white above; from chin to vent, pure white; bill, legs, and toes, black. Bill as in the sandpipers. Toes, three, as in the plovers.

Grey Phalarope (*Phalaropus fulicarius*)—Entire length, 8 inches; bill, 1; wing, 5; tarsus, ·8. General colour, in summer, brown, white, and rufous above; from chin to vent, chestnut. In winter, grey and white above: the under parts pure white. Bill very flat. Feet lobed like a coot. This bird is seldom met with in the British Islands in its summer dress. It visits us regularly in autumn (September and October), by which time it has acquired its winter plumage, and in some years is very numerous.

Occasional Visitors—The sandpipers which remain to be considered are those which make their appearance as rare and accidental visitors, usually during the period of the autumnal migration. Of these may be mentioned the Broadbilled sandpiper (*Tringa platyrhyncha*), which breeds in Lapland, Finland, Norway, and the tundras of European Russia, and the following American species: Yellowshank, Solitary sandpiper, Bartram's sandpiper, Buff-breasted sandpiper, Spotted sandpiper, Pectoral sandpiper, Bonaparte's sandpiper, and Wilson's American Stint, *Tringa pusilla* of Wilson (1812), *Tringa minutilla* of Vieillot (1819).

It is to be observed that in this article attention is of necessity confined to those sandpipers which are known as residents or visitors to the British Islands. The species to be met with in other parts of the world are far too numerous to be dealt with here, however briefly.

J. E. HARTING.

SCOTTISH SCHOOL CHAMPIONSHIPS—The interest in games, and indeed in school-life generally, has been greatly promoted by what are called the Football and Cricket Championships. These are not formal institutions, and there are no written rules as to how they are decided. But, with the exception perhaps of one occasion, it has always been quite clear which school has been the top of the tree for any particular season, or sometimes two have been equal.

Briefly the matter stands as follows:—There are seven schools which can play each other on something like equal terms; four of these are

purely boarding-schools—Glenalmond, Fettes, Loretto and Blair Lodge; one, Merchiston, is partly a boarding and partly a day-school, while the Edinburgh Academy and George Watson's College are purely day-schools. Of the boarding-schools Fettes is the largest, with about 220 boys, and Loretto the smallest, with about 120. Watson's has about 1,200 boys, and the Academy about 400. But the day-schools, though they have a greater pick, do not as a rule keep their boys so long as the boarding-schools. All these schools do not, however, play each other; but the exceptions have not hitherto affected the Championship. Merchiston has been most successful in the Football Championship, and Loretto in Cricket; Fettes having run close up in both.

The Cricket Championship may be said to have become a recognised institution from the first two-day match between Loretto and Fettes in 1875, and in the majority of years the issue of the Cricket Championship has depended on this match, which is played on the same days as Eton and Harrow. The Football Championship, again, may be said to have begun in 1881, when Fettes, Merchiston and Loretto first began to play each other regularly. It is the custom for all these schools, except Glenalmond, whose distance sometimes makes it impossible, to have football matches every Saturday from the end of October to the middle of March, and cricket matches for every Saturday of the summer term. Some of the day-schools sometimes turn out as many as ten teams, and the boarding-schools never less than three.

This rivalry between the schools naturally produces great attention to physical education generally. Particulars of the system of Merchiston are subjoined, as for its size and numbers it is probably the best football school in the world.

Boys are called at 7, when they turn out in flannels, and have a run or smart walk of about three-quarters of a mile, then a cold bath and rub down. Breakfast at 8; school from 9 to 12.

Monday, 12.30 to 1.30—Big side (as often as possible a team of masters and old boys play the Fifteen on Monday).

Tuesday, 12.30 to 1—The Fifteen look after the lower teams and make them play up. From 1 to 1.30 they practise drop and place kicking, and the halves and quarters practise passing.

Wednesday, 2.30 to 5—Football match, or, if before a school match, a cross country run of from seven to ten miles, usually over the Pentland Hills.

Thursday, 12.30 to 1.30—Big side.

Friday, 12 to 1—Cadet corps drill; 1 to 1.30—kicking in field, as on Tuesday.

From 3 to 6—There are four periods, three of work and one of gymnastics; so that every boy gets about forty minutes' gymnastics every day.

On Friday night they have in addition fencing and boxing. The Fifteen have also half an hour of this every night after preparation.

The tuck shop is not an institution among the schools, which stand high in the Football Championship.

Every boy in the school must play football, unless exempted by the school medical officer.

All boys are accurately weighed and measured twice a term.

The physical system of the other boarding-schools does not differ widely from this.

H. H. ALMOND.

SEA-FISHING—In spite of much that has of late years been done to popularise this branch of angling, which, it is recognised, offers great benefits both to fishermen who cannot afford the outlay nowadays incidental to good sport inland, and to the rivers and lakes which a temporary defection of anglers to the sea must relieve from the threatening ills of over-fishing, the general idea of sea-fishing as a sport continues as erroneous as it was when Mr. Wilcocks endeavoured, many years ago, to acquaint amateurs with the then new field for their operations. It is regarded by the many as a clumsy and unpicturesque pursuit, and the sea-angler is but too often looked upon as a successful, or unsuccessful, pot-hunter who has tried to make great hauls, by fair means or foul, and failed only by the lack of knowledge of the craft. Thus, however great his catch, he is condemned. The few, however, know that sea-fishing is, in its way and with necessary reservations, as truly a sport as any other kind of fishing, and that the same distinction may be drawn, as on river and lake, between those who try to catch for the market as many fish as possible with the least outlay and trouble, and those who, on the other hand, try to catch for amusement every fish, no matter what the aggregate, in sporting fashion. The increase in the ranks of sea-anglers, which has not escaped attention during the last ten years, may be regarded as in great measure due to the disgust aroused by the modern monopoly, either on the part of angling clubs and syndicates or of private owners, in inland fisheries, as well as to the general variety and healthfulness of the sport. No one, or not at any rate the present writer, would attempt to place for those with opportunities for both, sea-fishing on a level with the more gentle and artistic pursuit of trout or salmon; but it would not be difficult to demonstrate that, to men of limited means and leisure, to say nothing of the recreation it may furnish to becalmed yachtsmen, it offers attractions to be found in few other branches of angling nowadays available.

Sea-fishing is a somewhat wide subject for treatment in a restricted article, and perhaps the most convenient course will be to consider in

alphabetic order the principal fish encountered by the amateur, together with the tackle and baits recommended for their capture. A few topographical notes are offered under the head of each fish, and the concluding portion of the article contains general hints. It is, however, necessary to grasp the fact that sea-fishing is not, like pond-fishing or (in India) tank-fishing, a comparatively circumscribed branch of the art, but an aggregate of at least as many (considerably more, if we add the semi-professional methods sometimes followed) styles as those practised in fresh water.

I. Fish.

Bass (*Labrax lupus*)—This is a sea-perch, distinguished by Mr. Boulenger from the true perches, with which it formerly was classed. It is encountered on both rocky and sandy ground, chiefly on the latter, and often feeding in the surf in less than six feet of water. Almost any bait, if sufficiently large, is accepted by this fish, nor is freshness a matter of great moment. Thus, live sand-eels, pilchards (*minus* head, tail and backbone), soft green crab, ray's liver and the entrails of chickens are all accounted in their way deadly; and, besides these, it takes a salmon-fly and various spinning-baits. It is therefore taken by fly-fishing, spinning, whiffing, and drift-lining; also in ground-fishing with leger or paternoster (*see* below).

Among the favourite spots on our coasts for bass may be mentioned the east breakwater at Hastings, where they are caught on throw-out lines baited with fresh herring or soft crab; the harbour at Shoreham, where live sand-eels seem the best bait; the river Arun *above* Arundel, where they take a live roach or dace on snap-tackle; the Passage Bridge at Weymouth, where a strip of mackerel is most appreciated; the Cornish sand "splats," where the angler uses an unleaded line with a single large hook embedded in a decapitated pilchard; and parts of the Welsh coast, where ray's liver is a favourite bait.

Bream (*Pagrus vulgaris*)—The sea-breams, of which the common species may be taken as typical, are caught among the rocks at a moderate depth. They are mostly taken on ground-lines, though occasionally on drift-tackle, and the chopstick is as good as any other arrangement (*see* below). For bait, mussel, green crab, and pieces of herring, pilchard, or mackerel are all good. Small sea-bream, known as chad, are a great nuisance when the angler is anchored for pollack, though they form a fairly good bait for the latter fish. The Black Bream (*Chrysophrys*) of Australian inlets is the favourite fish of colonial anglers, who catch it on the finest of gut tackle, and with shrimps for bait, a ground-bait compounded of tinned salmon and cheese, and known as "berley," playing no unimportant part in the success of the day.

Cod (*Morrhua vulgaris*)—This is another ground fish, which is, however, caught on both rock and sand, the best season on our coasts being the late autumn. Amateurs use the paternoster more than any other tackle from a boat, or the throw-out tackle from the shore; and for bait, lugworm, sprat and whelk are perhaps equally good. Deal is one of the cod-fisher's favourite spots on our south coast, and the catches made there by amateurs in the months of October and November are certainly tempting. A few good fish are even landed by anglers on the pier, but the greater part are taken in boats. Bexhill is another spot, within easy reach of London, where I have seen good cod.

Conger (*Conger vulgaris*)—The great sea-eel is caught, chiefly at night, among the rocks. Only the smaller congers are caught by day, and these are never far from the rocks. It is of interest to note that every conger above 4 or 5 lbs. in weight is a female, the males not exceeding that weight. Large females, however, up to 50 lbs., or even more, may be hooked at night on inshore reefs within a mile of the beach, especially down in Cornwall, or in the west of Ireland. Very strong ground-lines are used, each carrying two hooks, and the bait is a piece of fresh squid, well hammered to make it soft, or a pilchard with the bones removed. Congers object to any but a soft, fresh bait.

Dab—*See* Plaice.

Dory (*Zeus faber*)—This ungainly but sweet-flavoured fish is caught in the neighbourhood of rocks or piers, but not as a rule in numbers, though there is occasionally a fair sprinkling of large dory with the bream and pollack on the deep-water rocks off Falmouth and Mevagissey. Otherwise, the drift-line, baited with a small pout or large sand-eel, would be the most likely way to catch these fish.

Flathead (*Platycephalus*)—An Australian fish, allied to our gurnards, which is caught on the sand, both at sea and in the estuaries. Colonials distinguish grass-flatheads and rock-flatheads, but these may probably be regarded as races rather than as valid species. The flathead, which is excellent eating, takes shrimp freely, the tackle being used without lead. It is a powerful fish for the light tackle used in its capture.

Grouper, or **Groper** (*Cossyphus*)—An Australian fish, allied, though not closely, to our wrasses, which is taken on the rocks. The ledges from which gropers, often scaling up to 50 lbs., are taken would be inaccessible to the visitor, save under the guidance of a colonial angler. The line is used without lead, and the bait is soft crab, similar to that used at home for bass.

Gurnards (*Trigla lyra*, &c.)—The gurnards, of which our seas contain several, do not give great sport, but are admired by all for the

beauty of their colouring, and by some esteemed for their table qualities, which, in the writer's opinion, are not high. He prefers, in fact, regarding them in the light of accidental catches; but those who desire to hook them in number can generally do so throughout the summer by anchoring their boat on the sand at the edge of the rocks and leaving their hooks on the bottom, any bait a shade too large for pout being suitable.

Mackerel (*Scomber scomber*)—The mackerel may be regarded as one of the amateur's best fish, for it gives, for its size, first-rate sport; it is generally present, if at all, in numbers, and, when quite fresh and properly cooked, is excellent for the table, though too rich for some digestions. It is captured at all depths, within a foot of the surface in warm summer weather, and within a foot of the bottom later in the year. Almost any baits, natural or artificial, will attract when mackerel are in the humour; and, according to the depth at which they are feeding at the time, they are taken on whiffing-lines, drift-lines, or chopstick-tackle; on the first when feeding near the top, on the second at any depth up to half a dozen fathoms, on the last when near the bottom. The most agreeable and artistic method, when practicable, is with a light drift-line and single hook baited with a couple of large mussels or a strip of mackerel or pilchard.

Mullet, Grey (*Mugil chelo*)—If, as it is fair to presume, the sporting value of a fish increases in direct ratio to the difficulty of catching it, then may the grey mullet be allowed to stand first among the English amateur's sea-fish. In Italy, these mullet are less fastidious; and the present writer has more than once filled a larger creel in the Mediterranean in a couple of hours before breakfast than he would undertake to fill in a week anywhere in the Channel. The grey mullets are partial to estuaries, in the mud of which they doubtless find the soft food on which they subsist. Light tackle used with a stout rod is best for their capture, a paternoster with three or four small hooks baited with ragworms being the accepted style at Littlehampton, in Sussex, the headquarters of south coast mullet-fishers. These use a rod of 7 feet, No. 5 (Redditch) hooks, and a pear-shaped lead weighing ½ lb. The favourite spot during the season (June to September inclusive) is the Beacon, at the end of the east works; but a few good fish are caught early in the season from boats moored to a tree two-thirds of the way down the works, as well as from the various quays on the left bank as far up as the railway wharf. A landing-net is always used, as mullet are tender-mouthed, and the hook easily breaks away.

Mullet, Red (*Mullus barbatus*)—The present writer had always regarded the red mullet as a somewhat unusual catch for the amateur on our coasts, but his attention was recently drawn by Mr. Wilcocks to its almost frequent capture both at Shoreham and in Guernsey; and other anglers have sent him accounts of similar cases from Cornwall and the coast of Brittany. (Another still rarer hook-fish is the Shad (*Clupea alosa*), of which, however, since the publication of *Sea Fish*, in the Anglers' Library, the writer has had note of several taken on Deal pier, one by Mr. Burgess, on Easter Monday, 1897, weighing 2½ lbs., another, more recently, by Mr. Litchfield of the B.S.A.S.) The red mullet, essentially a ground-feeder, has a preference for soft baits, and lugworm and mussel appear to be equally deadly. A small hook, 8 or 9 (Redditch), would answer the purpose. One red mullet has been reported as taken on a whiffing line, a most unusual event. The baits must have been close to the bottom.

Plaice and **Dab** (*Pleuronectes platessa* and *P. limanda*)—The plaice and dab, indeed most of the flat fish, may fairly be bracketed from the angler's standpoint, for all are ground-feeders, all comparatively small-mouthed and therefore requiring a small hook, and all with a fancy for soft baits, such as lugworm and mussel. Soles are taken in the mud, and mostly at night. Flounders are taken in estuaries, and far above the tidal waters in rivers.

Pollack and **Coal Fish** (*Gadus pollachius* and *G. virens*)—In these, again, we have two fish that, while valid species like the plaice and dab, may fairly be considered together, so similar are their habits and consequently the methods employed in their capture. With the bass and mackerel, they constitute the sea-angler's "game-fish," and they are taken at all depths, accepting the live sand-eel or artificial baits on whiffing-lines, or mussel and pilchard on drift-tackle. Of artificial baits, the various rubber eels, with or without a tin spinner at the head, are the most deadly. Neither fish can be accounted of high merit for the table.

Pout, or Whiting-pout (*Gadus luscus*)—Like the last two, this is a member of the cod family, and is also one of the commonest fish in the Channel, being taken on probably every reef of rocks within even a hundred yards of the beach. The pout taken on these inshore grounds are mostly very small, but further out in the offing there are pout up to 5 lbs., which, coming up two at a time, give good sport in the autumn. For bait, pieces of almost any fish or mollusc may be used, the pout being among the least discriminating of fish. The chop-stick tackle is the best. The boat must be anchored well over the rocks, and the hooks may be kept a couple of feet from the bottom. Pout are found to bite best with a little tide running.

Scad, or Horse-mackerel (*Caranx trachurus*)—Somewhat resembling the mackerel, in the company of which it is usually taken, the scad may be distinguished by its duller colour-

ing, as well as by the presence of a row of bony processes along the lateral line. The name of this fish must be kept distinct from that of the aforementioned shad and chad, with both of which it is not seldom confused. It is caught accidentally with the mackerel, and takes the same baits.

Schnapper (*Pagrus unicolor*)—In this great red bream we have the most sporting sea-fish of the Australian colonies. It is caught on the reefs of rocks that skirt that inhospitable coast, and it is usual to undertake schnapper-fishing expeditions in small steam-tugs chartered for the purpose. Handlines of great strength, and at least a hundred yards long, are used; the hook is large, and is baited with pieces of fish or squid, and the fish are hauled aboard, often running the gauntlet of innumerable sharks, as quickly as possible. In addition to its sport-giving qualities and large size, the schnapper is a most delicate table-fish.

Smelt (*Osmerus*)—The true (salmonoid) smelt is hooked mostly in East coast estuaries. [The so-called "smelt" (*Atherina*) of the South coast is really the Atherine, a distinct fish.]

Turbot (*Rhombus maximus*). — Like the garfish, red mullet, dory and some others, the turbot is not a fish to the capture of which the amateur expressly applies himself, as he would, for instance, in the case of bass, conger, or mackerel. It is not improbable that, with increased information relating to the habits and whereabouts of our sea-fish, a future generation of amateurs may find themselves in a position to follow turbot-fishing by design. There is no reason indeed why, given the requisite knowledge, they should not do so; there is every reason why they should. The turbot is a powerful fish, giving great sport, and it makes, properly cooked (*not* in portions) a desirable dish. At present, however, it ranks among the "accidents"; and, beyond suggesting a small hook, lying on the sand, and baited with a two-inch strip of sand-smelt or the half of a large sand-eel, the writer prefers offering no hints for its capture.

Whiting (*Gadus merlangus*).—The whiting, on the other hand, is among the amateur's favourite and most familiar fish. There are, of course, different qualities of whiting-fishing, and the usual handling of small ½ lb. fish close inshore is a far less inspiring performance than really brisk handlining, ten miles out, with the fish running a couple of pounds each and coming up two at a time. The sid-strap tackle, which can be recommended for whiting in deep water, is figured below; and sprat, herring, mussel and squid are all good baits. [The so-called Whiting (*Sillago*) of Australian estuaries is related to our weevers, and is caught with rod and fine tackle, baiting with shrimps.]

The fish with which the amateur may expect to meet, even in our coast waters, are by no means exhausted by the foregoing; for the writer once took, during a few weeks in Cornwall, no fewer than thirty-two species, and these included neither bass nor mullet. The principal kinds omitted in the above lists are the sharks (blue and porbeagle), dogfish and skates, all of which cartilaginous fish may be regarded as "vermin." It may be borne in mind, however, that the sharks, though unsought, give good sport, while the rays and skates are, according to some fancies, agreeable eating.

II. Tackle.

Handlining.—It is not necessary to open once again the vexed question of the relative merits of rod and handline. The writer has endeavoured to show, whenever occasion offered, that both have, in his opinion, their proper place, the rod in shallow water and fine weather, the line in deep water and wind. He is enabled, however, by the kindness of Mr. Walter Shaw, of Salcombe, one of the most accomplished anglers on the south coast, to give one or two hitherto unpublished improvements in the making and use of the hand-line.

In reference more particularly to pollack-fishing, Mr. Shaw says that he uses single gut at the end of the line, and allows the fish to run, as holding on to it generally means a break. His line is as follows:—

6 ft. single gut next the hook, then 7 ft. or 8 ft. twisted gut, the two traces being divided by a swivel; next come 30 ft. of very fine snooding, also separated by a swivel from the twisted gut, and lastly a large swivel to which is attached the main line, of which there are 10 fathoms, with a single pipe-lead strung on it. The lead is thus over 40 ft. from the hook, a great advantage in fine water. The main line of 10 fathoms is comparatively fine, and to this Mr. Shaw makes fast 40 yards of stouter line wound on a large pike-reel, which is fixed in a thole. By standing in the stern and sculling with a long oar out through the chock, holding the line in the free hand, he is able to go out single-handed, and he insists strongly on the advantage of the gentle way on the boat and absence of fuss in shipping oars; for the paddle, being made fast to the boat

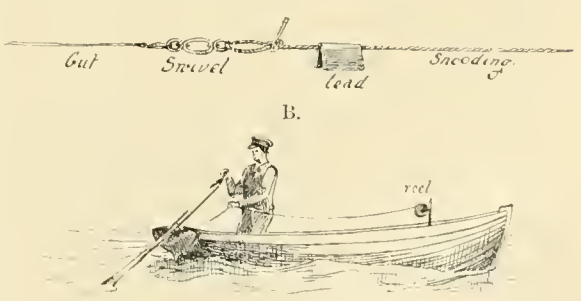


Fig. 1.—A, the line; B, method of working single-handed.

by a small piece of spun yarn, is simply let go of when a fish is fast. Sometimes Mr. Shaw uses a very small (under ¼ oz.) piece of sheet lead to straighten out the snooding quickly, as he found that in slack water chads would too often remove the bait before the line tightened.

Leads are an important consideration in hand-lining, for it is only in fine drift-lining that they play so light a part as in this tackle of Mr. Shaw. For "plummeting," as the Cornish fishermen call mackerel-whiffing (see Glossary),

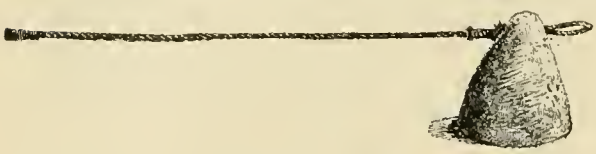


Fig. 2.—Plummet.

a plummet, specially cast by them for the purpose, is used, in which two arms of waxed cord are let. To one of these is attached the main line; to the other, the finer snooding carrying the gut and hook.

For bottom-fishing, few leads are better than the Cornish shearing lead, also with arms of

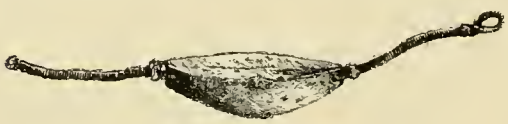


Fig. 3.—Shearing Lead.

waxed cord, to which, in like manner, are attached respectively the main line and hook-trace. The method of throwing this lead so as to avoid a foul is peculiar: the hooks are first thrown overboard and allowed to go off with the tide, and then, and not till then, the lead is thrown *against* the tide. The writer has always seen the hands kept *inside* the boat in hand-lining, the brunt being allowed to fall on the gunwale; but Mr. Shaw objects, and with much reason, that the hands should be kept outside, so as to produce in a measure the give and take of a rod. One more hint in respect of hand-lining in deep water, and that is, that in striking proper force must be put into the act, as it is otherwise impossible to drive the hook well home.

Rod-fishing.—With regard to rod-fishing, the more popular amateur method, to which, in fact, some enthusiasts would limit the definition of "sea-angler," there are three items of first importance,—the rod, reel and line. The rod may be any length up to fifteen feet, ten feet being suitable to boat fishing; while some anglers prefer their rod even shorter, and catch their fish on weapons of seven feet and even less. In these, however, much of the springiness required in a rod is necessarily lost. The reel should be free running with an optional check. The writer, after having tried a variety of substances, prefers either the somewhat costly vulcanite, or the cheaper and almost equally efficient Nottingham wood reels, bound with brass or gunmetal. The reel should, in any case, be not less than 4½ in. diameter, and the barrel should be capable of carrying 100 yards of line. The line itself may be of dressed cotton, or tanned hemp, and should be free of kinks. A deal depends, however, on its treatment, and, unless frequently washed in fresh water and carefully dried before winding back on the reel, these lines soon rot from the effects of salt water.

Fig. 4. Paternoster.

Various tackles. — Three tackles, the paternoster, leger and chopstick, have been mentioned in the foregoing notes, and it is now desirable to explain their nature. Briefly, the paternoster is a length of gut, gimp, or other material, having at the lower end a pear-shaped lead of various weight, and hooks, usually three in number, attached at short intervals above the lead. The upper end is looped, either with or without the intervention of a brass swivel, to the main line. This tackle may be used either with rod or hand-line, the former being necessary when using it from piers in order to keep it clear of the ironwork below. The leger is merely a line running freely through a pierced lead. It runs freely, at least, in one direction, viz. away from the angler, its passage in the opposite direction being checked by a shot nipped on to it and too large to pass through the lead.

The chopstick, of which there are various forms, consists of two arms, or spreaders of wire, from the end of which depend the hooks,

Fig. 5.—Chopstick.

the lead being usually fixed at the centre point of the spreader, though, in some forms, hanging below it.

On the subject of float-fishing in salt water, one of the most promising methods under the lee of pier heads, it is not proposed to offer any remarks, as the practice does not materially differ from the use of the slider-float (see vol. i., p. 23) in fresh water. A rod is, as in the

latter case, indispensable, and the float should be heavier and larger in proportion to the greater disturbance of water usual in the sea. It may be used either in conjunction with a light paternoster, or with a single hook at the end of a long-shotted gut trace, more after the fashion known to river-anglers. A modification of float-fishing is sometimes used by pot-hunters when pollack are biting furiously, two or three additional lines being thrown over the side, and each carrying a large cork bung which indicates a rush. The sportsman will, however, prefer to confine himself to his own rod or line.

One more tackle, the sid-strap, was mentioned above in connection with the capture of whiting in deep water, and it remains

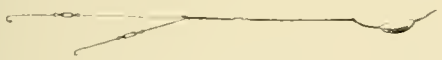


Fig. 6.—Sid-Strap.

to show its construction in the adjoining figure. The material used is generally gimp, and the lead, as will be seen, is boat-shaped.

Opinions vary much as to the best size of hooks, it being, and with reason, urged on the one hand that it is best to use the smallest hook compatible with safety, as many fish are easily frightened by a large hook and bait, while it is objected, also with truth, that the small hooks are often a great trouble to get out of the fish, and consequently entail much needless delay. As in most matters, a moderate course may safely be counselled. The sizes subjoined are those much used by the writer in the capture of the fish specified, but it would be dogmatic to insist

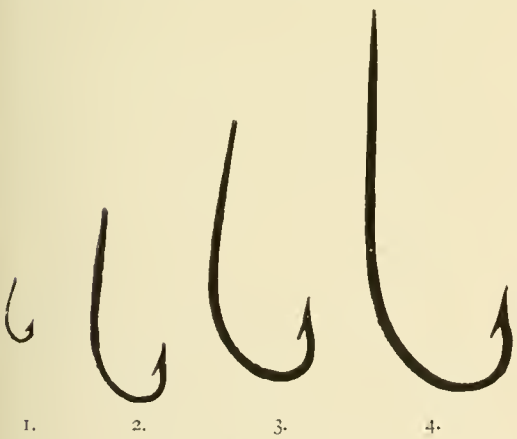


Fig. 7.—Sizes of Hooks.

1. Smelt. 2. Flat Fish and Pout. 3. Whiting and Mackerel. 4. Pollack and Bream.

on them as necessarily the best size for the purpose. The fact is that the best size of hook varies greatly according to the average run of the fish at any particular spot and also according to the state of the water, a factor that must regulate the consideration of light or heavy gear, or even of baits, on each particular outing.

Sundries—Under the comprehensive head of sundries come a number of articles that are the indirect means of improving the angler's chances. Such are the basket, or creel, the landing-net, and the gaff. The landing-net and gaff have already been defined (*see* Angling) in the present work; and it remains only to add an alternative, for which the writer is indebted to Mr. James Railton, of Teignmouth, and which is very serviceable on rocks or pier,

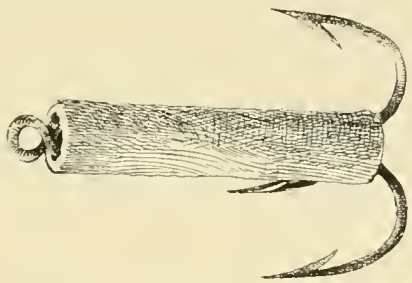


Fig. 8.—Landing-Hook.

where neither net nor gaff could be used, the angler being at too great a height above the water. The figure explains itself, the apparatus consisting merely of a wide brass tube filled with lead, having a strong brass ring at the one end, to which is attached a stout cord, and three large galvanised hooks at the other. Its use consists practically in getting it under the fish hooked and foul-hooking it. The objection is that, if missed, the fish might be badly wounded, and, in any case, this means of landing the fish should not be used unless the more usual and legitimate gaff or net are absolutely *hors de combat*, and the fish thoroughly played out. It would, in fact, be the very thing for Australian rock-fishing.

Yet another article of great use in keeping sand-eels and other bait alive is the "courge," a torpedo-shaped basket into which the baits

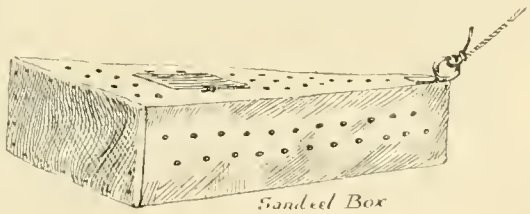


Fig. 9.—Bait-Box.

are introduced by an aperture that is closed with a bung, the whole being towed astern of the boat. The writer is likewise indebted to Mr. Railton for the suggested alternative of a triangular box of white deal, perforated by numerous small holes. It is said to keep the

sand-eels in better condition and alive longer than the courge. The lid is secured by a peg and eye. The measurements of a convenient size are given at 18 inches long by 6 inches deep.

III. Baits.

A very few notes on the chief baits mentioned in the foregoing remarks must here suffice; and they may, for convenient reference, be considered in alphabetic order.

Crab (*Carcinus mœnas*)—Like birds, crabs moult, and are so sensitive of intrusion at this period of their helplessness that they hide away under stones, where they may safely be looked for. Some anglers pass the hook twice through the crab intact, others remove the legs. The writer has found it answer to kill and bruise the crab before using it for bait, and this is certainly the more humane plan. Crushed crabs, where they can be had in sufficient plenty, make an excellent ingredient in a ground-bait, though not of sufficient consistency alone. They should be mixed with pounded shells and sand. The tail-end of a hermit-crab (*Pagurus bernhardus*), quite distinct from the soft crab, is found to be a good bait for most flat fish.

Herring (*Clupea harengus*)—Fresh herring is one of the best all-round sea-baits, and the writer has even taken good bass with bloater when the fresh herring was unobtainable. Large strips may be used for bass and conger, or small squares for flat fish and whiting. A killing combination may be made with a small strip of herring and another of mackerel, both being placed on the hook with the bright skin outwards. For conger, herring should be fresh, and all bones should be removed. It is even an advantage to hammer the bait with a stick before using. Unless herring is perfectly fresh, few fish but a bass will touch it, and it also comes away from the hook very easily, which is a great disadvantage when there are small fish round the hooks. On the south-west coast, the pilchard (*C. pilchardus*) takes the place of the allied herring, and is similarly used.

Lugworm (*Arenicola piscatorum*)—The lugworm is about the best all-round bait in sea-fishing, unless perhaps the mussel may be allowed to stand equal first. It has to be dug in the sand, an operation somewhat distressing to all but those accustomed, in consequence of which a high price is charged for these baits at some ports. The lug, as it is usually called, is best used whole; but when fish are madly on the feed, sport may be had with the smallest fragments, barely sufficient to cover the hook. There are various processes of preserving, or drying, these worms, but the best of these can be regarded only as a *pis aller* for the fresh-dug worm. Of other worms in common use by the sea-fisherman, mention may be made of the delicate and deadly nereid worm (*Nereis*) that hides in the shell tenanted by the hermit-crab, to obtain which it is necessary to break the shell with a stone. This may, after a little practice, be accomplished so neatly as to destroy neither the crab nor the worm for bait. Yet another favourite worm above-mentioned is the ragworm (*Glycera*), which is found in the soft mud of harbours and estuaries. It is exceedingly delicate, and can only be kept alive for a comparatively short time in some dark, cool place. The same remark applies to the crab-worm, which should not be taken from the shell until required.

Mackerel—The remarks which were made above in connection with herring apply to the mackerel. The "last" or "snade" of mackerel used in whiffing for these cannibal fish is cut from just above the tail, a very sharp knife being necessary for the purpose. A Cornish fisherman will sharpen his knife every hour or so for this purpose. The hook is inserted in the pointed end of the bait, which is triangular in form, and pushed home with the thumb and forefinger, or sometimes with a loop of the line, so that the "last" hangs from the bend.

Mussel (*Mytilus edulis*)—The mussel is one of the most easily procured, and also one of the most deadly baits on our coasts. Opening mussels is not a very easy matter, but, with a little practice, and by watching an expert (it is one of those matters almost impossible of explanation on paper), the novice soon acquires the knack of inserting the blunt knife in the aperture beneath the byssus, and rapidly working the blade round either shell until the whole mollusc comes away from the gaping shells. Nor is it without practice and instruction, that the angler may hope so to fix the mussel, even when thus extracted, on the hook that it shall not immediately come away in the water. The point of the hook is to be inserted in the round white substance observed at one end, and resembling gristle, then passed twice through the middle of the creature, and finally buried in the stringy material at the edges. Small portions of mussel are used for sand-smelts, but as a rule it is necessary to use them intact.

Sand-Eel (*Ammodytes lanceolatus*)—This very attractive bait has, somewhat like the lugworm, to be scraped in the sand, or, better still, since it easily perishes and is of little use when dead, caught in a small-meshed seine. Mention has already been made, and a diagram given, of a special box for towing live sand-eels to the fishing-grounds, a device that is considered by those who have tried both an improvement on the orthodox Channel Islands "courge." There are many methods of putting live sand-eels on the hook, but the writer invariably hooks them through the upper lip in a strong tide, in the lower lip in slack water.

Shrimp (*Crangon vulgaris*)—Shrimps are

extremely effective baits used alive, the hook being passed through the tail. They are also used, though with less success, dead; and pout are even taken with peeled boiled shrimp. Prawns (*Leander*) are also used alive, especially for pollack. At Selsea, they are the only successful bait.

Mention has been made of ground-bait, and it must be borne in mind that its successful use in the sea is regulated by proper attention to the altered conditions. Thus, it would be useless to throw in balls of ground-bait after the fashion of the Thames fisherman, for the tides and currents would quickly carry these far from the angler, and would in all probability thus draw the fish away from him instead of having the desired result. Ground-bait must therefore be lowered by the sea-angler in some form of receptacle. There are special "diving-bells" sold for the purpose, and if these were less fearsome, they could not be improved upon easily. The writer has had good results with a small piece of fine meshed net at the end of a cord, the latter being occasionally shaken to liberate some of the contents. It is important to place the baited hooks in respect of the ground-bait so that the tide flows to them past the latter, so that fish travelling along the streak of oil and particles of bait that emanate from the bait-net must first pass the larger and more attractive morsels on the hook before coming to the net itself. Crushed mussels and crabs, shell and all, make an excellent ground-bait for use in the sea.

Concluding Hints.

It is impossible to give in greater detail the elements of the sport under notice, but a few general remarks may be offered in conclusion, which the beginner will do well to note.

First, sea-fishing—boat-fishing more particularly—is not suited to every temperament, and the aspiring sea angler will be wise in ascertaining, ere he invest his money in tackle, whether he can stand the movement of a boat, or even the exposure to wind, sun, or cold, the glare of the reflected light, and the general roughing it. This caution may seem almost superfluous in a work addressed to sportsmen who are presumably prepared for some exposure; but the writer has come across many cases of men who would think nothing of the temporary exertion of a football match finding the long exposure, often night as well as day, too much, if not for their constitution, certainly for their ideas of enjoyment.

Again, some acquaintance with the handling of boats, rowing at any rate, is absolutely essential, and no one should go afloat who cannot swim. Upsets are, it is true, not frequent, but the first might for a non-swimmer also be the last. Much has been said in this connection of the necessity of the sea-angler acquainting himself with the "rule of the road" at sea, the cases in which responsibility lies with him, and those in which it lies with some other craft that threatens collision with his own. *Theoretically*, if his anchor is down, the entire responsibility would rest with any steamer that should run him down: in practice, however, it will be found better to ignore the rights of the case and get out of the way of the larger craft with as little delay as possible.

Dress is also an important consideration, not in the matter of appearance, but of health. Proper protection against the sun in summer and against cold in winter should be taken into account, and it is also desirable that all garments, boots and all, should be easily removable in case of an upset. It is not intended in the present remarks, which must now conclude, to offer any suggestions as to places where sport may be obtained. A few notes were given above in this connection. For the rest, the angler may be advised to seek his sport, if possible, on a rocky coast, like that of Cornwall, as the fish generally run larger, and are always in greater variety, than on sandy shores.

When in doubt on strange waters, and without the advantage of local guidance, the fisherman should always look after the gulls and other birds. The gannets, in particular, know where the fish are.

Those anglers to whom expense is no object should not on that account hugely overpay the fishermen and boatmen at the different ports they visit. They merely accustom them to wages which subsequent visitors will be either unable or disinclined to afford, and spoil them for future employment. There are parts of our coasts, on which unthinking visitors from town have spoilt these once unsophisticated men, in the same way as some African travellers have spoilt the native servants.

Sea-anglers cannot be too strongly urged to take note of all matters, however insignificant they may appear at the time, pertaining to the local fishing. The sport is yet in its infancy, and more information is wanted on all sides. They may elect to publish the information thus gained, or they may, and with perfect reason, prefer keeping it for their own use. Let them in either case not trust to memory, but jot down the facts. The time may come when they might desire to impart these in exchange for corresponding information about an unknown country.

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GLOSSARY OF TERMS NOT EXPLAINED ABOVE.

Bend—A simple method of joining two ropes, or lines, without any actual splice.

Booms—Cane outriggers projecting over the gunwale with the object of keeping the mackerel-lines clear of the boat.

Briming—The fisherman's expression for phosphorescence of the sea at night.

Disgorger—A notched implement of iron or wood, used in twisting the hook free when the fish has gorged it. For large fish with sharp teeth, it should be 18 ins. long, so as to enable its manipulation without endangering the hands of the operator.

Drift-Lines—Those which, bearing little or no lead, are allowed to drift with the tide.

Grapnel—An attachment of claws used in very strong tides, in conjunction with the lead, or sinker, to keep the hooks near the bottom.

Guffin—The Cornish name for ground-bait.

Hitch—The jam-hitch and timber-hitch are two simple fastenings, the former used for looping the mainline on to a gut trace, the latter for tying up the killick.

Killick—A large stone used in place of an anchor on rocky grounds.

Marks—Taking marks is the method of re-discovering known fishing-grounds at sea, the plan being to get two sets of objects ashore, imaginary lines through which converge, when produced, almost at right angles, at a point immediately over the fishing-ground. As an example, one set of bearings may consist of a chimney covering a more distant church steeple, the other of a particular tree coinciding with the flagstaff of a coastguard station. Care should be taken to choose marks of a more or less enduring nature, churches and lighthouses being preferable to more ephemeral buildings.

Pipe-Leads—Cylindrical leads, usually tapering from the centre, and pierced to admit the line

Railing—The name given to trailing lines, with either natural or artificial bait, behind a boat under sail, as distinguished from whiffing, a similar style of fishing, only with the boat propelled by sculls.

Rig—The various patterns of chopsticks in use on different parts of the coast are known as Kentish rig, Dartmouth rig, &c. ("Rig" is also the Kentish name for the common tope, one of the dog-fish.)

Seine—A bag-net, which is shot from a boat, and hauled in a semi-circle towards the shore.

Snood, or **Snooding**—The finer material to which the hook is directly attached.

Splice—A method of joining two twisted snoods, or lines, by untwisting a short length of each and interlocking the strands.

Trot—A long line, with sometimes several hundred nooks at intervals, kept on the bottom by heavy stones, or an anchor, at either end. Also known as a boulter, or spiller.

Whiffing—[*See* RAILING.]

F. G. AFLALO.

SHARK FISHING—Sharks are of many kinds and cosmopolitan distribution. They are usually captured with a hook and line, except the largest of all, the Basking Shark, which is taken with the harpoon. The Pacific Basking Shark is the largest of the sub-class. The record of the capture of two of these fish will be found in *Fisheries of the United States*, Goode, vol. ii. page 58. However, the real home of the northern "Basking Shark" is off the west coast of Ireland. Brabazon (*Deep Sea and Coast Fisheries*) says, if the weather is warm at the end of April, these fish appear on the Sun Fish Bank, situated about a hundred miles west of Clew Bay, and remain until the middle of May. The writer has made many inquiries of old fishermen as to the exact position of this bank, but without success. In the months of May and June they are also found off Boffin Island and at the entrance to Blacksod Bay, and they are said to run from 18 feet to 40 feet in length.

The following methods appear to have been used at different times to effect the capture of sharks:—

1. Harpoon, either hand or fired from a gun, line and lance.

2. Bait, hook, line and lance. Or, in lieu of a lance, a noose is slipped over the tail, and the fish is hauled bodily on board the ship, where a blow from a hatchet renders the tail powerless.

3. A bait, such as a dead horse or bullock, is placed where these fish abound, and they are shot with a rifle.

4. In some of the islands of the Pacific, the natives attack the ground-sharks with nothing but a knife, and come off victorious.

5. A bait containing a charge of some explosive, such as dynamite, and fired by electricity.

The most sporting of these fish is the aforementioned Basking Shark, or "Sun Fish," as the Irish fishermen call it; and the writer proposes to give briefly the method of harpooning which in his experience is most suitable for Irish waters. Of course, the best class of boat for this fishing would be an ordinary whale-boat, either Scotch or American, such as is used in the Arctic fisheries, or in pursuit of the sperm whale; but it is totally unnecessary to go to the expense of such a boat, for the shark has not the power of a whale. A yacht's whale-boat, or a good powerful gig, could be easily fitted for this fishing, and, if neatly done, no injury would be done to the boat, and the fittings could be removed when no longer required.

On the bow of the boat a piece of hard wood is fitted, in which is cut a score, or notch. This score ought to be from 3 to $3\frac{1}{2}$ inches deep, and from 2 to $2\frac{1}{2}$ inches wide, according to the size of the line used.

It is better to have it too deep than too shallow, as, if the line were to slip out of the score, the consequences might be serious. On the first or second seat from the bow fit a step and iron similar to that used for shipping the boat's mast. In this is shipped the "bollard head," a piece of hard wood about 3 to $3\frac{1}{2}$ inches in diameter at the top, left sufficiently high above the gunwale to enable one to take one or two turns of the line round it, so as to bring a steady strain on the fish.

A $2\frac{1}{2}$ inch whale-line is what the writer used: but a good 2 inch soft laid tarred rope should

be strong enough. The only guide as to length is the depth of the water fished: probably 120 fathoms would be far more than would ever be required, provided the harpooner keeps a good steady strain on the line as the fish sounds. A similar line, of from 50 to 60 fathoms, will be required for the second harpoon.

In case of the line running short, this second line can be bent on to the eye or loop spliced into the end of the first line for this purpose. Half a paraffin barrel, with rope handles to lift it in and out of the boat, will take the first line nicely, and a smaller tub will hold the other.

Bore a few holes in the bottom of the tubs to allow the water to drain off. One of the most important points is to see that all turns are taken out of the lines before coiling them down.

Splice an eye on the end of the line, and, leaving out about a fathom, commence to coil round the outside edge of the bottom of the tub from left to right (with the sun) until you have worked into the centre of the tub, then carry the line out to the side, and proceed as before. Each time you bring the line out from the centre of the tub preserve the formation of the spokes of a wheel, following the course of the sun.

Great care should be taken in coiling lines, for many accidents in whaling have occurred from carelessness in this respect.

Two or three ordinary hand-harpoons, with half a dozen ash handles about 5 to 6 feet long, such as are used by the Scotch whalers, three or four handy lances with handles of ash, and a light hatchet to cut the line in an emergency, complete the necessary equipment. Mr. J. C. King, of Peterhead, could supply the harpoons and lances.

If whale-harpoons are not procurable, any fairly good smith could make an ordinary arrow-head harpoon; but care must be taken that they are made of the best soft Swedish iron, so that they will bend into any shape and not break. If badly twisted, which they are sure to be if you obtain any sport, they can be heated slightly, and beaten into shape with a lead hammer or a wooden mallet.

If the sportsman decides to fit a harpoon gun to his boat, he must be careful to ascertain if her bows are strong enough to resist the recoil of the gun when fired. Probably an intelligent carpenter could strengthen the boat sufficiently for the purpose. In a fairly strong boat, all that is required is to carry a slight salvage deck from the stem-head aft for about 3 feet. The gun-wale must be raised about 3 inches over the salvage deck, and, as it comes aft, narrow to nothing.

In the stem-head is cut a score, or notch, about 3 inches deep and 2½ inches wide, to admit the line.

About 1 foot 3 inches, or thereabouts, from the stem-head, and slightly on the port side (to give room for the line to run), is placed the bollard head, to carry the gun. This bollard head can be made of a tough bit of oak, round at the head, and about 5 inches diameter, for a whale-gun. A smaller head would probably do for a porpoise-gun.

A hole is bored in the head, to take the crutch which carries the gun, and on this a light iron ring is slipped, to prevent the wood splitting. If the ring be warmed in the fire, it will contract as it cools, and remain in its proper position.

The best way to fix the bollard head is to slip it through the salvage deck, behind one of the little deck-beams, into a light step fixed to the boat's keel.

Although it must be heavy enough to carry the gun-crutch above the deck, it does not require the same strength below, and can be carried down square and crooked, to adapt itself to the shape of the boat.

On the port side of the stem a small eye-bolt is screwed, from which a preventer-stay is carried to the neck of the gun-crutch to bear some of the recoil of the gun.

A line attached to the bend of the crutch is carried down through the deck and made firmly fast below. This is necessary, as crutches are liable to break, and, without these precautions, the gun would be lost overboard.

On the port-side, far enough aft not to interfere with the movements of the gun, a small tub (about 1 foot diameter and 6 to 8 inches high) is fitted on the deck and held there by a bolt which passes through the deck, the nut being screwed on below. This tub holds the part of the line that is fired, viz., from ten to twelve fathoms of beautifully made Manilla line, slightly thinner than the other lines, and called the "foregore." One end of the foregore is either spliced to the end of the line just outside the score, or an eye is spliced in the end of the foregore, and the line is hitched on.

The latter plan is most convenient for sharks. The other end of the foregore is spliced to the shackle of the harpoon, and the bight coiled carefully down in the tub, in the same manner as the lines.

About 1 foot 4 inches from the gun, and in the centre of the boat, ship the line bollard head, which, if it was for whaling, would require to be of hard wood from 3 to 3½ inches diameter, but for sharks any wood will do. This bollard head can be made and fitted in the same manner as the one that carries the gun. The gun most in favour is a muzzle-loader by Greener, and, with crutch and harpoon, weighs about 75 lbs.

The harpoons, weighing from 8 to 12 lbs., are propelled by from 5 to 6 drachms of coarse-grained powder.

The writer's harpoons weigh about 12 lbs., and he found a charge of from 5¼ to 5½ drachms made the best practice.

Harpoon-guns shoot very wild at times. This

is most probably caused by the check the harpoon receives from the line when just clear of the gun, so that perhaps the slower the harpoon is to leave the gun, the less check it receives, and what is lost in velocity and trajectory is more than gained by increased accuracy.

For loading and cleaning the gun, two rammers are required; the one of iron, with a screw at the end, and the other of wood, with a brass cup at the end.

Directions for Loading—To clean the gun of oil, squib off a small quantity of powder with a light wad of tow.

Measure the charge of powder, and, placing it in the brass cup, lower the muzzle of the gun as far as possible.

Insert the cup of the rammer as far as it will go, and, retaining it there, raise the muzzle of the gun.

This insures all the powder reaching the breech of the gun. On the powder ram firmly a wad of oakum or old tarred rope, 2 or 3 inches thick, just sufficient for the harpoon to rest against.

Like all muzzle-loaders, these guns are liable to miss-fires, and it is necessary to carry a flask of very fine-grained powder, a small funnel to fit over the nipple, and a pin to work the powder down through the nipple, as well as a wrench to remove the latter. The best chance of avoiding miss-fires is to keep the barrel very clean and not leave it long loaded.

Some harpooners place a piece of cork between the bars of the harpoon at the end that is inserted into the gun, with a view to lessen the shock to the harpoon shackle when the gun is fired.

Run the harpoon into the gun, first seeing that the shackle runs easily down the harpoon (a tight shackle will probably cause a miss); put on a cap, insert the pin that acts as a bolt to prevent the gun going off, and everything is ready for a fish.

After the shot, the handle of the gun is swung round to port and rested on the side of the boat, to be clear of the line.

A painted canvas cover, which slips down over the muzzle and laces round the crutch and the handle, will be required to keep the gun dry.

The Norwegians have a workmanlike-looking breech-loading gun with lighter harpoons. The moveable single barb of these harpoons is made like two spoons joined together by the handles. One end of the barb is lightly secured to the harpoon with spun yarn. When the strain comes on the barb the spun yarn breaks, and the barb opens, exploding a shell in front of the harpoon. The only objection the writer ever heard made to these guns was that there was no proof-house in Norway to test guns, and therefore they might burst.

A small locker, open towards the stern, is placed generally on the foremost seat to protect the points of the harpoons and lances, which are covered with strong grease, and wrapped round with old canvas.

The handles are kept in their places aft by a light lashing to the side of the boat.

A porpoise gun would do well; but get Mr. King, or some other well-known harpoon maker, to supply the harpoons. Be careful to have your harpoons and lances as sharp as a razor.

Now suppose a fish in sight. Lower your boat; place the line you are going to run as far aft as it will conveniently stand, and, bringing the end of it over the seats out through the score, attach it to the harpoon.

See that the hatchet is placed in the bow in readiness to cut if anything goes wrong. The harpooner stands in the bow of the boat, and the fish is approached on the starboard, or right hand side, and, when opportunity serves, a dash is made for the big fin, when the harpooner must endeavour to drive his harpoon well home alongside the fin.

In approaching, do not let the boat get too far ahead; for the fish, if it were to see her, would disappear. The moment the fish is fastened, the harpooner should take a turn round the bollard head and keep as much strain on the line as the boat will safely bear. The crew ship their oars, and the steerer, or nearest hand, should watch the line running out, and, as it is taken in again, coil it back neatly in the tub.

The fish will tire, and be gradually brought to the surface.

Now the danger of these fish lies in the tail: and it is therefore necessary to let two of the crew get out their oars, and, facing the bow, endeavour to keep the boat away from the tail.

The harpooner now takes his second harpoon, being relieved of the first line by a careful man, who must be ready to let the fish take a little line on the receipt of the second harpoon.

The harpooner, watching his opportunity, places this second harpoon as far forward as he can, if possible, through the gills.

Slack the first line, and hang up the fish on the second, when a few thrusts of the lance through the gills will bring the matter to a satisfactory conclusion: but do not in the excitement forget the tail, for it is powerful enough to stave in a boat's side. The best way to do this is to keep backing the boat away from the fish.

All true sportsmen like to make use of anything they kill. Up to the present, the liver, which is converted into oil by boiling down, appears to be the only part that has been utilised: but there seems to be no reason why some use should not be made of the skin.

[Should any sportsman wish to try this fishing, he could not do better than get the assistance of Michael Halloran, of the Sound of Shark Cleggan, Galway, who has been in at the death of over a score of these fish.]

H. W. Gore Booth.

SHARK—Measurements, &c.—This shark is largest in circumference about the situation of the pectoral fins, diminishing in size towards each extremity. Head conical. The snout (especially in the young) appears like a beaked projection, being of much less circumference than the anterior end of the jaws; it is also covered with small pores. *Eye*—small, situated over the anterior end of the mouth: nostrils situated at the edge of the upper lip. Spiracle small, and situated midway between the eye and the first gill-opening. *Teeth*—small and conical, with smooth edges, and in from four to six rows. *Gill-openings*—very long, extending down the entire side of the neck. *Fins*—the first dorsal is of medium size: it commences on a line just posterior to the insertion of the pectoral, is highest in front and concave along its upper border. The second dorsal, which is about one-third the size of the first, is inserted just anterior to the anal, than which it is larger. Pectoral placed low down, rather small and nearly triangular. Caudal, with the lower lobe the longer and the upper notched, a pit at the root of the fin. Skin rough, especially when the hand is passed from behind forwards; a keel along the side of the tail. *Colours*—dusky black, brown, or blue along the back, becoming lighter on the sides and beneath. Snout of a dull reddish, becoming dull white beneath. (Day's *Fishes of Great Britain and Ireland.*)

SEROW (*Nemorhœdus bubalinus*)—*Serow*, *Serrow*, or *Surrow* in the central Himalayan ranges generally; *Thar* in the more eastern ones and those of Nepal; *Ramoo* in Kashmir, and divers other names in different localities extending as far eastward as, if not farther, than the Malay Peninsula.

Description—This somewhat nondescript animal, by naturalists considered to be a link between the antelope and goat tribes, might, from its general appearance, be supposed to have a strain of the ass as well. It stands over 3 feet at the shoulder, slightly lower at the croup, neck thick, short, and surmounted with a bristling mane of coarse black hair extending back over the withers, which, with its almost black face, large mule-like ears and dark fiery eyes, gives this animal a fierce expression which its character does not belie. General colour of its roughish and rather scanty-haired coat dark roan grey, intermixed with black: black dorsal stripe and tail, the latter very short; flanks and forequarters reddish brown. Sturdy limbs, creamy white from above the knees and hocks. Muzzle and chin whitish. The black, round horns rise almost in a line with forehead, curving slightly backwards, closely annulated, and creased longitudinally for nearly half their length, which, in good specimens, average 10 inches, with base circumference of about $5\frac{1}{2}$ inches and 3 or 4 inches between their sharp tips. The sexes much resemble each other, but the female's horns are less distinctly annulated.

The serow, like the musk-deer, has the noteworthy peculiarity of ordinarily depositing its droppings together in largish heaps. These, when found fresh, afford a sure sign of serow harbouring near by. Its alarm cry resembles a single sharp kind of shriek emitted at short intervals, but is comparatively seldom heard.

Habitat—In India the serow confines itself to the Himalayan Mountains, where it may be found at any altitude between about 4,000 and 10,000 feet, usually in deep, craggy wooded gorges, as a rule solitary, or accompanied by its mate and sometimes their young offspring. It is, however, about the most scarce of all Himalayan horned game.

Hunting—Although of very shy habit, its disposition is so bold that, if closely approached when wounded, it is always ready to show fight. The writer knows an authentic instance of a man, whilst handling a serow just shot, being charged by its unwounded mate from out the thick cover hard by. In some respects it may be termed almost a stupid animal. The writer

Serow.

Av. ht. at shoulder, 38 *in.* *Av. horn meas.* 10 *in.* *Max. horn meas.* 12 *in.*

has known it stand and gaze when suddenly surprised out feeding, even after having been shot at and missed: but when thoroughly alarmed it almost invariably dashes off down hill, however steep and broken the ground may be, until lost to view in the nearest dense cover below.

In the more Eastern Himalayas a reddish-coloured serow is met with, and is sparsely found as far east as the Malay Peninsula and Sumatra. Two smaller sized varieties are said to exist in China and Japan.

When serow are known to affect a certain thickly-wooded gorge or hill-side, driving quietly is often successful when stalking would be impossible.

Weapon—A double ·450 bore express rifle

with hollow-pointed bullet of unhardened lead, plugged with copper-tube or bit of wood, will be found as good as any weapon for shooting serow.

DONALD MACINTYRE.

SHOOTING — Carrying the Gun—If "the nice conduct of a clouded cane" was an essential part of a gentleman's education in the

WILL EITHER REACH HIS DESTINATION ALIVE?

eighteenth century, surely the careful manipulation of firearms should be a far more important branch of knowledge in these days, when most people affect to be sportsmen, and nearly everybody in the country carries a lethal weapon of some sort, with the ostensible purpose of destroying fur or feather, and to the greater or less danger of his fellow creatures.

Although it is hardly possible that anybody who did not begin as a boy, or as a very young man, can ever acquire that subtle facility of handling a gun which shows familiarity without contempt, there is no sort of reason why a person of any age, in full command of his faculties, should not learn how to carry rifle or fowling piece in such a manner, and with such precautions, as to place an accident almost beyond the range of possibility.

It is obvious to the meanest capacity that a gun which is not pointed at anybody can do no harm even if it does "go off of itself," and surely it is possible with a little care always to keep the barrels directed earthwards or skywards, so that the only evil result of a chance discharge shall be a slight shock to the nerves of the bystanders. I remember once being present when an old sportsman, standing in the midst of a crowd of beaters, keepers, &c., just at the luncheon gathering, suddenly fired in the air. We all turned round in amazement, but he calmly, gazing upward, remarked, "Curse that wood-pigeon," withdrew the remaining cartridge, handed his gun to his loader, and walked on. Every one was satisfied, and only he was for some time aware that in half cocking he had pulled the wrong trigger.

He told some of us afterwards, adding that he thought it better to say nothing at the moment, as it might have made us nervous to know that he could possibly do such a thing. He was right.

In Mr. A. Grimble's excellent book on shooting are numerous illustrations of the various ways most in vogue of carrying the gun, and the author adds his comments thereon. He is, if anything, hypercritical, for there is surely no danger, though he avers there is much, in the very common practice of tucking the gun under the arm with the front of the trigger-guard resting above the wrist, but if he errs it is on the side of safety, always a good error, safety being the one thing absolutely indispensable, to which readiness and elegance must be mere secondary considerations.

"But it's so unsportsmanlike," reasoned Mr. Winkle.

"I don't care whether its unsportsmanlike or not," replied Mr. Pickwick. "I'm not going to be shot in a wheelbarrow for the sake of appearances, to please anybody."

And that wise man insisting, it will be remembered that Mr. Winkle and Mr. Tupman marched with reversed arms, like a couple of privates at a royal funeral.

At any rate Mr. Grimble would admit that all requirements of safety will be satisfied by "breaking," *i.e.*, opening the gun and letting it

PERFECTLY SAFE: GUN BROKEN.

GUN ON SHOULDER: CORRECT POSITION.

hang thus on the forearm, when it can be closed and used in an instant if occasion requires.

Never carry a gun at the trail; if carried on

the shoulder let it always rest with the trigger-guard uppermost; by the reverse method the barrels are apt to come on a level with the faces of those walking in the rear.

Always draw cartridges before crossing a fence, and as a rule when walking from covert to covert. Half cock or put the locks at "safety" the moment a beat is finished.

Never shoot in the direction of anybody, however great the distance, some guns being apt to perform prodigies in the way of carrying when it is least desired.

By attention to these few simple rules a shooter may reasonably expect to pass his life without incurring the guilt of manslaughter.

Though the practice of walking in line has become unfashionable, it is still in vogue in counties which do not easily lend themselves to driving. Let the young sportsman, therefore, when thus engaged, keep his dressing. It is unfair to get ahead of the others, it is unwise to drop behind.

The safest position is obviously on the right, the best sport is usually obtained in the centre; the host will do well to occupy the former place, and to put the best shot in the middle. The most dangerous man of the party should invariably have the left flank, though in this style of shooting, where everybody is, or ought to be, in full view, there is no possible excuse for hurting anybody; when harm is done it is generally to one of the keepers or beaters who have stayed back to search for a wounded bird, and is quite unpardonable. A man with his wits about him can see the instant he turns round if the coast is clear, and if it is not, and he lacks the self-restraint to refrain from firing, he should never be allowed to shoot in company.

The worst accidents happen at driving, perhaps most of all at grouse driving. By some inexplicable infatuation some people seem impelled to pull the trigger just when their barrels cover the next box or station, and loss of eyesight has resulted only too often. It seems idle to warn a man not to shoot point-blank at his neighbour, for he would only wax wroth at being supposed capable of such recklessness, yet the thing happens over and over again, so that the only advice worth giving on the subject is, to watch your adversaries, for as such you must consider them till they have proved themselves friends, and, if they show an inclination to shoot in your line, throw yourself on the ground and save your eyes at the sacrifice of some of your sport.

Learning to Shoot—After all, it is on the first handling of a gun that the future career of a sportsman may depend, and the best way to avoid bad and careless habits is to begin as a boy under a strict instructor, but, man or boy, the first step for the beginner is to suit his shape and make with a gun; single-barrelled, say great authorities, especially for a boy, but herein I beg to differ. Nobody intends to go on shooting with a single barrel, and the best weapon for a start seems therefore to be a double barrel with one lock fixed or removed. It answers every purpose of the single, such as preventing a careless first shot because of reliance on a second chance, and, when the time arrives of graduating to the "double," the other lock has only to be opened or restored, and lo! there is the required article already proven, to which hand and eye have become accustomed.

That well-worn joke of our forefathers about sending a boy to be measured for a gun, is turned into real earnest nowadays. The process is simple enough. Let the boy hold the gun at the ready, with the stock about an inch from the chest and three inches below the shoulder, the neck (of the gun) being lightly grasped with the right hand, forefinger close to trigger; the left arm should be extended along the barrel with a slight bend of the elbow, the left hand grasping the barrel firmly.

From this position, if the gun is a fit, an upward motion of both hands will not only bring the stock into proper position, but will also bring the barrel into a direct line between the boy's eye and that of his instructor standing some four yards away, in fact, where the eye is fixed, the hand acting in unison will mechanically point the gun.

Great care should also be given to the position of the legs. They cannot be too steady, the left foot straight in front, its fellow at right angles to it, so as to facilitate shooting to the right without moving either foot. For good shooting, the habit of perfect balance is necessary, which, once acquired, is never lost save from injured limbs, or impaired health. No trick can be more uncomely than the not uncommon one of standing on the left and kicking up behind with the right leg, accuracy of aim being, of course, out of the question with such vagaries. At the same time it is only fair to remark that many a good shot stands with his legs rather widely apart, and shifts his feet according to the direction in which he wishes to fire. This cannot be right, since it disturbs the balance, and in shooting, as at billiards, firmness and equilibrium are of the first importance. To the well taught it becomes a matter of second nature to come to the proper position at the moment of firing, whether walking in line, standing in a grouse box, or at the corner of a covert.

The next step with a boy is to show him on a target the effect of his lessons in manual and platoon exercise. Do not allow him to poke his gun about and *seek* for his aim, or he will acquire the "following" trick, a most pernicious and constant cause of mischance in the field. On the contrary, make him put up his gun and fire with full confidence that it must be levelled right, and when confidence and knack have

been obtained at the inanimate object, let him try his 'prentice hand at sitting bird or squatting rabbit. One of the great joys of life is a boy's first success in this line, and how easily and often such shots are missed the *emeriti* only know.

The first series of lessons once completed, he will make rapid progress and soon get fairly proficient at game going straight away from him. After this stage come the difficulties and complexities of shooting, such as allowing for the movement of the proposed victim, whether it be flying or running, straight or obliquely across, or in calculating with what deflection from the straight line it may be approaching or retreating, at what distance and at what rate of speed, problems which have to be mechanically seized and solved within the space of a fraction of a second. Of all these, the judging of distance is perhaps the most difficult, nor is it possible to lay down rules for the guidance of the beginner. It seems that practice alone can bring the necessary instinct, but let him do his best to note, whenever practicable, where it is that his shot does strike, and he will find in nine cases out of ten that he is behind his mark from having fired point-blank at it. Two ways there are, however, of taking the angle, *i.e.*, of finding the spot, be it on earth or in air, where gun-

A WELL KILLED BIRD.

charge and game shall arrive simultaneously. Both are in common use and both satisfy their various exponents, though one seems rather quicker than the other. The first is called "chucking" the gun, which means that you cover the object and then give a slight swing or movement ahead, pulling the trigger at the same instant, thus effecting the desired collision between ammunition and fugitive, which latter will have traversed the two—three—ten yards, or whatever it may be, of given margin, whilst the charge is going up. Indeed, birds flying down wind with a sixty mile an hour gale behind them will often have covered a much larger space than that. The other and quicker method is to pitch up the gun and fire slap at the spot which you consider ought to be the point of contact, but it must be repeated that anything approaching to certainty in either mode can only be attained by much practice.

By way of emphasising this point, take the speed of the homing pigeon. During the sixteen hours of a summer daylight he can cover more than 500 miles, and at shorter distance has an even better record. One of these birds was timed from Orleans to Brussels on a south-westerly gale at the rate of 2,175 yards per minute, or about 36 yards 9 inches in a second.

If that bird had crossed a crack-shot at 40 yards, where would he have "chucked" or "pitched" his gun? Could he, with all his practice, decide the rate of flight?

Sharp rabbits in furze, fern or underwood are the best tutors for a beginner. There is no time for aiming. Whatever the rabbit's point may be, the shot, to hit him in the head, must be there almost before him, and as it is more or less easy to track a miss, the principle of the thing is soon picked up. Quite another matter is it to carry the principle, however well studied, into effect on fast flying birds, without ride or run to guide the eye, which is partly the reason why there are so few perfect all-round shots.

What to Shoot at—Justly enough, sportsmen have been classified as—1st, perfect; 2nd, first class; 3rd, good and moderate second class; 4th, bad. It is doubtful if more than a dozen men deserve to be placed in the first category, there are hundreds who belong to No. 2, thousands in No. 3, and millions, say many authorities, in No. 4, though from these I beg respectfully to differ: at any rate, it is far rarer to meet with a rank bad shot than was formerly the case. Thirty or forty years ago, out of a covert shooting party of six or seven, two or three were almost certain to be duffers of the first water, men who seldom hit anything but a beater, whereas nowadays even one such tailor would be a rarity. It is safe to add that, with very few exceptions, only those who have begun in early youth ever attain a higher standard than that of moderate second class.

Though the "pot" may be a gross and material consideration, it is, nevertheless, good for the beginner to be constantly reminded that game has a destiny beyond the larder, and that birds, at any rate, should be allowed to reach cooking distance before the fatal trigger is pulled; but above all things let him eschew a random style of taking long shots; the tip-top performer may and often does achieve absolute feats by apparent disregard of distance; the lesser fry of sports-

men ought never to be betrayed into such experiments. First, from a humanitarian point of view, they will often wound, and hardly ever accomplish a direct kill; next, for their own sakes, for depend upon it no host likes seeing his birds maimed.

It is astonishing that men are not ashamed of shouting, as they exultantly do, "I hit him hard; he's sure to die." Delinquents in this

A Winged Bird.

respect may feel pretty sure that their sins are duly noted by their entertainer.

I remember Lord Coventry (who, by the way, was about the best game shot I ever saw) once saying to me, *apropos* of a notorious offender:—

"I really believe H—— fancies I have asked him down for the sole purpose of *exterminating* my game."

With sorrow and shame, be it confessed that gunners of the exterminating class are just now far too abundant. The number is increasing of men who go shooting without idea or conception of the *sport* of pursuing game, but with the sole desire of firing off as many cartridges as possible in the shortest space of time, and with the minimum of exertion. Soon we may expect to see them discarding the double-barrelled breech-loader in favour of repeating weapons. Indiscriminate slaughter is the one object of these bloodthirsty individuals, and, as they are in constant practice, there are plenty of them who are tolerably unerring at birds flying high or low. The more blame theirs for taking them as they do, with cheerful complacency, within 5 or 10 yards of the gun, so that the unfortunate host, whose guests they are, finds at the end of the day that at least half his bag is unfit for table or market. Quickness is the test of merit with these murderers; the "plasterer" is their ideal; the man who kills his game at "kitchen range" they call a slow, bad shot. Picking birds off beater's heads is not only unsportsmanlike but dangerous; the most perfect trigger may clog and go hard, down drops the muzzle, and unless the beater is quick enough to drop himself he has every chance of going home in the cart.

What a tough uncomplaining lot, too, are these beaters! Many a man receives, without a word, wounds which would cause the inflictor to yell with pain and apprehension.

"'Tis over now, Bill, we can get out," said one of the smock frocks to another at the end of a hot rabbit corner. "And I be main glad of it," replied Bill. "That there gent in the brown jacket have been a powring the shot into I turr'ble."

At any rate, when the injury does become known, the compensation should be ample, instead of, as is too often the case, of the most meagre description. I have seen half a crown given where a couple of sovereigns would have been hardly adequate.

Selling Game—Having inveighed against the sporting "tailors" who smash up game and render it unfit for market, it may be *apropos* to add that nothing can be more unwise or unfair than to deride and decry those who thus dispose of their superfluous fur and feather. The public means to have game to eat; if it cannot be

A Towered Bird.

bought from the legitimate owner, then the poacher will become the purveyor. There will be the old story of excessive custom duties regularly accompanied by smuggling.

It is true that, perhaps, forty or fifty years ago there were many gentlemen who thought it derogatory to their position to sell game. What was the consequence? Poaching was a profitable profession and flourished, and, however

openhanded the owner might be, as he seldom had the means of packing and distributing his game in small quantities before it became bad, the wretched result followed that a large proportion had sometimes to be buried as unfit for human food.

Surely the more sensible system is that which now prevails; when nearly everybody sells of their abundance, the market is fully supplied on

STRUCK BEHIND.

reasonable terms from the right quarters, and the trade of the poacher becomes more and more discredited.

Loaders—To return to the actual details of the sport, the loader plays by no means the least important part in the rapid shooting of our modern days, more especially as in most cases he is the man who has charge of the guns, and his duty it is to clean and overhaul them, so that no speck of rust may invade any part of our weapons. Not that there is any great difficulty about the business, though, like everything else, it involves a certain amount of tuition, of which the first part relates to the gun itself. One can hardly expect the average loader to be a skilled mechanic, and to understand the mysteries of locks, bolts, &c., for which reason it is best absolutely to forbid interference with those vital parts, since there is always the maker to fall back upon when anything goes really wrong. He will also willingly instruct the loader in the rudiments of his craft, will give all necessary information as to probable contingencies and how to deal with them, and having been able during the process to form a very fair estimate of his pupil's aptitude and intelligence, will furnish thereon a useful report to the employer.

An untaught, even an inexperienced, loader is worse than none; setting aside the danger to the whole party, a man will shoot far more comfortably and quickly loading for himself, than when he has to supervise the clumsy struggles of a numb-fisted attendant. Yet loading is one of the things which anybody will undertake even if he has never seen a gun before.

"Am I to load for you to-day, sir?" said a new servant to me, on the morning of what was sure to be a very heavy shoot.

"Why, have you ever done such a thing in your life?"

"No, sir, but no doubt I could if I tried."

He was rather hurt when refused the trial. As already laid down, the rule should be that the man must never tamper with the mechanism—removing screws in order to look inside may easily prove as fatal as a child's curiosity to inspect the interior of a drum. Still, accidents will happen, such as a roll in a snowdrift, or a tumble in a bog, where locks may get clogged, and then it is that the lessons learnt in the gun-shop come into use and everything may be set right in a few minutes. Then, too, it may well be that a third gun in the ammunition wagon comes handy. But of that more anon.

The loading pure and simple, the mere act of charging the guns, must also be a matter where practice alone can make perfect. But the sportsman who aspires to eminence as a shot should be in continual harmony and accord with his loader. There is even a particular angle at which the latter should stand with his principal, who, if he is an experienced hand, may quickly teach the art with dummy cartridges in a room. The first thing to be con-

CHANGING GUNS.

sidered is the exchange of guns. The moment the shot is fired, the barrel should be thrown up, the shooter grasping the gun by the neck and slightly turning, so that the loader may easily seize the empty and replace it with the loaded

piece. If this manœuvre is properly executed, the guns will never touch each other, and many an indentation will be thus avoided.

The exact position of the loader cannot be laid down by rule, one man liking his servant on the right, another preferring the left side. Variety of game also affects the situation—*e.g.* when rocketing pheasants are the sole object, the loader may stand right half forward without in the least interfering with his master, who, indeed, will be rather helped than hindered; but if hares and rabbits are also coming out of covert, the man must be well half back. In grouse driving, a position on the immediate right is obviously to be recommended, for, thus placed, the loader will only interfere with a shot which would pepper the occupant of the adjoining box on that side. For partridge driving over high fences or belts, the rule is the same as with tall pheasants. The great essential for rapid firing is that the man should never be looking at the game—a most difficult principle to instil—since many loaders are as keen as if shooting themselves, and it is a sore trial to them not to watch the performance, though a second's inattention to their work may throw away the chance of a shot. Brass cartridges, which are the most waterproof and least likely to stick in the gun, with a wide opening cartridge bag, will also facilitate business. The best shooting waterproof is the Aquascutum—with this both master and man should be provided, and the loader should always carry in his pocket a little bag containing spare tumblers, a cleaning brush and lead. The latter used during a pause in heavy shooting will save a lot of recoil.

Rules for carrying the gun have already been given and apply equally to all parties concerned. It is almost needless to add that a spirit of loyalty should prevent the loader from pointing the weapon into his principal's legs or back.

Guns.—To the manifest advantage of trade, the life of a gun is now reckoned by years, and very few of them, instead of by generations, as once was the case; no doubt they are as good and durable as ever, better they could hardly be, but we may take it for granted that all self-respecting sportsmen order new guns twice or so in a decade. While they are about it they had better have three than two in the case, which is not materially larger than the old double, and they should always take the third gun out in the cart. Accidents will happen, and, apart from the inconvenience and humiliation of finishing a day with one gun, it must be remembered that a gun-maker should never be bustled over his repairs. If given proper time, he will do the work effectively and well, if hurried, he has no choice but to return a hastily patched-up article, which will soon have to return to the shop, and mending may in the long run become almost as expensive as making. Moreover, if a man can afford to devote his autumn and winter to shooting, he can surely manage this slight additional outlay for the immense convenience of a spare gun.

Ammunition.—On the matter of ammunition, it is imprudent as well as difficult to dogmatise. The maker knows from experiment what charge best suits guns of his own manufacture, and therefore it is wise to be guided by his dictum; but whose advice should we seek in the matter of powder, about which the only certainty seems to be that none is perfect? The old black powder, on the whole, gives the best result to the bag, but it has the undesirable disadvantage of filling a ride with smoke, and, on a damp close day, with ground game abundant, the smother is as bad as a London fog. Schulze & E. C. are perhaps the next best for strength, but they both have the great fault that when one is shooting up wind they fill the eyes with grit. There are many nitro-powders which make good practice enough up to thirty yards, but what we want is the penetration at long range of the "old black" without any of its defects. Still, an ounce of No. 5 or 6 shot propelled by a proper charge—say 42 to 44 grains of Schulze or E. C.—will make a very pretty pattern at 40 yards, either horizontally or vertically, and for the present we must rest satisfied at that. Nevertheless, there is a fortune in store for the inventor of a smokeless, gritless, and really powerful powder.

SUFFOLK AND BERKSHIRE.
W. G. CRAVEN.

HOW TO BUY A RIFLE—"What game do you propose to shoot with it?" is the natural question which arises. If you want to shoot a rhinoceros or an elephant, a small cannon will be best, *i.e.* anything from a ·500 express with expanding bullets to an eight or ten bore. If, on the other hand, your game consists of small deer such as gazelles, antelopes, or roe, a good rook rifle will be sufficient. But for almost all purposes the two best rifles at present in use are the ·450 express and the ·303 Lee-Metford, the latter used with the black bullet and cordite or rifleite powder. I say the black bullet, because it makes a more killing wound than the nickel-covered army bullet, which goes clean through any stag and does not stop him at once unless it strikes a vital part. I used to prefer the ·303 to the express, owing to the noiseless and smokeless ammunition and to the absence of recoil; for, in stalking, noise and smoke are naturally prejudicial to a second chance.

But of late many experiments have been made with the ·450 express with ·400 chamber and smokeless powders; and, if the proper powder is used, I have but little doubt that this will supersede all other weapons. The size of the bullet and the wound it makes give it a great advantage over the ·303. Besides, the lead of the black bullet is less likely to

remain in the groove of the express than in that of the ·303. Some experiments with tubeite have succeeded well, fired from the ·450, and this gives all the advantages of the ·303—*i.e.* no noise and no smoke, plus a lighter and less delicate weapon and a larger bullet.

In buying a rifle, soundness and shooting are the points to be ascertained first, and then the pull of the triggers, which latter entirely depends upon the purchaser's taste. I prefer the pull to be very light, and in hammerless rifles the half cock or safety bolt should have a guard so as to prevent its slipping when carried. The bend of a rifle is not so important as that of a gun, as it is very rare that one requires to put it up quick to the shoulder and snap off as one does with a gun. But the sighting is quite a study; and though the sight of a rifle may make admirable practice in one good shot's hands, it may not do so in the hands of another equally good shot, for the reason that the two men's eyesights may be quite different. A man may shoot well with an army ·303 rifle if he has young sight or even if he wears spectacles to assist short-sightedness. But a man with old eyesight, that is, who can see any distance within reason, but cannot read without glasses, will be apt to find the back-sight of his rifle totally useless. Such a man will generally be able to read the leader type of the *Times* newspaper, for a very short while, by holding it well away from him, say 26 inches or so, though it will make his eyes ache. If the back-sight, therefore, is put at the usual distance from the eye (said to be 14 inches) the old sighted man will not see it clearly, though he sees the bead at the end of the barrel. If he puts on his "clearers" he will see the back-sight, but not the bead or the bull's eye. This very common form of eyesight is rarely properly attended to on sighting rifles, and yet the remedy seems simple enough, viz.: to put the back-sight forward until it is clearly seen. It will of course involve the altering of the V, but it will not hurt the shooter's eye for the few seconds he takes in aiming, as it would if he tried to read for any length of time at the same distance. But before using this extreme measure, *i.e.*, of placing the back-sight so forward, I would recommend a trial of the bar-sight, which was so strongly advocated in the Deerstalking article in this *Encyclopædia* by Mr. Grimble. It suits some people with old sight, and its outline is very distinct, being white platinum on a black ground, but even this requires adjusting to the purchaser's sight. Hundreds of rifles are bought on the strength of a target pattern which is shown to the customer. They have been sighted to the proper eyesight of a man of thirty; but no offer is ever made by the seller to adjust the sight to the eyes of the actual purchaser. This the latter should see to himself. The most conscientious gun-makers fall into this error, an error which eventually does them as much harm as any other shortcoming in the rifle they sell, for their customer shoots badly and the maker gets a certain amount of the blame. We know that a rifle is rather disfigured by having its back-sight forward on the barrels, but the outward appearance is only a secondary consideration. I prefer the double-barrelled Lee-Metford to the single barrel and magazine. The former is a nice handy weapon, and to my mind two barrels should be sufficient, unless the *sportsman* (?) is of that blood-thirsty tribe who go out with the intention of killing all they can, not by fair stalking, but by penning deer into gorges and slaughtering them. Let them use magazines if they like, I shall not even be surprised if I hear some day of their adopting the Maxim!

As to the care necessary for preserving both guns and rifles during the non-shooting season, it is best to take the advice of a gun-maker. But the essential point is never to keep them in a damp place; and to examine them thoroughly not less than once a month, wiping every part each time and oiling where necessary. The browning of the barrels should also be attended to at the end of a season, as a small rub may give a shiny barrel.

W. G. CRAVEN.

THE SEWIN.

ENGINES AND ACCESSORIES—**Sewin**—The sewin, as applied to sport, is not a modern invention, although its original form has been much modified and improved in

recent years. Moreover, owing to the difficulty experienced in many districts in obtaining the

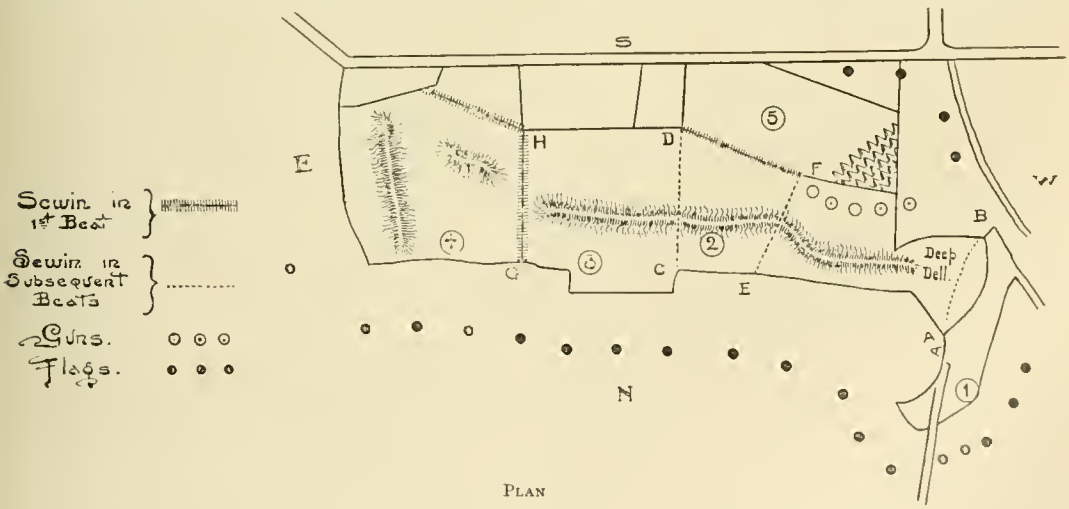
Sewin on Frame, ready to be run out.

requisite number of boys as stops, the practical use of the sewin is likely to extend.

Board schools, although willing to spare boys occasionally for the day, become naturally restive when keepers require them for three or four days successively. Under these circumstances the sewin, if properly worked, offers an effective and economical substitute. The sewin itself consists simply of a white cord, in 300 or 600 yards lengths, to which is attached, at intervals of 12 inches, white feathers and scarlet tape. Brass ferret bells, or "ruggles," are also fastened at intervals of 5 yards. The cord thus prepared is wound round a large reel, which is secured on the shoulders of the bearer by a light iron frame. Prior to the placing of the sewin in position, hazel or ash sticks, 2½ feet high and split at the top, should be inserted in the ground at suitable intervals to carry the sewin. Directly the sewin is set up a boy is left at the reel end, whose duty it is to keep jerking the cord. The sewin is used not only inside the covers, but also at varying distances outside. In the latter case, it is generally supplemented by red and white flags, which are placed in position first thing in the morning. The appearance of the sewin when wound round the reel, and when stretched, is illustrated in the three illustrations. The reel, iron frame, and sewin show the apparatus as modified by Mr. Jarvis Reckless, The Paddock, Ross, Herefordshire, who supplies the various parts at the following prices:—

Reel for sewin	5*s.* 6*d.*
Iron frame for winding reel .	5*s.* 6*d.*
Sewin, per 100 yards . . .	13*s.*

The accompanying plan represents the actual mode of working. This plan shows the position of the sewin and of the guns during the first beat. In subsequent beats the sewin is indicated by a dotted line drawn between the letters A B, &c., and the position of the guns described in the text is not shown. The cover represented is somewhat irregular in



Plan

shape, and consists of about 60 acres on very steep hill sides. About 9 o'clock on the day of shooting sewin is run on the south

side of No. 4 plot in the plan and continued between Nos. 4 and 3.

1st Beat. Half an hour before the guns arrive the line of beaters form at the north end of No. 1, and, keeping the right shoulder forward, sweep the birds into No. 2; they then re-form at the north end of No. 2 and drive into No. 5. The sewin is now run between Nos. 2 and 5 to prevent the birds running back. The corner of No. 5 is thick underwood, and affords good cover for the birds. The guns are then placed across the deep dell, and the birds are driven towards them as the beaters advance from the south-east side of the plot. From the corner the birds fly back to Nos. 1 and 2.

2nd Beat. The sewin is now removed from between Nos. 2 and 5, and is run out across No. 1 between the points A and B, the guns are placed on the opposite side of the deep dell,

Sewin in Position.

facing the sewin. The beaters then advance from the further corner and drive the birds over the heads of the guns.

3rd Beat. In this beat the guns are sent forward to a ride between Nos. 2 and 3, in which the sewin has previously been run, C D; and the beaters advance from the west side of No. 2. At this point some skill must be exercised to ensure the birds rising over the guns, as they will be disposed to fly back.

The sewin is now removed from the points A B on No. 1 to points E F between No. 2 and the corner of No. 5, to prepare for the reverse way of shooting.

4th Beat. The guns are stationed in the ride between 3 and 4, opposite to the sewin which was run in the morning between G and H, and the beat is driven from the W. side in the same way as in the 3rd beat.

5th Beat. After luncheon the line of beaters is formed at the east end of No. 4, and the guns take their position between 4 and 3. No. 4 is a rocky piece of rough ground on which the birds do not run, but rise as the beaters advance and fly high over the guns.

6th Beat. Guns go forward to the rise between 2 and 3, and beaters advance from the E. side as in the 5th beat.

7th Beat. Guns now make a *détour* to the right for the corner of No. 5, while the beaters form line at the north end of No. 2 and drive it into No. 5. While the birds are being driven across rides the sewin is removed, and is replaced after they have passed if necessary. The rest of the day may be made out in another cover.

It is scarcely necessary to add that the plan of beating ground backwards and forwards in the manner we have described can only be adopted where game is unusually abundant.

Kite (*artificial*)—Partridge shooting with the kite, which, twenty or thirty years ago, was not uncommonly practised by sportsmen, is now largely a thing of the past. It was chiefly used in dry seasons, when roots and cover in the open were scarce, or when the season was advanced and the birds refused to lie. In both these cases it has since to a great extent been superseded by driving. The artificial kite was made of brown calico, stretched on a wire frame; and although when closely viewed the likeness was very rough, yet in mid air the appearance of a hovering hawk was strikingly realised. In flying the kite, the object was to keep it as steady as possible, and to facilitate this, a cord was fastened to the tail, on which three or more caps of silk, or very light metal, were threaded at intervals: in rough winds more of these caps were needed. Owing to the calico being stretched somewhat loosely over the frame, its outer edges, when the kite was steady, were kept in continual agitation by the air, thus producing the almost perfect illusion of a hovering hawk. The mode of procedure was as follows:—The kite was always worked down wind, about one hundred yards in front of the guns, and from one hundred to one hundred and fifty yards above the ground: if flown lower it was apt to cause the birds to rise before the guns got near. When two guns only were out, each one took a side of the hedge. The keeper and his retriever went with one gun, while a beater went with the other. The man who was flying the kite kept at some distance from the guns: the object being to drive the birds from the open ground into the hedgerows. If four guns were out, two hedges were worked at once. The flight of a partridge before a kite is quite different to its ordinary flight; the bird never rises far above the ground, and a whole covey will often break up and dart away in different directions. Moreover, when the sportsman sees a covey betake itself to a hedgerow and flatters himself they are within his grasp, he sometimes finds on beating the hedge that he does not obtain a single shot. This generally happens when there is cover like long grass on the other side. In such cases the scared birds, no longer seeing the kite, run like Frenchmen (red legs), and are seen no

Drawn by A. Cleveland

Sown Electro Engrav

Shooting under a Rick

more. The kite is better adapted to large manors than to small ones ; but it may be used without detriment on the latter, provided there are plenty of hedgerows, or young plantations, for the birds to fly into. It is worse than useless to attempt kite flying in a wide, open country without hedgerows, gorse, or cover of some sort : for at the very first sight of the kite the birds will scatter in all directions, skimming or shooting in a long-sustained low flight, which will possibly carry them right away for the day.

A kite should never be used after the birds have paired, which in average seasons may be taken as January 10th. To use a kite after that date would be to run the risk of driving your birds on to an adjoining manor. Where partridges are found pairing, there or thereabouts they generally make their nests. So to drive them from such spots is not only impolitic, but somewhat cruel.

On the whole we cannot regard it as altogether unfortunate for sport that the art of kite-flying has practically been allowed to lapse. For whatever may be said in its favour, one thing is certain, that unless the practice is very sparingly resorted to, it must tend to frighten the birds away.

We have heard of recent experiments to prevent pheasants from straying, by flying kites on the outside of an estate. But what degree of success has attended these efforts we are not prepared to state.

Game Carts—The description of game cart required will depend on the nature of the bag. For partridge shooting, or for small days, a light, two-wheeled vehicle is all that will be necessary ; but in covert shooting, where hares and rabbits, besides a large head of pheasants, are killed, a heavier cart is needed. A good light cart on two wheels is constructed as follows :—The cart consists of a moveable tilt fixed on a panelled body, 18 ins. high. The back of the cart is entirely closed in, so that all game must be put in from the front. The tilt is made of stiff waterproof canvas, stretched over a wooden framework. The body, which rests on iron springs, must be strong, as also the frame of the tilt, otherwise they will not bear the weight when loaded. About 18 ins. from the top of the tilt a moveable shelf, of the same width as the cart and about 3 ft. long, is fitted at the back end of the cart. This takes coats, waterproofs, &c. The front of the tilt should be hood-shaped, projecting well over the seat ; and good stiff canvas curtains, suspended from the roof and made to draw across the front, will be found very useful in wet weather. A circular opening at the back of the tilt should be left for ventilation. The driver's seat should have a slight incline outwards, so as to throw off water, and the space underneath is appropriated to cartridge bags, magazines, &c. Six bars of wood fitting into slots run transversely from side to side of the tilt. These carry screw hooks, upon which the birds are suspended. Ground game is usually put in the bed of the cart. About 180 pheasants and 200 rabbits can be carried in a cart of this description.

We are indebted to a neighbour, an experienced sportsman, for the following details of his game wagon. It was built at Bristol on the lines of a light parcel van ; weight, 8½ cwt. Its dimensions are as follows : length, 9 ft. 6 ins., width, 4 ft. 6 ins., height of tilt, 5 ft. The tilt is made of white canvas on a strong frame. The colour makes it conspicuous in cover. The frame must be much stronger than usual, or the weight of game will soon break it down. The game is carried on hooks, which are hung on iron rods made from ⅜ in. gas piping. The hooks can be cut out of sheet iron and bent up at the ends. The shorter the centre hook is the better. The rods are kept in the bottom of the cart and put up as required. They are supported in the frame of the cover by a hole at one side and a slot at the other. Neither slot nor hole must go through the wood, or the rod will work through the canvas and thereby let in the rain. By hanging game in this way, a van of the dimensions stated will easily hold 1,000 pheasants, and still leave the bottom free for cartridges, magazines, &c. In the front of the van there are some strong hooks to take macintoshes and cartridge bags. The tilt is enclosed both back and front by curtains, fastened with straps and buckles. Above the ordinary tailboard there is a light board about 18 ins. wide, which is fastened on from the inside, and prevents any one from taking out the game on a dark night. The van is large enough to seat eight persons at luncheon, and a table is formed by placing the supplementary tailboard across two or more of the rods. The table runs lengthways down the centre of the van ; three people sit on either side and one at each end. The side seats, which are permanently fixed, are formed by a narrow ledge placed just at the set off of the tilt. In very rough weather this arrangement affords considerable convenience in the absence of a tent or other shelter. The game removed from the inside may be placed under the van.

We may add that although in both the above instances coats, cartridges, &c., have places planned for them in the cart, yet in our opinion it is much better to carry them in a separate vehicle. We know of no better conveyance for these articles in the case of a large party than one of her Majesty's discarded mail carts, which has been fitted up for the purpose.

Clothing—We know of no greater practical discomfort attending sport than that which arises from wet clothes. In our variable climate sport often has to be pursued, day after day, under

heavy rain, and the necessity of drying the garments of six or eight guns frequently is found to overtax the resources of a large establishment. Under these circumstances the sportsman may consider himself lucky who finds in the morning his boots, coat, overcoat, &c., even in a half-dried condition. Cartridge bags and gun covers often have no attention at all. Yet it is by no means difficult to make arrangements by which perfect efficiency in drying any reasonable amount of clothes may be secured in a very simple manner and at a small outlay. The task of drying clothes should not be thrown on the kitchen, servants'-hall, or pantry fire. If, however, it cannot be avoided, one of two evils must follow: either a man must be kept up nearly all night to maintain the fire and turn the clothes, or else the wearers must be content with imperfectly dried clothes. We have known the difficulty satisfactorily met by appropriating a spare room in the basement, or an outhouse, for the purposes of a drying-room. All that is actually required is that the room should be kept perfectly clean and free from all furniture, except one slow-combustion stove placed in the centre. The size of the stove must of course be adapted to the size of the room. The room must be also well ventilated, or the steam will not escape. The chimney pipe, which should be of iron to radiate the heat, should be carried across the room and up one of the walls inside, passing thence into the outer air. Cords or wires should be stretched tight across the room, upon which the clothes may be hung with pegs, as in a laundry. We have seen in a drying-room tailors' wire dummies, which not only facilitated the drying of the clothes, but kept them in form. With a contrivance of this sort it is quite possible thoroughly to dry the clothes of a large party, between six and nine in the evening, if a proper temperature be maintained.

Boots—To young sportsmen the question of dry boots may appear of little moment, but few who have attained the age of forty will despise any expedient which promises to secure to them the comfort of dry socks after walking through wet turnips or other marshy ground. Most of the old-fashioned receipts for waterproofing boots can be relied upon as effectual, but they generally include beeswax in their composition, the use of which renders the leather hard and uncomfortable to the wearer. Modern receipts are not always so trustworthy, and some of them produce a compound which is not only nasty to handle, but ineffectual to keep out water. For some years we have adopted with complete success the method of treatment advocated below, and have experienced the comfort of dry feet even when the conditions were most adverse. New shooting boots must on no account be blacked, as, if once blacked, it is more difficult to render them waterproof. The laces should first be removed, and a coat of dubbing (Prout's, we use) be applied all over with a brush. The boots should then be placed in a warm cupboard to dry; the process should be repeated three or four times till the leather is well saturated. If they are not required for some time, the boots should be brushed once again with dubbing before they are worn. After a muddy walk they must be washed thoroughly clean, treed, dried, and dubbed. Boots that have been thoroughly wetted should be dressed with bootmaker's dye, as the leather may be bleached. In every case, remove the laces before applying the dubbing. When boots are very wet they dry quicker if only skeleton trees are put in overnight; they can be treed up with block trees in the morning. On no account let them stand too near the fire. Treated in this manner, boots made with good leather become practically waterproof.

CHARLES C. TUDWAY,
JOHN FREDERICK HALL.

TRAINING SETTERS AND POINTERS FOR GROUSE SHOOTING—Setters and pointers are at the present day almost exclusively used for grouse shooting. The object aimed at in training these dogs is to teach them to gallop or range in any direction the trainer wishes, and to stand the moment they wind birds, so that the shooter may get within shot of the birds before they rise.

The keeper or feeder in whose charge the dogs continually are, and who is best known to them, has naturally the best opportunities of training them; but it is quite possible for the owner, if he can spare two or three hours daily for six weeks prior to the commencement of grouse shooting, to train two or three young dogs each year, and subsequently to work and shoot over them himself.

Dogs will always work better for the trainer than for any one else, but well-trained dogs can be trusted after their second season to work for any competent person who has had charge of them for at least a month before shooting begins.

It is a mistake to suppose that pointers and setters find their game by instinct and require little regular training. The only permanent quality on which a dog's education can be based is habit. Setters and pointers have a primary and a secondary habit. Their primary, and by far their stronger habit, inherited from their wild ancestors, is to chase their game; their secondary and very much weaker habit is to pause an instant before seizing their quarry.

In order to make a young dog of any use for grouse shooting, the trainer must entirely repress the strong primary habit and greatly develop the weaker secondary one.

From six to twelve months is the best age, and spring or summer the best time at which to begin a young dog's education. That is to say, assuming that a puppy is littered in April or May, in October or November it may be taken into the kennel and taught Lessons 1 and 2 specified below. Lesson 3 cannot be satisfactorily taught in winter, when the ground is wet and cold, and it is advisable to wait to teach that and the remaining lessons till the dog is ten or twelve months old. If the first four lessons can be perfectly learnt by the dog before the nesting season for grouse begins, it may be taken on to the moor in early spring to be taught Lesson 5, but probably July will be found soon enough for this purpose: there are then far more birds for the dog to find, and as they fly shorter distances there is less risk of disturbing the moor.

In training a young dog, a "masterly inactivity" is the

best policy: the art lies, not in doing, but in abstaining from doing, much.

The system of training may be divided into five lessons, viz. to teach a young dog

1. To keep to heel till told to go.
2. To come to heel when called by whistle.
3. To lie down when the trainer holds up his hand.
4. To gallop in the direction which the trainer indicates.
5. To stand the moment it winds birds, and to remain standing till the signal to advance is given, or failing that for at least five minutes.

These lessons should be taught in the order named, and no new lesson should be begun until the preceding one has been mastered, so as to avoid confusing the dog. The first three lessons are the most important, and the most frequently neglected. They should be taught entirely on a road, fenced if possible, or in a field free from game, the fourth lesson in a field free from game, and the fifth on the moor. A young dog should never see game until it is perfectly under control, or it may be spoiled.

SETTER AFTER PARTRIDGES. NO. 1.

In about a month, at two or three hours' work daily, the first three lessons should be taught perfectly, and about a week is required for each of the two remaining lessons, or about six weeks in all.

If a young dog is properly taught the above mentioned five lessons, the shooter can walk in a leisurely manner up to his dog when it stands at birds, instead of having to tear and tumble over peat hags or rocks for fear the brute should put up the birds.

First Lesson—As soon as a puppy has been taught its name, and is old enough (say six months) to be put into the kennel with the other dogs, it should be taken out to exercise with them on the road, coupled to an old and steady dog, and should be walked about for not less than an hour early in the morning, and an hour in the evening before feeding. In a few days, the couples may be taken off the young dog a short time after leaving the kennel, and put on again before returning home. It is assumed, of course, that the old dogs are all under control, and are not exercised in couples; nothing is more injurious to the health of a dog than coupling it constantly to another dog.

As soon as the young dog follows him well without the couples, the trainer should take some biscuit in his pocket and throw some occasionally to his dogs at exercise, at the same time giving a shrill whistle; he should also make a good deal of fuss about his young dog and call it by name; dogs are just as fond of admiration as men.

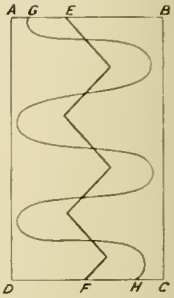
Second Lesson—Viz.—to teach a dog to come to heel when called by whistle. When No. 1 lesson has been perfectly learned, the trainer may, when going away from home, with a wave of his arm sign to the dogs that they may gallop in front; he should at the same time give a low whistle. The object of this is that the dogs may be worked on the moor without a word being spoken, as nothing makes grouse wilder than the sound of the human voice. When the dogs have galloped about for a short time (always on an inclosed road, be it remembered, so that they cannot get away), the trainer should give a shrill whistle, as a signal to the dogs to return to him; at the same time he should turn round and walk away from the dogs. Dogs are not such fools as to come to a man when they see that he is coming to them. Then let him give each dog as it arrives a bit of biscuit, the last equally with the first, and let him whistle shrilly as he does so; but let the same note be always used in whistling. Dogs have a very good ear for music and take very little notice of a whistle on a strange note. It is better at first to let the dogs gallop when going away from home, otherwise a young one might be inclined, if shy or wild, to go straight off to the kennel.

The trainer may carry a whip to help to keep his dogs in to heel, but he must never do more than crack it, and must positively never beat a young dog, for any fault whatever. It is not the fault of the dog if it does wrong, but the fault of the trainer, because he has taught it so badly. It is the trainer, not the dog, who should be beaten. Who ever heard of a huntsman beating his hounds? And yet it is not uncommon for a man to whistle to his shooting dog, which comes not until it thinks proper, that is to say, after a considerable interval. When it arrives the dog is beaten, a small inducement to it to come the next time, surely! How ludicrously, how brutally absurd! Dogs should be trained by kindness and force of will alone, like children.

Third Lesson—To teach the young dog to lie down when the trainer holds up his hand. He should continue to take all his dogs out every day together for an hour and go through the first two lessons, always remembering that no dog must ever leave his heel without

permission. Then let him put his dogs back into kennel, and take out one young and one steady old dog; let him make the old dog lie down and force the young dog to lie down also, holding it down with one hand and holding up the other hand; then let him reward the dogs with a bit of biscuit, and continue his walk, repeating the performance at intervals, but not often enough to bore the dog. In a day or two the young dog will lie down when the trainer holds up his hand. Let the trainer then begin retreating a few steps from the young dog, holding up his hand and cracking his whip if the dog moves, and, if necessary, let him take the dog back to its original place. Let the trainer always go back to the dog before he lets it get up, otherwise it can never be got to lie perfectly steady, and then let him reward it with biscuit as before. Every day the trainer should retreat farther and farther from the dog, and in time it can be taught to lie down at any distance at which the trainer is visible to it; then let the trainer walk out of the dog's sight while it is lying down, and teach it to remain down until he returns to it. As soon as the young dog is fairly proficient in this lesson the trainer should take it out alone. This lesson is the most difficult to teach thoroughly; it is the most important, as, if perfectly learned, the dog's steadiness is ensured. It would be advisable during this period to have three or four shots fired, say every other evening, close to the kennels, after the dogs have been fed; not before, in case those that are nervous might refuse their food. If the trainer is an amateur, he may, if he likes, assist at the feeding of his dogs, but it is not necessary. Dogs will always go with the trainer in preference to the feeder. They prefer their sport to their food.

Fourth Lesson—Is to teach a dog to gallop in the direction which the trainer indicates. This must be taught in a large grass field, absolutely free from game. Let the trainer take out one young dog and one old one and start them off with a wave of his hand in the direction in which he is walking, at the same time giving his low whistle. When the dogs have nearly reached the other side of the field, let the trainer turn at right angles to his original course; the dogs, if he has been kind to them, will be on the look-out, and will turn too. When they do so, but not before, let him wave his hand in the new direction, at the same time whistling his low note: let the trainer turn again at right angles to his second course, and so on, making a zigzag right down the field. The effect of this will be as in the diagram. Let A B C D be the field, let the straight lines E to F represent the trainer's course, and the curved line G to H the dog's course. If the trainer finds that the young dog ranges too far in front and misses ground, he has only to turn at an acute, instead of at a right angle, or, if it does not range far enough, to turn at an obtuse angle. The dog will always lean to him. By these means the trainer will make the young dog think that it is coming in the direction towards which he waves his hand, whereas it is in effect just the reverse; but if he keeps up the delusion, in time the dog will from force of habit really work in the direction which he indicates. After a few days the young dog should go through this lesson by itself. After the dogs have galloped about a bit, the trainer may then go through lessons 1, 2 and 3. It is to be observed that dogs are much more easily taught when they are a little tired than when fresh out of the kennel; it is never advisable to give a dog an order just at first, when his spirits are high.



No. 2.

After a few days of this work, let a man accompany the trainer and dog into the field with a gun, and let him fire two or three shots every day, at first some distance from the dog and afterwards near it; when he fires, the trainer should make the dog lie down, and from habit the young dog will in time do so at the sound of the gun—a very necessary practice, and one which prevents a dog from moving about and putting up birds while the shooter is loading.

It is advisable for the amateur trainer to tell his kennel-man never to take the dogs anywhere except on the road for exercise, and to keep them always in to heel; the kennel-man should on no account try to do any training, or the dogs will be ruined; more than one cook will be sure to spoil this kind of broth.

Fifth Lesson—After the first four lessons of the young setter's education have been satisfactorily accomplished, the trainer can then proceed to the fifth lesson, and take the young dog with one old one out on the hill

in search of grouse, but he must not carry a gun. In the south and east of Scotland, probably, July 20 will be early enough for this purpose, and August 1 in the north and west; before these dates young grouse lie so close that a young dog is apt to snap them up.

The trainer may work one young dog and one old one together for an hour or two on the hill every day: a gillie can follow the trainer at 300 or 400 yards distance, keeping as much out of sight as possible, and leading those dogs not being actually worked.

In August, the time of day when dogs most easily find grouse is before 11 A.M. or after 4 P.M.; in the middle of the day, birds are very apt to lie perfectly still and to give out little or no scent. If there is a steady breeze in the morning, it is better to work the young dogs then, as the wind is apt to drop in the evening. In any case, a young dog should not be taken out when there is no breeze; if so it will probably put up birds through no fault of its own, and this will make it unsteady. The best dogs will put up birds when there is no scent, when they are going down wind, or when their noses are not sensitive, owing to bad kennel management.

The non-attention of the trainer to this is one of the principal causes of unsteadiness in dogs. No one should allow his dogs, old or young, to draw on the scent of birds when the latter are running, unless the trainer is close by and gives the dog orders to go on. A dog should stand instantly on winding game, and never move until the trainer gets up to it. The trainer may, after the young dog has been kept lying down for five minutes, allow the old dog to draw on until the birds get up, the trainer leading the young dog on behind: immediately the birds rise the dogs should lie down, and not get up till told to do so.

Some people use a check cord on a young dog, but it is not of much use, and is apt to make a dog shy, and tires it. If the dog wears a collar, it can be easily led with the whip when going up to birds. If all goes well, and the young dog does not try to chase, in a couple of days, when there are plenty of birds, it may be taken out alone and allowed to find birds for itself; all that the trainer need do in addition to the above rules is to hold up his hand to make the dog lie down the moment it winds birds. As soon as the dog stands steadily when

No. 3.

It is better not to take a young dog on a very windy day out on the moor when scent is catchy and birds are wild. Let the trainer be very particular to keep his dogs in to heel until he gives them the signal to go. Let him choose as flat ground as possible, so that the dogs may not get out of his sight, and work up wind to give the dogs the best possible chance of winding birds, making a zigzag course (as in Lesson 4) and across the line of direction of the wind.

When the young dog turns, but not before, the trainer should wave his arm and also walk in the fresh direction in which he wishes the dog to go, and it will then get into the habit of working in the direction which he indicates, and (another delusion of the dog's) it will imagine that it has changed its course in consequence of an order to that effect.

When the old dog stands at birds, the trainer should hold up his hand and try to get the young dog (which is probably galloping about after the old one) to lie down; if successful he may then move the young dog, so that it may get the wind of the birds, and keep it lying down for five minutes. This is very important, as the whole satisfaction of shooting over dogs is to be perfectly sure that the dog will remain steady to birds till the shooter gets up to it.

it winds birds and does not offer to draw on, the trainer need not make it lie down, but should do so directly the dog moves without orders. All does not, however, by any means, always go well! Very probably the moment the old dog stands, the young one will dash past him, run right into the birds, and chase them frantically all over the place. Here is the dog's primary habit asserting itself.

In this case the trainer wants to get the young dog back to him as soon as possible. Now is the time for him to pursue a masterly inactivity. He must not whistle on any account. The young dog's primary habit of chasing has asserted itself vigorously, and will quite overmaster its acquired habit of coming to heel when it hears the whistle. If the trainer whistles the dog will not come to heel, the spell will be broken, the delusion will be dispelled, the dog will discover that it is not obliged to come when it hears the whistle, and in future will do as it pleases and not as the trainer likes. Some people seem to believe that they can compel a dog to come by whistling, whereas all they can do is to delude it into thinking that it must come. Whistling will not *make* a dog come any more than pulling at a horse's bridle will *make* him stop. The animal can only be deluded into

thinking so. "There's nothing is, but thinking makes it so."

In this connection it should be observed that an order should never be given to a dog, or, in fact, to a man, woman, or child, unless there is a reasonable probability that it can be enforced. No, when the dog bolts let the trainer lock up his patience and sit down. Nothing excites a dog's curiosity so much as to see its master sitting down.

The young dog may be allowed to rampage to its heart's content; it will soon get tired of doing what it is not forbidden to do, like the new shopboy at the pastry cook's, and will begin to return to the trainer. Then is the trainer's opportunity, up he gets and begins to whistle, walking away from the dog; dog comes and thinks that it does so because man whistles, whereas it is *vice versâ*, man whistles because dog comes; but the delusion is kept up.

When the dog arrives what must be done to him? Is he to be beaten? Most emphatically, no. The trainer's object is to get the dog to come quicker next time; he therefore rewards it with biscuit. Then he described when the dog chases grouse. If no hares are killed over the young dog, it will soon give up standing at or chasing them—just as a well-trained retriever is taught to take no notice of ground game. It is worth remarking that, unless dogs are encouraged to stand at any particular kind of game, they will take no notice of it. When a dog is trained to stand at grouse it will very likely take no notice of partridges and *vice versâ*, for a day or two.

Young dogs should not be encouraged to stand at snipe, or they may begin standing at larks, the scent of which seems to resemble that of snipe

If a young dog is slow and potters, it is best to work it for the first season with another dog to excite it, and for the trainer to walk faster over his ground, and encourage the dog with his voice. There is no use in the puzzle peg or any mechanical contrivance. If a dog potters, it is probably because it has a bad nose, and possibly also because its make and shape are not good, or it has bad shoulders, or its head and neck are not put on right. The best medicine for a confirmed potterer is an ounce of lead. Usually those turn out the best dogs

No. 4.

proceeds as before. If the dog is very wild, it will be necessary to let it gallop till it is tired; then it will be only too glad to do what it is told. Occasionally dogs develop a habit, when they find birds out of sight of the trainer, of coming back to tell him so. This is not to be encouraged, but it cannot be prevented.

If a young dog puts up birds, the trainer should, by holding up his hand, make it lie down if possible—that is, when it is under control and not excited—and this practice should be kept up in old dogs; it makes them careful, and besides, even if one bird gets up, more may be left, and if the dog moves about it may put these up also before the shooter can arrive. If a young dog is wild, the sooner it is taken out by itself the better—that is, as soon as it has shown any disposition to find birds for itself; the presence of another dog is sure to make it wilder.

Probably some hares will be seen when grouse shooting. It is better to educate dogs to take no notice of ground game, which is all very well in its proper place, but is a nuisance on the moor; therefore if a young dog stands at a hare, the best plan is to take the dog away and to work it in another direction. If the dog chases a hare, the trainer should behave in precisely the same way as before which begin by being the wildest; exuberance of spirits can easily be repressed, but it is difficult to inspire enthusiasm into a sluggard.

A young dog may be taken in hand by its trainer as late as July 1, and, if the above lessons are well learned, it may be shot over on August 12. When he takes his young dog out grouse shooting, the trainer must judge for himself whether to work it singly or with another dog, according to the temperament of the animal, and according to whether he will require the dog to work singly or as one of a brace. Only one gun should go out, and that a man who cares more for the dog's future than for the size of the bag, in other words the owner or trainer. At first two or three brace of grouse only should be killed over the dog, for fear of making it gun shy, when it should be given back to the gillie and another dog taken on. Each time the dog stands at birds, the whole performance of keeping the dog standing for five minutes, &c., should be gone through, and after a time gradually relaxed, according to the steadiness of the dog. It is not advisable to work a dog down wind its first season, its second year is time enough for that, but all dogs should do so after their first season; it is most useful. To learn this, the second season dog may be taken out once or

twice with an old one that knows the business. If the dog is fond of its master, he will have no difficulty in making it work where he wishes, as the dog will lean to the direction in which it sees him going.

If the trainer wishes to make a practice of working two dogs at the same time, all that he need do, in addition to the foregoing, is first to make one dog lie down directly the other stands at birds, and they will soon learn to "back" each other without orders. Secondly, the trainer must get the two dogs to work in opposite directions, and to cross and recross each other. It is very pretty to see two dogs working in this way, but it is doubtful if more birds are killed over two dogs than over one, and the dogs are apt to get nearer their birds than if worked singly. The kennel expenses are also doubled.

To sum up, let the trainer teach the lessons above set out, one at a time. Let him make the dog fond of him. Let him give no order unless he thinks he can get it executed; having given it, let him enforce it; and, finally, let him religiously observe the great law, that corporal punishment, "is, and remains, abolished."

W. E. Lawson.

(The Editors have to express their sincere thanks to Mr. H. J. C. Anderson, of Great Crosby, for the photographs illustrating this article.)

SHORE SHOOTING—By this term is intended the pursuit of the various species of plovers and sandpipers which frequent the mouths of rivers, seashores, tidal harbours and marshes by the sea, and which, by reason of their exposed haunts, extreme wariness and rapid flight, test the crafty powers of the fowler, his judgment and strength in stalking or punting, and his skill in shooting.

Many who delight in a long day's partridge shooting, grouse driving, or a big day at pheasants, are apt to refer contemptuously to what they term "shore-popping." They "do not see the fun," as they express it, "of going about up to one's knees in mud, or lying in a wet punt all day; getting aground, perhaps, on a sand-bank, and having to wait an hour or two for the tide in order to be floated off."

Perhaps they have never tried it, or have never been very successful in their attempts. The style of shooting is so different from that to which they have been accustomed that there are more "misses" than "hits," or, if they lack no skill in shooting, they are unable to exercise it for want of a knowledge of the habits of the birds, and the requisite skill to approach them.

After Curlew.

To be a successful shore shooter, one must take that real delight in the sport which will incur the necessity of early rising, with energy and indefatigable exertion, and must be sufficiently observant of tides and wind to judge where birds are most likely to be found at any given hour in any given weather.

There are several ways of getting to birds. You may punt down the harbour at low water, and shoot them on the "muds," you may stalk them at high tide under cover of a sea-wall or bank of shingle, or you may "lie up" in their line of flight just before high water, and shoot them as they leave the harbour for the beach or marshes.

The last-named plan answers admirably if you happen to select the right spot, and as soon as the last "mud" is nearly covered, and the birds begin to move, some good shooting may be the result if the gun be only held straight.

As good a plan as any is to walk round a tidal harbour, starting about an hour before high tide, keeping, when necessary, under cover of the sea wall. The advancing tide will bring the birds nearer to the shooter every minute; whereas if he goes forth on an ebb tide, every minute will see the birds farther away from him.

As the tide advances, and the area of the feeding ground becomes gradually narrowed, the highest mud flats are broken up into little islands, on which the birds congregate and remain until the water reaches them and becomes too deep for them to stand in. They then betake themselves to the sea-beach or the adjacent marshes; the dunlins and ringed plovers going to the former, and the redshanks and curlews to the latter resort; while the golden plovers and peewits congregate on the fallows or wide open pastures, where they usually contrive to keep as far as possible from fences which might serve to screen the approach of a gunner.

At high tide a few hours may be enjoyably spent in tramping about the salt marshes and visiting the sides of the great drains or "rifes" which, intersecting the marsh, mark the boundaries of the different holdings, and serve instead of fences to restrain the cattle which graze there.

In these drains at such times one may count upon finding the common sandpiper, redshank, greenshank, green and wood sandpipers, to say nothing of snipe, and occasionally Temmincks' stint, and the grey phalarope. These birds are often solitary, and though occasionally two or three may be found together, they are never so gregarious as, for example, are plovers, knots, curlews, whimbrel, or godwits, which must be looked for in very different situations.

It is a good plan, when visiting these drains, not to walk close alongside and parallel with the water; in a straight piece, should there be a bird ahead, it will instantly perceive your approach and rise out of shot. It should then be marked down and stalked in the open, by walking directly on to it, and looking quickly right and left for it to rise. It should be noted that a sandpiper of any kind, which has been flushed and marked down, is not to be sought for exactly at the point where it disappeared below the level of the drain, but some yards further on; and, should the bank be steep there, with little or no margin by the water's edge to offer foothold, the bird may go a long way under cover of the bank beyond the point where sight was lost of it before alighting. In the same way, therefore, that a huntsman has sometimes to recover the line of a fox where hounds are at fault, the shore shooter must be prepared to make a "cast" amongst the marsh drains ere he will get within shot of his fleet-winged quarry.

Dog for Shore Shooting—For this kind of sport a dog is indispensable so long as the shooter is ashore; not so much to find the birds, as to fetch them when shot, for they will frequently fall in deep water, or among reeds, or on the opposite side of a wide drain, and without a dog much time will be wasted in making a long *détour*, or in fruitless efforts to reach them.

As to the best kind of dog for the purpose, opinions no doubt will differ. So long, however, as he can retrieve, the chief points to be attended to are size and colour. Unless he can be trusted to lie down and keep quiet while his owner is stalking, and to come to him only at a whistle, he should be neither large nor light-coloured, otherwise the birds will see him at a great distance and never suffer an approach. For choice, there is nothing better than a liver-coloured Sussex spaniel, or an Irish water spaniel. The writer has used both, as also a retrieving Irish setter, but the last, though invaluable in a snipe bog, was, from his size and colour, too conspicuous for shore shooting. In a punt, a dog is not only unnecessary, but, if allowed to jump out and retrieve birds from a mud-bank (to save his master the trouble of putting on mud-pattens), he may become a positive nuisance by making the punt and everything in it as dirty as possible on his return, drenching his owner with vigorous shakes of his coat, and either whining with cold while moving restlessly about in his endeavours to get dry, or lying down generally where he is not wanted. From a purely selfish point of view, a wet dog in a punt is a most uncomfortable companion, while, on the score of humanity, no man who is fond of his dog should keep him shivering with cold and wet in a position where he has no chance of getting dry.

Shooting from Blinds and Pits—Should the shore gunner be in the habit of making repeated visits to the same shooting quarters and finding birds sufficiently numerous to warrant a prolonged stay in the neighbourhood, he will, if sufficiently observant, sooner or later discover their favourite haunts, notice where they go at high water, and mark the spots which are first laid bare at ebb tide—for to these they will regularly resort.

A judiciously placed hurdle, or ambush constructed of seaweed and big stones, within shot of such points, will sometimes enable the gunner to screen his approach until near enough to get a shot or two. Some professional fowlers are in the habit of digging pits in the line of flight when they have discovered it, and remaining therein

Drawn by A. Thurlow. Isaac Sloan Engraving

Shore Birds

for an hour or two, on the chance of intercepting the passing birds. This plan is sometimes pretty successful, but the necessity for remaining so long in a cramped position renders it distasteful to those who prefer a more active campaign.

Some experts indeed regard such devices as unsportsmanlike. Folkard, for example, in his excellent book, *The Wild Fowler*, remarks :—

"There are various other tricks and means resorted to for getting within range of the wary curlew, some of which are beneath the dignity of a sportsman, such as digging holes in open marshes, burying casks on the beach, and lying in ambush in those unenviable positions, thus taking the birds by surprise. Such proceedings," he adds, "may answer once or twice, but curlews soon forsake a place of resort when so assailed."

The plan recommended by Colonel Hawker as to making an artificial island by means of a few boatloads of rubbish is far better. Curlews always remain on the highest ground, nor do they leave it until the tide reaches their legs, so that by proceeding in a punt and using great caution, a good shot may sometimes be made. A variation of this plan is to lie in ambush on the island and shoot the birds as they approach it, recovering those dropped in the water by means of the punt.

Punters have usually a great antipathy to shore gunners, who often spoil their best sport, for just as they are approaching fowl, and almost within range, the report of a shoulder gun on the shore puts up the birds and spoils the shot. Shore shooters, on the other hand, have a similar dislike to the sound of a punt gun, although if they happen to be to leeward of the fowl shot at, they may sometimes profit by the occasion and get several shots at birds which, alarmed at the report, come scurrying down wind in their direction.

The fact is that in this pursuit, as in every other kind of sport, there must be a certain amount of toleration. No sportsman worthy of the name would intentionally spoil another's sport, and a shore shooter, on perceiving a puntsman "setting" or "sculling" to fowl which he himself cannot possibly reach, should be chivalrous enough not to fire until the other has had his shot. His virtue will not unlikely be rewarded :

Grey Plovers and Peewits.

for by watching through his glasses the movements of the punter, and noting the direction taken by the shore birds which he disturbs and does not fire at, when after duck or wigeon, the long-shore gunner may get many a chance at birds which would otherwise go away unnoticed by him.

Calling Birds—One of the most useful accomplishments of a shore shooter is to be able to imitate the notes of such birds as plover, curlew, whimbrel, knot and redshank, so as to entice them within shot, and to acquire this needs some practice. The plan is for the shooter to listen to one of these birds calling, and "to tune his merry note unto the wild bird's throat." If he has an ear for music he will at once get the right pitch, and a little practice will enable him to deceive even the wary curlew. Young birds are more easily decoyed in this way than old, and

single birds which have wandered from their companions will come to a whistle, when a flock will pass on unheeding it.

Should the flock, however, be composed of a lot of young birds, as is frequently the case in August and September, particularly with knots and godwits, which are more gregarious than redshanks and greenshanks, an imitation of the call note will bring them within shot; and, should several be dropped at the first discharge, if they are left for a time on the ground, or in the water, the remainder of the flock will wheel round and pass close to them, giving another chance to the expectant gunner.

Guns—The choice of a gun for shore shooting, on any given occasion, will depend upon whether the shooter is going to walk about all day in the salt marsh or along shore, whether he is going to lie behind a sea-wall, or spend half his time in a punt. In the former case, he will find a good stout 12-bore, weighing about 7¼ lbs., sufficiently useful for his purpose, and not too heavy to carry all day; in the latter case, if he is accustomed to the use of a heavy shoulder gun, he may have an 8-bore or a 10-bore behind the sea-wall, or a 4-bore in the punt as well as a 12-bore, using the heavier weapon for a big shot at curlews, godwits or plover, and the lighter one for single shots at birds passing within moderate range. Nothing is more disappointing at first use of a heavy shoulder gun than the frequent misses which occur from slowness of swing. For want of practice the heavy gun is not brought up quickly enough, aligned quickly enough, nor swung sufficiently ahead of the passing bird; the result is that the bulk of the charge passes behind it, and unless a pellet or two should happen to strike it in the right place, the bird gets away and is soon lost to sight.

Many persons seem to be under the impression that for shore shooting a heavy gun is indispensable, but this is really not the case. With an ordinary 12-bore, weighing 7¼ lbs., the present writer has killed curlew, whimbrel, godwits, redshanks, greenshanks, golden and grey plover, peewits, knots, and all the smaller sandpipers which are commonly to be found about the mouths of rivers and tidal harbours at low water, or in the salt marshes adjacent to the sea, besides ducks of various kinds at flight time, once a brent goose (one of three that came in shore), and on another occasion two wild swans. The fact is that with ordinary care in stalking, or with luck in getting near the birds (for one sometimes drops upon them unexpectedly within range) there is no reason why a properly loaded 12-bore should not effectually stop any shore bird that one is likely to come across.

KNOTS.

Loads—There is perhaps no question upon which opinions differ so much as upon the proper charges for guns. Experience has proved that most guns will shoot better with one size of shot than with another, and the best load for a particular gun should be carefully ascertained by experiment. When once discovered, it

should never be varied if sport be the only object. But when the shore shooter is also a collector, and is desirous of securing good specimens of particular species, the charge used must be accommodated to circumstances. No one would think of shooting a little stint with No. 5, or of firing at a strong flying curlew with snipe shot. The use of breech-loaders nowadays, amongst all but professional fowlers in remote fishing villages, makes it so easy to substitute one cartridge for another in case of need, that it is unnecessary to dilate upon this subject further. (See the article GUNS, section "Wild-fowl Guns," vol. i., p. 499.)

Care of Guns—To keep rust from guns used on or near the sea, there is nothing so good as vaseline applied with a soft toothbrush. If caught in the rain or drenched with spray from a boat, the wet should not be wiped off unless it is thoroughly done, and more vaseline applied when the barrels are dry. On getting home, the barrels should be taken off and every drop of wet should be wiped off; stock, barrels, and fore-end should all be well rubbed with a vaseline rag, and not put together again until wanted. The inside of the barrels, after being cleaned out, should be dressed with a mixture of paraffin and spirits of turpentine, half and half, and the next morning well polished with a strip of flannel rolled round the cleaning rod. If the gun is to be used again that day, superfluous vaseline may be wiped off lightly and the remaining film will protect the metal from the day's exposure.

Another recipe to keep rust from guns is to get a bottle of "Newark's Preparation for Guns," which costs a shilling for a 4-oz. bottle, and which, if used with care, will last some time, not only keeping the gun free of rust but also removing any leading that might be inside the barrels and keeping them bright and clean. A wild-fowler who has used this preparation for more than eight years asserts that he has found nothing to equal it for keeping guns in good order and free of rust.

For the stock of a gun a soft rag dipped in a little linseed is the best of all applications.

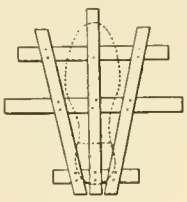
Shooting Boots—The foot-gear of a shore shooter must depend every day upon the nature of the ground to be visited. For wet, marshy ground there is nothing like a pair of long boots; not such as are made in London, for they are seldom waterproof and very expensive, but such as are made at a seaport like Great Yarmouth by a bootmaker who works for the fishermen, and who knows that if he cannot make his boots water-tight they are of no use and will not sell. They cost from thirty to thirty-five shillings.

After use they should be thoroughly washed in warm water with a brush, then dried with a rough cloth, and, while the leather is still warm from the contact with hot water, they should be well rubbed with vaseline; not lightly smeared over, but thoroughly rubbed in with the hand, the leather being well kneaded and so rendered pliable. The result of such treatment is that the next time they are worn, instead of being hard and galling to the feet, they draw on like a glove, and the shooter, wearing thick woollen stockings, feels comfortable all day. Boots thus treated (whether long boots or lace boots) will last for years, and it is advisable to have two pairs of each in use, so as not to have to wear the same pair two days running. There will then always be time to get them thoroughly dried. A good plan for drying boots is not to put them near the fire, which makes them hard, but to fill them with oats made hot in the oven. By giving the boots a thump or two and manipulating them a little, the oats will settle down and act as a boot-tree, with the additional advantage of absorbing any moisture there may be inside.

If the day is to be spent along the sands or on a shingle beach, long boots obviously would be a mistake, and would be very fatiguing. Over such ground lace boots answer best, with canvas anklets to keep out the shingle.

In a punt, shoes are more convenient, as being easier to put off and on, when one has to slip out on a mud flat or sand bank to pick up shot birds that have fallen beyond reach of the punt, or to shove the punt over land from one creek to another, to save time when birds have shifted their quarters.

Mud-pattens are always useful things to have in a punt in case one has to get out on soft ooze which will not bear one's weight without them. They may be simply made of two pieces of flat board on which the boot is placed, holes being bored on either side of toe and heel to allow of a cord passing through and tying across instep and ankle. Or they may be constructed more elaborately of $\frac{1}{2}$-in. board as in the annexed figure, the centre and cross pieces being $2\frac{1}{4}$-in. broad, the side pieces somewhat narrower, the patten being adjusted to the boot with cord as in the other plan. The middle cross piece should be cut somewhat shorter on the inside to prevent its striking the ankle of the other foot. In either case a little care is needed to prevent mishap, for unless each foot is put down flat, the mud will at once work over the edge and cause the wearer to trip and perhaps fall, an event too unpleasant in its consequences to be risked.



MUD-PATTEN.

Should the shooter hire a punt from a professional fowler, he may be able to borrow a pair of mud-pattens at the same time, and so save himself the trouble of making and carrying his own.

Cleaning Birds and Care of Specimens—If the sportsman be also a collector, or is desirous of taking home specimens with him in

as clean a condition as possible for preservation, it is as well to know how to proceed. Too often the birds are thrown together in a heap at the bottom of a punt, or are carried about all day in a capacious pocket, or game bag, or tied by the necks and thrown down anywhere when the next chance of a shot presents itself, no one of which plans is to be commended.

If a bird, when shot, has fallen in the water, or on dry sand or shingle, well and good ; but it will often happen with shore birds that they drop on soft ooze, where, if only winged, they will run and flutter and get considerably soiled with mud. This must be washed off sooner or later if the specimen be intended for preservation, and it is as well to do it as soon as possible before the mud or the blood has time to dry and stain.

When obliged to wash a bird, the collector will find it an advantage to use salt and water, instead of plain water, for the salt prevents the solution of the blood globules, and consequent

Bar-tailed Godwit.

diffusion of the red hæmaglobin. The specimen then being clean and dry, a plug of cotton wool should be inserted in the mouth, and the beak tied to prevent the saliva from oozing out and staining the feathers. The bird is then dropped head first into a cone of paper, which causes all the feathers to lie in the right direction, and the larger end of the cone being turned over, the specimen is kept clean and in good order until the time comes for skinning it.

This method of treatment gives very little trouble, and will make all the difference in the appearance of a bird if it is intended to be preserved and mounted.

J. E. Harting.

RIFLES FOR FOREIGN SHOOTING—The modern rifle is still in process of evolution, and the task of writing upon rifles and rifle shooting is, therefore, in the very nature of things, always a difficult one. Within the last five years immense changes and improvements have been wrought by the introduction into general sporting use of the ·303 Lee-Metford and the ·256 Mannlicher rifles, weapons which may be said to have effected a revolution in game shooting, and especially in the stalking of deer and antelopes and the destruction of other soft-skinned game. Yet, year by year, month by month, fresh improvements are being made, and even the Mannlicher and the Lee-Metford may, no great while hence, be themselves ousted from the field by still more perfect and effective weapons.

For a good many years it was a safe axiom—laid down by big-game shooters of great and varied experience—that the sportsman hunting in India, Africa, or any other part of the world where great game existed, could not go far wrong if he took with him two classes of rifle, viz., for thin-skinned game a ·450 or ·500 Express, sighted up to 300 yards, and for heavy, dangerous, and thick-skinned game like elephants, rhinoceros, and buffalo a ponderous large-bore rifle—4-bore or 8-bore—shooting 12 drams of powder and a spherical or conical bullet. With these weapons the sportsman was sufficiently well equipped. With the Express he could account for all kinds of deer and antelope, as well as lion, tiger, and bear. With the heavy 4- and 8-bore he could rely upon stopping almost certainly, even at very close quarters, the charge of elephant, rhinoceros, and buffalo. Add to these weapons a Martini-Henry sporting rifle, for all kinds of shooting up to elephant and rhinoceros—the Martini-Henry bullet is quite good enough to master even these gigantic game—and a 12-bore shot gun, and the sportsman was perfectly well provided for any part of the world. But the 4 and 8-bore are weapons of such tremendous weight and punishing powers that only the most robust sportsmen can, or are fitted to, undertake their use. A bullet weighing four to the pound—or even eight to the pound—propelled by a charge of 12 drams of black powder, not only gives a tremendous shock to the animal fired at, but inflicts considerable punishment upon the sportsman wielding it. Only a man of strong nerves and great physical strength can long stand the use of such a weapon. The weight alone of these heavy rifles is an immense handicap in a hot climate. A single 4-bore weighs about 21 lbs., a double 8-bore about 15 lbs. Many sportsmen therefore turned their attention to other weapons. The ·577 double rifle, shooting long, solid bullets, was found to be an efficient weapon even against elephants and rhinoceros. Other gunners favoured the now well-known ball and shot guns, which can be used as shot guns, and yet carrying, as they do, short, heavy bullets, are excellent weapons, even for dangerous game, in jungle and forest, where animals are usually encountered at close quarters.

Mr. F. C. Selous was one of the first sports-

men to demonstrate that heavy rifles and heavy charges are not vital essentials for the destruction even of the biggest and most formidable game. Some years ago, when hunting elephants in South Africa, Mr. Selous found himself, after an attack of fever, too weak to use a heavy rifle. He therefore attacked a troop of elephants with no more formidable weapon than a ·450 Metford-Gibbs, using long, solid, toughened bullets and a powder charge of 75 grains. With this rifle he killed in a single day no less than six elephants—if he had been in his usual health and better mounted he would have killed probably twice the number, as he had with the same weapon and charge killed previously buffalo, giraffe, hippopotami, and even rhinoceros. It became clear that to a cool and seasoned sportsman the ·450 was practically as useful a weapon as a 4- or 8-bore. But, in addition to Mr. Selous, many other sportsmen have demonstrated the fact that the cumbrous, heavy, and punishing large bore weapons are not absolute essentials for the bagging of elephant and rhinoceros, provided the sportsman is a fair rifle shot and has confidence in his own powers. Large numbers of elephants, buffaloes, rhinoceros, giraffe, and other heavy game have been killed in South Africa—especially by Boer and native hunters—with no heavier weapon and missile than the Martini-Henry, using the ordinary government military ·450—·577 ammunition. On the other hand, it has to be said that with a single 4-bore or double 8-bore a charging elephant or buffalo can be stopped or turned at close quarters, when no lighter weapon and charge would have effected that object. If, then, the sportsman is likely to be hunting elephant, rhinoceros, or buffalo in bushy or dense jungle country, where dangerous game would, if wounded, be probably encountered at very close quarters, he would be well advised, even at the present time, to take with him a double 8-bore, or a weapon of the Paradox type (ball and shot gun); few men nowadays care to tackle the cannon-like 4-bore rifle.

Quite recently Mr. A. H. Neumann, a hunter of great experience and success, has been shooting elephants in East Africa with the ·303 Lee-Metford service rifle, having a native hunter close at hand with a Martini-Henry as "cripple stopper." As Mr. Neumann bagged in 1895–6 a good many rhinoceros and elephants with this rifle and its slender missile, it must be conceded that the ·303, even when one is hunting such immense game as elephant, has a good deal to be said in its favour. On the other hand, thanks to a hitch or fault in the mechanism, Mr. Neumann, while using this rifle, was charged, knocked over, and all but killed by a cow-elephant, which crushed in his ribs, drove her tusk through his arm, and disabled him for months. If at that moment he had had in his hand an 8-bore, the elephant would have been pretty certainly stopped, or turned from her charge. It should be mentioned that all kinds of game, even up to rhinoceros, have been killed within recent years by other sportsmen, in Africa and other parts of the world, while using the ·303 Lee-Metford sporting rifle.

For stalking antelope upon open plains, wild sheep and goats in mountain country, for deer, wapiti, moose, and reindeer, and for lions, tigers, leopards, and other carnivora, the ·303 Lee-Metford and the ·256 Mannlicher, using smokeless powder and hollow-fronted bullets, have proved themselves almost perfect weapons, and are likely, for some years to come, to be held in increasing favour by sportsmen in all parts of the world. For stalking, especially, their astonishing accuracy, immense striking energy, and flat trajectory, combined with their lightness and absence of recoil, render them almost ideal weapons.

Smokeless rifle powders are an invention which add greatly to the comfort of the gunner. At the present time Rifleite seems to be the best and most reliable of these powders, and may be recommended to all sportsmen as a thoroughly sound powder, giving splendid penetration, together with great absence of recoil and little of the troublesome smoke known of old to users of black powder. It is, however, still contended by experienced sportsmen that, notwithstanding the wonderful powers of the new small bore rifles, a much heavier and stronger weapon and charge are necessary in following dangerous and especially wounded game in thick bush, or in tackling them at close quarters. There is much truth in this contention, and the smashing and shocking power of a 4-bore, 8-bore, or even 10-bore bullet, delivered at close quarters, is undoubtedly much more likely to be effective in turning, stunning, or killing outright so dangerous a beast as a wounded buffalo, elephant, rhinoceros, or lion, than a light missile such as the ·303 bullet. For great game shooting at the present day in South Africa, India, or any part of the world, a serviceable battery would be as follows:—

1. A single ·256 Mannlicher or ·303 Lee-Metford,[1] useful for almost all kinds of sport.

2. A double 8 bore, or double ·577, or Paradox, if elephant, buffalo, or other heavy game are to be encountered.

3. A single Martini-Henry sporting rifle, shooting solid bullets. This is a useful weapon for native servants, and is always a good, cheap, and most reliable spare rifle. For hunting giraffe or eland on horseback, where shots are often fired from the saddle, it is especially useful, the solid bullet giving just the requisite shock and penetration.

[1] It should be mentioned that gun-makers are now introducing the ·303 with improved breech action, thus obviating the cumbrous and unsightly bolt which has hitherto been the chief objection to the Lee-Metford ·303 for sporting purposes.

4. A double 12 bore shot gun—left barrel partial choke—for bird shooting.

With such a battery the sportsman can safely take the field in any country where big game is likely to be found. If he is inclined to be extravagant, he can add to it, if he pleases—

5. A double ·450 express, shooting both hollow pointed and long, solid, toughened bullets, or one of the new double ·256, ·303, or ·400 rifles which are now being introduced.

If the gunner is going to a country where neither elephant, rhinoceros, nor buffalo are to be encountered, he need take with him, unless he has plenty of money to spend in equipment, no more than a single or double ·303 or ·256, a spare Martini-Henry sporting rifle (for which ammunition can almost always be readily obtained), and a shot gun. With these weapons he can obtain all the shooting he requires. The rifle should be well tried before leaving England, the sighting most carefully tested, and the trigger pull adjusted to the shooter's liking.

For antelope or gazelle shooting on the plains or in open country, sighting should be adjusted up to 400 or 500 yards. There are many and divers opinions as to the safety bolt for rifles. On the whole the balance of opinion among practical sportsmen is rather against than for this convenience.

Spare sights, strikers, cleaning apparatus, nipple wrench, and screw should be taken. If the sportsman is going for a prolonged stay, loading and recapping implements and materials may be thought necessary, but it should be remembered that, for heavy or dangerous game, new, and not reloaded, cartridges are infinitely safer and more preferable. The rifles should have eyes and a leather sling, although not every mounted man cares, like the South African Boer, to carry his rifle slung at his back. Native carriers are, more often than not, to be met with, and in the South African interior the post of rifle carrier for the English sportsman is looked upon by Bushmen and other native hunters as one of great honour and credit.

Most English sportsmen prefer for South African shooting, where horses can be freely employed, to carry the rifle in the hand, in preference to having it slung across the back, or in a bucket. For the first day or two the arm becomes tired and stiff from the unaccustomed weight: that, however, soon passes off, and the sportsman will quickly become habituated to carrying a double rifle in his right hand, day after day, during long hot rides in search of game, without noticing the encumbrance at all. In the game country, native carriers are, however, as I have said, pretty constantly to be procured. These men usually insist as a point of etiquette upon carrying the rifle until game is sighted or known to be near. Strong leather bandoliers for carrying cartridges should not be forgotten. Ammunition should be taken out in strong tin-lined cases. A sight protector for the foresight, and a waterproof gun cover for wet weather, are items that ought not to be omitted. No sportsman should be without a good but light pair of field-glasses, nor should he leave camp without having in his belt-pouch a box of matches, a pocket compass, and (unless water is plentiful) a water bottle, containing tea or any other pet beverage, slung to his saddle, or carried by his native attendant.

In stalking small antelopes or gazelles, such as spring-buck, black-buck, &c., upon open plains, the shooting can as a rule be undertaken with some deliberation, and the sportsman can, more often than not, get a steady shot in a recumbent or sitting position. Where, however, as often happens with the larger antelopes, such as wildebeest, hartebeest and the like, the quarry sets off, so soon as alarmed, at a fast gallop, the gunner has little time for judging distances and must hastily put up what he thinks is the proper sight and fire from the knee or standing. Successful shooting of this sort can only be acquired by practice and experience. Mountain stalking, again, is a complete art in itself, and success can only be attained after a severe and often trying apprenticeship, not only in the actual shooting itself, but in studying wind, changes of temperature, the habits of the animal pursued, the difficult business of calculating distances amid mountains and valleys, in various kinds of weather and at different periods of the day, and a host of other details.

Before reaching the game country, the novice may be advised to practise shooting wherever possible, to habituate himself to the changes of light and atmosphere at different periods of the day, and to practise repeatedly the art of judging distances in a hot climate, by guessing and pacing out imaginary distances in the *terrain* through which he is passing.

In forest and bush country, where the shot is often a mere snap at close quarters, incessant vigilance, cool nerves, and great quickness are absolute essentials to success. For such shooting, the handy shot and ball weapons of the Paradox description, with which aim can be rapidly taken, as with a shot gun, are extremely useful. Dangerous and heavy game, such as lions, elephants, rhinoceros, and buffalo, are more often than not shot within 50 yards, and the gunner should be very sure of his nerves and proficiency with the rifle before attempting to tackle them. It is here that the advantage of a rifle of heavy calibre comes in. Armed with a 4 bore or 8 bore, a man, even if not a first-class rifle shot at longer ranges, can, with courage and determination, await the approach of an elephant or rhinoceros to within 20 yards, confident that, if he holds reasonably straight, the tremendous impact of the heavy charge and bullet will almost certainly turn or disable his antagonist. The novice, before taking the field

abroad in search of big game, will be well advised not only to read the works of reliable travellers and hunters who have exploited those regions he intends to visit, but to digest carefully the contents of some good work on rifle shooting. Mr. Augustus Grimble's *Deer Stalking* (Chapman and Hall), and that excellent little book, *The Sportsman's Vade-Mecum for the Himalayas*, by K. C. A. J. (Horace Cox), will teach him many wrinkles, which, in addition to his own practice with the rifle, will be of invaluable use to him. But, after all, even such good and practical works as these are but temporary aids to the would-be game shooter. Only an apprenticeship in the veldt, upon the mountain, or in the jungle itself, can teach a man the real art of hunting and shooting wild game. The reader will find much useful information on bullets, charges, trajectories, striking force, &c., in the article on "Ammunition" in Vol. I. of this Encyclopædia. He may be also referred to "Deerstalking" and "Big Game" in the same volume.

H. A. Bryden.

TARGET SHOOTING—Few outdoor forms of sport of a quiet character have attained such a degree of popularity as target shooting with the rifle. This is in some measure due to the wonderful results obtained with modern arms of precision, and the interest which the many problems connected with them have aroused. The chief cause, however, has undoubtedly been the enthusiastic manner in which the national Volunteer movement was received and the success which has attended it, causing an immense number of our citizen fellow-countrymen to become not only familiar with the rifle but expert in its use.

No industry has received a greater amount of attention from inventors than the manufacture of guns and ammunition, and improvement has followed improvement in such rapid succession that the history of the rifle is one of a continuous series of changes.

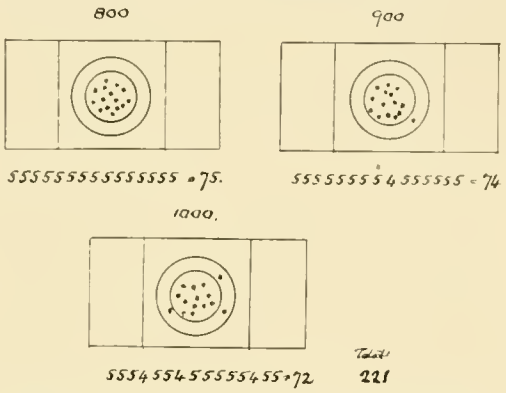
Consequent upon the recent adoption of the ·303 magazine rifle as the British service arm, in place of the ·450 Martini-Henry, the conditions of target shooting have in the last couple of years undergone a change so complete as to be almost revolutionary.

The Martini-Henry could always be relied upon to make good shooting at 200 and 500 yards, and, under favourable circumstances, at 600; but as a reliable target weapon the last distance was its limit. Under no circumstances had it the slightest chance against the old ·450 match rifle, which monopolised the shooting at the long ranges; but, as the cost of a match rifle and the necessary outfit seldom came to less than £25, the number of riflemen using it was limited. In experienced hands, however, the results obtained with this match rifle were little short of marvellous. The following are the highest scores made with it in public competitions in this country:—

Competition.	Date.	Competitor.	Yards. 800	900	1000	Total.
Competition for the Scotch Eight	1885	T. Caldwell.....	74	75	72	221
Regular and Volunteer Officers	1889	Capt. T. Lamb..	75	73	72	220
Elcho Shield Match	1892	Capt. T. Lamb..	75	71	73	219
,, ,, ,,	1894	Capt. G. Gibbs.	74	72	72	218
,, ,, ,,	1891	Capt. Foulkes...	74	73	71	218

The highest possible score is 225.

Black powder was almost universally used in the ·450 match rifle and Martini-Henry; but



Diagrams of T. Caldwell's Score of 221 made at Irvine, N.B. 28th June, 1885. Rigby Rifle. Strong 11 o'clock wind.

on the introduction of the magazine ·303, with its small based and long bullet, the use of a much stronger explosive was necessary, and it soon became apparent that if the match rifle were to be retained as a useful weapon and not merely as a toy, the limit of its bore should be so reduced as to bring it into touch with the new Service weapon.

Match Rifle—The *raison d'être* of the match rifle is to ascertain the degree of accuracy obtainable at the long ranges with a rifle conforming in general conditions to the Service rifle, but equipped with the finest sights and using the best ammunition.

Fortunately for target shooting, the National Rifle Association of Great Britain is admittedly the supreme authority in all matters relating to this form of sport; and its regulations with regard to ranges, targets, positions and classes of rifles are universally adopted by the various rifle associations and clubs throughout the Kingdom. Recognising the necessity of the change, the National Rifle Association, early in 1897, issued the following definition of the Match Rifle, which has governed all competitions held since.

Match Rifles—Any breech-loading rifle complying with the following conditions:—

1. When of British make, to bear proof marks both on barrel and breech.

2. *Weight*—Maximum, 10 lbs. In magazine rifles the magazine, whether detachable or not, to be included.
3. *Length*—Maximum, 52 inches.
4. *Calibre*—Maximum, ·315.
5. *Stock*—Full stocked, and sufficiently strong, in the opinion of the Bisley Committee, for service purposes, and fitted with swivels for a sling. No pad or shoe for the heel-plate of the butt allowed.
6. *Pull of trigger*—Minimum, 6 lbs.
7. *Sights*—Of any description, except telescopic or magnifying.

Nearly all the match rifle shooting under the above conditions has been made with ·303 magazine rifles of the Lee-Metford or Lee-Enfield patterns, or with Mannlichers.

(The Lee-Metford is the pattern originally adopted by the Government, the rifling being on the Metford principle. The Lee-Enfield has an improved system of rifling, invented by Mr. John Rigby, late superintendent of the Government Small Arms Factory at Enfield, and has superseded the Lee-Metford. The Mannlicher has a bore of ·256, and is known as the Dutch pattern.)

Many shooting men possessing Lee-Metfords or Lee-Enfields converted them into match rifles by having aperture sights, removable at pleasure, fitted on them. It thus became possible to use one and the same rifle throughout the service and match rifle competitions. As the extra sights only cost about £5, the saving to the competitor was considerable, both in expense and in trouble, by having only one rifle instead of two to bring about with him. It is further worthy of note that some of the most valuable match rifle prizes at Bisley were carried off by competitors using converted service rifles and Government (cordite) ammunition.

The usual *distances* for match rifle competitions are 800, 900 and 1,000 yards. A few are held at 1,100 yards, notably the Wimbledon Cup at Bisley and the last range of the Cambridge Cup.

As between the merits of the ·303 and the Mannlicher ·256 as match rifles, opinions appear evenly divided. The latter works well in wet weather, and the ammunition (Troisdorf powder) suits it. The very small hole made in canvas targets is at times difficult for the markers to find, and the bullet, being lighter, is slightly more sensitive to wind variations. John Rigby won the Wimbledon Cup at Bisley in 1897, using a Mannlicher rifle, with the magnificent score of 71 out of a possible 75 at 1,100 yards. Special match rifles of ·303 bore are now to be had from all the leading rifle firms, and particular loads which suit them are recommended by the makers. Many of these rifles are not of the service pattern, and can only be used in match rifle competitions. For those to whom expense is a matter of little importance, a special rifle for match shooting is on the whole preferable; but there are plenty of service pattern rifles to be had which shoot well with the open sights, and form equally good match rifles with the addition of the aperture ones. A few do not, owing, in most cases, to some weakness or defect in the stock.

Next only in importance to the choice of a rifle is the choice of the *ammunition* to be used with it. What a target shot most desires is an explosive giving uniformity of result, a quality possessed in a very high degree by black powder. There appears little to choose between Ballistite, Cannonite, Cordite, Rifleite and Troisdorf; but a beginner cannot do better than adopt the load recommended by the party from whom the rifle is purchased, until he is fortunate enough to discover a charge better suited to his particular weapon. To those who have time and patience, the carrying out of experiments forms one of the pleasantest phases of rifle shooting; and the discovery of a reliable load will well repay many an afternoon spent on the ranges. Having found a charge giving consistently good results, the wise shot will be slow to change it.

Owing to the strong corrosive action of the nitro-compounds, great attention must be paid to cleaning the rifle as soon as the shooting is finished. If the barrel be wiped out before it has had time to cool and the fouling to harden, considerable trouble will be saved.

In competitions cleaning out is forbidden except between ranges.

The *back position* is universally used in shooting with the match rifle. It is much steadier in a wind, and does not require the same physique or nerve to get through a long competition or a close finish.

The back position generally adopted is that illustrated in No. 1, with the rifle resting between

Position No. 1.

the legs. The left foot should be placed flat upon the ground, the knee almost upright, and the left instep gripped firmly by the inside of the right knee. The head may be supported by catching the left sleeve, or a small band attached to it, in the teeth. No. 2 is known as the toe position. As the shooter's knees somewhat interfere with his observing the wind changes whilst aiming, it is of importance that the shot should be fired as quickly as possible, consistently with a steady aim being taken, after the sights have been adjusted. A little practice will enable a beginner, by closing his hand on the grip, to release the trigger almost instantly, yet without the slightest

jerk. Shooting over the thigh (No. 3) has the advantage of giving a clear view of the targets;

Position No. 2.

Position No. 3.

but, owing to the rifle merely resting on, and not being caught by, the legs, it is scarcely as steady as either 1 or 2.

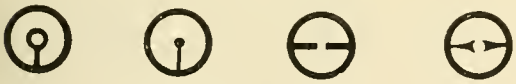
Aperture back and front sights, adjustable by screws and scaled, are, together with the greater distances between the sights, the chief advantages of the match over the service rifle. The scales are drawn so that a movement of one division means a change of one inch on the target for every 100 yards, or eight inches at 800, &c.

With aperture sights, aim is always taken at the same spot on the target, generally at the bull's-eye, although the rifle may be pointed to throw many feet away from it.

Spirit levels are permitted, and always used, with the match rifle for the purpose of keeping the sights upright—a necessary precaution, for the line of aim is high over the centre of the barrel. Should the sights lean over to the right, the bullet will be thrown to that side, and if the lean is at all considerable, low shots will also result.

The front sights generally used are (1) the hollow bead or ring; (2) the solid bead; (3) the calipers, and (4) the earwig. The ring stands on a stem in the centre of a strong circular guard. The bull's-eye is seen in the centre of

Foresights.



Hollow bead or ring. Solid bead or pin head. Calipers. Earwig.

the ring, and this again in the centre of the back-sight, the three circles of the bull's-eye, ring and back aperture being concentric. This form of sight is excellent in good light, but is apt to strain the sight in dull weather.

The solid bead, or pinhead is either centred on the bull's-eye so as exactly to coincide in size with it when looked at through the back-sight, or is placed on the white of the target to the right or left, almost touching the bull, and forming a figure of ●●. A different sized bead is necessary at each distance. This sight is used by the majority of match rifle shots, and is undoubtedly the best for all classes of weather.

The hollow bead, calipers or earwig should be sufficiently large to permit a clear ring of white to be seen round the bull's-eye.

Long-Range Clubs find the difficulty of obtaining suitable range almost insuperable, and this accounts for their number being so small. The long-range clubs in the Kingdom are:—

The English Eight Club.
The Cambridge University L.R.R.C.
The Oxford University L.R.R.C.
The Hounslow L.R.R.C.
The Dublin Rifle Club.
The Irish Rifle Association.
The Ulster Rifle Association.
The National Rifle Club of Scotland.

The English Eight Club, the Irish Rifle Association and the National Rifle Association of Scotland hold annual prize meetings for the purpose of aiding the captains of the teams for the Elcho Challenge Shield, to choose their representatives. The Irish Rifle Association holds an open prize meeting in June, at which £200 is offered in prizes for the match rifle.

The Service Rifle—Whatever difference of opinion may exist as to the merits of the ·303 service rifle in actual warfare, there is no denying its superiority in accuracy and effective range over its predecessor, the Martini-Henry. At Bisley, 1897, the Volunteers for the first time used the ·303 in all the service rifle competitions. Such was the improvement in the shooting, and so numerous were the full scores made, that an alteration in the S.R. Ranges from 200, 500, and 600, to 300, 600 and 700 yards, or a change in the dimensions of the targets, appears by no means improbable.

The following are the winning scores made for the Queen's Prize at Bisley in the last three years:—

	First Stage.			Second Stage.		Third Stage.		Total
Highest possible score.	200 35	500 35	600 35	500 50	600 75	800 50	900 50	330
M.H. 1895 Private Hayhurst	30	33	32	46	55	45	38	279
M.H. 1896 Lieutenant Thompson...	32	33	30	45	55	38	40	273
L.M. 1897 Private Ward...	32	34	32	50	70	41	45	304

The shooting in the final stage of this competition clearly demonstrated the capabilities of the ·303 service rifle at the long ranges. Only one miss was recorded in the scores of the first thirty-five prize-winners, and Lieut. Ross, of Canada, who was fourth, succeeded in making 46 at 800, and 46 at 900 yards, a really fine performance with open sights.

The National Rifle Association definition of service rifle is :—

S.R. *Service Rifle.*

·303 magazine rifles as issued by the Government or of private manufacture, of *bonâ fide* Government pattern, and bearing the Government viewer's mark.

All service rifles must comply with the following conditions :—

1. *Weight*—Including cleaning-rod, oil-bottle, pull through and magazine, not to exceed the greatest weight of the regulation rifle of the corresponding pattern and mark.

2. *Length*—Maximum, measured from the muzzle to the butt when placed vertically on the ground, 49½ inches.

3. *Stocks*—Must not be checkered. No pad or shoe for the heel-plate of the butt allowed, nor may the butt-plate be checkered.

A metal fitting for the sole purpose of the attachment of a match backsight is permitted.

4. *Pull of trigger*—Minimum, 6 lbs.

5. *Sights*—Strictly in accordance with those on any pattern of Government service rifle.

As the sights are immovable laterally, allowance for wind must be made either by aiming off the bull's-eye, or seeing the fore-sight to the right or left of the centre of the back-sight. The result is the same as putting on the allowance the other way on the fore-sight of a match rifle; it brings the muzzle into wind.

With open sights great attention must be paid to changes of light, especially when a fine fore-sight is taken. As a general rule a bright light requires a higher elevation than a dull one or than shade. Some individuals are affected by these changes to a greater extent than others, and the alterations to be made must be found out by personal experience; but the effects are minimized by painting the fore-sight, so that the same amount of it will be regularly seen. (See Figures *a* and *b*.)

The back-sight consists of a sliding bar with a **V** in the centre. This bar may be reversed, or a plain bar substituted (known as a match bar), so as to have a straight edge to aim over. The sights should always be kept a dead black, to prevent the light glancing on them, and also to give good definition. Black and white paints may be used. When shooting through the **V** it is useful to paint a small white dot on the back of the barleycorn: this dot should be just visible resting in the angle of the **V**, and is a great aid in keeping good elevation. (See Fig. *a*.) In shooting over the bar, instead of taking a fine front-sight, many competitors prefer to see the whole of the barleycorn, bringing the top of the block level with or visible over the bar. In this case a small white line is painted on the barleycorn for the purpose of keeping its centre accurately over the windage line on the back-sight. (Fig. *b*.) When the wind is blowing from the

(*a*) Aid in keeping elevation when using the V. (*b*) Aid in keeping elevation when shooting over the bar.

right, the latter line will be to the right of the centre of the back-sight and *vice versa*.

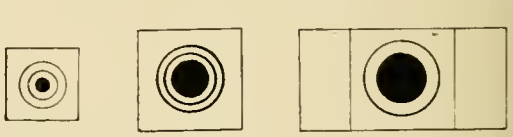
Owing to the back-sight not being marked in fine divisions, a detached vernier scale is allowed, and its use is necessary to ensure sight alterations being made with accuracy. These verniers are scaled so that an alteration of one division means a change of 1 inch for every 100 yards. They are also useful for making the white line give the wind allowance on the back-sight.

As spirit levels are not permitted, the sights must be kept horizontally by aligning the top of the bar with the top or bottom of the target, or one of the uprights of the back-sight with a flag-post or other suitable object.

Position—In service rifle competitions open to all comers any position is usually permitted at all distances, but special matches are also held at 200 yards standing, and kneeling. The Volunteer positions are, at 200 yards kneeling, at 500 prone, and at all distances over 500 yards, any.

It is difficult to describe briefly the correct position for standing and kneeling shooting; and as most competitors who enter for competitions under these conditions are Volunteers, and therefore already acquainted with them, lengthened directions are scarcely worth the space required. It is well, however, to remember that the great secret is to get the body and rifle thoroughly braced together, and for this purpose the use of the sling is an advantage. In standing, the feet should be at right angles to each other, as also the arms, the left elbow being directly under the rifle, and the right elbow on a level with the shoulder.

In the prone position the shooter's body should point well to the right of the target aimed at. His legs may either be stretched widely apart, or crossed, whichever he finds



Third Class. Second Class. First Class.

TARGETS.

most conducive to steadiness. Good trigger-pulling is of much greater importance in these positions than in the back, as the slightest jerk will throw the rifle out of position.

The Dimensions of the Targets used at the different distances are as follows:—

Divisions.	Third Class. 200 yards.	Second Class. 500 & 600 yds.	First Class. 800 to 1,000 yds.	Marking Values.
Bull's-eye	8 in. diameter	2 ft. diameter	3 ft. diameter	5 marks
Inner.....	20 ,, ,,	3 ,, ,,	4½ ,, ,,	4 ,,
Magpie...	32 ,, ,,	4 ,, ,,	6 ,, ,,	3 ,,
Outer.....	Remainder of a target 4 ft. square.	Remainder of a target 6 ft. square.	Remainder of a target 12 ft. × 6 ft.	2 ,,

Elevation—In addition to the force of gravity, the elevation of the bullet is influenced by the direction of the wind, except when it is blowing at right angles to the range. A twelve o'clock wind depresses, and a six o'clock wind lifts it in its flight. A moderate wind will require nearly one, a stiff breeze two or even three points over or under the normal elevation at 800 yards, according as it is from the front or rear. (See diagram.)

Normal Elevation means the elevation a rifle requires in a calm. When ascertained, the normal elevations for the different ranges should be marked on the back-sight, and all calculations made from them as starting points.

The direction of the wind, or the situation of a shot on the target, is referred to by the position of the figures on the face of a watch. Thus a twelve o'clock wind is a head, a six o'clock a rear wind; a three o'clock shot is on the centre line of the target out to the right. Wind allowance, and the difference in elevation above or below the normal, are calculated in feet and inches, and the sights are adjusted to read off the required amounts.

The density of the atmosphere through which the bullet cleaves its way has also to be reckoned with. A high barometer means a heavy atmosphere, and consequently a high elevation. A low barometer and moist weather in general a low elevation.

Wind Allowances—Roughly speaking, the bullet takes about one second to travel up to the 600 yards, and two up to the 1,000 yards target. The distance it is carried out of its true course by the wind in this time has to be calculated by the shooter, and, by shifting the foresight to one side to the other, the rifle is pointed sufficiently into the wind, so that the bullet may strike the centre of the target. As the wind changes in direction, its effects on the bullet vary laterally and vertically in an inverse ratio. A head, or twelve o'clock wind, requires the maximum elevation, with the minimum allowance for wind. As it changes round to III, the elevation sinks to normal, whilst the wind allowance increases to its maximum, and so through each quarter, as a reference to the diagram will show. Wind allowance must be learned by experience. It is in gauging its effects on the flight of the bullet that the skill of the rifleman is chiefly displayed in target shooting at known distances. The changes in the strength of III and IX o'clock winds are the easiest to appreciate. Head and rear winds, especially those known as fish-tails, in which the direction is constantly shifting from XI to I, or from V to VII, are the most difficult to follow and judge correctly. A stiff breeze often holds its strength steadily; a soft wind, especially in hot weather, rarely.

A cloud bringing up a shower always affects both the direction and strength of the wind. A thunderstorm usually causes it to shift round suddenly to the opposite quarter, an equally

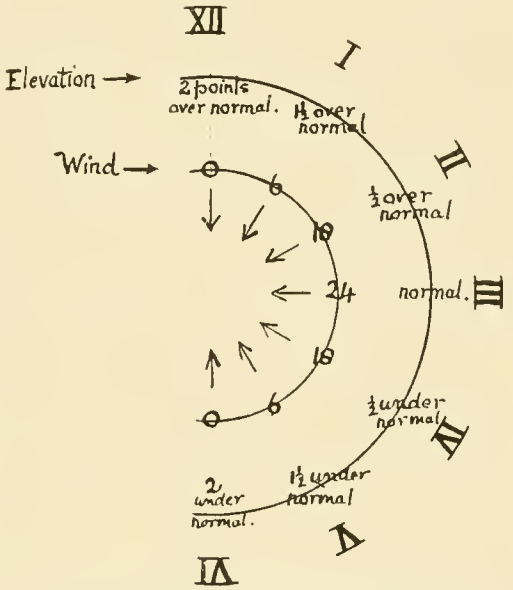


Diagram of the Alterations in Elevation and Wind Allowance, necessary upon a strong but steady Wind changing in Direction from XII to VI o'clock.

quick return to the original direction taking place when the storm is past.

Mirage is the name given by riflemen to the heated air rising from the earth. In hot weather it interferes with the aim, more especially when one is using open sights, the target appearing to rise and fall on the vapour clouds. When the mirage is strong and bubbling, a slightly higher elevation is necessary.

It is only waste of entry fees, ammunition, and temper to enter for competitions except with a good rifle in which the competitor has confidence, and until his last shot is registered he should never relax his efforts to make every possible point. Once started, the sooner a competitor has finished a competition the better; the less time occupied, the fewer changes of wind will be encountered. The unexpected happens in rifle shooting as often as, if not oftener than, in any other form of sport; and delay has often lost and but seldom won a match.

Before commencing each range, both eleva-

tion and wind allowance should be checked, and care taken that the latter is on the right way. Carelessness in these matters has ruined many a good score. Extreme and, during the continuance of a match, undivided attention must be given to the atmospheric changes. Particular note should be made in the memory of the strength and direction of the wind, on each shot being fired, for reference prior to altering for the next one.

A good field-glass is essential, to spot the patch indicating the bullet hole, and to keep a sharp look-out for changes of wind in the vicinity of the targets. Special attention should be given to the movements of the mirage when any exists, as it is often affected by changes of wind not otherwise discernible.

The Sporting Rifle—It is only those who have tried that are aware how difficult it is to make a really close and central group of shots at 100 yards with a single sporting rifle; and how great a treasure a double-barrelled one is, that will throw six or eight bullets consecutively into a 4-inch circle at that distance.

Few sportsmen in purchasing a rifle of this class appreciate the importance of testing the accuracy of the sighting themselves, and making certain that it suits their individual peculiarities, until the lesson is learned by bitter experience. However carefully tried by the manufacturer, it is quite possible that in other hands a rifle may throw at 100 yards 2 or 3 inches away from the point aimed at, an error which in the majority of cases means wounding an animal instead of dropping it.

The sporting rifle, as used for shooting at Bisley, must conform to the following definitions:—

Sporting Rifles—*Calibre*—Maximum, ·360.
Pull of trigger—Minimum, 3 lbs.
Sights—Open sights, or such as have received the sanction of the Council or of the Committee. The Lyman back-sight and the Beach combination fore-sight have been sanctioned.

No lateral adjustment of fore- or back-sight will be permitted. The centres of both sights must be fixed over the centre of the barrel. If a platinum or other line is used on the back-sight, only one such line will be permitted.

Spirit levels are permitted.

N.B. Any single, double or repeating rifle (whether of Government pattern or not) coming within the above conditions may be used in sporting rifle competitions.

The target used is a 12-inch disc, divided into inch rings. The bull's-eye is 3 inches in diameter (counting 6), with a central carton (counting 7). The highest scores recorded in the stationary target competitions at Bisley, distance 100 yards, are:—

Single Rifle—48 out of a possible 49 by Edward Ross, 1889; W. R. Joynt, 1895; Lieutenant Ranken and Mr. Littledale, 1896.
Double Rifle—54 out of a possible 56 by Edward Ross, 1889.

The competitions held at the Running Deer Ranges at Bisley are amongst the most popular on the Common, and afford sportsmen excellent practice for the migration to the North later in the season. A small target with a 6-inch bull's-eye, coinciding with the position of the heart, is marked on the deer, which is painted through-

DAN. FRASER COMPETITION 1895. RUNNING DEER.

Distance 110 yards. Double Rifle. Four runs—both barrels fired at each run.

Earl Cairns, 3.4—3.3—4.4—3.3 = 27.

out its natural colour. To place six or eight consecutive shots within the inner ring as the deer runs first from one side and then from the other is no mean performance. At Wimbledon Earl de Grey was *facile princeps* in these competitions, and, at the present time, Earl Cairns occupies the premier position.

In single-rifle competitions the Mannlicher has, since its introduction, completely swept the board. The high velocity of the bullet makes only a small allowance in front necessary; and the closer it is possible to aim at the object, the better and more consistent will the results be.

Many deerstalkers now use the Mannlicher in preference to the Express, and speak highly of its performances in the field. The low trajectory, high velocity, greater accuracy and range, and small recoil amply compensate for any disadvantage in the weight and shock of the bullet. [*See* DEERSTALKING.]

The National Rifle Association and the Bisley Meeting—No account of target shooting would be complete without some reference to the National Rifle Association of Great Britain and its great annual Prize Meeting. This Association was founded in 1860 for the purpose, as its charter declares, of giving permanence to Volunteer corps, and encouraging rifle shooting throughout the Queen's dominions. Its list of members numbers about 3,000, and its annual Prize Meeting, held until 1889 at Wimbledon, and since that date at Bisley, is the most important of its kind in the world. Commencing on the second Monday in July, it lasts a fortnight, and regularly attracts not only well-known shots from all parts of the kingdom, but contingents from several of the Colonies. Upwards of 2,000 competitors stay in camp under canvas for the meeting, whilst the train service brings large additions every morning from London and Aldershot.

As will be seen from the following summary, a very large number of the individual competitions are open to all comers.

List of Competitions held at the Bisley Meeting.

Rifle used.	Total No. of Competitions.	Ditto open to All-comers.	Team Matches.	Ditto, open to All comers.
Match R.....	17	17	3	1
Service R...	42	30	25	—
Sporting R..	6	6	—	—
Revolver.....	15	15	2	1

The prizes annually offered in these competitions amount to over £10,000 in cash, the value of the Challenge Cups and Plate being at least as much again, and upwards of £3,000 additional is distributed as the results of pool shooting.

The principal team competitions are :—

With the *Match Rifle*: The *Elcho Challenge Shield* between teams representing England, Ireland, and Scotland; the *Regular* v. *Volunteer Officers' Match*, the *Humphry Cup*, Oxford *v.* Cambridge.

With the *Service Rifle* (limited to Volunteers): The *Belgian Challenge Cup* for volley firing; the *Lord Lindsay* mounted competition; the *Mullins*, firing at moving figures; the *Chancellor's Plate*, Oxford and Cambridge Universities; the *Rajah of Kolapore's Cup*, Mother Country and Colonies; the *Ashburton Shield*, Public Schools, and the *China Cup*, inter-county match; open to all the service, *United Service Challenge Cup*.

The Individual Competitions Open to All-Comers include—

	Distances.	No. of Prizes.	Amount of Prizes.
M.R. The Albert	800, 900 & 1000	5	£86 and Cup.
,, The Halford. ..			
S.R. The Alexandra .	500 & 600	325	£1000
,, The Graphic ...	500	126	£340 and Cup.
,, The Daily Graphic.....	200	126	£340 Sketches and Cup.
,, The Daily Telegraph.....	600	112	£300 and Cup.
Open to members of all the Services—			
S.R. The Imperial	200, 500, 600 & 800	120	£250 and Challenge Cup.
And for Volunteers only—			
S.R. The Queen's	200, 500, 600 800, 900	600	£2420, Medals and Badges.
,, The St. George's..	500, 600, 900,	325	£900 and Cups and Badges.

Full information of the foregoing competitions and the regulations governing them will be found in the Bisley Programme published every June by the National Rifle Association, 10, Pall Mall East, London. (Price 1*s.*) The latest books on rifle shooting are *The Theory and Practice of Rifle Shooting*, A. G. Foulkes. (Horace Cox, 10*s.* 6*d.*) *Notes on the Rifle*, the Hon. F. F. Freemantle. (Vincent, 5*s.*)

W. R. Jovnr.

THE REVOLVER—The revolver, in its present form, is not the result of the invention of any one man, although Col. Colt was the first to make it a practical weapon; but rather the result of a long series of evolutions from the old single barrel pistol.

When the pistol was first made it was soon found that there was need of a way to fire several shots in rapid succession, long before such a pressing need was felt in the rifle.

The pistol is only used, as a rule, at close quarters; so if the first shot is a miss there is no time to re-load to take another shot.

Double barrelled pistols and then three, four or more barrelled ones were in consequence made, but in the early stages these barrels were all made of the full length of the pistol, and each barrel loaded as a separate pistol.

The double barrelled ones had a lock for each barrel, the three barrelled ones were often made with the barrels one below the other (the double barrels being either horizontal, or more rarely vertical to each other).

When more than three barrels were used, they were generally grouped in a cluster round a solid core, never, or hardly ever, with a centre barrel surrounded by others, as this would present a mechanical difficulty in firing the centre one.

I remember, some years ago, seeing a French pin fire revolver which fired twelve shots. The chambers in the cylinder seemed in a double tier, with two barrels, one for the inner circle and the other for the outer circle, but I did not have a chance to examine it closely as to the construction.

In order to fire the various barrels of the pistol, one of the earliest forms had a firing pin, which was put opposite the cap of each barrel in succession (this was not possible in the wheel and flint lock days). Another form was to have the hammer come opposite each barrel in turn, first moved by hand, and later by mechanism, automatically; this form was used in flint locks, and is retained in some modern pistols and multibarrelled rifles.

The first actual *revolver* had the barrels revolve so as to come opposite the hammer in turn. This was found mechanically weak, so the revolving cylinder with chambers coming opposite a barrel common to all in turn was evolved, and this, with modifications, is the form of all modern revolvers.

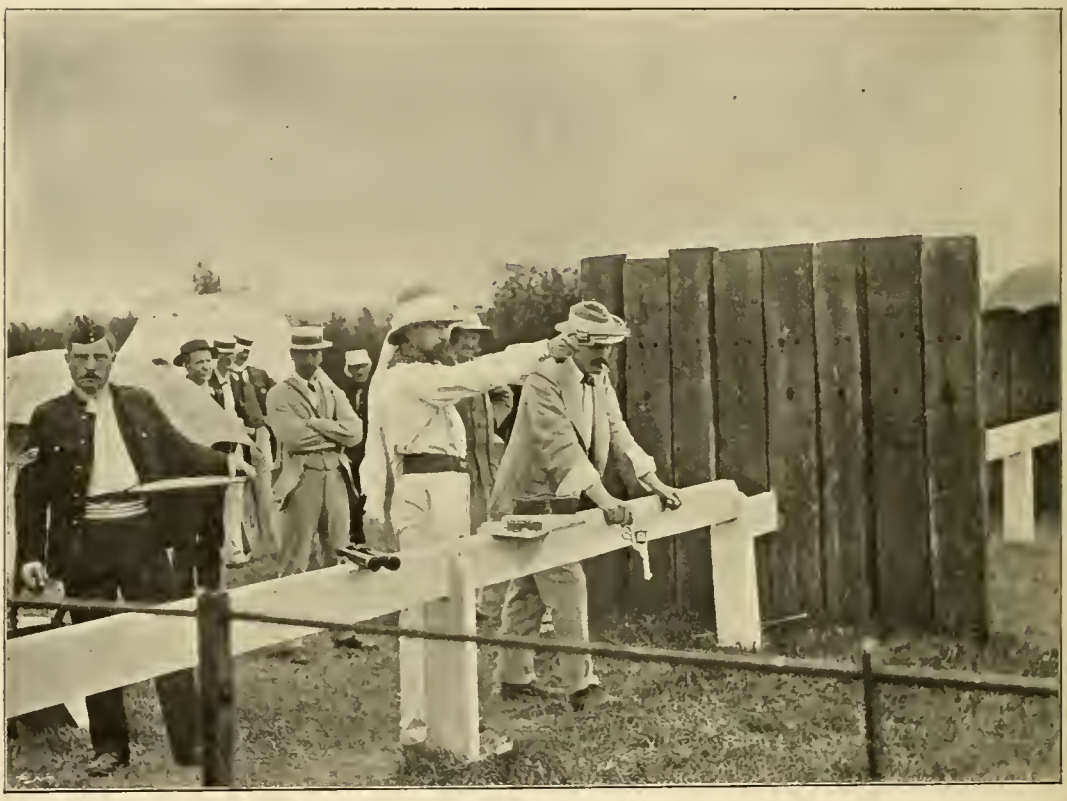
The reason the original idea of a set of barrels was abandoned for a cylinder with chambers opening on to a barrel common to all is the following :—

At the first glance it would be thought that

the former plan is the best. A barrel complete in itself shoots not only harder (owing to there being no escape of gas, such as unavoidably takes place between the barrel and cylinder of the later plan), but more accurately (as there is no joint between the cylinder and barrel). Nevertheless the cylinder revolver is not only lighter, owing to there being only one barrel instead of several, each the whole length of the pistol, but it can shoot much more accurately. At the same time, each barrel of the "pepper box," as the old revolving barrel pistol was called, shot *individually, better and more accurately*.

If this difficulty is found in double barrels, it is infinitely increased as the number of barrels is increased. In fact I do not think any amount of regulating can make four or more barrels shoot together.

For this reason the revolving cylinder has been almost universally adopted, in spite of the varying escape of gas inevitable, and of the fact that the chamber occasionally does not come opposite the barrel, owing to fouling or dirt getting into the action. If there is an extra escape of gas at a shot, it makes that shot weaker, and consequently low, and, if the chamber does not



REVOLVER SHOOTING.

The reason of this seeming paradox is as follows:—

Any one who has shot, or regulated, a double barrelled rifle knows how difficult it is to get the two barrels to shoot parallel, both horizontally and vertically, to each other; each barrel may shoot perfectly in itself, but, when joined together, one barrel will be found to shoot higher than the other, or they will shoot across or away from each other. Fixing the two barrels mechanically parallel to each other is no use, as, there being more resistance to the recoil where the barrels touch each other, they shoot away from each other (or apart), and they can only be regulated by hand at great expense and trouble. quite come round far enough, a shaving is taken off a side of the bullet, causing irregular flight and an inaccurate shot. In my opinion the revolver of the future will have an arrangement for making the connection between the chamber and barrel gas tight during each shot, so as to make it as accurate as a single barrel pistol. The cocking arrangement also needs improvement. It has either to be cocked by hand, causing loss of time, and, what is more important, loss of aim; or it is cocked by the trigger, which latter plan, though more rapid, gains rapidity by loss of accuracy, as it is impossible to "hold" on to the object, and at the same time lift the hammer by the trigger. There ought to be some

way of the revolver cocking itself by the discharge; this cocking only to take place when wanted.

A revolver with these two improvements would be, in my opinion, superior to any repeating pistol, as it would balance properly, which no repeating pistol I have seen does, and would be of much more compact shape. Also the stock should be more in line with the barrel (like the duelling pistol), instead of below it, as so many revolvers are made, especially those of the "Bull Dog" pattern.

The way revolver-shooting is practised in the Western States of America is the only real way to learn to shoot a revolver. In this country revolver-shooting is practised as a sort of game, like croquet, tennis, or golf.

Subjoined are diagrams of the best on record scores to date at various forms of revolver shooting, but I personally do not think the deliberate sort of shooting of much use. The only useful practice is rapid shooting and a

BEST ON RECORD, TARGET ADVANCING RAPIDLY FROM 50 TO 15 YARDS. BISLEY, 1896.

BEST ON RECORD, 50 YARDS, 12 SHOTS. BISLEY, 1894.

BEST ON RECORD, TARGET APPEARING AT INTERVALS OF 3 SECONDS AT 20 YARDS.

BEST ON RECORD, MOVING TARGET ACROSS LINE OF FIRE AT 20 YARDS.

moving series of competitions, as a revolver is only used for war or self-defence at extremely short range and in very rapid firing.

There are many enthusiasts who make good scores at small stationary bull's eyes, and are constantly improving at that sort of skill, who could not hit even the outer edge of the target if called on to take a snap-shot from either on foot or horse-back.

In all shooting competitions, as in fact in all competitions which were originally intended to be practised for some useful purpose, there is a constant and seemingly inevitable tendency to drift into unpractical lines, and a development in just that direction which is useless for all practical purposes.

In racing it gets into breeding racing "machines" which cannot carry a child's weight; in pigeon-shooting, clay bird shooting, and rifle-shooting, it only teaches a knack for those particular sports which is of no use in the field. In the same way revolver shooting at stationary targets spoils a man's handling of a revolver.

If I had to train a man to shoot a revolver for practical use, I would rather take one with good eyesight and a steady hand, who had never fired a revolver before, than some of our crack revolver prize winners. The former may learn to shoot properly; the latter never. I consider the Series 3 (Rapid firing, six shots in 12 seconds), which the National Rifle Association have adopted at my suggestion, a very practical revolver competition, but unfortunately very few men enter for it, preferring the stationary targets.

As revolver shooting clubs have to study the likes and dislikes of their patrons, it seems inevitable that revolver shooting will have to continue on the same old unpractical lines of deliberate shooting at stationary targets.

WALTER WINANS.

SINGLESTICK—This weapon, as we know it nowadays, is nothing more than a somewhat poor substitute for the light fencing sabre, and there are some among us who are inclined to clamour for its entire abolition; they are not, however, likely to be gratified, as its very cheapness serves as its recommendation to members of many of the minor schools of arms. Singlestick, or cudgel-play, is moreover an honest, manly old English sport, which should rather be encouraged than allowed to sink into oblivion; we can trace its progress through the ages of fence side by side with that of its more lordly relative the broadsword; we find it all over civilised Europe in the fifteenth century, and even much earlier used, in conjunction generally with a shield of some sort, as the medium of deciding in the lists a difference between two common fellows, who, being persons of low degree, were not permitted to wear swords. A few notable examples have been handed down to us; one being in England in the time of Edward III. between Walter Blowberne and Hamon le Stare, who were nothing better than a pair of thieves who had fallen out about their booty; while Olivier de la Marche gives us a most accurately detailed account of a similar combat between two tailors named Mahuot and Jacotin Plouvier, which took place at Valenciennes in the presence of Duke Philippe le Bon in the year 1447. These judicial fights were conducted with considerable ceremony, and it was the common belief in those days that the Deity himself interposed to protect the innocent. The lists were carefully prepared, and the two men also, they being clothed in a special costume of dressed leather so tight that it had to be sewn on to their bodies; their hands and feet were bare; their hair was cut close, and the nails of both fingers and toes

carefully pared, while a stout gallows at the entrance to the lists was ready for the reception of the vanquished man. When the quarrel was between a man and a woman, the latter had an advantage given to her, she being at large within the "Champ Clos" and armed with a large stone tied up in a cloth, while the man, provided with a club or cudgel, was placed up to his waist in a circular pit.

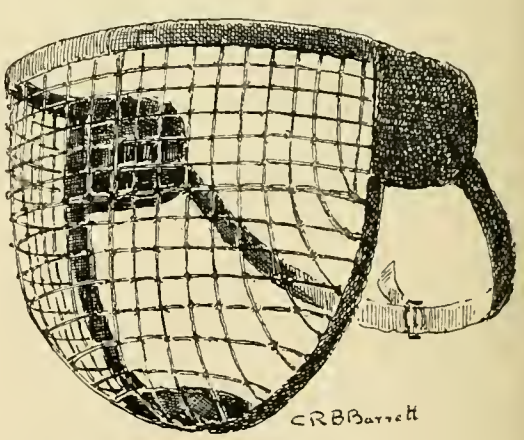
In the second part of *King Henry VI.* Shakespeare gives a similar encounter between Horner, an armourer, and Peter, his apprentice, in which the King himself acts as umpire.

The judicial combat died out; but we find our cudgel in Elizabethan times in the form of the "wafter" of the London 'prentices, sometimes mounted in a handle like that of a sword, and always accompanied by the hand-buckler as a means of defence. The sport, for such it had now become, was called "playing at bucklers."

In the seventeenth century we find but little mention of the cudgel, owing to the paucity of books on such matters, because, although prize-fights were many in those days, and the practical side of the art was sedulously cultivated, the men professionally engaged in it were anything but erudite, and the few fencing books in the English language were the work of enthusiastic amateurs who naturally paid more attention to their own proper weapon, the sword. But when we come to the eighteenth century we see it in the hands of the "gladiating" prize-fighters, such as Figg, Delforce and others (about whom Captain Godfrey tells us much that is interesting), in company with the backsword, just as much as we see the fencing foil and the small-sword in the hands of the gentlemen. The prize-fights with swords died out about the middle of the last century, but "cudgelling" remained popular, in the west of England, at any rate, until the middle of this present one. The fair at Purton, in North Wilts, was famous for encounters of this kind; and somewhere about 1820 a butcher named Blackford is recorded as having broken no less than fourteen heads in one day. The "Hungerford Revel" was another festive occasion in which cudgel-play, or "backswording," as it was sometimes called, formed a prominent part; and here one Morris Pope, a blacksmith, whose skill was such that he was regarded as Blackford's "successor," scored many a victory, and as many as twenty men on each side, representing the counties of Wilts and Somerset, made their appearance. The combatants stripped to their shirts, and their play, which was something analagous to that of the German students, was directed principally at the head, on which part alone a hit counted, and not even then unless an inch of blood made its appearance. Donald Walker, in his *Defensive Exercises* (1840), gives a very clear description of the "backswording" method: the men stood very near together, and the lunge and recover, as we have them, were not in any way recognised. In the position of *guard*, "the body is held upright; the head *backward*; the leg straight; the right arm advanced and nearly straight; the hand opposite the left

THE GUARD.
(From Walker's *Defensive Exercises*.)

shoulder. The left hand grasps a handkerchief, which is tied loosely round the left thigh, and the left elbow is elevated and thrown forward so as to protect the head." Masks, it is clear, were not in general use; but occasionally a sort of demi-mask was employed, which covered the face up to the eyebrows, leaving the upper part of the head exposed.



DEMI-MASK.

This old style of "cudgelling" is now quite extinct, and the "singlestick" of to-day is mainly a medium for learning the management of the light sabre as it appears in our modern fencing rooms. When "on guard," the weapon should be held in such a position as is at once the

most secure for defence and the most handy for attack, being also the least fatiguing to the sword arm; and it is clear that this position is either the "medium" or the "resting medium," in which latter the hand is lowered a little to allow the pummel to rest on the thigh.

MEDIUM GUARD.
From *The Swordsman*.)

The cuts are six in number—two diagonally downwards at the head or shoulders, two diagonally upwards at the legs, and two horizontals at the belly and ribs; but in all well-regulated schools of arms the blow at the inside of the leg is strictly forbidden, on account of its serious consequences; the thrusts are usually delivered with the hand in "pronation." In defence, recourse should be had to the parries of foil play, in which the pupil ought to be well trained before he is allowed to take a stick in his hand at all; thus "Quarte," with its high and low variations, covers everything on the inside, from the top of

QUARTE. SEPTIME.
(From *The Swordsman*.)

the head to the hip, and the lower line is protected by "Septime," while all the outside is covered similarly by "Tierce" and "Seconde."

TIERCE. SECONDE.
(From *The Swordsman*.)

Care should be taken to train the pupil in reposting smartly the instant he has stopped the attack with his parry; from *quarte* the best repostes are over the stick at the right cheek or shoulder, or under it at the right side or leg; and last, but not least, the point, in this case with the hand in "supination." From septime point in "supination," or give a drawing cut at the outside of the leg by reversing the hand, which, if quickly done, is almost impossible to avoid; the repostes from tierce are a cut over the stick at the left cheek, under it at the left side or belly, and the point in pronation, while from seconde the cut should be given at the right cheek, or the point should be delivered over the enemy's stick with the hand in pronation.

The above five illustrations have been reproduced from *The Swordsman*, by permission of Messrs. Grevel and Co.

ALFRED HUTTON.

SKATING—Figure-Skating is an art, in the practice of which British experts differ from all others. There are, in fact, but two schools of figure-skating, the British and the non-British. Austrians, Canadians, Frenchmen and Swedes all skate in much the same way, but British figure-skaters adhere rigidly to their own peculiar style.

Skates—The best kind of skate is one that can be attached immovably to the sole of the boot. Adjustable skates, which always work loose or shift their position, should, if possible, be avoided. The foot plates, or mounts, one for the sole and one for the heel, are best made of light metal (aluminium answers admirably), and should be attached firmly to the boot with ordinary screws, four for the sole and four for the heel. It is best not to countersink the screw holes, as round-headed screws hold more securely than those with bevelled heads. These screws, $\frac{3}{8}$-inch long (exclusive of the head) for the sole plates, and $\frac{1}{2}$-inch long for the heel plates, should be blued to prevent rusting. The skate-blade should fit closely into the jaws of the mounts, and be secured by bolts having hexagonal nuts. Rivets work loose, and should not be used.

The blade which I have always recommended as most suitable for English ice and the British style of figure-skating is one which bears my name. It is $\frac{3}{16}$-inch wide on the face, *i.e.* between the two cutting edges, and is throughout its entire length (except the extreme toe and heel, which are rounded off) ground to a curve which forms an arc of a circle whose radius is 7 feet. It projects about $\frac{1}{2}$-inch behind the heel of the boot, and $\frac{1}{4}$-inch in front of the toe, and its sides are straight, and ground to an angle of about 95° with the face, so that the edges are obtuse-angled. If this blade is intended to be used on very hard ice, such as is met with in Switzerland or Sweden, the edges should be ground to a right-angle. There are two other blades used by expert figure-skaters which need mention. One, termed "the Dowler," from its inventor, Captain Dowler, has concave sides ground to a radius of 16 feet, so that the face of the blade varies in width from toe to heel. It is narrowest 4 inches from the heel, and widest at the toe. When

travelling on large curves, an increased length of edge is said to be in contact with the ice, so that friction is diminished. The other blade is the one recommended by Mr. W. F. Adams, and is similar to that used by Swedish experts. Its sides are convex, the exact opposite to those of the Dowler. The widest portion of the blade is 4 inches distant from the heel, and measures $\frac{1}{4}$-inch. At the toe and heel the width is $\frac{1}{8}$-inch. This blade is generally ground to a radius of 6 feet, as it is chiefly used by those who practise the small curved continuous figures of the non-British school of figure-skating.

The skate, with blade fitted, should be about $1\frac{3}{4}$-inch high, measured at that portion of the skate which lies under the ball of the foot. A skater equipped with a pair of skates such as I have described, needs to keep a pair of boots on purpose for skating. For those who do not care to do this, and for children and beginners, a good pair of "Acme" or of "Barney and Berry" skates, not too highly curved, will serve.

Boots and Costume—The upper leathers of skating boots should be moderately thick, and not extend higher up the leg than those of other boots. They should not quite meet when tightly laced up, so as to allow for stretching. Eyelet holes should be nearer together than usual. Under the tongue of the boot should be placed a strip of spongiopiline to prevent galling of the instep. Heels should have straight sides, and be about $1\frac{1}{8}$-inch high, the corresponding thickness of sole being $\frac{3}{16}$-inch.

Members of the "Skating Club" wear tall hats, black coats and trousers when skating in London, and no costume looks better for good skaters. In the country, knickerbockers, loose tweed coats (Norfolk jackets are very popular), and caps, or soft hats, are generally worn. Personally I think trousers always look better than knickerbockers. For ladies a well-fitting tailor-made dress looks best.

Ice and its Care—I am often asked, "How did you ever learn to skate in England? There is never any ice!" but the record of the Wimbledon Skating Club shows that during the past 18 years there have been 356 skating days, giving a yearly average of 20 days. During these eighteen years there have only been three winters without any skating.

Ice of the best quality is free from snow, and frozen upon deep water at a moderately low temperature. A thickness of $1\frac{1}{8}$-inch of such ice will just bear an adult skater, but large numbers of people should not be allowed upon less than $2\frac{1}{2}$ inches. Snow ice of the latter thickness will sometimes not bear even one skater, and during a thaw a much greater thickness of the same ice is quite unsafe. Ice may be kept in excellent order for figure-skating by the use of only one tool—the "Wimbledon Scow" (Fig. 1). This (to quote Mr. Dryden in *Figure-Skating Simple and Combined*, by

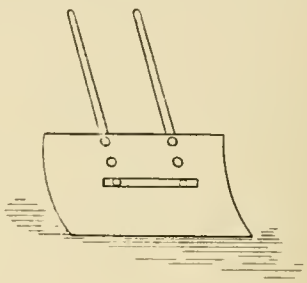


Fig. 1. The "Wimbledon Scow."

Monier-Williams, Pidgeon, and Dryden; London: Horace Cox) "consists of a plain sheet of No. 18 gauge galvanized iron, measuring 4 feet 6 inches in length and 2 feet in breadth. On to the back of the sheet of metal are bolted two wooden handles which run out parallel to each other for about 2 feet 6 inches beyond one of the longer sides, so that the person using the scow can hold one handle in each hand and push the scow in front of him along the ice, with the sheet of metal at such an angle to the face of the ice as he may at the moment find convenient." The scow will remove snow better than any other tool. It gets rid of dry skate cuttings, and the soft wet cuttings of thawing ice more efficiently than the commonly used broom, and answers all the purposes of the heavy ice scraper, or plane, in removing dangerous irregularities of ice surface. For depositing the snow heaped up by the scows on the nearest bank, snow boxes and shovels are of course essential.

Artificially-frozen Real Ice Rinks—There are now many of these rinks in different parts of the world, and figure-skating can be practised upon any one of them during the winter months when they are open. London possesses three rinks (Niagara Hall, National Skating Palace, and Prince's Skating Club, the last being only available for members); Paris has two (Pôle Nord and Palais de glace), and each of the following cities has one—Brighton, Brussels, Glasgow, Munich and New York. The method of construction is much the same in all. The rink floor consists of a network of pipes laid on a solid foundation. The water to be frozen—a shallow layer only—lies between and above these pipes, through which is constantly kept circulating a liquid termed the "brine" (solution of calcium chloride or some other saline). The brine is not liable to freeze, but can be brought to a very low temperature—below zero (Fahrenheit) even—by means of a suitable refrigerating apparatus, such as one depending upon the compression and condensation of ammonia gas.

Skating Clubs—The leading figure-skating club is "the Skating Club" of London, founded in 1830. Its members skate in the grounds of the Royal Toxophilite Society in Regent's Park, and wear a small silver skate as a badge of membership. Combined figures were originated in this club. The Edinburgh Skating Club, founded in 1642, is the oldest club, and the Wimbledon Skating Club is a very important organisation. Other clubs in Great Britain are the following:—Arctic, Birmingham, Cambridge University, Chiswick, Clifton, Crystal Palace, Glasgow, Hampstead, Ipswich, Leamington, Manchester, Norwich, Oxford University, Southampton, Thames Valley and Tonbridge: for entrance into almost any of the foregoing clubs a test of ability in figure-skating is demanded. The National Skating Association was founded in 1879, and is a member of the International Skating Union. One of its objects is to promote figure-skating by means of the establishment of standards of proficiency. These standards are represented by the four tests printed at the end of this article. A distinctive badge for each test is awarded to successful candidates. There are at present some 600 badge holders.

The N.S.A. has recently instituted a competition in combined figure-skating. It is open to teams of four skaters, either (1) representing branches of the N.S.A., or (2) representing properly constituted skating clubs, or (3) composed of full members of the N.S.A. The Davos Platz Skating Club has twice been successful in winning the Challenge Shield presented to the best team.

The Amateur Championship of the World in figure-skating was held in London in February, 1898, under the auspices of the N.S.A. Herr Grenander, of the Stockholm Skating Club, was the winner. Previous champions have been, in 1896 Herr Fuchs, of the Munich Skating Club, and in 1897 Herr Hügel, of the Vienna Skating Club. No serious British competitor has yet entered in these competitions, as the British style of figure-skating is not recognised by the International Skating Union.

Form—There is a singular unanimity of opinion amongst British experts as to what constitutes good style in figure-skating. Certain rules governing the attitude of the body and intended to assist the skater to preserve stability of balance with least effort to himself, have been termed the rules of "form." These have long been accepted as embodying the best British ideas on the subject, and a skater must adhere to them if he wishes to be considered an exponent of the British style. The essentials of these rules of form may be summarised as follows:—

I. Body to be held strictly upright, moderate flexion only being permitted at the moment of taking a stroke.

II. Employed leg to be kept straight, the knee being fully extended whenever possible, flexion only being permitted at the moment of taking a stroke.

III. Unemployed leg to be carried behind the employed whenever possible, the heels being approximated.

IV. Head to be turned in direction of progress, and carried horizontally, any tendency to look down upon the ice being particularly avoided.

V. Arms to hang loosely by the sides of the body as far as possible.

When progressing upon an edge, it is usual for the skater to hold his body not facing full

PLATE I. BRITISH STYLE OF FIGURE-SKATING.

front, but with a sideways inclination, so that if he is moving forwards on the right foot, the right shoulder leads and looks together with the head in the direction of progress, while the left shoulder, together with the unemployed leg, is held back. If, on the other hand, he is moving backwards on the right foot, the position of the body remains as before, the left shoulder and the unemployed leg now leading and looking together with the head in the direction of progress. The unemployed leg is generally carried not only to the rear of its fellow, but with the knee slightly bent, and the foot turned so as to make something more than

a right angle with the employed foot. In any event, the unemployed leg should be carried in an easy unconstrained attitude, and should be kept quiet and not swung about. Plate I., reproduced from a photograph taken and kindly sent to me by Mr. W. Leaf, represents Mr. Edward Pollock on a curve of outside edge backwards. It is a good illustration of the best style of figure-skating according to British ideas.

Most skaters allow themselves a certain amount of latitude in their interpretation of these rules of form, just so much, in fact, as to prevent stiffness and want of elasticity of movement. Those trained at St. Moritz and Davos, however, not only allow themselves no such latitude, but have expanded the rules of form somewhat in the direction of fostering rigidity of action. A straight unemployed, as well as employed leg is insisted upon, the former being held close against the latter. The toe, also, of the unemployed foot generally points in much the same direction as its fellow. The best exponents of this ultra-British or Anglo-Swiss style of skating are probably the strongest and most accurate figure-skaters of the day. Plates II. and III., reproduced from photographs kindly taken at St. Moritz by Mr. E. Cohen, represent Dr. Holland on curves of outside edge forwards, and outside edge backwards respectively. The

PLATE II. ULTRA-BRITISH OR ANGLO-SWISS STYLE OF FIGURE-SKATING.

reader will note how the style of this very fine skater differs from that shown in Plate I.

With regard to the non-British style of figure-

PLATE III. ULTRA-BRITISH, OR ANGLO-SWISS STYLE OF FIGURE-SKATING.

skating, no very definite rules of form have yet been laid down by its exponents, who, indeed, are not entirely agreed amongst themselves as to what is the correct way of skating the very difficult and complicated figures performed by them. There is, however, a unanimity of opinion with regard to the employed leg, the bending of the knee of which is not only permitted, but enjoined. The leg, too, which British skaters term unemployed is as much employed as its fellow, being constantly swung forwards or backwards; indeed, it appears to contribute more than anything else to the skater's balance. Somewhat extensive excursions of the arms, also, are not discouraged (*see* Plate IV.) The small circles and narrow curves which predominate in the figures peculiar to this style of skating are best performed in the way just described, while the British figure skater's rules of form are best adapted to the large curves and bold turns which constitute his ideal.

If the skater observes British rules of form, he will find that he travels approximately upon that portion of the skate-blade termed in Fig. 2 the **Travelling Area**. This is the case whether he is simply travelling forwards or backwards upon a curve of outside or inside edge, or executing one of the many turns enumerated later on. The portion of skate-blade in front of the travelling area, termed in Fig. 2 the **Striking Area**, is used almost entirely for making a stroke from one foot to the other. The table accompanying Fig. 2 explains in detail the exact portion of skate-blade used in the various edges,

turns, and changes. It will be noted that the changes and some few of the turns are made a little in front of, or a little behind, the travelling area; but nevertheless the majority of the work of figure-skating is done on that area of the skate, if the skater holds himself in accordance with the rules of form. Should he not observe those rules, he will probably rock to and fro beyond the limits of the travelling area, and his balance will become proportionately unstable. The illustration, Fig. 2, and the table following it, are taken from the *Figure-Skating* volume of the Isthmian Library, now in the press, written by the author of this article, and published by A. D. Innes and Co.

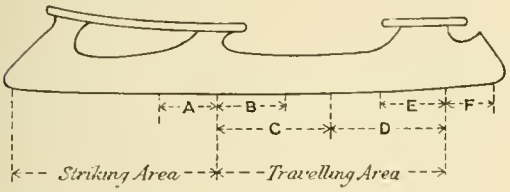


FIG. 2.

A. Inside back change made with the continuous stroke.
Outside back change made with the continuous stroke.
Outside forward bracket.
B. All the forward turns, except outside forward bracket.
C. Inside and outside edges backwards.
D. Inside and outside edges forwards.
E. All the back turns, except inside back three, inside back bracket, and outside back bracket.
F. Inside forward change made with the continuous stroke.
Outside forward change made with the continuous stroke.
Inside back three.
Inside back bracket.
Outside back bracket.

The four edges—Figure-skaters do not travel much upon the flat of the skate, but almost entirely upon one or other edge. The inside edge corresponds to the inner side of the foot, and the outside to the outer side, and as progression may be forwards or backwards upon either edge, four edges are spoken of.

Inside edge forwards—To make the stroke, say, from the left to the right foot, the body and right knee must be bent, and the left foot turned toe outwards at an angle of 45° with the line of motion. A vigorous thrust is then made against the ice with the left foot, the striking area (Fig. 2) of the skate-blade being chiefly used, although the whole length of blade may be employed for a powerful stroke. As soon as he is launched on the edge, the skater must straighten the body and right knee, and hold himself in accordance with the rules of form, and travel upon the portion of skate-blade marked D in Fig. 2. The next stroke on to the left foot is taken in a similar way. The main difficulty in skating on this edge is to hold large sustained curves, there being a tendency to curl inwards and make small scratchy strokes. The antidote is to hold the body perfectly upright and keep the unemployed leg well to the rear, with the toe turned outwards.

Outside edge forwards is best learnt by taking short steps as if walking, but crossing one foot over the other, and placing the skate down on the edge at each step. When confidence is established, strokes may be taken from one foot to the other without any crossing of the feet. As on the inside edge forwards, the skater travels upon D (Fig. 2).

Inside edge backwards is by far the most difficult of the four edges. The best way to learn it is to practise the forward "three" turn described later on. The stroke from one foot to the other is exceedingly difficult. Just before the stroke is taken, say, from left to right foot, the skater must forsake the proper attitude on the left inside edge and turn his head to look over the left shoulder. The left heel must then be turned sharply inwards till the foot is almost at right angles with the line of motion, and at the same moment the right foot must be placed down on the edge close to and parallel with the left foot, a push off being obtained from the latter. The skater will now be in correct attitude for the inside edge backwards on the right foot, and must travel on C (Fig. 2).

Outside edge backwards is best learnt by a gentle walking movement backwards, one foot being placed exactly behind the other at each step. If the head is turned on to the right shoulder as the left foot is put down and *vice versâ*, the skater soon gets on to the edge and makes curves of gradually increasing length. He must remember (1) not to cross the feet, but to place the rear foot down as though about to follow in the same curve as its predecessor; (2) directly the skate touches the ice to travel upon C (Fig. 2); and (3) to skate very slowly and without any hurry at the stroke.

The four simple eights consist each of two plain circles on one of the four edges, skated so that the marks on the ice resemble the numeral 8. The two forward eights are very easy, and the two backward eights very difficult, especially the inside back eight, which involves the difficult stroke from inside back to inside back. In practising these figures it is usual to commence each stroke at a fixed point or "centre" as shown in Fig. 3. An orange is generally placed on the ice for the purpose. The symbol R.O.F. means right foot outside edge forwards. Other similar symbols on the diagrams in this article need no explanation.

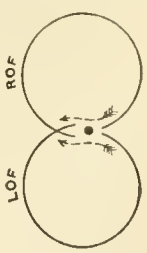


FIG. 3.—SIMPLE EIGHT.

The four changes—A change of edge or "serpentine line" is made when a skater progressing, say, on the inside edge forwards, passes across the flat of the skate on to the outside edge forwards (Fig. 4). A similar change can of course be made from

any of the other three edges. There is no difficulty in these movements if the skater holds himself in correct attitude on each edge.

The four "three" turns—By a "turn" is meant a turning or revolving of the body upon one foot, so that forward progression is converted into backward progression, or *vice versâ*. Three turns and bracket turns are accomplished upon two edges, rocking and counter-rocking turns upon one edge only. In corresponding threes and rockers, the body is revolved in the same direction. Similarly with brackets and counters.

Inside forward three (Fig. 5)—This is a turn from inside forwards to outside backwards. On the right foot the body revolves from right to left. In the corresponding bracket turn the revolution is from left to right. The skater travels upon D (Fig. 2) before the turn, and upon C after the turn. To make the turn the skater shifts his balance forwards on to B, and starts the revolution of the body by pressing back the rear shoulder, so that the front shoulder comes still more to the front. At the same moment the heel is turned outwards away from the unemployed foot, and the head is turned to look over the shoulder which is to lead after the turn.

Outside forward three—from outside forwards to inside backwards. The same portion of the skate is used as in the preceding figure. To commence the

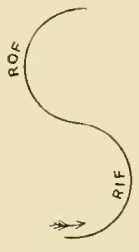


Fig. 4.—Change.

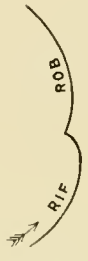


Fig. 5.—Three.

necessary revolution of the body on the right foot from left to right, the left shoulder is brought forwards. At the turn, the heel is turned inwards and the head moved to look over the left shoulder. After the turn the left shoulder must be strongly rotated back again. The difficulty which exists of holding a bold curve after the turn, without curling inwards, depends upon this necessity for contra-rotation of the body. The turn must not be hurried, and the unemployed leg must be kept well behind its fellow after the turn, with the knee and toe turned in the direction of progress.

Inside back three—from inside back to outside forwards. This is the most difficult of all the threes. The skater travels upon C (Fig. 2) before the turn, and D after the turn, the actual revolution taking place as far back on the skate as possible—*i.e.* upon F. Some seconds before the turn, the skater, if upon the right foot, must move the head on to the right shoulder, the shoulders being rotated from left to right. At the turn the toe is turned outwards, and after the turn the body must be contra-rotated, so that the shoulders regain the position they previously occupied.

Outside back three—from outside back to inside forwards. At the turn the skater pivots upon E (Fig. 2), and no contra-rotation of the body is needed after the turn.

The four simple Q's—A Q (Fig. 6) is a change followed by a "three" turn. Hence there are four Q's, two forwards and two backwards, the latter being the most difficult. The outside back Q, which contains the difficult inside back three, is the hardest of the series. The Q's can be skated strictly in accordance with the rules of form, if commenced at a good speed; but if used as a means of gaining pace, as they often are, they must be skated with the "continuous stroke," which is described under the heading of continuous figures.

The four simple reverse Q's—A reverse Q is a "three" turn followed by a change, so that there are four reverse Q's, two forwards and two backwards. The outside forward reverse Q (Fig. 7) is an excellent figure

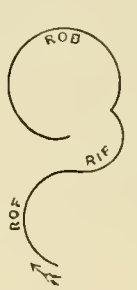


Fig. 6.—Q.

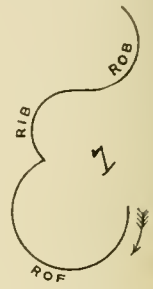


Fig. 7.—Reverse Q.

for testing the capabilities of a skater. If he can change the edge after a bold curve of inside edge succeeding the turn, it shows that he has overcome the tendency to curl inwards after the turn. If a reverse Q is utilised as a means of gaining pace, the continuous stroke must be used.

The four rocking turns—Rocking turns or rockers are turns in which one edge of the skate only is used, the body being revolved in the same direction as in the corresponding "three" turns. Hence the outside forward rocker (Fig. 8) is a turn from outside forward to outside back, and on the right foot the body revolves from left to right. There are three other rockers, the inside forward, the inside back, and the outside back, and the last named is the easiest. The foot has to be turned through a greater angle in rockers than in threes, hence more confidence is needed. The difficulty in all is to hold the edge after the turn.

The four counter-rocking turns—Counter-rocking turns or counters (Fig. 9) are turns in which one edge of the skate only is used, the body being revolved in an opposite or counter direction to that in which it is revolved in the corresponding "three" turns. Just as there are four rockers, so there are four counters, and the

Fig. 8.—Rocker.

Fig. 9.—Counter.

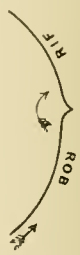


Fig. 10.—Bracket.

back outside counter is far the most difficult. The use of the continuous stroke facilitates the execution of these turns.

The four bracket turns—A bracket is similar to a three, but the body is turned in the opposite direction, and the skate marks resemble a bracket in shape (Fig. 10). Brackets, like threes, can be skated from all four edges. They are all very difficult, but especially the back outside bracket. The turn of the outside forward bracket is made at A (Fig. 2), and that of the inside and outside back brackets at F. Suitable movements of the arms are essential for executing these figures—movements of the shoulders and head being unimportant.

The four mohawks—A mohawk is a drop from either of the forward edges of one foot, to a similar, but

back edge of the other foot, or *vice versâ*, the direction in which the skater moves remaining the same throughout.

Outside forward mohawk (Fig. 11)—The skater, when on the outside forwards of the right foot, rotates his body from right to left and looks over the left shoulder. At the same moment he crosses the left foot, toe outwards, behind the right foot, and places it down on the outside backwards.

Inside forward mohawk—is skated in a similar manner. The two **back mohawks** are simple strokes from the back edges to the corresponding forward edges.

Choctaws—are similar figures to mohawks, except that if the skater starts, say on the outside forwards, he drops on to the inside backwards (Fig. 12).

Cross-mohawks and cross-choctaws—In these figures, which are curiosities and not serious movements, the skater crosses the second foot in front of the first, and turns his body almost completely round in a direction

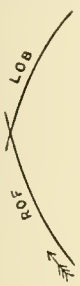


FIG. 11.—MOHAWK.

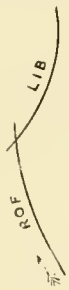


FIG. 12.—CHOCTAW.

opposite to that in which it is turned in corresponding mohawks and choctaws.

Besides the simple eights, many others are skated in which the different turns or other figures are incorporated in each circle of the eight. A **rocker-Q** is a change followed by a rocker. Similarly we have **counter-Q's** and **bracket-Q's**, and the reverse varieties of each. Two, three, four or more "three" turns can be skated in sequence. So also can rockers, counters, and brackets. The expression "two turns" always means two "three" turns in sequence. In correspondence with this practice, the term "turn" in combined figure-skating always means a "three" turn. It is usual, too, in combined figures to replace the term Q by the call "Change, turn." Similarly, a reverse Q is "Turn, change."

Combined Figure-Skating is the art of skating in combination with one or more skaters the figures already enumerated. Suppose, say, six skaters (A, B, C, D, E, and F) standing at the corners of an imaginary hexagon, in the order shown in Fig. 13. A and B, who are partners, skate towards the centre of the hexagon, and crossing one another at that point, skate away from one another to the circumference of an imaginary circle, whose centre is the centre of the hexagon. The other pairs, C and D, and E and F, take a corresponding course; but C and D start directly after A and B, and just before E and F. If the figure is one of the circling variety, all six skaters now skate in the same direction round the centre, at equal distances from it and from one another, each skating opposite to and in time with his partner. Towards the termination of the figure, the skaters approach the centre again in the same order as before, and partners pass one another at the centre, shoulder to shoulder, and commence a fresh figure.

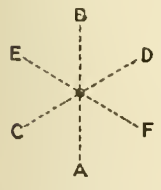


FIG. 13.

Explanation of terms used in Combined Figure-Skating—(Taken from *Figure-Skating: Simple and Combined*, and founded on the "Explanation of Terms" authorised by the Conference of Skating Clubs, July, 1891)—

1. A "movement" is a figure or a part of a figure skated on one foot only—*e.g.* Q, three.

2. A "figure" is a movement or a series of movements, having a recognised name—*e.g.* Q, twice back, mohawk

3. A "call" is a figure or a series of figures beginning and ending at the centre, such figures being determined by the word of command of the caller.

4. The term "centre" applied to any figure means that it is to be executed close to the centre.

5. The terms "meet" and "pass" are used to express two methods in which the centre may be passed in the middle of a call.

When the word "meet" is called, a fresh stroke is taken up at the centre.

When the word "pass" is called, a fresh stroke, if demanded by the call, is taken up beyond the centre.

6. The term "about" applied to any figure means a change in the direction of revolution round the centre in the course of that figure.

7. The terms "out" and "in" are used in any call or part of a call in which the skaters do not circle round the centre.

8. The term "entire" may be applied at the option of the caller to any single figure in the course of which the skaters both leave and return to the centre. Should the skaters leave and return to the centre more than once in the course of such a figure, the caller must repeat the word "entire" each time he passes the centre.

Rules of Combined Figure-Skating—(Taken from *Figure-Skating: Simple and Combined*, and founded on the "Rules" authorised by the Conference of Skating Clubs, July, 1891)—

1. The caller sets the time, speed, and mode of skating all calls, and must be accurately followed by the other skaters.

2. Every figure must be commenced on the outside edge, unless the inside edge be specified in the call.

3. Whenever the foot is changed at the commencement of a new figure the word "and" must be used in the call to denote that change.

4. The centre must always be kept outside the curve on which it is approached, unless the word "off" is called, when it must be kept inside the curve.

5. When starting from rest to skate a new call or set of calls, the skater must keep the centre inside the curve on which he leaves it, and must commence the first figure on the right foot, unless it is otherwise specified.

6. Whenever the centre is passed in the middle of a call one of the words "centre," "meet" or "pass" must be inserted in the call.

Combined figures may be divided into three groups—

(1) The ordinary circling figures, in which the skater circles round the centre in the same direction throughout the call.

(2) The "about" circling figures, in which the skater, after circling in one direction, turns about, somewhat like a ship tacking, and circles back again in the opposite direction.

(3) The "out and in" figures, in which the skater does not circle round the centre at all,

but skates directly away from the centre, and directly back again

Group (1) is further subdivided into (*a*) figures in which the centre is not passed in the middle of the call, and (*b*) figures in which it is so passed.

As there are many hundreds of commonly-practised combined figures, it is impossible within the limits of this article to do more than enumerate one or two belonging to each group. The *centre* is a fixed point on the ice (an orange is generally used) from which the skaters start each call and to which they finally return to commence the same or a new call. The *caller* is one of the first pair of skaters. He decides what figures are to be skated in each call, and calls them out in a loud voice. A good caller's qualifications are as follows :—(1) He must have a facility for arranging groups of calls so that each call is skated on both feet, but with one or more different calls intervening. (2) He should as a general rule deliver a new call before the skaters reach the centre, not after they have commenced to leave it. (3) He must know every variety of combined figure, and give each call its correct name in accordance with the above Rules and Explanations, and not call figures which are too difficult for his team. (4) He should be a good, steady and accurate skater.

Twice back and forward (Fig. 14) is the commonest call belonging to Group I, sub-division *a*. The skaters, two, four, six or more, stand each about three yards from the centre, and if there are six, in the order shown in Fig. 13. The different pairs skate towards the centre to commence the call in rotation in the manner already described. Each skater starts on the right foot, and makes the first stroke to the left of the centre (*see* Rule 5). The figure "twice back" consists, as Fig. 14 shows, of a forward three followed by a drop on to the outside edge backwards of the other foot and the same two movements repeated. When all the skaters are circling round

Fig. 14.—Twice Back and Forward.

the centre they should again occupy the same relative positions adopted at the start (Fig. 13). This is called keeping the figure "square." They return to the centre on a bold curve of outside edge forwards, and, remembering to keep the centre outside the curve on which it is approached, unless the word "off" is called (*see* Rule 4), commence the same call, or any other that may be called, on the left foot. The average diameter of the circle round which the skaters move in this and other circling figures is 80 feet.

The following points must be borne in mind by the first pair of skaters in a combined figure. The caller leads the figure and sets the time, speed and mode of skating all calls (see Rule 1). The diagram represents the mode in which the average caller skates the figure. His partner's duties are (1) to watch the caller, skate as he does and keep time with him, (2) to keep the centre in a straight line between himself and the caller, (3) to arrive at the centre simultaneously with the caller. Each remaining skater in a combined figure must remember (1) to watch the caller and skate as he does, (2) to watch all the other skaters and skate so that his position relatively to them corresponds with Fig. 13 —*i.e.* help to keep the figure "square," (3) to keep time with his partner, and not skate opposite to him unless the latter is "square" with the others.

Other simple calls belonging to Group I, sub-division *a*, are—"Forward entire," being a plain circle of outside edge forwards beginning and ending at the centre, "Inside forward entire," "Forward turn entire," "Inside forward turn entire," "Twice back and forward turn,"

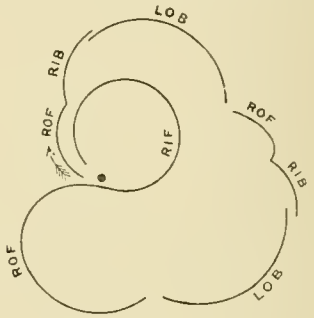


Fig. 15.—Twice Back and Forward Centre-change Entire.

"Twice back and forward and inside forward turn," "Twice back turn," "Twice back and inside back turn," and countless others.

Group I, sub-division *b*, may be further subdivided into three sections—(1) centre figures, (2) meet figures, and (3) pass figures.

Twice back and forward centre-change entire (Fig. 15) is an easy call belonging to section (1). After the "twice back," the skaters run up on the outside edge forwards to the centre, on the near side of which they change the edge, continuing back to the centre on the curve of inside edge forwards. A similar change can of course be made at the centre from the other three edges preceded by suitable movements.

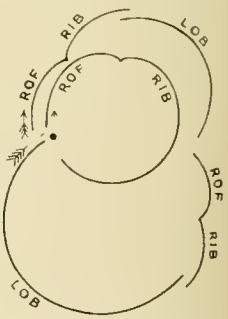


Fig. 16.—Twice Back Off Meet and Forward Turn Entire.

Twice back off meet and forward turn entire (Fig. 16). This is one of the most familiar calls belonging to section (2). The skaters run up to the centre on the second "back" and take up the fresh stroke necessitated by the forward turn on the "off" side of the centre.

Twice back and forward and inside forward off

pass and forward (Fig. 17). This call belonging to section (3) is easily understood from the diagram.

Group II. consists of the "about" circling figures and the call, **Once back and forward turn about and**

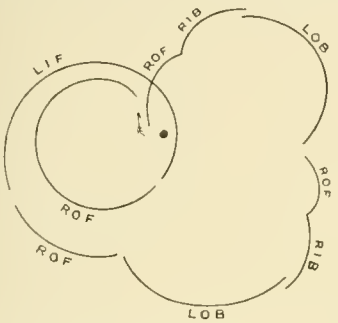


Fig. 17.—Twice Back and Forward and Inside Off Pass and Forward.

once back and forward turn (Fig. 18), sufficiently explains this variety of combined figure. The chief point to be noted is that the skaters must all skate the about forward turn simultaneously.

Group III. contains the "out and in" figures, and **Forward and forward turn out and forward in** (Fig. 19)

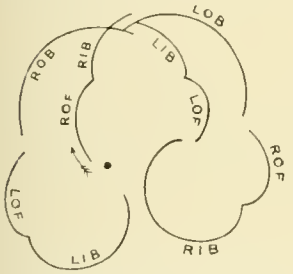


Fig. 18.—Once Back and Forward Turn About and Once Back and Forward Turn.

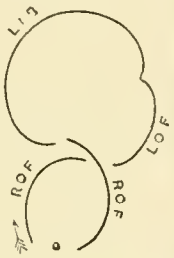


Fig. 19.—Forward and Forward Turn Out and Forward in.

is a typical call. It is one of the easiest and most commonly used on the ice, and the diagram fully explains it. Calls consisting of figures belonging to two or more groups are frequently skated. In fact, the number of combinations of figures making suitable calls is without limit.

Simultaneous Combined Figures—In these figures the same calls are skated as in the ordinary combined figures, but each skater is not paired off with a partner, as all the performers skate together simultaneously. To make this possible the skaters do not skate right up to the centre, but to the circumference of an imaginary circle surrounding the centre. This plan is useful when odd numbers are skating together.

Continuous Figure-Skating—This is the kind of figure-skating in which experts in the non-British style are proficient. The figures practised cannot be executed with facility in the British style, and so have not hitherto been introduced into combined figure-skating. Small circles and narrow curves are predominant, and for these the bent employed knee and non-quiescent unemployed leg are essential. The continuous figure-skater's aim, moreover, is to make sustained efforts on one foot, and to skate figures of a definite prescribed pattern, devised perhaps by himself, and often limited "to place" on the ice. Such "picture figures," as they are termed, composed generally of movements of exceptional difficulty, require constant persevering practice. The average English skating winter is never long enough to enable even our best men to attempt these figures with prospect of attaining even reasonable proficiency, but now that artificially frozen ice-rinks are open in London for

Plate IV. Non-British Style of Figure-Skating.

six months of the year, many skaters are mastering them. Although the style adopted by most continuous skaters is the reverse of graceful to the English eye, it is certain that the most difficult continuous figures can be executed with perfect grace, as Herr Grenander, the World's Amateur Champion in figure-skating for 1898, and by far the most accomplished continuous skater yet seen in this country, has shown us. I am much indebted to Herr Grenander for permission to publish Plate IV., a portrait of himself just finishing a curve of inside edge forwards. A description of this distinguished

Swedish expert's style will be found in the *Figure-Skating* volume of the Isthmian library. A skater obtains the impetus necessary for progressing continuously upon one foot by means of a succession of "destroyals" and "rightings" of equilibrium effected at the moment of changing the edge or making a turn, and termed "the continuous stroke." When about to change, say, a forward edge, the skater leans strongly over, so as momentarily almost to lose his equilibrium, his body being in advance of his foot. To regain his balance, he turns his skate into a sharper curve, and brings the foot quickly forwards on the new edge so as to overtake the body. This rapid advance of the foot to catch up the body gives the skater added impetus. Similarly, when skating turns, the skater allows the body to get in advance of the foot, and at the moment of turning draws the latter rapidly after the body at an increased rate of speed.

Besides the changes of edge and different varieties of turns already enumerated in this article, the following miscellaneous figures are used in continuous skating :—

Loops are of three kinds—the ordinary variety, the turn loop, and the bracket loop. **Loops of the ordinary variety** (Fig. 20) are formed by suddenly converting a large into a small curve with an equally sudden return

Fig. 20. Loop.

Fig. 21. Turn Loop.

Fig. 22. Bracket Loop.

to the large curve. They can be skated from all edges, those on the inside edge being the most difficult. **Turn loops** (Fig. 21) are turns worked into the form of a loop, and **Bracket loops** (Fig. 22) are brackets skated in a similar way.

Ringlets are circular loops.

Cross-cuts are of three kinds—the ordinary variety, the counter cross-cut, and the Swedish cross-cut. **Cross-cuts of the ordinary variety** (Fig. 23) are commenced in the same way as corresponding loops, but at the apex of a possible loop the skate is brought to a standstill (in the case of a forward cross-cut), and is then

Fig. 23. Cross-cut.

Fig. 24. Counter Cross-cut.

Fig. 25. Swedish Cross-cut.

drawn rapidly backwards to be again brought forward until the last curve cuts the first. The base of a cross-cut may be straight, as in Fig. 23, or curved. Cross-cuts can be skated from all edges. Fig. 24 is a diagram of the counter cross-cut, and Fig. 25 of the Swedish cross-cut.

Beaks resemble rockers and counters, since each figure is skated on one edge, and the foot is moved in the same direction as in the corresponding rocker or counter. In **rocker-beaks** (Fig. 26) the foot is moved rocker-wise, and in **counter-beaks** (Fig. 27) counter-wise.

Both rocker and counter-beaks can be skated from all edges. Beaks of both varieties can be made either narrow or broad, according as the two curves are near together or far apart. When the second curve is so near

Fig. 26. Rocker-beak.

Fig. 27. Counter-Beak.

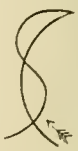


Fig. 28. Pig's-ear.

the first as to be practically superposed, a **hook** is the result—a most difficult figure.

A **pig's-ear** (Fig. 28) is a rocker-beak followed by a change, skated so that the serpentine line crosses the first curve of the beak twice. Figs. 29 and 30 are illus-

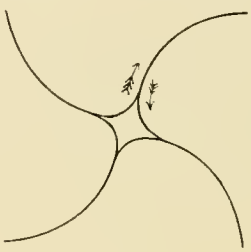


Fig. 29.

Fig. 30.

trations of two picture figures, both of which occur in the special test of the National Skating Association. Fig. 29 is a cross comprised of four hooks with changes, and Fig. 30 is a complicated figure consisting of counter-beaks and changes. Figs. 31–34 are diagrams of different varieties of continuous eights.

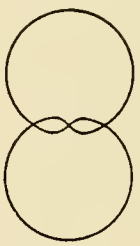


Fig. 31. Continuous Eight.

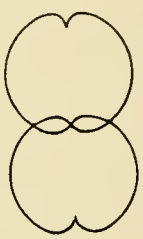


Fig. 32. Continuous Change Turn Eight.

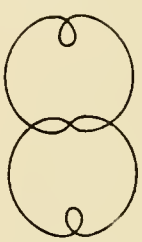


Fig. 33. Continuous Change Loop Eight.

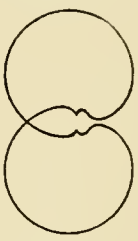


Fig. 34. Continuous Counter Eight.

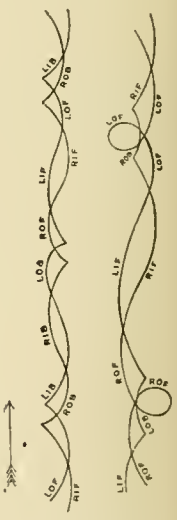


Fig. 35. Fig. 36. Grape Vines.

Grape-vines are two-footed Canadian figures of which here are a great many different varieties. Both feet are kept on the ice throughout, and the skater always pro-

gresses in one direction. The movements, though not hard to execute, are difficult to learn, as it is not easy to follow the complicated intertwining of the feet. I have only space to give diagrams (taken from Mr. Meagher's book on *Figure Skating*) of two of these figures—the single grape-vine (Fig. 35), which can be skated with the right or left shoulder leading, and the double grape-vine (Fig. 36), which can be skated forwards or backwards.

Hand-in-hand Figure-Skating—A large proportion of the figures enumerated in this article can be skated by gentleman and lady hand-in-hand. As a book has recently been published (*see* Bibliography) devoted entirely to hand-in-hand figures, it is unnecessary to give any detailed account of them here.

MONTAGU S. MONIER-WILLIAMS.

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TESTS OF THE NATIONAL SKATING ASSOCIATION OF GREAT BRITAIN.

THIRD CLASS ICE FIGURE-SKATING TEST.

The judges will require the test to be skated in good form, the essentials of which are (1) Sideways attitude of body; (2) Face turned in direction of progress; (3) Uprightness of carriage; (4) Straightness of employed leg, and (5) Approximation of heels.

Test—(*a*) A forward outside 3 on each foot, the length of each curve being 15 feet at least. The 3 need not be skated to a centre. (*b*) The ordinary and cross outside roll forward and backward, the length of each curve being 10 feet at least. (*c*) A forward outside 8, the diameter of each circle being 5 feet at least.

In every case two of the appointed judges must be present at the examination of a candidate, and the candidate must satisfy both judges.

SECOND CLASS ICE FIGURE-SKATING TEST.

No candidate can be judged for this test unless he has previously passed the Third Class Test. The judges will require all turns to be skated clean, and all movements to be executed in good form.

Test—(*a*) The following figures skated on each foot: namely—1. Forward inside 3, the length of each curve being 40 feet at least. 2. Forward outside 3, the length of each curve being 50 feet at least.

(*b*) The following figures skated to a centre on alternate feet without pause, three times on each foot: namely—1. Forward inside 3, the length of each curve being 15 feet at least. 2. Forward outside 3, the length of each curve being 15 feet at least. 3. Forward inside two turns, the length of each curve being 10 feet at least. 4. Forward outside two turns, the length of each curve being 10 feet at least. 5. Forward inside three turns, the length of each curve being 10 feet at least. 6. Forward outside three turns, the length of each curve being 10 feet at least.

(*c*) Back outside two turns on alternate feet on the cross roll, three times on each foot, the length of each curve being 8 feet at least.

(*d*) The following figures skated on each foot: namely—1 Forward inside "Q," the length of each curve being 30 feet at least. 2. Forward outside "Q," the length of each curve being 30 feet at least. 3. Back inside "Q," the length of each curve being 15 feet at least. 4. Back outside "Q," the length of each curve being 10 feet at least.

(*e*) A set of combined figures skated with another skater, who will be selected by the judges, introducing the following calls in such order and with such repetitions as the judges may direct:—1. Forward 3 entire. 2. Once back—and forward 3. 4. Once back off meet—and forward 3 entire. 5. Once back meet—and back—and forward 3.

When a stroke is taken in a combined figure from outside back to outside back it must be taken on the cross roll.

The whole of the above test must be skated on the same occasion and before two of the properly appointed judges, and the candidate must satisfy both judges.

FIRST CLASS ICE FIGURE-SKATING TEST.

No candidate can be judged for this test unless he has previously passed the Second Class Test. The first-class test is divided into two sections, A and B. The whole test must be passed before the same judges. The judges shall not be required to judge a candidate in section B, unless he has passed in section A.

SECTION A.

This section consists of a set of Combined Figures (skated with another skater who will be selected by the judges) introducing all the calls in Part I., and also such of the calls in Part II. as the Judges (for the purpose of alternating the feet, enabling the candidate to recover his position, or otherwise) may require.

The call "back entire" must be skated at least six times in succession on alternate feet, *i.e.* three times on each foot. Any other call in Part I. must be skated at least twice, beginning once with the right foot and once with the left. Subject to these conditions the calls shall be skated in such order and with such repetitions as the judges may, while the set is in progress, direct. In calls introducing "twice back" the candidate must recede at least 35 feet from the centre. The figure "back entire" must be 6 feet in diameter at least.

To pass the section the candidate must satisfy both judges in the manner in which he skates the set considered as a whole, and also in the manner in which he skates each individual call in Part I. The judges may pass a candidate, notwithstanding a reasonable number of errors on his part in the course of the set, provided that he ultimately skates all the calls in Part I. to their satisfaction. Whenever a stroke is taken in a combined figure from outside back to outside back it must be taken on the cross roll.

Part I.—1. Twice back—and forward three—and forward inside three, off meet. 2. Twice back—and forward three turns—and back meet—and back two turns—and forward two turns. 3. Twice back—and forward reverse Q, meet. 4. Twice back—and back, off meet. 5. Twice back—and back inside reverse centre turn Q—and forward. 6. Twice back turn, centre turn entire, off meet. 7. Twice back centre change Q entire. 8. Once back—and forward—and forward inside two turns, centre change entire. 9. Twice back—and forward two turns, pass entire. 10. Twice back two turns, off pass entire, meet. 11. Inside twice back—and forward inside two turns. 12 Forward two Q's out—and forward reverse Q—and forward Q in, off meet. 13. Back entire.

Part II.—1. Forward entire. 2. Forward—and forward inside. 3. Inside forward—and forward. 4. Once back—and forward change.

SECTION B.

To pass this section a candidate must score 60 marks at least. No marks shall be scored in respect of any one-footed figure, unless it is skated on each foot, and in compliance (on each foot) with the printed conditions as to form and dimensions. A corresponding rule shall apply in the case of two-footed figures.

The number set against each figure represents the maximum that can be scored for that figure. Thus, for example, where the maximum for a figure is 10, a candidate who skates it to the complete satisfaction of the judges on each foot will score 10 in all, and not 10 for each foot. Subject to these conditions, the judges shall allot such number of marks for any figure as they consider proportionate to the merit shown in skating it.

The figures in the section are divided into groups, and a candidate shall attempt all the figures he proposes to attempt in an earlier group before attempting any figure in a later group, but he may resign marks scored in an earlier group for the sake of scoring for a figure in a later group. The judges may allow a candidate any number of attempts at a given figure that they consider reasonable.

In Groups 1—6 every loop must measure in its longest diameter between 6 inches and 1 foot 6 inches; and where more loops than one are introduced, the loops must not cut each other. The curve both before and after each trefoil, double loop, or loop, as the case may be, shall be 3 feet long at least

Group 1.—Continuous Trefoils, Six in Number.—In each trefoil the curve succeeding the last loop must cut that preceding the first. Forwards 18, backwards 26.

Group 2.—Double Loops.—A candidate shall not score for a figure in this group if he has obtained marks for the corresponding figure in Group 1. Forward inside 3, back inside 5, forward outside 3, back outside 5.

Group 3—Continuous Loop 8.—Six complete 8's must be skated, the diameter of each circle being 5 feet at least. Forwards 12, backwards 18.

Group 4—Continuous Loops.—Six loops must be skated. A candidate shall not score for a figure in this group if he has obtained marks for the corresponding figure in Groups 1 or 3. Forwards 6, backwards 10.

Group 5—Loops.—A candidate shall not score for a figure in this group if he has obtained marks for a corresponding figure in Groups 1, 2, 3, or 4. Forward inside 1, back inside 2, forward outside 1, back outside 2.

In Groups 6—10 every cross-cut must have a base at least 8 inches long, and where more cross-cuts than one are introduced the cross-cuts must not cut each other.

Group 6—*Continuous Cross-cut* 8.—Six complete 8's must be skated, the diameter of each circle being 5 feet at least. Forwards 9, backwards 15.

Group 7—*Continuous Cross-cuts.*—Six cross-cuts must be skated. A candidate shall not score for a figure in this group if he has obtained marks for the corresponding figure in Group 6. Forwards 5, backwards 9.

Group 8—*Maltese Cross.*—The cross-cuts must be approximately of the same size, and approximately at right angles to each other. Forward inside 5, back inside 8, forward outside 5, back outside 8.

Group 9—*Inverted Maltese Cross.*—The cross-cuts must be approximately of the same size, and approximately at right angles to each other, the bases being towards the centre of the figure. Forward inside 5, back inside 8, forward outside 5, back outside 8.

Group 10—*Cross-cut.* The curves before and after the cross-cut must be each at least 3 feet long. A candidate shall not score for a figure in this group if he has obtained marks for a corresponding figure in Groups 6, 7, 8, or 9. Forward inside 1, back inside 2, forward outside 1, back outside 2.

In Groups 11—16 the curve before and after each turn must be 6 feet long at least.

Group 11—*Continuous Q* 8.—Six complete 8's must be skated, the diameter of each circle being 5 feet at least. Inside turns 10, outside turns 10.

Group 12—*Continuous Q's.*—Six Q's must be skated. A candidate shall not score for a figure in this group if he has obtained marks for the corresponding figure in Group 11. Inside turns 4, outside turns 4.

Group 13—*Continuous Bracket* 8.—Six complete 8's must be skated, the diameter of each circle being 6 feet at least. Inside turns 15, outside turns 17.

Group 14—*Continuous Brackets.*—Six brackets must be skated. A candidate shall not score for a figure in this group if he has obtained marks for the corresponding figure in Group 13. Inside turns 9, outside turns 11.

Group 15—*Brackets.*—A candidate shall not score for a figure in this group if he has obtained marks for a corresponding figure in Groups 13 or 14. Forward inside 2, back inside 3, forward outside 3, back outside 4.

Group 16—*Continuous Counter* 8.—Six complete 8's must be skated, the diameter of each circle being 5 feet at least. Inside turns 18, outside turns 20.

Group 17—*Continuous Counters.*—Six counters must be skated, every curve being 9 feet long at least. A candidate shall not score for a figure in this group if he has obtained marks for the corresponding figure in Group 16. Inside turns 10, outside turns 12.

Group 18—*Counter.*—The curves before and after the turn must be 9 feet long at least. A candidate shall not score for a figure in this group if he has obtained marks for a corresponding figure in Groups 16 or 17. Forward inside 2, back inside 3, forward outside 3, back outside 4.

Group 19—*Continuous* 8.—Six complete 8's must be skated, the diameter of each circle being 5 feet at least. Forwards 4, backwards, 4.

In Groups 20—24 the curve before and after the turn or change of foot must be 30 feet at least.

Group 20—*Rockers*—Forward inside 4, back inside 3, forward outside 4, back outside 3.

Group 21—*Counters.*—Forward inside 3, back inside 4, forward outside 4, back outside 8.

Group 22—*Brackets.*—Forward inside 3, back inside 4, forward outside 4, back outside 8.

Group 23—*Mohawks.*—Forward inside 2, forward outside 3.

Group 24—*Choctaws.*—Forward inside 3, forward outside 2.

Group 25—*Spread Eagle.*—The curve must be 30 feet long at least. A candidate shall not score for more than one figure in this group. Inside with 60 feet radius 1, straight 3, outside with 60 feet radius 6.

Group 26—*Toe Steps.*—A candidate shall not attempt more than six varieties. Each variety 1.

Group 27—*Grape-vines.*—A candidate shall not attempt more than seven figures in this group. Each variety 2.

Group 28—*Canadian* 8.—One foot in advance of the other. Forwards 1, backwards 2.

SPECIAL ICE FIGURE-SKATING TEST

The test must be skated in London or the neighbourhood. All the figures must be skated to the satisfaction of three duly appointed judges. The whole test need not be skated on one day, but must be skated before the same judges within a period not exceeding one month. A candidate will be allowed a reasonable number of attempts to execute any particular figure.

No candidate shall be judged for this test unless he have previously passed the first-class test. No candidate who has failed to pass the test shall be permitted to make another attempt to pass in the same skating season, without the special written permission of the judges before whom he failed.

PART I.

This part must be skated in strict Englisb form.

Section A.—The following set of combined figures must be skated in the order stated below:—1. Twice back and forward two turns, off centre turn, two turns, and forward inside turn off. 2. Twice back and forward off centre rocker entire off. 3. Forward bracket, turn entire. 4. Twice back centre bracket entire. 5 Forward inside turn, bracket entire. 6. Forward inside, and once back and forward, and forward inside three turns off centre change three turns entire. 7. Forward two counters out and forward inside two brackets, and forward mohawk and back inside off centre rocker entire. 8. Forward inside and once back and forward and forward inside off centre rocker entire.

Repeat beginning on left foot.

N.B. In the above calls "turn" means an ordinary or three turn.

Section B.—In Nos. 1 to 8, the turns are to be made at two oranges placed 50 feet apart, and the candidate must travel at least 50 feet before the first turn, and at least 50 feet after the second one. All threes and rockers to he done on the off side, and all counters and brackets on the near side of the orange. The cusps of all forward turns must be within 1 foot of the orange, and those of all back turns within 3 feet. In Nos. 9 and 10, the mohawks and choctaws must be executed at two oranges placed as before, and the length of curve, before and after the figure, must not be less than 30 feet. Outside mohawk and choctaw must be done on the near side, and the corresponding inside movements on the off side of the orange, the end of the forward curve being within 1 foot of the orange in every case. Eacb figure is to be skated on both feet.

1. Forward turn bracket. 2. Forward inside turn bracket. 3. Forward bracket turn. 4. Forward inside bracket, turn. 5. Forward two rockers. 6. Forward inside two rockers. 7. Forward two counters. 8. Forward inside two counters. 9. Forward mohawk, rocker, choctaw. 10. Forward inside mohawk, rocker, choctaw.

N.B. In the above list of figures "turn" means an ordinary, or three turn.

PART II.

This part must be skated in good style, having regard to the nature of the figures skated. The following will be regarded as points of good style:—(1.) Preservation of control over the body and limbs, whether the unemployed leg and arms are swung or not. (2.) Continuity of movement and uniformity of pace—*i.e.* the movement of the body and limbs should be such as to produce the effect of rhythm or cadence. Abrupt movements and sudden changes of speed, except such as are characteristic of the particular figure, should be avoided. The speed should be the same in the corresponding parts of the figure, whether on the same or different edges. (3.) Vigour.

The figures must be approximately symmetrical. In Nos. 1 to 7 the figure must be continued as long as the judges may require, the curves, turns, &c., being approximately superposed. In Nos. 3, 4, 6, 7, the turns and loops must be made approximately half-way round each circle of the eight. Every figure must either be executed on both feet, or, where a choice is given of edges, the figure may be skated on another edge on the other foot. No. 4 must be skated on the opposite edges to those selected for No. 3.

1. Continuous eight forwards. 2. Continuous eight backwards. 3. Continuous change, turn eight, inside *or* outside turns. 4. Continuous change, bracket eight, inside *or* outside turns. 5. Continuous counter eight, inside or outside turns. 6. Continuous change, loop eight, forwards. 7. Continuous change, loop eight, backwards. 9 to 12. Maltese cross on all edges. 13. Inverted Maltese cross on one edge. 14. Continuous counter cross-cuts, forwards *or* backwards. 15 and 16. Picture figure (1) on both edges (*see* Fig. 29). 17. Picture figure (2) (*see* Fig. 30). 18. Single grape-vine right and left shoulder leading. 19. Double grape-vine forwards. 20. Double grape-vine backwards. 21. Philadelphia grape-vine forwards. 22. Philadelphia grape-vine backwards. 23. Pennsylvania grape-vine forwards.

In addition to the above, the candidate will be required to skate three picture figures of his own selection on either foot to the satisfaction of the judges.

SPEED SKATING—This sport, the national sport of Holland, does not seem, until of late years, to have been extensively practised elsewhere on the Continent or in Great Britain, with the exception of a district lying on the east coast of England, known as the Great Level of the Fens. This district, so like Holland in appearance and characteristics, has always been the home of speed skating, and has afforded skating in abundance and with a frequency unknown elsewhere in our island.

Fen Skating—The still waters of the Fen drains and of the sluggish rivers are readily frozen, and are traversed, like those in Holland, from village to village and from town to town by skaters. The washlands alongside the rivers, flooded and frozen, are used for races and in some places for bandy. The names of the fastest skaters are household words, their performances and styles the subject of great interest, and the result of races looked forward to with eagerness. Those who lived elsewhere had neither the skates nor the skill requisite

for skating distances with ease and speed. On the rare occasions when an outsider, who found himself the fastest man of his locality, came to compete in the long races in the Fens, he was hopelessly beaten. And while the Fen skater could travel with ease at a speed of nine or ten miles hour after hour, and thus do forty, sixty, or seventy miles in the day with enjoyment, the athletic highlander would think a journey from Cambridge to Ely and back, some twenty-eight miles, a feat almost beyond his strength. Of late years, however, partly owing to the races held near Cambridge and London, Fen skates and the Fen style of skating have become better known, and are being gradually adopted in other parts of the country. The art has also become almost as popular with women as with men; and the former not only skate with speed and elegance, but accomplish journeys not much shorter than those above-mentioned.

The art of Speed Skating—The alternate movements of the legs of the skater are called "strokes." The skater runs or glides forward upon one leg—say the right—at first nearly upon the middle line of direction, but towards the latter part of this stroke he curves away towards the outer side, that is, in the case put, the right side. At the end of the stroke he thrusts his skate strongly against the ice, sideways and backwards, gripping the surface with the inside edge of the blade of the skate, and thus obtains the impetus necessary for driving him along during the next stroke. Meanwhile the other leg, the left, has been brought back from the final thrust of the previous stroke towards, and indeed over, the middle line, and has been drawn well under the body. As the stroke of the right leg is curving away from the middle line towards its finish, the left skate is placed upon the ice. The skater now makes the outward thrust on the right side, and throwing his weight forwards, rests it upon the left leg, upon which he runs in a manner similar to that already described for the right leg, and so on. During the time that the skater runs or glides upon his skate he maintains a steady balance upon it. To do this he leans over the leg upon which he is running towards the outside, so as to bring his centre of gravity immediately over his skate. When he is doing this the skate follows the direction of the body, and leans over towards the ice on the same side, and the skater runs upon the outside edge of the blade. The skater can thus run straight and steady, the edge of the blade acting as a guide, and preventing the skate from wobbling. Just before the final thrust the skater ceases to balance himself on the outside edge; his skate curves outwards, but his weight does not follow it, and he comes upon the flat of his skate and then finishes upon the inside edge. He thus prepares himself for transferring his weight to the other leg, which by this time is brought under him. It is in the ability to obtain and preserve a balance upon the outside edge after making a vigorous thrust with the other leg that the art of speed skating largely consists. It is impossible otherwise to make a long and steady stroke, or to skate with ease and speed for any distance, much more with grace. In easy travelling, say at eight or nine miles an hour, the stroke is considerably curved, the skater dwelling upon it as it turns outwards, and he thus starts the next stroke more or less on the *inside* of the middle line of direction. When this is carried to excess, the centre of gravity, instead of keeping in a steady line, follows a more or less wavy one, and we say that the skater rolls. When it is desired to increase the pace this tendency must be avoided, the body must be kept in the middle line, the stroke must be straighter and more forward. In racing, especially with the old Fen skate, the stroke is close to the middle line during most of its length, and the curve at the finish is not sustained. To make a vigorous backward thrust with one leg, and at the same time to place the other upon the middle line, and receive upon it, with steady balance, the weight of the body thus driven forward, and to run upon it along this line, is a feat requiring much practice and skill. In order to assist him in accomplishing it, the skater swings his arms across his body at each stroke to that side on which he is running, carrying them as far as they will go. This practice used to be invariably resorted to in racing when the old skate was used; but now, when the long Norwegian skates are used, the arms, except in spurting, are kept steady, usually behind the skater's back.

In making the outward thrust it is not necessary to raise the foot far off the ice. The thrust may be made and the skate brought back into position without being raised more than an inch or two. This gives much greater neatness to the stroke, and avoids unnecessary labour, and is the practice with most of our better skaters. But the Dutch raise their heels somewhat higher, and so also, when racing, do those, as a rule, who use the long-bladed skates. The former method is certainly more graceful for ladies.

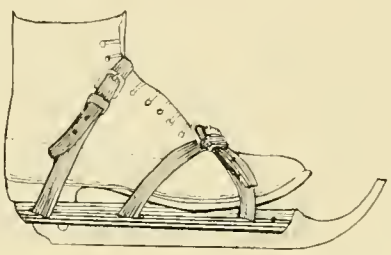
Length of Stroke—Although a good skater is distinguished from a bad one by his longer and steadier stroke, still it is possible to dwell too long upon it. From 5 to 7 yards may perhaps be given as the average stroke of an ordinary man.

Stopping—The commonest way of stopping is to turn up the toes, thus forcing the sharp heels of the skate into the ice, at the same time arching the back, slightly bending the knees, and leaning backwards for the sake of balance. This way is effectual, but it cuts up the ice on limited spaces. Another way is to turn the

toes inwards so as to put the skates athwart the ice. A third way is to turn both skates parallel to each other, and across the direction in which the skater is going. The skater should be master of all three methods.

In Holland the style is broadly the same as here. In travelling, ease is aimed at rather than great speed, and the skaters usually roll more from side to side of the course, and raise their heels higher after the thrust. A common practice is for two or more persons to join themselves by carrying a pole under their arms on one side. This enables them to swing along in file from side to side with great regularity and precision, and gives the foremost man assistance in facing the wind.

Skates—The ordinary English running skate has a wooden top, a steel flat blade about $\frac{1}{8}$ of an inch wide, with the prow turned up beyond the toe some inches above the ice. The wooden part is about as long as the foot. It is fastened on by leather straps, aided by an iron peg or screw at the heel, and short spikes on the fore



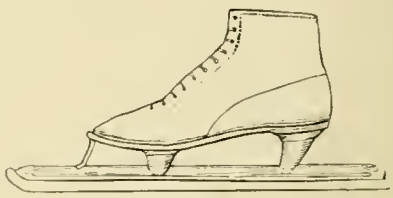
English Skate.

part. The bottom of the blade is only very slightly curved from end to end, rising about $\frac{1}{64}$ of an inch at each end. A good example is the "Standard" skate, known by the device of a flag and barrel, or of two crossed bandies upon the blade. For bandy, skating expeditions, and general purposes, no skates are more serviceable or reliable.

The rising prow carries the skate over rough ice and other obstacles, the blade is not easily broken, and the straps give a firm and comfortable hold without tending to pull away the sole of the boot.

Of late years the Norwegian racing skates have been introduced into this country. They are made entirely of metal, and are very light. They are rivetted on specially made boots, have a flat and very thin blade, from 16 to 18 inches long, projecting both behind and before. They are specially suitable for hard ice, and reduce friction to a minimum. They also run more easily than the shorter skate on ordinary English ice.

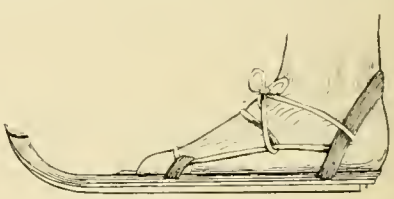
The skates used in Holland are somewhat milar to our own. They have, however, a thinner blade, which projects on the ice beyond the toe for some distance before curving upwards, and are tied on the foot with thongs, without the aid of any heel screw. They are seldom liked by strangers who try them. To combine the advantages of the Norwegian and Fen skates, a long-bladed skate with a wooden top, fastened on in the manner of the English



Norwegian Skate.

skate, has been brought out on the design of Mr. C. G. Tebbutt, and is worth a trial. In fastening on the ordinary skate, a hole is made in the heel of the boot to receive the heel screw. The position of this hole is usually at the centre, but may be put a little backwards or forwards according to the length of the skate. The forepart of the skate is usually placed under the inside part of the sole. This points the skate more towards the line of direction. The boots worn should be of fair thickness, so as to afford some protection to the feet from the pressure of the straps, which should be broad for the same reason. Of course ladies should not wear high heels.

Racing—Formerly races were held at various places in the Fen district under the promotion of local lovers of the sport. Latterly the best racing has been at Swavesey and Lingay Fen, near Cambridge, under the National Skating Association, and at Littleport, near Ely, under the Skating Club there. The championship course is a mile and a half,



Dutch Skate.

with three (sharp) turns, that is to say, it is 660 yards long. The old method of racing was to run off the men in pairs, and then the winners of these heats, till the champion was arrived at, as in lawn tennis and golf. But now for some years the *time test* has been adopted; the competitors run in pairs, the four shortest times are chosen, and those who have made them are again paired with each other, and the event decided by the shortest times of these second heats. This system, though not

perfect, seems the best that can be devised. Until quite lately the tracks of the race-course have been close alongside each other from end to end, passing at the turn round a barrel. But the oval-shaped course with wide, rounded ends, as used on the Continent, has been adopted on one or two occasions, and is favoured by some racing men. The art of rounding these wide ends is a special one, requiring the skater to bring the leg on the outside of the curve after each thrust over the other, and, when striking with the leg on the inside of the curve, to make the thrust quite under his body. In this manner, and particularly when using long-bladed skates, the racer can curve round at great, almost at full, speed. In his races with Hagen, in Norway, in 1891–1892, Smart, accustomed to the English courses, was seriously handicapped by the superior skill of his rival in this respect.

During the last twenty years the fastest skaters in this country have been George ("Fish") Smart and James Smart, of Welney (Norfolk), the former until 1888–1889, the latter since. Whether they are better or worse than L. Regester, William ("Turkey") Smart, and T. Watkinson, who came before them, it is hard to say, as when these latter flourished the courses were not measured, nor the times taken with any accuracy. In the last skating season, a man new to Englishmen but known abroad, H. Lindahl, a Norwegian now residing in this country, disputed the supremacy with Smart. These men are professionals. The amateurs have never equalled them in speed.

Great efforts of late years have been made to bring the best skaters of different countries together. In January, 1887, C. G. Tebbutt, of Bluntisham (Hunts), won the International Amateur Race at Leuwarden in Holland. A few weeks later J. Smart and G. See won the open race at Slikkerveer, and again in 1890–1891 at Heerenveen in the same country, making record times on the former occasion over the mile course.

In 1888–1889, at the International Amateur Races at Amsterdam, A. von Panschin, of St. Petersburg, won the mile, and J. F. Donoghue, of Newburgh, N.Y. (U.S.A.), won the two mile race. Two years later at the same place, after having just before defeated the amateurs of this country, Donoghue won every event from half a mile to five miles. In February, 1891, H. Hagen, the Norwegian champion, beat McCormick, the Canadian, at Christiania, over distances of one and three miles, and next season, at Hamar (Norway), beat J. Smart over various distances, varying from a half mile to five miles, both men beating previous records.

In the same season J. J. Eden, of Haarlem, who subsequently became international amateur champion in 1892–3 at Amsterdam, in 1894–5 at Hamar, and in 1895–6 at Petersburg, defeated our best amateurs at Lingay Fen (Cambs.).

Records—In considering records, regard must be had to the country skated in. The ice is better in Holland than in England, and better still in Norway, and the records are consequently better. Thus J. Smart did the mile at Hamar in 1891–1892 in 2min. 53secs., but his fastest time here is 3min. 8secs. Unfortunately there is reason to think some of the claimed records are untrustworthy. Subjoined are a few times.

RECORDS WITH ONE OR MORE TURNS.

Half Mile.

1m 20⅕s. H. Hagen, Hamar, February 28th, 1892.
1m. 33⅕s. G. See, Lingay Fen, January 28th, 1887.

One Mile.

2m. 47⅗s. E. Halvorsen, Hamar, February 27th, 1892.
2m. 49s. Hagen, Hamar, January 3rd, 1892.
2m. 53s. J. Smart, Hamar, January 3rd, 1892.
2m. 53s. G. See, Slikkerveer, February 17th, 1887.
3m. 8s. J. Smart, Lingay Fen, December 24th, 1890.

Five Miles.

15m. 11s. Hagen, Hamar, December 27th, 1891.
16m. 2⅘s. J. F. Donoghue, Amsterdam, January 7th, 1891.
15m. 19⅗s. J. Smart, Hamar, December 27th, 1891.

One Hundred Miles.

7h. 11m. 38s. J. F. Donoghue, Stamford (Conn.), January 26th, 1893.

One Mile Straightaway (with Wind).

2m. 12⅗s. J. F. Donoghue, Newburgh (N.Y.), February 1st, 1887.

Straightaway (no Wind).

3m. 0s. G. Smart, Cowbit Wash, January 20th, 1881.

H. Hagen, G. and J. Smart, and G. See are professionals.

River and Canal Skating—The best, and almost the only place in this country where this can be enjoyed is the Fens. The large drains with which they are traversed, as well as the rivers Cam, Old Nene, and Witham, are locked at both ends, and, except when for drainage the locks are opened, or the pumping engines on their banks going, which is not often the case, these canals are quickly frozen. In addition, the rivers Ouse and New Nene are sometimes frozen and bear, the Ouse from above Bedford to Welney or even Deurer Sluice, the Nene to Guyhirn.

In such winters as 1890–1891 and 1894–1895 there are days when the whole district may be traversed on skates, and the towns of Peterborough, March, Wisbeach, Lynn, Ely, Ramsey, Chatteris, and Spalding, as well as the neighbouring ones of St. Ives, Huntingdon, and Cambridge, are connected by ice highways.

Unbroken runs of fifty, sixty, or even eighty miles over fresh ice have thus been obtained. In less severe seasons, fair runs may be had if the skater knows how and where to go. Of the three levels into which the district is divided,

the "Middle Level" is perhaps the most likely, and the "Old Bedford" river, running twenty-one miles from Earith to Salters Lode, past Welney, the most likely drain for bearing. But the places where the ice is best depend on circumstances.

The tourist cannot expect to find, except rarely, a long unbroken run on the drains. He may have to get off more than once, and walk along the bank past weak places. Or he may find that the washes alongside the drain are flooded and bear, and may make a journey on them, hardly going on the drain at all. Or he may abandon his course altogether, and reach some other drain by walking, or by worming his way down some smaller cross drain or ditch. He may have to skate over much virgin ice. He should therefore be acquainted with the nature of Fen drains, with various kinds of ice, and with the topography of the district. For such expeditions it is almost essential to have a stout bandy or walking stick with which to try the ice. Familiarity enables him to tell pretty accurately by a couple of blows whether the ice is sound and will bear him. Hard black ice is usually the toughest, and two inches of it, or even less, will be safe for men of ordinary weight going singly. But with white snow-ice much greater thickness is necessary. The skater need not be alarmed by a lengthy single crack, accompanied by a rolling sound, running in the direction in which he is going. Such often occurs when the water beneath has slightly fallen, and may be quite consistent with strength and safety. Indeed, if the sound is deep it shows strength. The skater's saying "cracks she bears, bends she breaks" is broadly true. But if the ice begins breaking into many small cracks, or cross ones, it is time to be off. Of course the explorer should be master of his work, should be able to skate for miles on rough ice, or through an inch or more of snow, to go along the side of a drain on ice slanting towards the middle, to stop within three or four yards or less, and to accommodate his stroke to suddenly perceived obstacles. It is a good plan for a rope to be carried by one of the party, care being taken that he is the hinder, and not the foremost man. This precaution is too often omitted. Over deep and dangerous water the party should be roped together. If a long journey is intended, it is essential to start early, for winter days are short and exploration takes time, and it is dangerous to skate in the dusk even over a track, unless the frost has been very severe and the ground is well known.

Nor must it be assumed that because the drain bears one day it will do so the next with no change of weather. A lock opened or a pump set going may in a few hours spoil miles of good ice.

The scenery of the Fens is monotonous, though it has its charm. Unfortunately the tourist may see little of it, as many of the principal drains have banks too high to be seen over. This remark does not apply to the rivers Ouse above Earith, or to the Cam for some miles below Cambridge.

In severe seasons, good runs may be had upon canals in other parts of the country. Perhaps the most interesting and likely of these is the Basingtoke canal, running in a winding course from that town to the Wey at Weybridge, some thirty-five or forty miles. The route is picturesque, but the part between Basingtoke and the tunnel at Greywell is seldom safe, and much of the other part is crowded with locks. The Grantham canal, from that town to Nottingham, some thirty-two or thirty-three miles long, sometimes gives good skating. There are several other canals which in a good winter would afford fine skating if they were not broken up by steam tugs, and thus, even when bearing, rendered unskateable.

Unfortunately no arrangement exists for sweeping away the snow from the rivers, canals, or drains in this country, and when it falls heavily the skating is destroyed. This is the case with the Basingstoke canal, on which the snow soon gets trodden down.

Holland is par excellence the distance skater's home. The frost there, especially in Friesland, though somewhat more severe than here and lasting longer, is not accompanied by such heavy falls of snow as in Norway and Sweden. Moreover, every care is taken to preserve the ice and accommodate the skater. The drains are kept quiet and not allowed to be broken up by the vessels, warning notices are put up at dangerous places, and when snow falls a continuous track is everywhere swept. These frozen waterways are the winter roads, and are used by all classes as highways for business and pleasure.

The Dutchman and Dutch vrow roll along from side to side at an easy pace, but often for very long distances.

The Frieslanders are especially good and habitual skaters, going thus to market, work, or church. The tourist will find Amsterdam a good centre to stop at, and thence in a good year, excursions may be made in the day to Monickendam and the Isle of Marken, Haarlem, Leiden, The Hague, Gouda, Utrecht and other places. But there is more certainty of skating farther north, and those who like a rustic and kindly folk, quaint towns, and the "buried cities" of a maritime people will not fail to visit Friesland. A notable feat for Dutchmen is to skate a journey so as to visit the eleven cities of Friesland in one day, a distance of over 120 miles. This was accomplished for the first time by foreigners in 1890, by three well known English amateurs. Part of the

Zuider Zee becomes frozen in severe weather, and numbers of people thus visit the quaint little Isle of Marken lying some two or three miles from the mainland, having the novel experience of skating over salt water.

Except in Holland and the English Fens, there is little river skating. No other Northern country has the slow quiet waterways and the moderate fall of snow. The skating in Norway is on the lakes and fiords, and is soon limited by the snow to a swept track. The magnificent skating on the Hudson river in America is soon stopped by the same cause.

NEVILLE TEBBUTT.

ROLLER SKATING.—Little more than twenty years ago the pastime of Roller Skating, which had previously been extremely popular in America, took England by storm; rinks sprang up in all the principal towns: to give but one instance, Brighton possessed at that period no less than six.

For a time the pastime flourished exceedingly, and numbered among its votaries many good ice skaters, and the *élite* of the fashionable world; the bad management of most of the rinks, however, eventually brought it into disrepute, and for some years roller skating languished until the opening of the large hall at Olympia, Kensington, by an American company as a roller rink in 1893. This company introduced a great improvement in roller skates, namely the Raymond Ball Bearing Skate, which, though in its main mechanical characteristics modelled on the older Plympton pattern, had the advantages of being lighter, and the addition of ball and cone bearings. The wheels, instead of being turned out of boxwood as formerly, were made of an extremely hard composition which prevented them from wearing into (so-called) flat edges. These improvements made roller skating on a good floor a delightful exercise, and one requiring but little exertion. The Plympton skate, with rocking foot-plate and four wheels working on rubber springs, was suggested by an ice skate of similar construction which Mr. Plympton had designed to overcome the difficulty of skating on a single blade. In the latter skate four small blades were introduced in the positions occupied by the wheels of a roller skate; it was not a success, however, owing to the difficulty of effecting turns on the small blades. The rink at Olympia was, for a time, very successful. Shortly after it opened, the National Skating Association took the sport in hand, and instituted 1st, 2nd, and 3rd class tests for proficiency in figure skating on rollers. These tests were modelled on the existing ice figure skating tests, with which they were almost identical, and the action did much to popularise the sport among good skaters, and those who saw in it greater possibilities than the somewhat mill horse exercise of circling a limited area. Many candidates were successful in passing the tests, and the judges appointed by the Figure Skating Department of the National Skating Association attended the rinks at Knightsbridge, the Aquarium, Lambeth, the Crystal Palace, Leeds, Brighton, and also at the Royal Normal College for the Blind, Norwood, which numbers among its many aids to physical culture two excellent rinks.

Mr. Guy Campbell, a son of the Principal of the College, was an enthusiastic skater, and the blind students, who were intensely fond of the pastime, made such progress under his tuition that two (one of them a lady) were successful in passing the 2nd class test, and eleven the 3rd class.

In this connection I may mention that the blind students, when skating the combined figures, were guided as to the position of their partners entirely by sound, and it was extremely interesting to observe the accuracy with which they timed their turns and returns to the centre by this method.

Two candidates only were successful in passing the 1st class test, the combined figures of which seemed to present a very serious obstacle to most of the competitors, probably from want of sufficient space for practice, as combined skating is really easier on rollers than on ice, owing to the greater certainty with which the skater can control his edges when leaving or approaching the centre.

While giving here some general directions, I may refer aspirants to proficiency in roller skating to the article by Mr. M. Monier-Williams on Figure Skating for information regarding form and the figures to be skated; these are practically the same in both branches of the art; indeed, certain figures, such as the Mohawks and Brackets, were probably discovered by roller skaters.

I believe that the Mohawk steps were first skated by the professionals Moe and Goodrich at the Crystal Palace Roller Rink in 1870, and were afterwards skated and named at the London Skating Club. The Brackets also were skated on rollers, and first described by Mr Witham in the *Field* of 1880.

A somewhat different method is necessary to acquire the art of roller skating as distinguished from blade skating.

The blade of an ice figure skate is always more or less curved, and consequently, when the skater is travelling on an edge, the point of contact with the ice will constantly shift as his body is inclined forward or backward, and, unless his weight is thrown well back, a weak and uncertain edge results. In roller skating there are four points of contact, which render the holding of an edge considerably easier, and the throwing of the weight on the heel is not so

all-important, though always desirable. Moreover a much smaller impetus is required, a comparatively slight stroke of the unemployed foot being sufficient to secure a curve of 40 or 50 feet; indeed, the novice will do well to avoid taking a strong stroke, as he will find that the tendency of a good pair of roller skates is to run with such freedom as to leave him in a sitting posture. This free running tendency has, however, the advantage of rendering unnecessary the somewhat strenuous and violent stroke to which even the most proficient of ice skaters are occasionally compelled to resort.

One point that seems to have escaped previous writers on roller skating is the possibility and desirability of skating the turns (except loops) with all four wheels on the floor. This method, which one may term a flat foot turn, has the advantage of eliminating the clatter and shock incidental to the ordinary method of turning on the front or back wheels and dropping back upon the other pair.

The sensation produced by these flat foot turns is far more pleasing to the skater, and they present to the spectator the smooth and even appearance of a clean-skated turn on ice. The method must be acquired by gradually diminishing the lift of the heel, or toe, when turning, until the turn can be skated in the manner described, the weight of the body being thrown principally on the toe for forward turns, and on the heel for back turns. The toe or heel will then become a fixed point, the other pair of wheels being permitted to slide over the floor. They describe a segment of a circle in the same manner as the marking leg of a pair of compasses, which travels round the fixed point determined by its companion, on which the weight is principally thrown.

Considerable practice will be found necessary in order to skate these turns satisfactorily; but the result is so effective that they are well worth the extra work involved.

As regards that debated point, the comparative difficulty of ice and roller skating, I may say that in skating 3's, Q's, Brackets, Rockers and Counters on rollers, I have found the turns more difficult, but the edges preceding and succeeding them easier to hold than on blade skates, only a very slight effort being necessary to correct any momentary loss of equilibrium. The four points of contact formed by the wheels counteract the tendency to lean forward and to rock, which the novice finds it difficult to overcome on blade skates.

The loops are undoubtedly far more difficult to execute on rollers, and I found that it was only after the most persistent and persevering practice with a pendant rope that I was able to overcome their difficulties. The back loops, as in ice skating, are the most difficult; these I used to skate on the front wheels, the forward loops on the back wheels.

Cross cuts I have only once seen skated on rollers, by a professional at the Brighton rink, who used to skate them on the outside edge forward. The reverse, or Swedish cross cut, I have not seen attempted; indeed, it was but little known in this country even on ice at that time (1893).

In conclusion I may say that although the introduction of artificial ice rinks has caused roller skating to be neglected, it has still its votaries. Many of our best ice skaters of to-day learned their first lessons on rollers, and have still affection for their first love. I can conceive no more pleasant addition to the resources of a country house than a good roller rink with wooden floor, which could also be used for lawn tennis, &c. Such a one would provide amusement and healthy exercise during the many wet and dreary days of an English winter.

E. Syers.

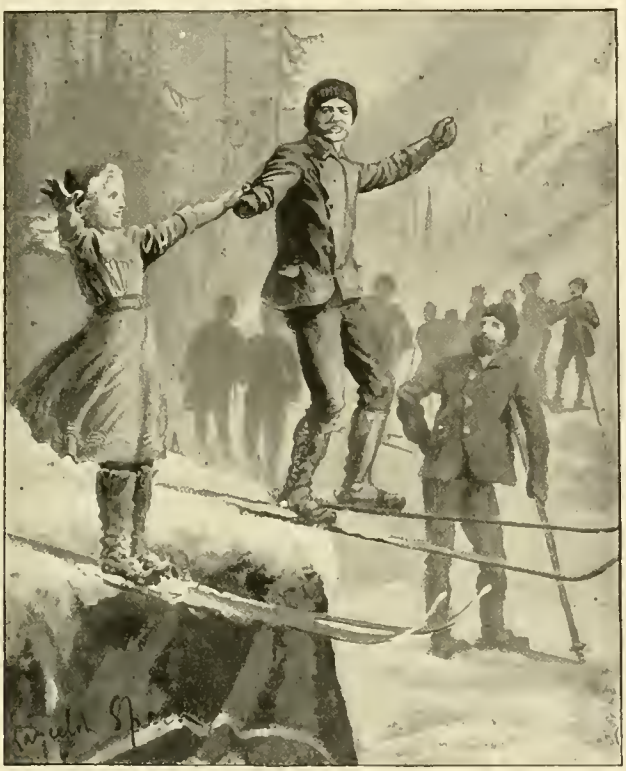
SKI—AND THEIR USE—Very few ever heard of ski in England until the appearance of Dr. Nansen's book on Greenland, and indeed it is only within the last two or three years that the public had any idea of what ski really mean. In northern lands, such as Norway, Sweden, and Finland, ski have always been a necessity; without their aid children could not go to school during the long and weary winter months, when the country is covered by many feet of snow; the farmer could not get from village to village, the postman would be unable to deliver letters, and life would be even more isolated than it is.

In Norway, amid the snow-clad mountains, the exercise has perhaps developed to its greatest perfection. The sport is encouraged in every way, prizes being given in each hamlet to the best skilöber, while the annual competition—a Norwegian Derby—for the greatest proficiency in the art is held on the first Sunday of February in Christiania.

An ordinary-sized man's ski are eight or nine feet long. They are only about four and a half inches wide, and an inch deep at the thickest part, that is to say immediately under the foot, but towards either end they taper to half this thickness. As a rule they are both the same length, and pointed upwards at the toes; but in some of the Norwegian valleys and in Finland one ski is much longer than the other, and that one is usually quite flat.

In the middle of this plank-like piece of wood, which is split with the grain to stand the great strain often imposed upon it, and never sawn at all, the toes are fastened by a leather strap. Another strap goes round the heel in a sort of loop fashion, securing the foot, but at the same time giving the heel full play. A special ski

boot is worn over enormously thick horsehair stockings. This boot (lauparsko) has no hard sole at all, and, instead of being sewn at the sides, the large piece of thick leather which goes under the foot is brought well over the top and secured to what might ordinarily be called a leather tongue. At the back of the boot is a small strap, which is used to fasten the ski heel-strap securely to the lauparsko. Once fixed on the ski, the foot is so secure no fall can loosen it, and the only way to extricate the foot is to undo the three straps. Outside these huge ungainly



Learning to Jump.

hair stockings and strangely comfortable boots thick gaiters are worn. It is necessary to keep the feet and legs warm in such a cold land as Norway, where the mercury freezes in the thermometers, and snow six or seven feet deep covers the land sometimes for months together. Such cold sounds appalling, but it is quite the reverse. The air is absolutely dry, and there is seldom any wind.

The great annual competition at Christiania lasts two days; the first day is for distance, about twelve English miles; the second for jumping. About a hundred competitors come from various parts of the country to strive for these blue ribbons of the ski-racing world. The ascents and descents are about four hundred feet, the competitors having to cross clefts and ravines, hillocks and mounds in turn, a road with every possible kind of obstacle being chosen to tax the proficiency of the performers. Along the flat the skilöber shuffles, at each step accomplishing a distance of several feet; down the hill side they glide gaily over the crisp-frozen snow, keeping their ski as nearly together as possible and bending their knees; the speed becomes tremendous and would be dangerous could it not be lessened by thrusting into the snow a pole some six feet long which the skilöber carries, to act as a kind of drag. Going up hill—even to the initiated—is a trial of skill, as the general tendency of the ski is to slide backwards. The clever performer stamps the snow with his shoes so as to get a better bite.

The twelve English miles are generally accomplished in about an hour and three-quarters, but, though that is amazing, it is nothing to the second day's competition, which is for jumping, an act which strikes terror into the heart of an onlooker. A very steep hill side is chosen for the purpose, half way up which a small platform built out in the snow enables the competitor to

spring from its edge, eighty or ninety feet on to the sloping hill below.

The winter saw a hundred and five competitors at Holmentollen; at the given word a man rushed from the plateau on the hill top. Down the hill he tore, the pace in consequence of the steepness being tremendous. On he came till he reached the little platform built out from the mountain side; then, making a huge effort, his legs doubled up and his arms whirling like windmills in the air to keep his balance, he jumped.

Out of those competitors over sixty managed to regain their footing and complete their descent of the hill. The longest jump was nearly ninety feet!

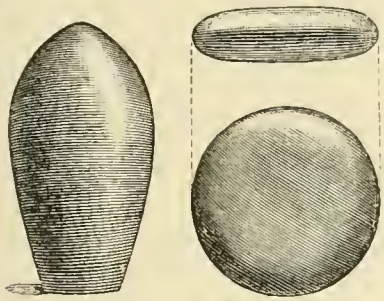
A Ninety Foot Jump.

A man once sprang 120 feet, but he fell after landing in the snow; therefore 103½ feet is the record for a clean jump on ski.

Ethel B. Tweedie
(*Mrs. Alec Tweedie*).

SKITTLES—This is probably one of the oldest games on record, and used to be far commoner a couple of decades ago than it is now. Even now many village inns have a place set apart for skittles.

I have seen it played in three different ways. One consists of but four large pins, arranged on



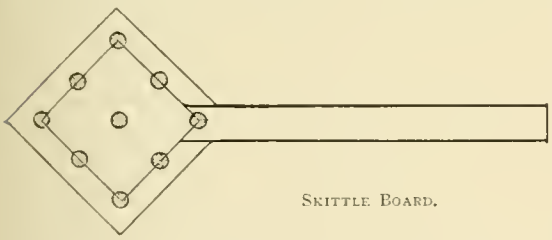
Pin and Bowl, or Cheese.

a square framework, one of the angles only being presented to the player. The bowl used is of the shape of a cheese and is made of the toughest, hardest, and heaviest wood procurable.

The bowl must be thrown upon the skittles and not rolled up to them: it thus requires more bodily strength than the variety in which nine pins are used and the ball rolled up to them.

The best mode of playing it is to throw the bowl with a round handed swing of the arm, so as to strike the nearest skittle at the right of its upper third. The bowl then springs on to the second skittle and from this generally twists on to the third, while the fourth skittle is sent down by the roll of the one first struck.

It is not at all easy to make this throw successfully, and many players prefer driving down the first and third skittles with a straightforward shot, and then making their second bowl spring across from the second to the fourth. This latter stroke appears very difficult, but is



Skittle Board.

soon learnt; the great point is to throw the ball high, so that it may drop as perpendicularly as possible on the left of the upper third of the second skittle. By constant repetition of this, practice will overbalance mere occasional brilliancy of play.

Another form of this game is played with nine pins, which are set up in a regular order, the aim of the players being to throw down as many pins as possible in the fewest attempts. Each player is permitted to throw three times at the pins and if he can knock them all down in two throws, it is called a single and they are again set up for his last throw; if he can knock them all down in one throw, it is called a double, and they are set up again.

There is another form of this game called the American. The floor is planked in a line with the pins to where the thrower stands, a marker is used, and there is on one side a raised rectangular platform just large enough to hold the balls, sloping down towards the player; the balls are put in at the end near the pins and roll down to the player.

There is yet another form called the Dutch skittles. It is a modification of the nine pin skittles, the pins being higher and the centre one called a king, with a crown on its head. The great aim in this game is to strike the king out of the board without knocking down any of his subjects. If this be done, the game is won. In all other cases the king counts for no more than that of his subjects.

F. T. Pollok.

SLEDGING—As usually practised in the North of Europe, more especially in Russia and Scandinavia, sledging is a necessary and expeditious mode of locomotion for some six months in the year, since away from the railway tracks there are no other means of travelling over the snow-covered country, the use of wheeled vehicles being out of the question. In the large towns it is the fashion amongst the upper classes to make up sledging parties, and it is a most pleasurable and exhilarating sensation to find one's self on a still moonlight night gliding over well-kept frozen roads in a comfortable sleigh with plenty of fur rugs and drawn along by a pair of fast-trotting horses to the accompaniment of the cheerful jingling of sleigh bells. In Christiania. trotting races are often held in January at the time of the horse fair, on the Fjord, when the ice is in good order. The course being straight, as many as sixty or seventy sleighs will start in a row, making a very exciting spectacle to witness. Trotting matches also take place at Stockholm on the ice, but this city has not such a pleasant climate in winter, being exposed to strong cold N.E. winds from the Gulf of Bothnia. Petersburg is the city in which the finest sledges are to be seen, the fastest trotters and most luxurious and expensive furs. The Nevsky Prospekt (the Regent Street of Petersburg) on a fine afternoon in mid-winter presents one of the grandest sights in Europe in that respect. Moscow also should be visited at that time by sporting Englishmen who are able to afford the expense of a journey there. In Norway and Sweden, light single horse sleighs are used mostly for travelling up country, but double ones seating two persons are also to be found at the posting

stations. The roads are kept in excellent order, rather better, as a rule, in the former country than in the latter, the snow-ploughs being in constant use, so travelling is expeditious and inexpensive even in the mountainous districts.

But on the Russian country roads the clumsy double sleighs with fixed leather hoods, which are ordinarily in use, necessitate the employment of more horses, three being generally used. These are harnessed to the vehicle in a ludicrous variety of positions, sometimes all three being tacked on to one another in single file, the "Yemtschik," or driver, riding on the fore horse, one of course being in the shafts; at other times two are yoked, one at each side of the shaft horse. Sometimes one is harnessed to the near side and the other in front; and again sometimes two are driven in front of the shaft horse. No regularity is observed, but they are ridden or driven according to the caprice of the yemtschik. The harness is of the most primitive description, and is patched and repaired with rope, string, and odds and ends of any kind of old leather available.

The smell of rancid birch bark oil with which the harness was originally cured and cleaned becomes intensely disagreeable after a time. The roads in winter, which one would naturally expect to be kept level and clear by the snow plough, are as bad as it is possible to conceive, for the snow plough is seldom in use, and the consequent joltings over the uneven surface are most unpleasant experiences for the traveller on a long journey; the scenery, too, owing to the flatness of the country and the denseness of the forests, is uninteresting and monotonous in the extreme, and not a source of pleasure to the traveller. The horses, driver and sledge are changed at each station, which vary in distance from fifteen to thirty versts (ten to twenty English miles); a verst = 1,167 yards.

About three kopecks (fivepence) per verst is the usual charge for horses, and one kopeck (about $1\frac{3}{4}d.$) per verst for driver. There is usually a tolerably comfortable guest room at the stations, and a "samovar," or tea urn, is always in readiness. Milk is generally procurable; but of course a well-furnished provision basket with wine, spirits and etceteras should be taken.

Norway presents a great contrast to Russia, owing to the vastness and grandeur of the mountain scenery, especially when it is enveloped in a mantle of snow. A very enjoyable trip may be made by a hardy sledge traveller, starting from Christiania in February as the days begin to lengthen, taking rail to Hamar on Mjösen Lake, and driving *viâ* Lillehammer up Gudbrandsdal over the Dovre Fjeld to Stören, about a 200 mile sledge journey, thence by rail to Trondhjem if necessary. The return journey south can be made by rail and sledge *viâ* Rendalen and North Österdalen to Koppang, thence by rail back to Christiania. Or one may take the rail from Stören to Röraas, thence to the north end of the big lake Faemund, driving down it from Nordvigen, on four or five feet of ice, to Elgaaen, some 20 miles distant; from there some 50 or 60 miles over the mountains to Idré in Vestradal, or Western Dalecarlia. One can drive down this valley *viâ* Lake Siljan in Dalecarlia through a most picturesque and interesting country to Carlstad, on Lake Wenern, some 650 miles in all; this valley is rarely or never visited by Englishmen in winter. For such a trip it would be best to buy (or hire) a sledge and harness, and sell them at the end of the journey. A long sledge coat and rug, both of fur, must be taken, and reindeer skin Komagers (with the hair outside) for the feet and legs (these can be hired and returned when no longer wanted); also fur cap and mittens, a spare shaft in case of accidents, and a ball of strong tarred marline for mending a broken shaft. Be sure to have some stout wire netting, with small meshes, fixed a good height above the dash board on the front of the sledge, to prevent the snow cast up by the horses' feet from hitting the face. The road stages average from about 6 to 15 English miles apart. The price for horses is from one kroner 50 öre, to two kroner per Norsk mile (7 English miles, 8·89 kilometres); a Swedish mile = 6 English.

It is usual for the traveller to drive himself in Scandinavia, the post-boy sitting behind; 30 to 40 öre (3*d.* or 4*d.*) is enough for drink money. It is highly dangerous to drink spirits which have been exposed to the outside air at a low temperature, they should always be warmed. If a pocket flask is carried, it should be placed in an inner pocket near the body. The greatest cold experienced by the writer on any sledge journey in Scandinavia or elsewhere was once when crossing the Dovre Fjeld towards the close of December, on which occasion the Reaumur spirit thermometer outside the posting station of Kongsvold, which is nearly 4,000 feet above sea level, stood at 36 degrees of frost at nine o'clock at night. This is equal to 49 below zero of Fahrenheit, or 81 degrees of frost. The drive across the Dovre Fjeld at such a time takes one over a scene of magnificent desolation on a grand scale, and is well worth the time and expense. The cold does not inconvenience one in any way, for the air is absolutely calm and the lightness and transparency of the atmosphere most remarkable.

Frost bites are very rare in Norway, though common in Russia and parts of Sweden. The stations in the more frequented valleys are excellent, the accommodation very good, and the food plentiful of its kind, though a well-filled hamper should be taken and some old port wine and a bottle or two of Scotch whisky, and one or two of aquavitæ if required.

GERARD FERRAND.

SNAKES—Snakes are to be found in most parts of the world, and are the subject of unreasoning horror to many. On coming to know somewhat of their ways and powers, it will be found that they are not much to be dreaded, that they are very beautiful and interesting, and well worthy of the attention of sportsmen. They are difficult to find, the swift ones are hard to catch, and the large ones are immensely strong, and require great skill and strength to capture them alive.

In my experience of fifty years, only two Europeans of my acquaintance have been bitten—one by a cobra he caught by the tail as it was nearly buried in a rat-hole. Unfortunately the hole had a sharp turn and another exit, from which the snake got his head out and bit him in the thumb. He at once put a cord very tight above the bite and cut away the flesh, and lived for many years, although he suffered a great deal from abscesses, &c. The other case was a bite from an adder kept by one who collected live snakes and carelessly pointed his finger too near one. He also recovered after a good deal of pain.

In England there is more chance of being bitten by a mad dog than by an adder.

Although the number of natives reported to be bitten seems large, it is not so great considering the hundreds of millions in India, and that they have bare feet and legs, live in houses without doors, sleep on the ground, walk in the dark, and take practically no precautions.

Treatment of Snake Poisoning—Send at once for a doctor. Immediately tie a strong cord tightly round the finger or limb above the bite—also two or more a few inches apart, twisted as tightly as possible, higher up. Twist them tight with a piece of stick as for a tourniquiet, cut out the part bitten with a sharp knife, wash well, allow the wound to bleed, and squeeze to get out the poison. Cauterise with a red-hot iron, and thereby prevent absorption of poison into the blood. Give stimulants till surgeon arrives: fifteen drops of liquor ammoniæ in wineglass of water every twenty minutes—four doses. Brandy or other spirits in three times amount of water, but not sufficient to cause inebriation, should be taken, and food stimulants. Rest, coolness and good ventilation are important. The favourite remedy of keeping the patient moving about is wrong, as it only increases the exhaustion.

Of the numerous snakes that I have killed or caught alive none have had a chance to bite, except one at Lucknow, which was seen shining in the water outlet from my bath-room. When boiling water was put in, the snake came out at the outer end, where I took it up on a loading rod. I saw it was not a cobra by its small head and his colour, and took it to a tame mongoose. The beast had more sense than I, and at once took care not to be bitten. The snake began to yawn, and disgorged a snake nearly as long as itself. I then killed it, for it would have got more lively when relieved of its meal. On looking it out in Fayrer's book it turned out to be *Bungarus cæruleus*, a very poisonous sort. This made me more careful of snakes that I did not know.

Snake Capturing—A good way to catch them would be leave the drain from the bath-room open, or with a trap-door only opening inwards, taking care to secure any outlet. They require water, and in the dry season are often attracted by the flow from the bath or gussul khana.

Eggs are a very good bait, as most snakes like them and swallow them whole. One, the

A Ten Foot Python.

deirodon or anodon, has no regular teeth except modifications of the spinal vertebræ far back in the gullet as gular teeth; these break the shell as it goes down the throat. Snakes have been known to squeeze into a hen-house; they can flatten the ribs, but after swallowing some eggs are unable to get out. This might be used as means to trap them.

It is not easy to run some snakes down. One evening I saw a cobra gliding over a walk in my garden at Secunderabad, and gave chase with one European and three active natives. It made very good running and was lost to sight several times, went up and through the branches of trees rapidly, and gave us all we could do not to lose it. After half an hour's hard work it all but escaped. I found it coiled up in a thick shrub growing in a large pot, poked it out and killed it. I now look on the skin—five feet—hung up in my room, with the skin of a pytl on

that has been tanned. This makes the very toughest leather, neatly marked with the scale-like indentations.

The capture of a large python would well repay a sportsman and be worth the work and cost if the snake were taken alive; if above twenty feet long, it would be of great value to any zoological collection. The best I killed was about sixteen feet long, in the Annamallys; it had just swallowed a large black lungoor, one of the most active of monkeys. Professor Owen says: "They can outclimb the monkey, outswim the fish, outleap the jerboa, and, suddenly loosing the coils of their crouching spiral, they can spring into the air and seize a bird upon its wing." Their strength is also surprising. Returning to my house at Kamptee at 3 o'clock a.m., the river being in high flood, I saw by the lantern light a snake in the verandah. By his fine marking I made out that he was a python, and therefore not poisonous, and went for him, got

SNAKE CHARMER.

my foot on his neck, and caught hold of him. Two sturdy native servants at once came to my help, and it was all we could do to get him into a strong cage, although he was only between seven and eight feet long, such was his muscular power.

In the morning the various birds came up to his cage, and stayed screaming so near that he could have caught them had he been free.

On one occasion a lad, fifteen years of age, was heard calling out; his comrades, thinking he was caught by a panther, were afraid to go to his aid, and ran for men; they found him killed by a python, and got it; it was fifteen feet long. This was near Hyderabad.

The Indian python *Molurus* is not known to exceed twenty feet. The python *Reticulatus* of Burma and the Malayan region is said to reach thirty feet; and the carpet snake, an Australian python, twenty-five and a half feet. I have seen tracks of apparently larger snakes in the Travancore forests, without being able to get up to them, as they led either into impenetrable swampy jungle or impracticable rocks. Had I a chance of snake-hunting, I would engage a snake-charmer, as they are experts, and can draw out cobras from their holes by music.

A large python when found gorged—a very rare event, as they get into such safe retreats—might be noosed with a strong rope, the other end having been made fast to a tree. One should be armed with a sharp hunting-knife, so as to cut him asunder in case of being caught in his coils.

To catch a small snake alive, push him from side to side with a slight, straight stick five or six feet long; this is a safe way of stopping without injuring him. Secure him with a landing net, as used for large fish, with a long handle.

A sharp stroke with a stick easily dislocates the vertebræ, and the reptile can be safely killed.

Books on Snakes—Sir Joseph Fayrer's *Thanatophidia of India*. *The Poisonous Snakes of India*, by Joseph Ewart, M.D. *Snakes: Curiosities and Wonders of Serpent Life*, by C. C. Hopley. *The Reptiles of British India*, by Dr. Günther. *Indian Snakes*, by Dr. E. Nicholson.

P. W. L'ESTRANGE.

SNIPE—The difference between a snipe and a woodcock is not merely one of size. Irrespective of the fact that the former rarely exceeds one-third the weight of the latter, the following characteristic distinctions may be noted. In the snipe the head is streaked or barred longitudinally, in the woodcock transversely; in the former bird the flight feathers are plain, in the latter variegated; in the snipe, also, the leg is bare above the tarso-tibial joint (popularly, though wrongly, termed the knee), while in the woodcock it is feathered to that joint. Inattention to these differences has given rise to many errors, amongst others to an announcement that the European woodcock had been met with in South America (*The Field*, 4th April, 1896)—a statement for which there is no foundation.

Of the twenty or more distinct species of snipe known to naturalists, three only are found in the British Islands, the remainder being natives of Siberia, China, India, Ceylon, the Malay Archipelago, Australia, New Zealand, Africa, Madagascar, North and South America.

The so-called "Common" or "Full" Snipe (*Gallinago gallinaria*), so much sought for by English sportsmen, has a wide geographical range. It is found throughout Europe (including Iceland and the Faeroes) and Northern Asia, up to about latitude 70°, and migrates southward in winter to North Africa, India, and the Malay countries. In India, China, and the Malay Archipelago its place is more or less usurped by two species of so-called **Pintail Snipe** (*Gallinago stenura* and *G. megala*), characterised by possessing respectively twenty-six and twenty tail feathers (instead of fourteen), and having the outside ones (eight and six on each side

respectively) so attenuated as to consist of little more than pin-like shafts. In South Africa, Cape Colony, and Natal, the English snipe does not occur, its place being supplied by a larger and darker species, known as the Black-quilled snipe (*Gallinago nigripennis*), while in Madagascar and Mauritius is found a remarkably long-billed and long-toed snipe (*Gallinago macrodactyla*), in which the bill measures as much as $3\frac{1}{2}$ inches.

The common snipe of North America (*Gallinago wilsoni*) is so like our English bird as to be scarcely distinguishable from it, except (it is said) by the possession of sixteen instead of fourteen tail feathers, though it is doubtful whether this alleged peculiarity is constant, or independent of moult.

In South America there are several species of snipe, some of which (as *G. frenata* and *G. paraguayæ*) so closely resemble our own bird and Wilson's snipe in colour and size—the measurements of bill, wing, and tarsus being nearly identical in these four—that to the majority of shooters they appear indistinguishable, while others (as *Gallinago imperialis*, *jamesoni*, *stricklandi*, *undulata*, and *gigantea*) are so conspicuous by their larger size and varying plumage as at once to attract attention. The largest known snipe is *Gallinago gigantea*, a native of Brazil and Paraguay. It is about double the size of our bird, being 19 inches in length instead of 10 inches, with a bill of 5 inches instead of 2·8 inches, wing 6·6 inches instead of 5·3 inches, and leg 2·2 inches instead of 1·3 inches.

In Australia there is a large snipe (*Gallinago australis*), measuring $11\frac{1}{2}$ inches, with a wing nearly $1\frac{1}{2}$ inches longer than in our bird, and having 18 instead of 14 tail feathers, the two outer ones in their attenuation resembling in character those of the pin-tailed snipe.

The snipe of the Auckland and Chatham Islands are about the size of our Jack Snipe, of a sandy brown colour above, mottled with darker brown; face, neck and underparts buff.

Painted Snipe—The Painted Snipe, so called from their variegated plumage, belong to a very different genus (*Rhynchæa*), and in their mode of flight, and actions generally, exhibit some affinity to the rails. From their sluggish habits and feeble flight they afford but poor sport to the gunner, who generally reserves his cartridges for something more worthy of his attention. Three species are recognised by naturalists; one which is common to Africa, India, Ceylon, Burma, China, Japan, the Malay Peninsula, Sumatra and the Philippines, and is known as *Rhynchæa capensis*, seu *bengalensis*; a second occurs in Australia, *Rhynchæa australis*, and a third in South America, *Rhynchæa semicollaris*, which is met with from Peru to Chili, Uruguay, Paraguay and Argentina.

Common Snipe—Of the three species of snipe found in the British Islands, the so-called "Common" or "Full" snipe is at all times the most numerous. A great many remain to breed with us, in haunts favourable to their mode of life, but the majority which are killed here in winter are immigrants from the Continent, and come to us about the end of October, or first week of November, those which escape the gun and the poacher's snare quitting the country in spring for more remote breeding haunts.

Those who delight in rural sights and sounds are familiar with the curious zig-zag flight of snipe in the pairing season, and the singular sound which is produced when the bird descends from a height with half-closed wings. This has been variously termed "humming," "drumming," and "bleating." Very different views have been expressed as to how this sound is produced, and it is disputed whether it is vocal or mechanical. One writer asserts that it is effected by the action of the wind causing a vibration of the outer tail feathers (See Meves and Wolley, *Proc. Zool. Soc.* 1858, p. 202.)

Common Snipe.

In the opinion of the writer it is caused by a vibratory movement of the flight feathers in the downward descent of the bird (as happens with varying sounds in the peewit and rook): and this is the view taken by Naumann, Jardine, Hancock, Saxby, Chapman, and other observant naturalists. A long chapter on the subject reviewing the various theories will be found in the present writer's "*Essays on Sport and Natural History*," 1883.

Sabine's Snipe—When Vigors, in August, 1825, received from Queen's Co., Ireland, a very dark, almost black specimen of a snipe, he took it to be an undescribed species, and named it after a distinguished contemporary (*Trans. Linn. Soc.* vol. xiv. p. 557). At irregular intervals other specimens were subsequently obtained, and although in none of these did any of the measurements differ appreciably from those of the common snipe, the singular coloration seemed to justify its separation from that species. In December, 1870, there were at least five-and-twenty examples on record (*The Field*, 10th December, 1870), and since that date the

number of recorded specimens has been more than doubled. In *The Irish Naturalist* for January, 1895, Mr. Barrett Hamilton, reviewing the records, remarked that out of fifty-five examples of Sabine's snipe existing in collections, thirty-one were obtained in Ireland, twenty-two in England, one in Scotland, and one in France. This bird is now generally regarded as nothing more than a melanic form of the common snipe.

Great or Solitary Snipe—Larger than the common snipe, and when in good condition double the weight, *Gallinago major* may be recognised not merely by its size, but by the white bar across the wing, white outer tail feathers, and more profuse spotting of the under parts. Its habits are altogether different. It does not breed in any part of the British Islands, but arrives from the north of Europe in September, long before the Continental common snipe make their appearance; it affects much drier situations than the better known bird, is generally solitary, rises heavily, and flies off silently.

Instances of the occurrence of the great snipe here in spring are very unusual; it is much rarer in Ireland than in England, and is equally rare in Scotland.

Jack Snipe—Less numerous than its larger relative, the jack snipe (*Gallinago gallinula*) is to be found generally distributed throughout the British Islands, in haunts congenial to its habits, between September and April; for it is only a winter visitor, never remaining to breed here as does the common snipe. In Europe its nesting haunts are in northern Scandinavia and Russia, whence it migrates in autumn to North Africa, visiting Egypt and following the course of the Nile to Abyssinia. In Asia it breeds on the tundras of Siberia as far north as latitude 70°, migrating to Japan and even to Formosa in the cold season, as well as to Tenasserim, India, Persia and Turkestan.

In its habits it differs considerably from the common snipe. As a rule it is very solitary, and lies so close as to be almost trodden upon, and then, instead of rising with a loud squeak and flying to some distance, it rises silently and, if not shot at, seldom goes far before alighting. It is only when deep snow lies in patches on the ground that the jack snipe show any tendency to congregate. At such times several may be found within a few yards of each other in sheltered situations, under tussocks, or to the leeward of reed-beds, where the snow has not covered the ground where any food can be obtained. Under such conditions the present writer once shot seven jack snipe in about half-an-hour on a small patch of bog land in the co. Kildare.

Snipe-shooting—How to make a good bag of snipe is a problem upon which many an opinion has been given. Whether to shoot over dogs, or without them; to walk down wind or up wind; to fire the moment a snipe rises, or to give him time; to use very small shot, or pellets of a medium size, in case of a chance at a duck or hare. These are some of the questions which perplex the tiro, and puzzle even experienced shooters to answer.

Those who have had much experience in snipe-shooting are of opinion that the sportsman should always, if possible, walk *down wind;* for the reason that as snipe, like other birds, generally rise head to wind, they jump *towards* the shooter, as it were, instead of away from him, and hang for a second in the air before going away. In so doing they offer a pretty cross-shot. This is all very well if the country be very open, and you can choose your direction, but in an enclosed country, where one has often to follow a winding stream, or go from one point to another irrespective of wind, one has to take one's chance how snipe may rise.

The argument in favour of walking *up-wind* is that the birds are less likely to hear your approach, and will therefore lie better. This course is doubtless preferable when a sharp frost has made everything very crisp, and the ground crackles at every step you take, thereby alarming the snipe, which are likely to rise out of shot.

Amongst ordinary game shots, not one in ten probably is a good snipe shot, and there is more knack required in killing a snipe than perhaps any other bird. The following practical hints for acquiring this knack are given in the Badminton volume on Shooting, *Moor and Marsh*, p. 146. "Always aim *above* a snipe; the bird is pretty certain to be on the rise when going away, though you may not think so. In the same way, if crossing, aim well forward, or one beat of the powerful pinion will put the bird three yards a-head while the finger is pressing the trigger. Let 'forward and high' be an absolute rule when pulling on snipe."

Dogs—As to dogs, setters are best fitted for such work, and are generally stronger in constitution than pointers, but it is doubtful if they ever attain the regularity and certainty in beating of the latter. Snipe lie in all sorts of out of the way places, often in the least expected spots. A setter will dash over them, rout them out, slash through the wet ground, spring the ditches, and leave and lose many a bird which the less hardy pointer will be almost certain to find. The latter will walk gingerly through the gorse, leap the wet ground cautiously, and, though moving with equal rapidity, will, as a rule, find more birds. Nevertheless, one of the best dogs for snipe which the writer ever owned was a red Irish setter, which he received as a puppy and trained to retrieve. On an Irish snipe bog full of soft places, this dog was invaluable, for he often had to pick up a bird which fell on spongy ground, which would not support his master's weight, and he would swim out to the middle of a pool for a duck or teal, even in the coldest

weather. Sir R. Payne Gallwey is of opinion that the best dog for use in snipe shooting is a small Irish water spaniel. Others maintain that a well broken retriever is all that can be desired.

Boots—As to the best boots for snipe-shooting opinions differ. Long boots that reach far above the knee like fisherman's boots are very tiring to walk in all day; ordinary shooting boots with or without gaiters will not always keep the feet dry, even if waterproof; sooner or later one is certain to get in over the tops. In the pursuit of home-bred snipe in the early part of the season, one may just as well wear these, and get wet as soon as possible, but one must move quickly, and so keep the feet warm. In mid-winter, when the water is icy cold, and there is perhaps a lot of snow lying about in patches, the best boots are those which reach only to the knee, not above it, and so do not interfere with the action of the knee-joint. These, if made in two pieces instead of three, so as to reduce the number of seams, and lessen the chance of leakage, may always be kept waterproof with a little care. The mud should never be scraped off when dry, but washed off with a brush and hot water. The surface of the leather is then undamaged, and in a sufficiently warm condition (after being wiped dry with a cloth) to receive the waterproof mixture, which should be well rubbed in with the hand. The following recipe is an old but a good one: Boiled linseed oil, one pint; beeswax, one ounce; Burgundy pitch, half an ounce; spirit of turpentine, two ounces. Melt the first three in an earthen pot, and then add the turpentine. This ointment well rubbed in before the fire will be found most efficacious.

Guns and Charges—The lighter the gun the better for snipe shooting, though we do not advocate a 16- or a 20-bore. They have too small a killing circle, and 12-bores nowadays are made sufficiently light to answer the purpose. A 12-bore weighing say 6½ lbs. with a charge of 2¾ drs. of Curtis and Harvey's No. 6. (or the equivalent in Schultze or E.C. powder) and an ounce of No. 8 shot will be found most effectual. A heavier gun than this handicaps the average shooter when out snipe shooting, although we have often seen professional coast gunners kill snipe and redshanks with a much heavier charge in a 10-bore gun. These men, however, in daily practice and in robust health, will carry all day with ease a gun that would tire an amateur in an hour.

Size of Shot—As to the best size of shot opinions differ. A wild-fowler of experience says No. 9 may be taken as the shot *par excellence* for snipe; No. 7 or 8 at farthest if the day be wild, but the first named will answer best at all times. True there are the chances of meeting with duck and teal in the very best places for snipe; but if No. 7 or 8 shot can bring one down No. 9 will do so with equal certainty, for not one of the three sizes will kill such large birds except under the alternatives a "short fair," or a "long chance" shot.

That most enthusiastic of snipe shooters, Colonel Peter Hawker, (the author of *Instructions to Young Sportsmen*,) thought there was nothing like No. 7. In his very entertaining *Diary* we find this remark:—"The difference between large and small shot in a gun is that the former goes in like the back of a knife and occasionally only; the other cuts like a razor with unerring certainty. No. 7 is best for everything unless you take a duck-gun."

Record Bags—For records of large bags of snipe in the British Islands the reader cannot do better than turn to the pages of the Badminton volume on shooting (*Moor* and *Marsh*, pp. 140–143) and to *The Fowler in Ireland*, pp. 205–211. The west of Ireland is by far the best part of our islands for snipe shooting. Snipe are more numerous and consequently larger bags are made in the counties of Cork, Kerry, Clare, and Mayo than elsewhere in the United Kingdom. Forty or fifty years ago Norfolk and other eastern counties of England afforded nearly as good sport as Ireland does now, or lately did, but the drainage and enclosure of marsh and waste land has interfered greatly with the snipe-shooter's sport.

For large bags of snipe the sportsman must go to Egypt or India. There are few localities perhaps better suited to this bird than the great marshes of Lower Egypt, where Captain Shelley states that in the month of February he has shot over forty couple in a day (*Birds of Egypt*, p. 249). In India, Colonel Peyton has killed between 80 or 90 couple of snipe before mid-day in the marshes on the banks of the Cabul River, where it debouches from the hills before entering the Peshawur river, and since his day even this record has been beaten by English officers in India and Ceylon, owing not merely to the abundance of birds there, but to the increased facilities for shooting them with central fire breech-loaders and improved ejectors. The largest bag of snipe shot in one day in Ceylon was made for a bet, some five-and-twenty years ago, when 110 couple were killed by one gun (*The Field*, May 14, 1898).

Weight of Snipe—Amongst the questions that periodically crop up for discussion in the columns of *The Field* and other journals devoted to sport, we are accustomed to read, "What is the average weight of a snipe?" The answer must depend upon circumstances. As soon as grouse shooting has commenced, a lot of home-bred snipe are moved from the moors and get scattered about the country. They are not then in the best condition, and often weigh no more than 3 oz. or 3½ oz. The foreign snipe come in about the first week of November, and are in the finest order within a week of a frost. The

average weight then will be from 4 oz. to 4½ oz., and perhaps one in a hundred will pull down the scale at 5 oz.; anything above this must be considered an unusual weight.

A solitary or great snipe will weigh from 7 oz. to 10 oz., according to its condition and the state of the weather at the time. A jack snipe is generally half the weight of a common snipe, and varies from 2 oz. to 2¾ oz.

Springes for Snipe—As a device for capturing snipe, a horse-hair noose at the end of a pliant wand, bent downwards and set in such a way that it flies upwards when the struggles of a captured bird release a wooden trigger, is very effective if set with judgment in the right spot by a skilful operator. But it is a poaching contrivance and scarcely deserves notice in an encyclopædia devoted to sport. It is mentioned here chiefly on account of its general adoption in some parts of Ireland, where large numbers of snipe, and woodcock also, are by this means captured for sale to the game dealers. Illustrations of a springe for snipe or woodcock will be found in *The Ornithology of Shakespeare*, 1871 (p. 229), in *The Fowler in Ireland*, 1882 (p. 218), and in Macpherson's *History of Fowling*, 1897 (p. 454). In the last-named work may be found also much interesting information relating to the methods of capturing snipe and woodcock in different countries, whether by springes in England and Ireland, by drag nets in France, by flight nets in Holland, or by tunnel nets in Sicily. The so-called "Polish snipe snare" is, perhaps, the simplest of all the devices mentioned, consisting of a number of horse-hair nooses attached to a line stretched between two pegs, which are driven into the ground at such a height that the lower half of the noose just touches the breast of any snipe that may approach it when feeding.

J. E. Harting.

SOLITARY SNIPE IN RUSSIA—The Solitary snipe, or double snipe, a variety coming—in size and appearance—half-way between the ordinary or single snipe and the woodcock, is rarely met with in the British Isles, and when one is seen he is, as the name implies, a belated solitary specimen, driven to our shores by contrary winds or lost through temporary aberration of the instinct which should have carried him with his fellows in their customary line of flight south-eastwards. In Russia, which apparently lies in that line, he is seen for about a fortnight, during which space of time companies of his tribe pass like a great army over the region within, roughly, a hundred mile radius of St. Petersburg, billeting themselves upon the grass, stubble, and potato fields in batches of ten, twenty, or a hundred. The new arrival has come from his breeding grounds somewhere in the north, and is bound for Egypt and Asia Minor and beyond; he is weary, and arrives thin and quick on the wing, like his cousin the ordinary snipe; but a few days of rest and fat feeding by suction soon change all that, and at the end of the week or fortnight of his stay he is a very different bird—fat, lazy, loth to rise, and slow and heavy on the wing when rise he must.

Should any sportsman reading these lines, having friends in St. Petersburg, desire to make the acquaintance of this beautiful bird, let him be on the spot on or about August 31st, old style, which is, being interpreted, September 12th. That day is the central one of the red-letter fortnight of the doubles. They begin to arrive—a pioneer or two—some ten days before this, increasing in numbers up to the day indicated, and afterwards decreasing again until, by about September 25th, English style, if one belated specimen be still found in the fields he is probably wounded, or else he would have felt himself impelled by his instinct to move on. During his fatal fortnight of fatness there is no bird that flies more pitifully accessible and helplessly unable to avoid the sportsman's pellets. So fat has he become that he may occasionally be kicked with the foot before he will move, and when he does elect to fly he must soon alight again to take breath, even if shot at and missed.

Unfortunately for sportsmen, it is not every year that is a good "double" year. For, whether owing to an unfortunate breeding season among the birds themselves, or whether the vagaries of wind and weather have driven the flights to east or west of the usual course, it sometimes happens that the St. Petersburg sportsman is disappointed of his doubles. In that event the fortnight passes dolorously, with but here a snipe and there a snipe, and with no rich flights; whereas in a good double season a fair shot may bag his thirty or forty brace in a day.

Fred. Whishaw.

SPORT, OBSOLETE—BADGER BAITING—Many animals, the fox, for instance, have to pay a price for their existence, and just a century ago this is what the badger had to pay for his.—"They dig a place in the earth about a yard long, so that one end is four feet deep. At this end a strong stake is driven down. Then the badger's tail is split, a chain put through it, and fastened to the stake with such ability that the badger can come up to the other end of the place. The dogs are brought and set upon the poor animal, who sometimes destroys several dogs before it is killed."—This is a friendly description, and conveys but little idea of the barbarities actually practised. That the badger was not alone the victim of this fiendish cruelty is evident from the concluding sentence of the above quotation. Often half-a-dozen dogs were maimed for life in the contest, a jaw torn away being a common

Drawn by A. Thorburn

Lizars Celestine Engraver sc

Snipe

result. A glance at a badger's armed cranium suggests a good deal in this connection, the interlocking teeth—the "holders," and the way in which the lower jaw is articulated with the upper, explaining the hold which the badger is able to take and keep.

It may at once be stated that the older barbarous methods of badger baiting had nothing in common with badger hunting proper, or "digging the badger." If fairly pursued, this is a legitimate sport to every one concerned —including the badger. The method of hunting him nowadays is to wait quietly until he has left his "earth" on his nightly foray, then to insert a sack with a running noose in each of the principal entrances to his abode. Having given him a fair start, a scratch pack—and it matters little how this is constituted so long as the members composing it will give mouth—is laid on his trail, and *Meles taxus* is hustled unceremoniously homeward. If the plans have been properly laid, his reception is often of an undignified character, for he suddenly finds himself hopelessly involved in a sack—that is, unless he has gone clean through it. Once taken, he may be transferred to a new country to establish a new earth, may be conveyed home as an interesting pet, or, best of all, turned loose so as to afford another (or a series) of moonlight runs. Only those who have taken part can appreciate the fun to be derived from rushing the "brock" back to his dark retreat.

The above is one method of hunting. Badger digging proper is another. Here men, tools, and terriers are brought into requisition; and the badger is fairly (always laboriously) dug out of his rocky fastness. One of a team of reliable terriers marks the game—which has then to be dug up to. This may take two hours, but more often takes twelve—and I have known it to take twenty-four. The business of the terrier is to mark and bay the game, but unless compelled he should not tackle it. If, as occasionally happens, the badger charges home, the dog is compelled to act on the defensive.

BADGER.

Then the war becomes desperate. I have seen the jaw of a hard-haired terrier wrenched off and an eye torn out, but this, fortunately, very rarely happens. The dog or dogs having fixed their game, and its *locale* having been reached by digging, the badger is drawn by hand or with badger tongs. A badger's teeth can splinter iron, so that considerable care has to be exercised in handling him, especially as at this time his temper is considerably ruffled. I may mention a third method of hunting—that employed by a Cambridge undergraduate and his staff. This consisted of a badger, a

beagle, and a bull-terrier.—"The badger was turned out, the beagle laid on after a certain amount of law, and the bull-terrier held in reserve to recover the badger should he go to ground. This sporting quartet thoroughly understood each other, and, as a rule, each kept to his own special department. The badger was expected, at least, to give a two or three miles run over a country, the beagle to speak to him all the way and to account for him, the man to keep the beagle in view, and the terrier to facilitate the operation of bagging the badger at the finish."

Even to-day there might be legitimate and illegitimate methods of badger baiting—only the former is never practised. For instance, but few terriers could "draw" a badger from a properly constructed badger-box. In this case the conditions would be something like equal. In the old badger baiting, however, the badger was often half-starved and maimed; the conditions under which the drawing was practised did not give it a chance, and after being placed in a tub, every dog in the neighbourhood was "tried" upon it. The poor imprisoned brute generally managed to leave its mark upon each of the snarling crew, and often had to be knocked on the head in the end. Public-houses in town and country were generally the scene of these barbarisms, and the week-end the chosen time for the "sport." The sickening scenes which were the sequels to these encounters did much to form public opinion against them, and in time the brutal exhibitions were proscribed. Subsequently the number of badgers rapidly declined, but now, thanks to the intervention of several landowners and country gentlemen, the species is again establishing a fairly firm footing. The badger is a harmless, unoffending creature, extremely interesting to watch and study, and long may it survive in the peace to which it is entitled.

J. W.

BEAR AND BULL-BAITING—It is not impossible that the chief performers in certain sports that rank as obsolete, such as badger-baiting and cock-fighting, might, if cross-examined under promise of indemnity, confess to some practical experience even now of pits and mains, of badger-bones and stakes; but the glories of bear and bull-baiting have now absolutely passed, without a possibility of return, in spite of the impassioned defence of a certain military member of the House which discussed the matter in 1809. He stoutly upheld the latter manly exercise as a prime cause of the growth of our population and a most necessary foundation of our militant spirit. Such an argument carried conviction to the mind of the House, and the Bill for the suppression of bull-baiting was thrown out by seventy-three votes to twenty-eight, and the militant spirit was saved for the moment.

The Reformed House, however, put a stop to the custom in 1835, to the intense disgust of the few faithful adherents, who frequently, as at Wokingham, were by no means satisfied by the mere present of beef which it had been hoped would be found full recompense for the loss of their sport.

As to the origin of the amusements, bear-baiting seems to have needed no other motive than ordinary cruelty, and the invariable desire on the part of the owner of a good dog to try its mettle to the full; but bull-baiting had excellent medical excuse. Bull's blood, as the ancients knew, was a swift and deadly poison; bull-beef, as Thomas Muffett explained (*Health's Improvement*, 1655), "unless it be very young, is utterly unwholesome and hard of digestion, yea, almost invincible. Of how hard and binding a nature bull's blood is may appear by the place where they are killed: for it glazeth the ground, and maketh it of a stony hardness. To prevent which mischief either bulls in old time were torn by lions, or hunted by men, or baited by dogs, as we use them: to the intent that violent heat and motion might attenuate their blood, resolve their hardness, and make the flesh softer in digestion. Bull's flesh being thus prepared strong stomachs may receive some good thereby, though to weak, yea, to temperate stomachs, it will prove hurtful."

The local authorities were much occupied in carrying out this regulation. At Leicester, "on Thursday before St Simon and St. Jude," an order was made at a Common Hall that "no butcher kill a bull till baited." At Southampton it was part of the mayor's duty to see that plenty of bulls were provided for baiting, and at Weymouth, in 1618, one Edward Hardy, butcher, "one of the searchers sworn and appointed for the viewing and searching of corrupt flesh killed within borough and towne, sayeth and presenteth upon his said oath that John Hingston, butcher there, upon Friday, being the fourteenth day of this instant month (August), did kill a bull unbaited, and did put the flesh thereof unto sale, and thereupon he is amerced by Mr. Mayor at iijs. iijd." Twenty-eight years later another Hingston, Justinian, was fined for the same offence.

Fitzstephen, in his well-known description of London about 1174, describes the amusements of the populace. It may be as well to give the original, for the translation is no way over-certain—"In hieme singulis fere festis ante prandium, vel apri spumantes pugnant pro capitibus et verres fulmineis accinctis dentibus addendi succidiae vel pingues tauri cornupetæ, seu ursi immanes, cum objectis depugnant canibus."

Bear-baiting appears always to have been an expensive amusement, and therefore was chiefly kept up by the Court, the royal bears giving displays from time to time during the 16th and

17th centuries. The London Bear Garden itself, situated in Southwark, was coupled by Sir Walter Ralegh with Westminster Abbey as one of the national sights to be shown to foreign visitors.

From 1550 to about 1680 seems to have been the palmy time of the sport, and Philip Stubbs, in his *Anatomy of Abuses* (1583), rails fiercely against it. "Is not the baiting of a bear, besides that it is a filthy, stinking and loathsome game, a dangerous and perilous exercise? Wherein a man is in danger of his life every minute of an hour, which thing, though it were not so, yet what exercise is that for any Christian? What Christian heart can take pleasure to see one poor beast to rend and tear and kill another, and all for his foolish pleasure."

It would seem that Philip somewhat exaggerated the danger, for the spectator, unless he were one of the enthusiastic owners who would rush in to rescue the dogs when they were in difficulties, would seem to have been as safe as the supporter of a modern bull-fight.

Again he denounces the bear-baiters—"And some, who take themselves for no small fools, are so far assotted that they will not stick to keep a dozen or a score of great mastives and bandogs to their no small charges, for the maintenance of this goodly game, (forsooth,) and will not make any bones of XX, XL, C, pound at once to hazard at a bait with 'fight dog, fight bear,' (say they,) 'the devil part all.' And to be plain, I think the devil is the master of the game, bearward and all."

Of course the sport was by no means confined to the rich, and one poet describes in rather hobbling verse the enthusiasm of the commons—

> "And yet every Sunday
> They will surely spend
> One penny or two
> The bearward's living to mend.
> At Paris Garden each Sunday
> A man shall not fail
> To find two or three hundreds
> For the bearward's vail.
> One halfpenny a piece
> They use for to give,
> When some have no more
> In their purse, I believe."

As to the dogs, we are told that "the force which is in them surmounteth all belief, and the fast hold which they take with their teeth exceedeth all credit: for three of them against a bear, four against a lion, are sufficient to try masteries with them." Mention is made of an English mastiff in France who pulled down successively a bear, a pard, and a lion in one day before the French king; but this record lacks detailed confirmation.

The passion for bear-baiting grew so fast that the Court of Aldermen of the City of London, in a reply to the Council in 1583, assigned the general desire for it as the prime cause for the neglect of archery, and deplored that even "the recent judgment in Paris Gardens," whereby seven or eight lives had been lost, had failed to check the popular liking. This judgment, on Sunday, January 13th, 1583, was caused by the collapse of a gallery when overcrowded, and gave emphasis to the denunciations of Stubbs and his sympathisers, and recalls Sir Thomas More's anecdote of what befell at Beverley, "when, much of the people being at a bear-beating, the church fell suddenly down at Evensong time and overwhelmed some that were in it. A good fellow that after heard the tale told, 'Ho,' quoth he, 'now may you see what it is to be at Evensong when ye should be at the bear-baiting.' Howbeit the hurt was not in being at Evensong, but that the church was falsely wrought."

During the next century there was a steady opposition on the part of the Puritans to the whole practice of bear-baiting. It is to be hoped that the historian sacrifices strict truth to antithesis when he declares that they hated it, not because it gave pain to the bear, but because it gave pleasure to the spectators; but it must be confessed that the sport was usually stopped by the short and easy method of shooting the bears.

The Restoration naturally saw an enthusiastic revival. Pepys recounts his evening with his wife at the Bear Garden, and Evelyn was disgusted by the baiting of a gallant horse, upon which no dog could fasten till the assistants ran him through with their swords. On this occasion, however, even hardened baiters felt some excuse to be necessary, and they therefore pretended that the horse had killed a child, "which was false."

Suspended during the Plague, and deprived of Court patronage after the Revolution, bear-baiting sank out of fashion.

It cannot be denied, however, that the public was loath to let it go, and the Paris Garden was from this period eclipsed in celebrity by the "New Bear Garden" at Hockley in the Hole, a part of Clerkenwell.

At this spot bear-baiting was still kept up, but was no longer the chief feature. From an advertisement in 1709 we learn that, with other diversions, "there are two dogs to jump three jumps at the bear, which jumps highest, for ten shillings to be spent." Bears seem to have grown too valuable by this time to be baited to death, and the chief events of a Hockley entertainment were "trials of skill between masters of the noble science of self-defence." It is interesting to note the following advertisement in 1716:—"At the request of several persons of quality, on Monday the 11th of this instant of June, is one of the largest and most mischievous bears that ever was seen in England, to be *baited to death*, with other variety of bull-baiting and bear-baiting; as also a wild bull to be turned loose in the game place, with fireworks all over him." Efforts were made in

1724 to suppress the sport altogether; but they do not seem to have been wholly successful, for in 1730 the following advertisement was issued on behalf of His Majesty's Bear Garden:—

"A mad bull to be dress'd up with fireworks and turned loose in the game place. Likewise a dog to be dress'd up with fireworks over him, and turned loose with the bull amongst the men in the ground. Also a bear to be turn'd loose at the same time; and a cat to be ty'd to the bull's tail.

"*Note*:—The doors will be opened at four and the sport begin at five exactly, because the diversion will last long, and the days grow short."

The expense of the amusement and the growing sense of its brutality had done the work required before the eighteenth century was half completed, so far as the bear was concerned, but the bull was in a worse plight. The sport, for one thing, was cheaper, it improved the quality of the beef, as men were informed on the highest medical authority, and, which one may hope was the chief factor, the bull had a fair sporting chance of getting on even terms with his persecutors. Beyond question, he would have done ill to exchange his chance with the trapped pigeon or the enclosed rabbit of to-day. The bull could put down as paid not a few of his tormentors, including an enthusiastic publican of Stamford, who was driven into the river, when heated with liquor and the chase, and expired forthwith from apoplexy.

It is well to distinguish between the bull-running and the bull-baiting proper, of which the former was seen in its greatest perfection at Tutbury in Staffordshire and at Stamford.

The traditional origin at Stamford was a chance fight between two bulls in a meadow by the town. A dog interfered in the fight and drove one of the bulls into the town, where it was promptly beset by all the other dogs, and "became so stark mad that it ran over man, woman and child that stood in its way." The lord of the town, William, Earl of Warenne, was attracted by the tumult, and it appealed so keenly to his sense of humour that he bestowed the meadows in which the quarrel started upon the butchers of the town, upon condition that they should provide a mad bull for the continuance of that sport, every year on the day or week before Christmas.

The bull was always stabled overnight in an alderman's outhouse, and for the next day all shops were closed, all business suspended. The only rule of the game seems to have been that there must be no iron on the bull-clubs. The bull was turned out, and then, in Butcher's picturesque style, "hivie, shivie, tag and rag, men, women, and children of all sorts and sizes, with all the dogs in the town, promiscuously run after him, with their bull-clubs scattering dirt in each other's faces, as when Theseus and Pirithous conquered Hell and punished Cerberus. 'A ragged troupe of boys and girls doe follow him with stones: With clubs and whips, and many nips, they part his skin from bones.' And (which is the greater shame) I have seen both senatores majorum gentium et matrones (*sic*) de eodem gradu, following this bulling business."

The bull running at Tutbury was also not without its smack of quaint ceremony. Blount describes it in the *Tenures of Land and Customs of Manors* as follows:—

"After dinner all the minstrels repair to the Priory Gate in Tutbury, without any manner of weapons, attending the turning out of the bull, which the bailiff of the Manor is obliged to provide, and is there to have the tips of his horns sawed off, his ears and tail cut off, his body smeared all over with soap, and his nose blown full of beaten pepper. Then the steward causes proclamation to be made that all manner of persons except minstrels shall give way to the bull, and not come within forty foot of him, at their own peril, nor hinder the minstrels in their pursuit of him; after which proclamation the Prior's bailiff turns out the bull among the minstrels, and if any of them can cut off a piece of his skin before he runs into Derbyshire. then he is the King of Music's bull, but if the bull gets into Derbyshire sound and uncut, he is the Lord Prior's again. If the bull be taken and a piece of him cut off, then he is brought to the bailiff's house, and there collared and roped, and so brought to the bull-ring, in the High Street at Tutbury, and there baited with dogs; the first course, in honour of the King of Music; the second, in honour of the Prior; the third for the town, and if more, for divertisement of the spectators, and after he is baited, the King may dispose of him as he pleases. This usage is of late perverted: the young men of Stafford and Derbyshires contend with cudgels about a yard long, the one party to drive the bull into Derbyshire, the other to keep him in Staffordshire, in which contest many heads are often broken. The King of Music and the bailiff have also of late compounded, the bailiff giving the king five nobles (£1 13*s*. 4*d*.) in lieu of his right to the bull, and then sends him to the Duke of Devonshire's manor of Hardwicke, to be fed and given to the poor at Christmas."

The Duke of Devonshire in 1778 abolished the whole ceremony "respecting rather civility than antiquity."

The *modus operandi* of ordinary bull baiting was thus described by John Houghton in 1694:—

"I'll say something of baiting the bull: which is by having a collar about his neck, fastened to a thick rope about three, four, or five yards long, hung to a hook so fastened to a stake that it will turn round; with this the bull circulates to

watch his enemy, which is a mastiff dog (commonly used to the sport) with a short nose, that his teeth may take the better hold. This dog, if right, will creep upon his belly that he may, if possible, get the bull by the nose, which the bull carefully tries to defend by laying it close to the ground, where his horns are also ready to do what in them lies to toss this dog; and this is true sport. But if more dogs than one come at once, or they are cowardly and come under his legs, he will, if he can, stamp their guts out."

According to a contributor to *Notes and Queries* the custom was for owners of dogs who wished to bait the bull to pay one shilling each entrance fee, and if the dog "pinned" the bull, they received five shillings.

As mentioned at the beginning of the article, bull-baiting lasted well into this century. The abandonment of Queen Caroline's trial was celebrated by a baiting at Aylesbury in 1820, and the jubilee of George III. in 1809 by a like performance at Windsor, and so late as 1828 there was a baiting at Oakley, for which the bull was dosed with beer and gin "to promote a little excitement in him."

Wokingham had always been proud of its bull-ring, and great resentment was felt when the Corporation suppressed the practice in 1822. Two bulls per annum had been bequeathed from 1661 to the populace by one George Staverton to be first baited and then distributed. The authorities decided to kill the beasts mercifully; but the poor resented deeply the loss of the sport. For several years they carried out informal baitings, breaking into the yard where the bulls were penned before the killing and dragging them off to the bull-ring. Actually as late as 1835, the year of the definite legal suppression of baiting, they broke into the place where one of the bulls was kept and baited him in the market-place. It is said that an enthusiastic amateur, lying on the ground, actually seized the poor brute by the nostril with his teeth! A sharp sentence of imprisonment on the ringleaders ended the sport as far as Wokingham was concerned, and though sporadic cases occurred for another year or two, by 1840 tethered baiting could fairly claim to rank as an obsolete sport.

The Stamford bull running also came to an end in that year, after a very animated fight for existence in the face, not only of local, but of national, authority. Lord John Russell as Home Secretary, a regiment of dragoons, and hundreds of special constables all took part in the efforts to stop it, but for five years local ingenuity managed to smuggle one or more bulls into the town and to let them loose in the streets. Legal penalties failed to secure their object, but on the 3rd November, 1840, the inhabitants of Stamford held a public meeting and decided that the enormous expense of their military garrison and of special constables obliged them to abandon their ancient custom. All that now remains of it is the bull-song, which for some time might be heard in the streets or in the theatre on great occasions, and may be heard even now.

C. S. Colman.

COCKFIGHTING—Although cockfighting must be classed among the obsolete sports, it is "obsolete" only in the sense that it is illegal. Nor—in the North and Midlands at all events—has its popularity greatly declined. True, "mains" are not now fought by the boys of the Free Grammar Schools, nor is the Master's salary made to depend upon the "cock-penny"; and it may be presumed that the cockpit at Rose Castle, Cumberland (the official residence of the Bishop of the diocese), is not now kept sodded. To a bygone generation the plucky "black-red" was supposed to set an example to virtuous youth; and to arouse a noble spirit of emulation in fighting the Gallic or other wide-throated cock that dared to crow defiance or flap his wings. The good Bishop probably fought his cocks from pure pleasure, as a rest from more serious labours—as, years later, did "Christopher North," at Elleray, his home on the banks of Windermere. Professor Wilson—Professor of Moral Philosophy and one of the representative men of his time—was wont to carry a game cock under his arm ready to pit against that of any of his neighbours. Once, at least, he indulged the pastime in his drawing-room on Sunday afternoon. He thought much of his fighting game, and an entry in his diary sets out a "list of cocks for a main with W. and T."—then follows an enumeration of the birds. His enthusiasm is equalled by that of an old lady of Houghton, who upon one occasion admitted she had "gone down on her bended knees," and prayed that a certain cock of her feeding might win at Newcastle. Although we do not now present boys who have won mains with Prayer-books "with an inscription suitable to the occasion," yet today the seal of a certain Northern School displays a "black-red"; but the motto "While I live I crow" is omitted.

In the cockfighting days the pedigrees of the birds were carefully kept; they were "taken up" at a certain time and fed with infinite care; and, needless to say, they were trained with great elaboration of detail. First, their wings and tail were cut, then they were carefully "conditioned," next they were sparred daily with tiny boxing gloves tied to their heels. The commonest fights were single battles for £5 or £10: or "four mains," in which the winners had to win two battles. These were individual contests, but when two districts pitted themselves against each other the number

of cocks engaged was very large, and "mains" have been known to last for two or three days.

The sport had royal as well as episcopal patrons, and in the present century there were royal cockpits at St. James's Park and Westminster, the former being pulled down in 1824. Hogarth's and Cruikshank's pictures show the interiors of these, and the motley company which attended them. The mains were fought on raised circular platforms, and Hogarth depicts a man in a cage suspended from the ceiling, suffering the penalty of being a "blackleg." To these pits came peers and pickpockets, butchers and rat-catchers, gentlemen and jockeys, and gamblers of every description. Not only our own, but European monarchs visited them upon occasion, gracing the cocking with their presence. But all this pertains to the archæology of cockfighting, so to speak.

Of all the obsolete sports there can be no question that cockfighting was the most popular and the most widely practised. The pleasure to be derived from a Main of Cocks appeals to a wider class than is generally supposed; and among its upholders to-day are magistrates, tradesmen, farmers, and yeomen. It is indulged in quiet spots among the hills where the chances of molestation are small. Assemblages of surreptitious cockers are still not unfrequently pounced upon by the police; and certain classes of the community still stick to the sport in spite of all the efforts of the law to suppress it.

And there is perhaps a reason for this. Scientific cockfighting may be barbarous, may be debasing, but there is little of real cruelty about it. There is nothing in common, for instance, between cockfighting and badger baiting. A trained cock, either with natural or steel spurs, strikes straight home, and one clean blow generally suffices. At the same time, I do not wish to defend it. Its prohibition is on the statute books, and there it will remain.

J. W.

FOOTBALL IN THE STREETS—Amongst the Shrovetide attractions in many towns, a football match in the streets used to rank very high. Now that peaceful citizens are beginning strenuously to resent a faction fight only sanctioned by custom, it is to be feared that in a year or so the great contests will become wholly obsolete. The example of Dorking shows that the most stolid conservatism, and the keenest love of such football as unnumbered sides and undefined rules provide, are both unavailing against the yet more stolid resistance of an unhistorical police force.

On Shrove Tuesday it was the custom, after a sufficiency of cock-throwing and goose-riding, to start the great *mêlée*. Usually the town was conveniently split geographically into two sections, and the rules were simple. The ball had, by fair means or foul, to be carried to some prominent landmark in the rear of the enemy's quarters. Whether it were carried, thrown, or kicked there mattered not at all; but it was usually found out that straightforward pushing was of little avail when each side ran into three or even into four figures. Strategic retreats and flank attacks were adopted, and stories were handed down how the defences had been forced by swimming rivers, penetrating drains, and even, on one occasion, by breaking through a house wall.

As the ball was probably absent in nine out of ten of the places where the contest raged, and would be in any case invisible to the majority, the game fairly incurred the often repeated censure upon its "being meeter for the laming than the making able" of those that played thereat.

By a wise provision, the ball, at the beginning of this century, was usually filled with shavings, and thereby better able to resist rough usage; but even thus there are instances on record in which the Ulysses of one side has reversed the Trojan horse method by stripping the case of its interior, and carrying it in his own bosom within his opponents' lines.

Of recent years, however, as local feeling has grown less intense, and the growth of towns in one direction or another has spoiled the meaning of such old rallying cries as "St. James" and "St. Philip," the fashion of the game has changed; to a large extent the charge is true that tradition is made a mere pretext for rowdyism. Instead of the one ball round which the contest centred, half a dozen or more may be seen, driven in any and every direction by the band behind it, who prefer taking their own line to meeting the organised force of others.

PALL MALL—A paragraph is perhaps justifiable which recalls the famous game of pall mall, once the fashion of a brilliant Court, and, from what one can learn of it, a game that deserved to survive better than many another which has passed the test of time. Put briefly, and therefore, of course, inaccurately, it may be defined as golf played with a croquet mallet down an elongated skittle alley. The tools and implements were, by a happy chance, found in a house that was being pulled down in Pall Mall in 1845, and are now preserved in the British Museum. The head of the mallet is curved, and its ends are both sloped, the plane running back towards the shaft. The balls, which in the only surviving examples are of boxwood, are about twelve inches in circumference.

The aim was, as in golf, to drive the ball over the course in the fewest possible strokes, but instead of holing out, it was necessary to drive under hoops which were set down the alley.

From the scanty records of the game, it would appear that one feat required was to drive the ball through a ring of no great diameter, suspended, as would appear from one illustration, at the height of some eight or ten feet in the air. It is hard not to suspect that the artist, like others since his time, had trusted to imagination rather than actual inspection, for, apart from the enormous difficulty of driving a ball through the ring, there would be the absolute impossibility of persuading one's opponent that it had gone through and not outside. In the days when swords were worn, the closest friendships might have been permanently severed. In his course, the pall mall enthusiast had less variety than the golf player. With a floor of hard beaten sand, "dressed with powdered cockle-shells," says Pepys, there was every chance of a good lie, and the probability of being bunkered behind a hoop wire was extremely small. The alley itself seems to have varied, in the same fashion as a links, in its dimensions, but that at St. James's was about 800 yards long, and there were very few hoops in it, giving a very fair opportunity for a successful drive, considering the shape of the mallet. Side walls seem to have existed at Whitehall, but one cannot be sure whether they were a necessary feature or a luxury.

TOURNAMENTS — Under the head of Tournaments it has been customary to include many varieties of contests, the fact being that on the proclamation of a tournament different kinds of encounters were indulged in on succeeding days. We must be careful to distinguish between tournaments and pas d'armes, on the one hand, and the serious challenges which were often made to assert or refute the justice of an accusation, on the other. Accidents often occurred at the peaceful encounters, but they were not intended, and we do not propose to deal with the judicial combats and duels.

The contests at these tournaments may be divided into horse and foot encounters. The first would include **Tourneys** and **Jousting**, which later on became, at least in this country, tilting, and running at the ring; while the foot combats were generally fought out with axes, lances and swords, and eventually became the sport known as **Barriers**.

It is difficult to say if we can call the challenges which Jacques Lalain sent out to various countries, and which are so fully described in his Life by Chastellain and in the Memoirs of Ollivier la Marche, sports. Certainly the combats in which he took such a prominent part never actually led to fatal results, yet they were terribly earnest. So also, in the combat of Lord Scales and the Bastard of Burgundy, if it had been carried out to the bitter end, it is probable that the Bastard would have been slain. We are told that the English Duchess of Burgundy, sister of our Edward IV., never would attend at serious fighting, and Jacques Lalain was not allowed to spread his challenges in England, where the peace-loving Henry VI. evidently had quite enough of serious fighting without the fiery Burgundian's exploits.

Tournaments, on account of the many accidents attending them, were frequently denounced by the Popes, but for all that, and in spite of the accidents and deaths, we find mention of them continually.

As we have remarked, tourneys were one of the sports included in the term tournament, and we may as well proceed to give an idea of this class of game. For illustrations of the tourney the reader must refer to the numerous manuscripts, chronicles and histories, of which there are so many in our national collections. The MS. of Meliadus is full of pictures of tourneys, and gives us the appearance of them in the fourteenth century. Many illustrations from this MS. will be found in Cutt's *Scenes from the Middle Ages*, where also the student will see excellent reproductions of the warlike sports of those days. But in M. Quatrebarbe's handsome work, *The Tourney Book of King Réné of Anjou*, we get drawings of the whole of the incidents before and at a fifteenth century tourney. In one of these we see the knights with gorgeous crests on their helmets and trappers on their horses, armed, as usual in this sport, with wooden maces and blunt, pointless swords. The knights are in a large pen formed by posts and rails, and separated by two cords drawn across and forming a lane in which stand the heralds and others managing the tourney. When all is ready the officials withdraw, and men placed at the ends of the lane or passage cut the ropes with axes. Immediately the two parties engage and mingle and hammer away at each other till the judge or presiding officer commands them to desist. This was evidently not done at once, for the combatants soon became excited, and only those who got the worst of it would care to discontinue. In the drawings of Jost Ammon and others we see the "admired confusion" which prevailed, and in these German pictures we observe how a public square or place was often taken up for the sport. The successful combatants afterwards received the prize from the chief lady present, and the day's amusement would end with banquets and dancing.

Jousting, and its later form, tilting, was a more scientific and serious sport. Sometimes it was performed with sharp spears, and then accidents were pretty frequent, as we see in Rouse's *Life of the Earl of Warwick*, where that accomplished traveller is shown driving his spear right through the body of some unknown foreign knight in honour of his own lady.

Jousting was originally carried out in a large enclosed space, the riders fully armed and pro-

tected by armour, and their horses also wearing metal body and head defences. The two combatants rode straight at each other, and each endeavoured to dismount the other by striking him on the head or body. If the lances had blunt or rebated points, or were furnished with coronels, that is, heads with three or more short points to prevent slipping, a good blow would, if delivered straight, certainly shake, if not unseat, the person struck. If, however, the blow were not quite direct, the lance would be shivered. The terms of the challenge would decide how many courses were to be run and the nature of the weapons employed. This was generally arranged by those wishing to take part touching with their spears certain shields hung up near the lists. One shield would be for sharp lances, another for lances with coronels, and so on. If a knight and his friends issued the challenge to last for so many days, then as many knights duly qualified by birth, &c., as chose would ride against the challengers, who would be called the *Tenans*, while the others were the *Venans*. Prizes would be given to the most successful.

But it was found that some riders tried unfair means to unseat their opponents, jostling them, and otherwise departing from the true sportsmanlike practice. Accordingly, in 1443, we find a new style of jousting introduced, which in some places almost entirely superseded the open running. This was the running at the tilt. The tilt was originally a stout rope with a cloth (*toile*, Anglice *tilt*) hung over it, and stretched across the lists for some ninety yards.

Fig. 1.

From the Weise König, showing how by a toy the youth of the middle ages were instructed in the sport of Jousting.

The two riders were placed at opposite ends and at opposite sides of this *toile*, and then riding towards each other, each, with his left arm to the *toile*, endeavoured by a well-directed blow to dismount his opponent. Of course, in order to reach the other, each jouster had to place his lance on the left side of his horse's neck. It is clear that the right hand of each rider was at least three feet from the *toile* throughout the course, and the spear being but fourteen feet long from butt to point, it is evident that the spears were inclined at an angle of some 30° from the line of the *toile*. Thus no direct blow could be given, but, considering the combined weight of the two horses and their riders, a shock sufficient to break the spears, if they struck the head or body, was obtained. A rider might be knocked out of his saddle, but it was not likely, as the blow would be a very light one, and the lance would break before the person hit would be unseated. Soon the *toile* was changed into a wooden barrier, and in the challenge would be noted the height it was to be. It seems to have varied from five feet to six feet, and perhaps more. Now it is evident that two men riding in opposite directions, one on each side of a six-foot wall, would not see much of each other, and so it was. In the splendid tournament roll of the first year of Henry VIII., now preserved in the Heralds' College, we can only see the head of the knight who is charging along on the other side. The chances of hitting him would be small, except for very expert jousters. Then again it was sometimes difficult to get the horses to run close alongside of the barrier, and in that case the knights would be out of reach of each other. Sometimes double lists were used, forming a narrow lane for each horse to travel along. At the Field of Cloth of Gold, Henry objected to these double lists, but on one occasion at least he had to change horses, as the one he rode would not keep to the track. Besides this difficulty, a high wind sometimes quite prevented the lance being held steady, and such was the case more than once at the Field of Cloth of Gold.

The rules for the jousters at the tilt appear in England to have been drawn up in 1466 by John Tiptoft, Earl of Worcester. This was the year of the challenge of the Lord Scales and the Bastard of Burgundy, though the fight only came off the next year, and in that contest no tilt was used. These rules were, with slight differences, in use for many years, and are said

to have been commanded to be observed and kept by an order in the fourth year of Elizabeth, 1562–1563. Generally speaking, they were as follows :—

Breaking a spear between the saddle and the fastening of the helmet to the breast-plate (for so we may interpret the *charnell* of the helmet)	1 point.
Breaking a spear above this spot	2 points.
Breaking a spear so as to unhorse the opponent or to unarm him so that he could not run the next course	3 ,,
But breaking a spear on the saddle caused a forfeiture of	1 point.
Striking the toile or tilt once	2 points.
Striking the toile or tilt twice	3 ,,

Breaking a spear on the sight of the helmet thrice, counted towards the prize before the breaking of most spears, and striking coronel to coronel was again better, whilst unhorsing the opponent was best of all. No prize would be given to the jouster who struck a horse or a rider with his back turned, or who struck the toile or tilt thrice. Nor could a prize be won by a jouster who lost his helmet twice, except by fault of his horse. If the spear broke within a foot of the end, it only counted as a good attempt.

Now it is clear that in the later days of jousting, with a six-foot tilt, some of these conditions would never be fulfilled, as but little more than the head of the opponent could be seen or touched. And hitting the toile or tilt was a clumsy thing, like playing into the net at lawn tennis.

Of course, in the case of striking coronel to coronel, each rider was equally expert, and one may suppose points were allowed to each.

In the early days of jousting the ordinary armour for war was used, with the addition of the tilting helm, which, unlike the helmet, rested on and was fastened by staples and buckles to breast and back, and was large enough to allow of the head being moved inside it, as in the case of a diver's helmet. But as time went on, it was doubtless found more convenient to have stouter and richer armour for the showy occasions of the tournament, where the blows were more deliberate than in the field, and also where there were spectators who could admire at their ease. And in Henry VIII.'s time we find that, taking into consideration the fact that the lance blows could only be received on the side next to the opponent, that is, on the left, it was thought a good idea to strengthen that side of the armour by wearing additional pieces. The helm had its air-holes only on the right side, so as to avoid any chance of the lance-point or the coronel *biting* on the surface of the left side, and the rivet-heads were either flush with the surface, or so rounded as not to arrest the lance-head if it struck. For the defence of the left side of the rider the *volant*[1] piece was devised. This protected the left side of the helmet, and just came round the front medial line, the helmet being bolted to it, and the lower part of the volant piece bolted to the top of the breast. With this was worn sometimes a sort of shield of metal called a *manteau d'armes* ; in other cases, as for the German jousting with sharp spears, a stout wooden shield, covered with small plates of bone, was fastened by a stout plaited thong to the breast-plate. This thong passed through the breast-plate, then through a wooden ball to keep the shield the proper distance from the body, and then through

FIG. 2.
George, Earl of Cumberland, temp. Elizabeth in tilt-yard costume. From his portrait at Skipton, Yorks.

the shield itself, the two points being tied on the outside of the shield and hanging down on its face. Yet another form of additional defence was used. This was a stout piece of metal, which stretched across the upper part of the body, turning forward on the right shoulder, but backward over the left, and reaching down the crest of the breast-plate to a point about four inches above the waist. To the upper part of this was riveted the volant piece, and a bolt passing through the crest of the breast-plate near the lower part attached this *grand-guard*, as it was called, to the breast-plate, to the curves of

[1] *Volant* is the term applied on the Continent to movable pieces.

which it closely conformed. On the left elbow also was fixed a pin, to which by a linch-pin could be fixed a large plate protecting the elbow and parts of the upper and fore arm. This was the real *pasguard*, though in modern times the heavy miton-shaped gauntlet with long cuff and no finger divisions. This covered the back of the hand and forearm, and, while not fitted for holding a weapon, was quite sufficient for the rein hand. This series of additional pieces is

FIG. 3.

Armour of Robert Dudley, Earl of Leicester, with the Grand-guard, Pasguard, and Main de fer for the tilt. This armour, now in the Tower of London, was made 1566–1588.

name has erroneously been transferred to the upright plates springing from the pauldrons or shoulder armour, and to a certain extent protecting the sides of the neck. Below this pasguard again was worn over the left gauntlet a large manifer, or *main de fer*. This was a seen in the armour of Robert Dudley, Earl of Leicester, made between 1566 and 1588 (Fig. 5), and similar pieces belonging to Henry VIII., are still at Windsor Castle and the Tower of London.

Now it is evident that when the jouster had

these pieces put on over his armour he was more helpless than ever. First his helmet was linched to the *volant piece*, which was riveted to the grand guard, in its turn bolted to the breastplate. The rider thus had his head fixed in such a way that from his waist upward he was all one piece, and any movement to avoid an impending blow or for any other purpose was impossible. Nor could he see much —in fact, all the sight he had was through the slits in his helmet just above the volant piece. Considering this, we shall better understand the state of Charles Brandon, Duke of Suffolk, at the time of the accident described by Hall in the year 1524, when the king, having forgotten to close the vizor of a newly designed helmet, on the signal to go being given, the two jousters rushed along the course. It was too late to stop them, and Brandon shivered his lance on the brow-piece of the king's helmet. Brandon himself said that he was not only short-sighted, but that he could not see, for "my headpiece taketh from me my sight."

There was one unwritten rule, the non-observance of which cost Henry II. of France his life. That was that, after breaking the lance, the butt end should be cast away at once. Now, when Mongommeri, by a dexterous stroke, had shivered his lance and knocked off the king's plume of feathers, instead of casting away the stump, he rode straight on, and the splintered end of the stump, entering the sights of the king's helmet, pierced his eyes, and so led to the fatal termination.

From all this it will be seen that jousting at the tilt was a very peculiar sport. It required a good horse that would run truly along the course, and a steady hand ; but there was a great deal of chance in it. If the opponent's horse swerved, however good one might be, one could not touch his rider, and one could not see enough to be able to vary by much the direction of the lance stroke. It was more a matter of the opponent riding on to the lance-head than of finding him by any movement of the lance itself.

In fact, the more one considers the conditions of jousting at the tilt, the more one is surprised that so much could be done. The jouster could not suddenly shift the position of his lance, nor follow the rider whose horse broke away from the track. What he had to consider was, where the opponent would come into contact with his lance-head, and, of course, two good riders with steady horses might score hits each course, whereas the best man in the tilt-yard would fail to hit a bad rider. Pluvinel gives a hint for overcoming the unsteadiness of the horses—namely, that each rider stood at his end of the tilt, but with his back to the course ; then, on the word to go, he would make his horse wheel suddenly a half-turn to the right, and, giving the spur at the same moment, would drive the horse alongside of the tilt before he had time to swerve off. George Peele, in his *Anglorum Feriæ*, describing the jousting, 1595, on one of the many Queen's days in Elizabeth's time, speaks of young Dudley, whose "armed horse made dreadful harmony grating against the rails." This may sound well in poetry, but it could hardly have been pleasant for young Dudley. Certainly some of the valiant jousters of Elizabeth's Court took all precautions not to be hurt, for we see William, Earl of Worcester, esteemed the best tilter of his day, wearing a breast and back plate, which alone weigh upwards of 40 lbs. The suit is in the Tower collection, and seems more suited to keep out a musket ball than to guard the rider from a light deal lance. Such a suit would give every reason for the platform of three steps which Pluvinel tells us was erected at each end of the lists for the riders to mount their horses from after being armed by the armourer and his assistant. There would be no vaulting lightly into the saddle with such equipment, and it must have been more of an embarcation than a mounting. So also when the six or more courses were over and the knight had to be got out of his armour.

Illustrating the difference between the armour for the field, called "hosting harness," and that for the tilt yard, we have an interesting account written in 1547 by Sir H. Poulet and Sir J. Harington to the Protector Somerset, of a sort of Gymkhana got up by the gentlemen of the garrison of Calais to celebrate the accession of Edward VI. to his father's throne. Of course these gentlemen had only their war armour with them in that outpost of the English on French soil, so they had to do the best they could with what they had. The fête took place outside the town and though the old plans of Calais show a tilt within the walls, they had for want of one outside to "run at random." Young Henry Dudley and Jerningham determined to rehearse the sport and ran at each other in their hosting harness and with coronel staves, that is lances with coronels in place of the usual sharp steel head. At the second encounter "they met so freely that both went to the ground, their harness flying about the field and their horses astonished, but without hurt both leaped on horseback again and brake sundry staves very honestly." Of course the cause of this disarrangement of their armour was that while the portions of suits for the tilt yard were mostly bolted together, the war armour was to a great extent connected by straps. Sully himself tells us how at the assault on Rouen 1591, he got upset and all his armour disarranged, so that he had to withdraw to get it put in order again.

Although the word **Carrousel** has been in later times associated with the sport of running

at the ring, it appears from the work *L'Arte del Cavallo* by Nicola Luigi Santa Paulina, published at Padua in 1696, that the original sport took its name from carosello, a hollow ball of chalk varying in size from a hen's egg to an apple. The persons taking part in the game were divided into two parties, each of which had a supply of these caroselli besides reserves held by attendants on foot. The sides then rode towards each other and threw them, each one guarding his head with a shield borne on the left arm. The encounters first took place by two against two, and then by squads. Paulina says this game was much played in Spain, where it was known as Alcançias, and often light canes were used for throwing instead of the chalk balls and then it was called the Feste di Cannas.

As late as 1760 we see, in the beautifully engraved work by Johann Elias Ridinger on the Manège, a gentleman in a three cornered hat and the costume of that date exercising with a tilting lance both at Turk's heads and also at the ring.

In the Armeria at Madrid is preserved the arrangement for the ring business, and Jubinal has figured it. There is a split tube, down which slides a spring holding the ring. The compression of the tube is sufficient to keep the ring suspended at the lower end until it is forced out by being caught by the lance-point. The lance for this ring running in the Tower has a small conical button on the point so as to prevent the ring slipping off the lance after it has been taken from the tube.

Running—If we may distinguish running at an inanimate object from the same at a living person, we shall find that the former was practised at a very early date and by the humblest classes as much as, if not more than by the wealthy. Thus we have the runnning at the quintain fixed or swinging, and the running, if we may so call it, in boats at a water quintain. Of these sports a famous MS. of the life of Alexander the Great in the Bodleian Library dated 1344, has supplied Strutt with illustrations for his work. We see boys and youths pushing with poles, now at a fixed mark on a post, at other times at a mark on the one end of a horizontal revolving bar, at the other end of which is suspended a sandbag. In other pictures we see an ambitious youth imitating his betters, being mounted on a wooden horse which two of his companions are pulling along, while the rider poises his lance at a fixed mark. In another picture some naked lads are about to charge against a tub of water set on a post. In the water tilting the lance bearer is on a small platform rigged up on a boat propelled by four or five of his companions, and the penalty of not striking the mark is apparently that the person so failing would overbalance and fall into the water. Then, again, in another MS. at Oxford we have a sort of inverted tug of war. Two boys, instead of pulling at a rope, are endeavouring to push each other backward, each having hold of one end of a pole.

As to the use of the swinging quintain, it is difficult to see what relation it bore to the jousting or tilting, for as the blow of the counterpoise could only be avoided by a quick movement of the body, a feat quite impossible in the later days of tilting, as we have already shown, it was evidently on quite different principles from the nobler variety of the sport. Plot, in 1677, mentions that at Deddington in Oxfordshire he had seen the running at the quintain, but that it was then only "in request at marriages." From what is said of the sport, it was evidently performed on horseback.

Running at the ring was an improvement on the above exercises and became a sport for the richer classes, who took to it very seriously. In time it became the sole surviving form of mounted exercises of this class and we may refer now to some notices of it in history.

The earliest mention of running at the ring in Hall's chronicles is on the occasion of the Spanish ambassadors being entertained in 1509 by Henry VIII. We are told that with other sports they witnessed Running at the Ring, when Henry and six courtiers ran against seven others. Each person ran twelve courses, but the king won the prize by taking the ring five times and touching it three times. Henry, however, seems to have preferred the rougher play of jousting, and the running at the ring does not often occur in his reign—at least Hall does not mention it.

In Elizabeth's time the sport was used, but probably more as practice for the nobler pastime of the tilt yard. With James's accession this mild exercise was more in favour than the manlier game, and in 1606, on the occasion of Christian IV. of Denmark's visit, we find the royal brothers-in-law excelling all their competitors. In 1612 the young Prince Henry and five others ran at the ring a match for a supper, which he won, and the next year, at Somerset's wedding, the King and the bridegroom also ran. So on during James's reign on state occasions running at the ring was one of the chief items of amusement, and, as might be expected, the Prince Charles generally took the prize. Pluvinel in his great work on horsemanship deals at length with the sport and gives most minute directions for the handling of the lance.

The Lists—As to the lists where the jousting took place, this was an enclosed space of ground with posts and rails and sometimes a bank and ditch round it. The ground was hard, even and firm, and in the preparation for the Field of Cloth of Gold Sir Nic. Vaux mentions that it will not do to scatter the earth from the enclosing ditch.

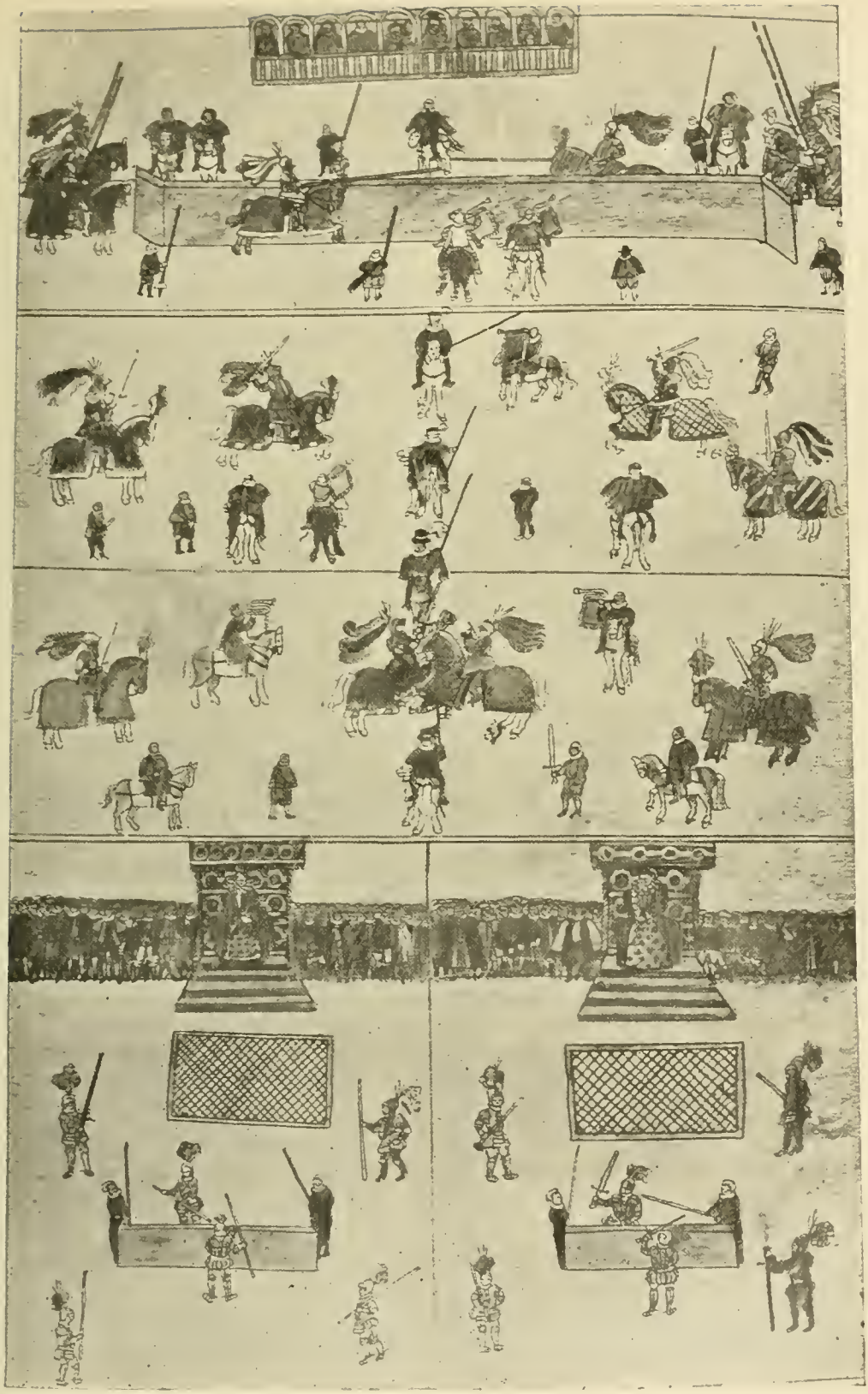


FIG. 4.

From a manuscript of Sir William Gregory, Garter King at Arms, and now the property of A. Wood Acton, Esq., of Acton Scott, Salop. The manner of the Tilt, the Tourney and the Barriers, as practised temp. Elizabeth, is well shown in this exceedingly interesting drawing.

over the lists, "for it will mar all the ground that none shall gallop nor runne surely upon it." Of course the arrangements varied with circumstances, but the general idea was to have stages for the spectators on each of the sides of the lists, and at each end entrances and exits for the jousters. There were also pavilions or chambers for the chief actors to prepare in, and the grand stand was richly furnished. The general shape of the lists was rectangular, but longer in breadth than in depth. At the Field of Cloth of Gold they were 150 paces long. In many towns there were places kept for the jousting, and could stand to have the finishing touches given, and the last strap or bolt arranged, and from which they got on to their horses. Representations of the tilt are to be seen in numerous manuscripts, and we may quote the fine Froissart in the British Museum, which was, however, executed some seventy or eighty years after the events therein recorded. Consequently we have the tilt shown at the joustings at St. Inglevert, though at that date, 1389, the use of this arrangement was not known. Then in Rouse's life of the Earl Warwick, which has been engraved by Strutt, in the 2nd volume of

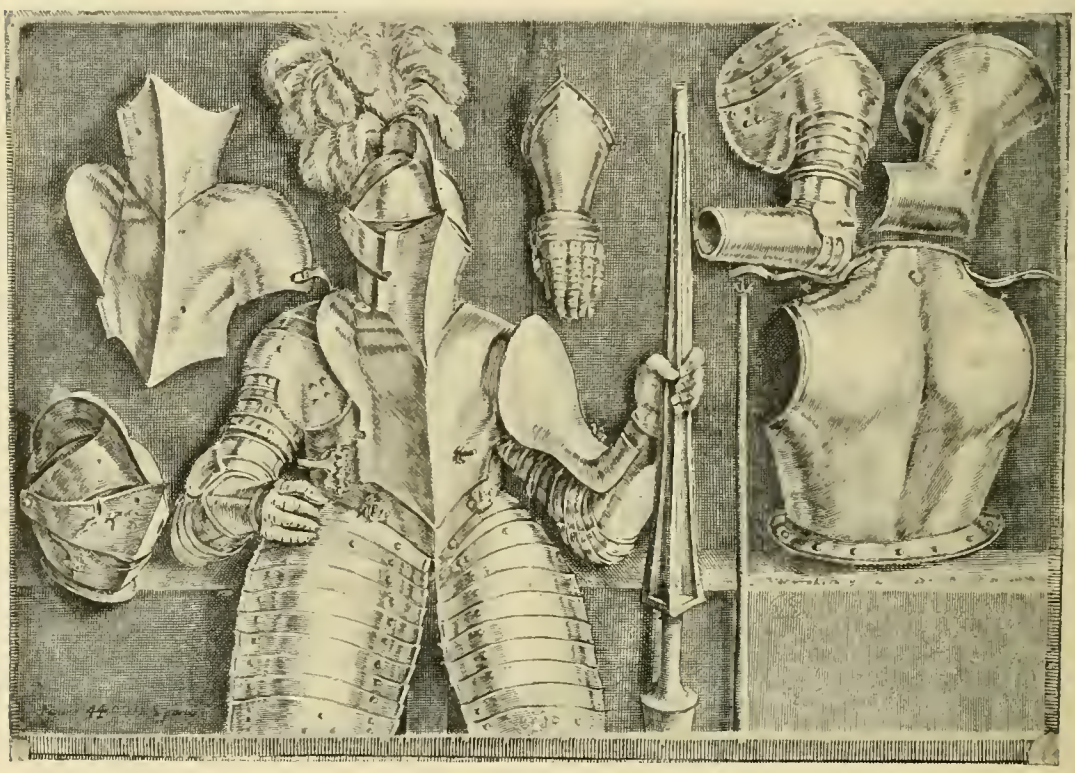


Fig. 5.
Tilting Armour of Lance (1627), from Pluvinel's *Instruction du Roi.*

in the Tilt yard at the back of the Horse Guards we have the survival of the name, this place being the site of the tilt yard in the latter part of the sixteenth century.

In some places we read of jousts taking place under cover, and in 1513 they were held at Lisle in a large chamber paved with black marble, the horses being shod with felt or flock (felto sive tomento) to avoid slipping. In other instances we read of stable litter being used. Across the lists, but not reaching to either side, ran the Tilt, and it is said that such a tilt still exists in Mantua. At each end of the tilt were the small platforms on which the jousters with their armourers and attendants Horda, we have good contemporary illustrations, and in the College of Heralds' Tournament Roll of the 1st year of Henry VIII we see the arrangements very clearly. Pluvinel and Perissem in their engravings also show the latest form of the tilt. In or near the lists would be arranged, on an artificial tree or mound, or in some such way, the shields, the touching of which by the "Venans" would indicate the class of combat in which they wished to engage. A very good idea of the whole arrangement may be had from the large picture at Hampton Court of The Field of Cloth of Gold, in the upper corner of which we see the lists, stands, tilt trees, &c. Of course in Germany, where

these sports were very common, we find numerous illustrations by the hands of Jost Ammon, and by others, though Jost Ammon shows the jousters riding right arm and right arm along the tilt, which, if it ever took place, must have been peculiar to Germany.

It is quite clear that jousting was not an exercise to be taken up suddenly, but one which demanded a long course of training. We read of jousts held at Dijon in 1442 where jousting armour was used, but smooth saddles, *i.e.* without high backs. These were for new jousters to learn the business, and we are told that many of them were knocked out of their saddles. It is natural to find also that the older and more experienced knights scorned to take advantage of the young tyros, as in the case of Cotte Brune, a stout captain, who, when he learnt that he was to oppose the young Bastard of Bourbon in a match held in 1414 between Arras and Lens, with four jousters on each side to represent the French and Burgundians, managed to have *lances gracieuses* only used, and so no harm was done. St. Remy, who mentions the incident, uses the above term, but *lances courtoises* is also often met with.

The *ladies' lance* appears to have been an extra course at joustings and was run last, just as in Henry VIII's time, after a regular set of courses, we are often told that the jousters ran *volant*, *i.e.* without the toile or tilt, as a sort of extra show for the beholders.

Some of the blows given at these joustings were pretty severe, and the armour often was pierced and broken, though as some portions of the armour were attached by straps only, a man might have much of his panoply displaced without anything being broken.

The lances used for jousting were probably in the early days the stout war lances of every day use, but later on we find very light lances of soft wood used. These lances were made of little weight by being deeply fluted on the outside, or, in some cases, hollow for a considerable length. Of these lances the Tower collection fortunately possesses some specimens, and from the dimensions and the actual weights it will be seen how much lighter they were than they looked.

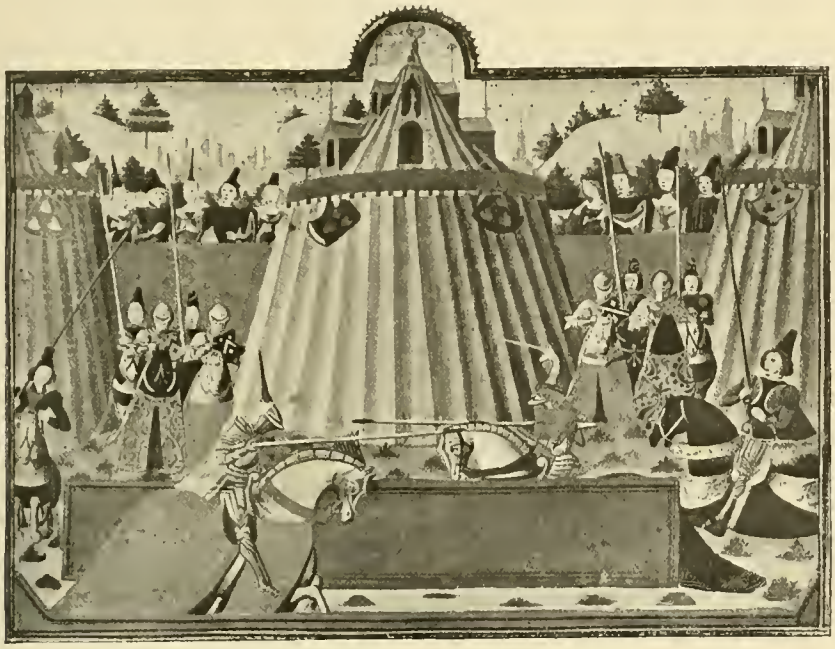


Fig. 6.

Tournament of St. Inglevert (1389), from the fifteenth century MS. of Froissart, Harl., 4379, British Museum.

When Hentzner the German traveller visited the Tower of London in 1598, one of the objects shown then, as now, was the lance said to have belonged to Charles Brandon Duke of Suffolk. Hentzner describes it as *tres spithamos crassa*, and in fact its girth at its largest part, that is, just in front of the hand grip, is 27½ inches, with 12 deep flutings extending some 6½ feet towards the head. The total length is 14 feet 4 inches, and its weight is but 20 lbs., showing what a large hollow space there must be. Two other lances of probably the same period are also in the Tower. One of these has been broken, and we are thus able to examine the construction of it. The maximum girth is 15 inches, and the total length is 12½ feet, the weight 10 lbs. From the broken specimen it can be seen that there is a hollow groove some 2 inches in

diameter extending to about 1½ feet from the point.

There are several lances in the Tower, evidently of the Elizabethan period. They are 11 feet 7 inches long and weigh about 7 lbs. Externally they are fluted with 8 grooves. The section in front of the grip is octagonal, but none of the vamplates in the Tower have any but a circular mouth.

Sometimes jousters appeared in the tilt yard with abnormally large lances, as did Sir John Peche in 1514 at Paris where he ran a course with a spear "12 inches in compass." On the same occasion the Comte Galeas ran a course with a spear 5 inches square at the point and 9 inches square at the butt. At the Field of the Cloth of Gold the master of the horse of France ran a course with a spear four fingers in diameter at the point.

Philip de Commines refers to the large spears called Bourdonasses, which were hollow, and of which many were picked up on the field of battle of Fornoue. These were Italian, and in 1523 Henry VIII. received as a present four large Neapolitan and two Spanish spears. The military lances of the period were called chasing staves and punching staves, also Collen cleves, from their place of manufacture, Cologne.

The expression lance stroke is perhaps misleading. In war, a man riding at another with a spear would on some occasions move his spear arm freely so as to follow and reach his object, but with the jouster it was quite different. Having a stout substance to encounter, a strong resistance would either break or strain the wrist, or the lance would be driven backward through the grip. Now in the case of the jouster all this was avoided by the lance rest, a metal bracket (sometimes folding) which was fastened to the right side of the breast plate. The lance was held on this bracket and at such a point that the *burre* or ring of iron or leather, fixed round the lance just behind the grip, rested against the bracket and thus the force of the shock was distributed over the whole of the body of the jouster. With the heavy lances sometimes used in Germany the lance was further supported by the *rusthaken*, a long bracket reaching backward and curling over at the end so as entirely to support the spear in conjunction with the breast lance rests. The spear had then merely to be steadied by the right hand of the jouster. Any one couching a lance close up under the armpit will see how feeble the unassisted wrist would be in this constrained position to withstand any great resistance. Of course in old military pictures we see cavalry charging lance in rest, but for individual fighting the lance would have to be carried either under hand, as the English horsemen did in the Irish wars, or overhand, as their opponents are shown in the curious work Derrik's *Image of Ireland*, where we see the two methods of using the lance. Of course with running at the ring there was no occasion for the lance rest, except as a help to the hand in keeping the lance properly poised.

In Elizabeth's days the score was kept by marks on a series of lines opposite to the jouster's name on the roll, or cheque as it has been called, of the performers. Such a cheque is to be seen in the Bodleian Library and refers to a great match in 1570. The arrangement is as shown below, and seems to have been that in use in the early part of the sixteenth century also. The courses run are marked outside the figure, while the nature of the hits is shown by marks on different parts of the diagram.

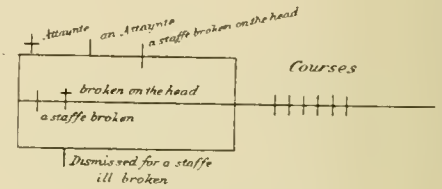


Diagram of Score.

Barriers—In volume xxix of the diaries kept by Sanuto of the events of the Field of Cloth of Gold, held in June 1520 on the selected site between Guisnes and Calais, we have an interesting description of the exercise of Barriers.

He tells us that in front of the Queen's stage was a square stockade with sufficient space for ten couple of men, and in its centre a long bar, about three feet high, with two side bars apparently touching the centre one. The opposing bands of men then fought two at a time, thrusting at each other with rebated spears until their weapons broke, and then they continued to cudgel each other with the fragments until separated by the smaller side bars being swung outward by four men, one at each end of each side bar. Even then they would hurl the fragments of their broken weapons at each other. The separation of the excited combatants could only be safely effected by these side bars, and wrestling was thus prevented. The fighting with swords at barriers was conducted in a similar manner.

In an engraving by Hogenberg, representing Spanish officers amusing themselves at Brussels, dated 1569, we have a good representation of the sport, though the side bars are not shown. The well-known engraving by Dunkarton after Passe shows Henry Prince of Wales in one of the postures adopted by those at barriers, though for portrait purposes the head is of course bare, the helmet lying on the ground.

For this exercise, a special form of gauntlet was often used. It resembled the manifer or left hand miton gauntlet, so often seen with mounted suits, but it had in addition small

upright plates which, when the hand was closed round the spear or lance, fitted close to the wood and so prevented the opponent's lance point getting between the lance and the hand. This did sometimes happen with ordinary gauntlets, and in the very fine MS. of the life of Petit Jean de Saintré in the British Museum one of the illustrations shows a combatant whose hand is bleeding, the other fighter's lance having penetrated the palm and of course made him drop his weapon.

In the combat at barriers between Galiot de Baltasin and de Ternant, 1446, the latter held his lance with the butt end in his right palm and the left hand at the balance. Baltasin held his in the ordinary way. He broke a piece off his lance point when striking, and Ternant broke his helmet. The guards then interfered, and produced a knotted rope, to show the seven paces of two feet each, and the combatants were stationed at this distance from each other. They then advanced again and after seven strokes had been exchanged the combat ceased.

May 29, 1510. Luis Caroz de Villaragut writing to Ferdinand the Catholic from London says: "The King of England amuses himself almost every day of the week with running at the ring and with jousts and tournaments on foot, in which one single person fights with an appointed adversary. Two days in the week are consecrated to this kind of tournament, which is to continue till the feast of St. John, and is instituted in imitation of Amadis and Lanzilote and other knights of olden times of whom so much is written in books. The combatants are clad in breastplates and wear a particular kind of helmet. They use lances of fourteen hands breadth long with blunt iron points. They throw these lances at one another and fight with two-handed swords, each of the combatants dealing twelve strokes. They are separated from one another by a barrier which reaches up to the girdle in order to prevent them from seizing one another or wrestling. There are many young men who excel in this kind of warfare, but the most conspicuous among them all, the most assiduous and the most interested in the combats, is the King himself, who never omits being present at them."

FIG. 7.
Spanish Officers at Barriers. From Engraving by Hogenburg, 1569.

Barriers was no doubt a very exciting sport, and the separating bar was perhaps often the only thing which prevented the combatants from proceeding to more extreme measures when they had lost their temper. In 1515, at the barriers on the occasion of the marriage of Mary of England to Louis XII., Lord Gray fought with a big Frenchman who "tried to pluck him over the barrier."

In Hogenberg's drawings it appears as if the combatants at barriers had no upper part to

their vizors, and, in fact, with the lower part covering the face, such an arrangement would be much more comfortable and nearly as safe. The blows would be given from below upward, and with the upper part of the vizor closed it is difficult to understand how there could have been much science or ability to see and avoid the opponent's strokes.

The rules of barriers forbade either of the combatants to touch the bar with the hand, to strike below the waist, or to use a closed gauntlet, or have any arrangement for fastening the sword or lance to the hand. Of course, thrusting under the barrier was also strictly forbidden.

DILLON.

SPORTING RIGHTS—Although there is considerable difference in detail in the law as to the rights of different kinds of Sporting, yet there are certain general rules that apply to all such rights, whether hunting, hawking, shooting, fowling or fishing. The law regards all such rights as belonging to the class known as *Profits à prendre*, and consequently the various special rules by which that class of rights is governed apply to all of them. Of these the most important is, that such rights cannot be possessed by the general public. The public can make out a title by long user to a right of way, but no length of use will give the public a title to sport in any form over land. The legal reason is that the public can acquire an easement, to which class rights of way belong, by prescription, but cannot acquire *Profits à prendre* in the same way. The ground for the distinction is not altogether obvious, but it is a well-settled law resting upon a decision in the time of Lord Coke (*Gateward's case*, 6 Rep. 596). The distinction has led to a great deal of litigation and disappointment, but it is at the present day recognised law and could only be altered by statute. It follows from it that all sporting rights must be owned by some definite person or body of persons, an individual or a corporation. Another consequence is that a landowner who has allowed time out of mind persons to sport over his land, and at their pleasure to hunt, shoot or fish, can at any moment take away his permission, and the public have no remedy nor cause of complaint, however much they may have used the permission, and however valuable it may have been to them.

Legally, there is no such thing as open fishing or shooting in England or Wales. There are places, every year becoming fewer, where the owner allows trespasses to be committed and says nothing, but there are no places, except the seashore and tidal navigable rivers, where the Queen's subjects have a right to sport as they have to pass over a highway. Sporting rights being therefore strictly private property, as much so as a man's house or his coat, and belonging to that class of property known as incorporeal, they can only be transferred from one person to another by the legal mode for transferring such property. This can only be done in one way by deed, by writing under seal; any other mode of transfer is invalid in law. This rule frequently causes great inconvenience in agreements for shooting or fishing, for if a person takes one or the other and signs an ordinary agreement, and soon after finds some one poaching and prosecutes him, the prosecution fails, on the ground that the tenant has no legal right to the sporting and so no right to prosecute, as he has no grant under seal. It should, however, be noticed that although he has not the legal right to the sporting and cannot act as legal owner, he is yet liable to pay the rent he agreed to pay, as that is payable in respect of the enjoyment of the property, not of the legal ownership of it.

Another general rule is that *prima facie* the sporting rights do not belong to the owner of the land, but to the occupier. He is the person in whom by law they are vested, and he as a rule need show no other title than that he is in the actual occupation of the lands; every one else must show some special title that prevails over the general one. The occupier stands on his legal right.

These rules apply to all sporting rights—(1) a definite owner, (2) who is presumed by law to be the occupier of the lands over which the rights are exercised, and (3) if owned by any one but the occupier, the owner must claim by deed.

The points to consider are—(I) The different kinds of sporting rights. (II) The places where. (III) The times when, and (IV) the mode in which they may be legally exercised.

I. Sporting rights are five in number:—(1) Hunting, (2) Hawking, (3) Shooting, (4) Fowling, (5) Fishing. All of them belong to the occupier of land by right of his occupation. If owned by any other person, whether he has all or only one or some of them, depends on the terms of his grant. Here the cases are legion, for each grant is a law to itself, and itself alone; the rule may be broadly stated that, while a grant of all sporting rights over land would include all five, a grant of shooting alone would not include fishing or hunting, a grant of shooting game would not include shooting birds not game. The safest and best term to use is the widest "all rights of sporting," for if once it is attempted to define the rights, and anything is left out, the grantee does not get it.

(1) As to *hunting*, strange as it may seem, it is in law clear that no one has a legal right, except it is reserved to him by deed, to follow hounds over enclosed lands. At any time an occupier can forbid all or any of the members of the hunt following a pack of hounds coming on his land, and can compel them, if necessary, by just as much force as may be required to make them do so, to quit his land, and he has a legal remedy for such trespass, if it is persisted in. It used to be said that the fox was a noisome beast, and any one was justified in going over a man's land to destroy it, but if this was ever law, which is extremely doubtful, it has been long ago exploded, and the rule is as stated, that all persons following hounds only do so on sufferance, and that whatever may be the animal hunted, whether stag, fox, otter or hare. If the occupier of the land so pleases, he can stop all or any of the persons following the hounds over his land. There is, however, one exception, but it is of such rare occurrence that in practice it is of small importance. If lands are within the bounds of a Royal forest, or if there is a right of free chase or free warren existing over the land, the holder of the Royal authority in a forest or a chace, or the owner of the franchise of free warren, can go over land within the limits of the forest, or chace, or free warren for the purpose of taking by hunting or otherwise, beasts of forest, beasts of chase and beasts of warren. Beasts of forest are hart, hind, bear, boar, wolf, and all beasts of Venery. Beasts of chase are buck, doe, fox, marten and roe. Beasts of warren are hares, roes and conies, and it would seem that the owner of these rights could take with him any one he thought fit for the purposes of hunting. It is said that there are sixty-three forests in England, but the hunting that is done in these privileged places is merely a fraction of the hunting that is done each season, and it only serves to justify a very small percentage of the persons who hunt, even if it legally justifies them; the broad rule is that all hunting is legally trespass, and is only carried on by the leave of the occupier, which could be withdrawn any day and at any time and without any notice. It makes no difference what is the animal hunted, or what is the mode of hunting, whether with a pack of hounds, or with greyhounds, or otter hounds, or in any other way, the law is the same. Hunting is only permitted trespass.

(2) *Hawking*—As to hawking, the broad rule is the same as to hunting. It can only be carried on with the leave of the occupier, but in hawking there is this im-

portant difference from hunting, that the owner or the servants of the owner of the hawk, if the quarry was started on land on which the owner had a legal right to go, would be entitled to go on the land on which the hawk killed the quarry for the purpose of getting it. The rule in hawking is the same as in shooting; the person who starts game on his own land and kills it while flying over another man's, may justify going on the land to pick up the game. But if the quarry is started on land where the owner had no right to go, he could not go on another man's land to pick it up. The term "quarry" has been used to include whatever it is that may be hawked, *e.g.*, larks or rooks, for although not game, the rule in this respect is the same as if they were. It will not be necessary to say any more about hawking here, for the rules as to it are the same as those as to shooting and fowling, except that a shooting tenant, unless either the words of his lease were general so as to include everything, or else the right of hawking was expressly included, would not be legally able to hawk, and it is quite possible that the owner of the shooting might object to the tenant hawking, unless he had expressly allowed it, on the ground that it might drive away the birds off the beat.

(3) *Shooting* is the right on which most questions as to sporting arise, but in law, with certain slight exceptions, there is no difference between shooting and other modes of exercising sporting rights, and no difference between whether the shooting is for game or beasts and birds not game. The right is now in the occupier, who, unless he is prevented by the deed under which he holds, or by the Ground Game Act, can, subject to the Game Laws as to the time for killing game, the Wild Birds' Preservation Acts as to the time for killing wild birds, and the Excise Acts as to gun licences and game licences, shoot and kill whatever he may find on the lands. He cannot, however, if he kills game, sell it except in accordance with the Game Acts. But the law, as long as the shooting takes place at legal times, and the shooter has the proper excise licence, takes no account as to the way in which the shooting is done. It is not illegal to shoot partridges on the ground, or pheasants running, or in trees, if the shooter is otherwise qualified, and it may be questioned whether under most shooting leases the tenant is not entitled to kill the game in any way he thinks fit. He may do it in an unsportsmanlike way, but that is not illegal. The only case in which it would seem the law would interfere is in the case of a man shooting on his boundary, not for the exercise of his rights, but to disturb the birds on his neighbour's land. The two cases that have been decided do not give a very clear rule. In the first a man shot near a decoy so as to disturb and drive out the birds in the decoy. This was held to be illegal, as the carrying on a decoy was a trade, and the shooting was in effect disturbing a man carrying on his legal trade. In the second a man shot so as to disturb and drive away his neighbour's rooks, and it was held no action would lie, the ground being that rooks were noxious birds not protected by law. So far the law is not settled as to whether a man can legally shoot on his boundary in such a manner as to drive away his neighbour's game. He certainly could not if it were a game farm, and probably not if his neighbour regularly sold his game, nor even if he regularly let it, for he would injure him in his trade, nor if the shooting drove the game from his neighbour's on to his land so that he could shoot it. But if it was merely to drive it away, it is doubtful if he could be legally prevented For birds or beasts not game and that cannot be sold, it would seem that the person on whose land they are, if his neighbour deliberately frightens them away, has no legal remedy unless he could prove special damage.

The other exceptions as to the right to shoot are those imposed by the Ground Game Act. That Act gave to the occupier of land an inalienable concurrent right with the person who may be entitled to the sporting, to kill the ground game, hares and rabbits, but it limited the exercise of that right by providing that only one person on the occupier's behalf can use firearms to kill ground game. If the occupier lets his shooting, he still retains the right to the ground game, but if care has been taken to have the tenant of the shooting appointed the one person to kill ground game by firearms on the occupier's behalf, then the occupier, although he can still kill the ground game, cannot use firearms.

Subject to these exceptions the law does not interfere with the way in which shooting rights are exercised.

(4) *Fowling*, as opposed to shooting, would mean taking game and other birds by some mode other than shooting. Here again the law does not interfere with the exercise of the right except as to the times when it may be exercised. It cannot be used during close time, and a proper excise licence is also required to be taken out to use a gun or to kill game.

Game taken by fowling can only be sold in the way allowed by the Game Laws. But the person who is legally entitled can take the game and fowl by nets, snares and other devices, the only exception being poison and spring traps elsewhere than in rabbit holes. He can take his own game in his own way, however unsportsmanlike and however much his neighbour may dislike the methods he uses. The chief kind of fowling now carried on is at the decoys, where large numbers of wildfowl are taken. The professional bird-catcher also falls under the class of Fowlers. Nowadays fowling, except in decoys, is more or less a device to enable poaching to be carried on, but it is well to bear in mind that it is legal and can be legally carried out, and that it is important to a person who desires to acquire sporting rights that he should include the right of fowling, not for his own use, but to prevent it being given to any one else and used to his detriment.

(5) *Fishing*—The rights as to fishing are legally the same as the others, the law recognising no distinction between sporting over land and over water, in fact, regarding water merely as so much land covered by water. The rule is that in waters that are not tidal the soil of the river belongs to the owner of the adjoining bank, and he has just the same rights as if there was no water, and it was dry land. It is therefore a trespass to go on the water in a boat, it is a trespass to try and take the fish, as it would be to go on the land to take the game. The same rule as to the public being unable to acquire a right to fish by long user applies as in the case of shooting. However long an owner may have permitted the public to fish, he can at any moment withdraw his permission, and this whether the river is navigable or not, so long as it is not both navigable and subject to the regular flow of the tide, that is so long as the soil is not the public property of the Crown. It follows from this that there is really very little public fishing in the country, and if a person wants to fish he must either get leave or buy or rent fishing rights. Like other sporting rights, the right to fish will only legally pass by deed under seal. Fishing rights are, however, more restricted by legislation than other sporting rights. Game can be legally taken in any way but by poison and spring traps, but there are numbers of ways in which it is illegal to take fish, and some ways which are legal for certain kinds of fish are illegal for others. All these rules apply equally to public and to private fishing. A person cannot even kill the fish he has himself bred except in a legal way.

II. The next point to be considered is in what places the person entitled to sporting rights can exercise them. The broad rule is that his right is limited to the land over which he has the grant from the occupier. In a Royal forest or chace the right extends over all the lands within the boundary of the forest or chace, whoever may be the owner. The rights of the owner there are subject to the paramount right of the Crown, and this rule also prevails in the case of a right of free warren. This can be exercised over a defined tract of ground quite independently of the ownership of the soil. In a manor, the lord often claims the right of sporting over the lands within the manor, but as a rule the lord, in the absence

of a grant of free warren, has no legal right of sporting over the enclosed lands, whether copyhold or freehold, only over the open unenclosed waste. The lord, however, may have retained the right to sport over the enclosed lands at the time of the enclosure, and if he has exercised it without interruption for a long series of years after the enclosure, it would be assumed in the absence of express evidence to the contrary that he had done so. In the case of a modern enclosure, the question whether the lord can sport over newly enclosed lands turns almost entirely on the construction of the document authorising the enclosure. As to the unenclosed wastes of the manor, the lord has the exclusive right of sporting over these, and could prosecute as a trespasser or poacher any tenant of the manor he found sporting on the waste. In strict law a commoner has no right to go on the waste except for the purpose of exercising his right of common. There may be a right in the commoner to the sporting on the waste, that is, such a right could legally exist, but it is of extremely rare occurrence, but common of fishing, the right of the commoner to fish in the waters in the manor is, although not usual, by no means unknown.

Subject to these exceptional cases of the existence of a superior right to that of the occupier, the sporting rights belong to the occupier of the lands. The exception that on the sea-shore the public can shoot or fish is not really an exception, for the land over which the public possess this right is only the land between high and low water mark, and is supposed to be in the occupation of the Crown, as trustees for the public, and therefore the public are entitled to go over it.[1] A distinction must be made between the land that belongs to the Crown, as such *jure-coronæ*, and the private estates of the Crown. Of these last, which are managed by the Office of Woods, the Crown is as much the private owner as any other landowner, and over them the public have no right of sporting. The right of fishing in a tidal navigable river is the same as shooting on the sea-shore. The soil of the bed of the river is by law in the Crown as sovereign of the country, or, as it is often said, as trustee for the public; here, therefore, the public can fish, but when once the place is reached where the tide ceases, the right of the Crown ceases and so do the public rights of fishing, however much the river may be navigable, for the soil of the bed of the river becomes the property of some one else.

An erroneous but very common idea exists that if a road crosses a river or runs along its bank, the public can fish from the bridge or the road, but this is not so, for (1) the public are only entitled to use the bridge or road for the purpose of passing along it, and (2) fishing from a road is really entering on the property of another without his leave. The case of the man who walked along a high road and shot the pheasants as they flew across, and of the man who walked up and down a road to obstruct grouse-driving, both of whom were held to be acting illegally, show this most clearly.

There are certain cases in which a person is justified in going on another man's land to seek for the game he has killed, such as if it was started on the sportsman's own land and fell dead over the boundary, or the case of where a man hooked a salmon, and while playing it, followed it into his neighbour's water; but all these depend on the special circumstances, and are an exception to the general rule, which is that to exercise sporting rights, the consent of the occupier, either implied from the sporting rights being reserved when he commenced his occupation, or existing by a paramount title, or expressly granted under seal by the occupier, is legally necessary.

III. When sporting rights may be exercised depends upon what they are. The Statute law has now laid down certain rules which apply to all sporting rights; there is a close season for game, a close season for birds not game, a close season for salmon and trout, and a close season for other fresh water fish. Whatever may be the rights of the owner, even if he is the grantee of the Forestal rights of the Crown, he can only exercise his sporting rights at a time the law allows. Close season applies equally to all the Queen's subjects. Besides close time there are prohibitions as to killing game on Sundays and Christmas Day and at night, and there are also in certain places prohibitions as to fishing at night, but subject to these the rule is that the owner of sporting rights can exercise those rights during the open season when he pleases.

IV. How can sporting rights be exercised? The answer is in any legal way. As to game, the only illegal modes are poison and spring traps; but as to fish, it depends on the kind of fish. For instance, it is illegal to use a fixed instrument to take salmon, and the size of the net that may be used is in many cases prescribed by local regulation, both as to the maximum and the minimum. In some cases a gaff used with a rod and line is prohibited either altogether, or at certain times of the year. Spearing salmon, trout or char is illegal, and these fish can only be taken by a properly licensed instrument, the difference between fish and game being here strikingly brought out. It is legal, if you take out a game licence, to kill game by any legal mode you like, while if you take out a fish licence you can only kill fish by the special instrument named in your licence. Thus, if you could knock a hare on the head with a stick, it would be legal if you had a game licence, while if you had a rod licence and did the same thing to a salmon it would be illegal. In the one case it is the person who is licensed to use any legal means to take game, in the other the use of a particular legal means to take fish only is given.

It may be said in conclusion that it is almost impossible to state concisely the different points that constantly arise in connection with the subject of sporting rights. It is only possible to state general principles, and it is the exceptions to these principles that create the difficulties; but the possessor of sporting rights must bear in mind (1) that such rights can only be legally acquired by a grant under seal, and that by this grant in some way, either expressly or as a consequence of law, the occupier must be bound. (2) That the rights do not generally, but only in very exceptional cases, extend beyond the boundary of the land of the person who makes the grant. (3) That they can be only exercised subject to the general law as to close time, licences, and employing legal methods of taking game or fish, and this even if the possessor of the rights buys or breeds his game, or hatches and turns out the fish. He will thus avoid many difficulties, and will not go very wrong.

J. W. Willis Bund.

[*See also* Close Time, Game Laws and Licences.]

SPRING HARE, or **Jumping Hare** (*Pedetes caffer*)—This, the **Spring Haas**, of the Cape Dutch, is the largest and most remarkable of the African Jerboas. In general colour of a reddish-brown, slightly tinged with yellow upon the upper parts, and paling to greyish-white underneath, the spring hare is, about the head and body, not unlike our English hare. Here, however, the resemblance is at an end. The animal, with its semi-erect attitude, short fore-legs, strongly developed hind-legs and tail—the latter as long as the animal's body, covered with stiff hairs and black-tipped—is in other respects—although not, of course, a marsupial—far more like the kangaroo. Its leaping powers are extraordinary, and unless surprised or circumvented, it is not by any means an easy animal to come up with. Its habits are essentially

[1] Except when let or sold by the Crown to individuals or Corporations for some special purpose, such as oyster beds.

nocturnal, and it is seldom seen in daylight. Burrowing in sandy ground in large numbers, the spring hare issues forth soon after sunset, and if a farmstead or native location is anywhere near, at once devotes itself to an attack upon the crops and vegetables. It is in this way an extremely mischievous animal, and is hunted down as much as possible alike by white men and Africans. It is, however, from its nocturnal habits, a somewhat difficult beast to circumvent. On moonlight nights, in a locality where large numbers of these animals are known to attack the crops, a field can with great care and silence be surrounded and a good bag made with guns and knobkerries. The unaccustomed European, however, needs to keep a sharp lookout, or he may be knocked over and even partially stunned by the flying leap of a startled

Spring Hare.

spring hare. Occasionally the natives pour a quantity of water into the animals' burrows, flood them out, and kill them with their knobkerries as they issue forth. The flesh of the spring hare is fairly good eating, and is much relished by natives. These animals are fond of the vicinity of hills, and upon hard, rocky ground their extraordinary jumping powers are best displayed. Their leap is said to cover in distance as much as from twenty to thirty feet. That is probably an exaggeration; but from fifteen to twenty feet may be put down as a not impossible achievement for the spring hare. The range of this animal extends from the Cape as far towards the Equator as Angola and Mozambique.

H. A. Bryden.

STABLES—In the construction of stabling many matters must be taken into consideration if the results of one's labours are to be an adequate and satisfactory return for the expenditure of time and capital. The first thing is to be absolutely certain as to one's requirements; second, to insist that these requirements are always used as the basis of construction from the time the foundations are laid until the last touch has been put to the completed work. Nothing spoils good work so much as chopping and changing, or departing from the lines of the original designs as the building progresses. Let the plans be drawn and approved and let the builder adhere rigidly to them.

In proposing to build a range of stabling, every man should know more or less what he requires. That is to say, he will have a general idea of how many horses he will want to accommodate. From this as a starting point, his architect will be able to supply him with plenty of details, some of which will probably be valuable, but, on the other hand, many of which will merit rejection. The latter will most probably refer to the inner construction of the stables, and as I attach much more importance to these details than to the outside appearance of the building, I will confine myself more particularly to them. The reason for this is obvious. The animals which will inhabit the new buildings will spend more of their time in the interior than on the roof. At the same time, no man should permit a building to be erected for him, the exterior of which would afterwards prove an eyesore. But before the point of fitting and arrangement is considered, a very important question arises as to the site.

Site—The best built and most scientifically arranged stable in the kingdom will be a comparative failure, unless built on a suitable site. Too much stress cannot be laid on this. A bad site is injurious to the health of horses and to that of the men employed with them. It creates endless annoyance and expense in this way, and generally gives rise to a very unsatisfactory state of affairs. A man who is contemplating the erection of new stabling knows his own ground; he should also know which is the most suitable for his purpose, and it is for him to choose the spot.

In considering this point, and in fact the whole question of stabling, I assume that the stables for a country gentleman's establishment are required. A certain number of carriage horses, hunters, and perhaps, in these days, a string of polo-ponies will be kept. These animals will spend more of their time in the stables than actually at work; therefore they will require better accommodation than, say, cab or 'bus horses. This follows quite independently of the fact that the difference in value between these classes would induce better treatment as a sort of insurance against monetary loss. In many instances the choice

of the site will be, to some extent, limited by local conditions, but where it is possible every effort should be made to give effect to the following hints.

The site should be on high dry land, so situated that all surface water is carried away naturally; low-lying or marshy ground should be avoided under all circumstances. For subsoil nothing is better than gravel or sand; both are porous and lend themselves readily to nature's drainage system, ensuring a quickly drying surface after heavy rains. A clay formation or alluvial soils and *made* ground are of exactly the opposite quality, and should be avoided as being almost as objectionable as a swamp. Next to sand or gravel, a rocky formation such as granite, limestone or chalk is probably the best. The site being chosen, the next thing to do is to go thoroughly into the drainage question. With a sand or gravel subsoil all surface water will quickly disappear, but it is advisable and, in fact, absolutely necessary that the normal level of the land soakage or ground water should be kept at a certain depth below the surface. This depth I put as from five to six feet. Other points which must be taken into consideration in utilising the chosen site are light and ventilation. The building should have a south or west aspect, and be sheltered from cold northerly and easterly winds, but at the same time there should be no interruption to the free passage of air on all sides.

Walls—These points being satisfactorily settled, the main plan of the building may be considered. Whether brick or stone is to be used and whether solid or hollow walls are to be constructed are but matters of detail. If solid brick walls are decided upon, they should not be less than fourteen inches thick for externals; with stone the thickness should be at least twenty inches. A point in favour of hollow walls is that that they are warmer in winter and cooler in summer than solids.

Air-Space and Ventilation—My next point is the consideration of the cubic contents of the stable and its proper ventilation.

The cubic content, that is, the air-space contained by the building, is a most important point. Animals, as much as men, must have a sufficiency of air when kept in confinement. It is not enough to insist on plenty of outdoor exercise for horses that are not fully worked, if, when the exercise is ended, they are put into stuffy stalls or boxes which cannot contain a sufficient volume of air to ensure health. Taking a general average of stables in England, I find, from General Sir F. W. Fitzwygram's excellent book *Horses and Stables*, that the cubic contents range from 550 cubic feet in the case of the average cab-horse stables to 2,500 cubic feet per horse in the Royal Mews. Here we have a minimum and a maximum; the former is too low, the latter need not be insisted upon, though, if it can be allowed, there is no doubt that the increased air-space, unnecessary though it be for actual breathing purposes, facilitates ventilation. I would lay down the rule that the cubic content of a first class stable should be anywhere between 1,500 cubic feet and 1,700 cubic feet per horse. This gives ample breathing space, and should, in the majority of cases, give perfect control in the matter of ventilation. I am somewhat opposed to the idea of building to a greater height than 15 feet, inside measurement; air-space beyond that is not available for breathing, and, moreover, the superficial area of a stall is reduced should the building be carried higher and only the same cubic content retained as I suggest. If one takes 1,600 feet as the average and builds to 15 feet high, the result gives a superficial area per stall of 106·6 feet. This would not be altogether wrong, but a far better plan would be to reduce the height by two feet and increase the superficial area from 106·6 feet to 123 feet. Too much stress cannot be laid on the importance of floor area per horse as opposed to loftiness of the stable, but of course either point can be carried too far. I speak now of the ordinary stall; when the question of loose boxes is considered, the matter is considerably widened. In this case I would practically double my floor area and retain the maximum height of the walls at 13 feet. This would give the cubic content as 2,198 cubic feet, and both the air-space and superficial area would be ample for any horse whether sick or well.

The next point that arises is ventilation. By this I mean the complete changing of the atmosphere several times in the course of each hour. All the gaseous vapour, carbonic acid gas and organic particles given off by the animals must be cleared out of the stable almost as soon as they are formed. This can only be done by the complete changing of the atmosphere. Horses are not so susceptible to the effects of draughts as are human beings, so that the ventilation of stables is a somewhat easier problem to face than is the ventilation of houses. Speaking broadly, the scheme adopted should ensure a change of atmosphere every ten minutes or quarter of an hour. How this is to be brought about had better be left in the main to the architect. The great principle involved is the rising of the heated and vitiated air to the upper parts of the stable; outlets should thus be provided in the roof for the carrying off of this, whilst the fresh air should be admitted at a comparatively low level.

Another point of importance is that these outlets and inlets should not be under control of the stablemen. If valves are provided, these worthies will often close them to create a feeling of warmth in the stable, or they may be closed and forgotten for days at a time. If valves are

provided, an unchecked arrangement of inlets and outlets, giving the *minimum* quantity of fresh air per hour, should also be added.

Paving—The last great point in the construction of new stabling is the paving or flooring. Many different materials have been used for this purpose, such as common and special bricks, wood blocks, flags, asphalt, many patent bricks or tiles, and concrete. Of them all, I recommend good Portland cement concrete; but, to be satisfactory in every way, it must be of the very best. I will state briefly my objections to the other materials mentioned: common bricks are by no means impervious to moisture; special bricks, usually glazed and very hard, contain small channels or grooves very difficult to keep clean and free from dirt; wood blocks are even worse absorbents than common bricks; both flags and asphalte form very slippery and dangerous floors.

Draining—Adopting, therefore, the very best Portland cement concrete, the only other thing to provide is sufficient slope of the fall of the floor to carry off urine and other liquids. I would recommend a slight fall from either side of the stall to a shallow channel running down the centre: this latter should have a drop of about one in sixty to a deeper channel at the end of the stall running at right angles to it, which might have a somewhat sharper fall to its point of connection with the main drainage system of the stables. This will insure the quick passage of all liquids and prevent objectionable smells and injury to the horses' health.

Under this head may be taken into consideration the matter of sanitary disinfectants, and for the comfort and well-being of the horses a liberal use of same must be made; when I say a liberal use, it must be understood that the medium must be taken, for to overdose the stable with a strong disinfectant means irritation to the animals, and the remedy in that case would be worse than the disease. Care should be taken to place such sanitary compound in places where most required—particularly when smells arise through liquid channels. Many of such compounds have come under my notice, and I have failed to find a better mixture than Jeyes' sanitary compound, which combines every ingredient necessary for the purification of stable air, and is not an irritant.

Renovation—An article of this description would hardly be complete if confined to new stabling only. In many places there are existing stables which require renovation, and this question I will now briefly consider. In the work of renovation, the first thing to be done is to take up all floors and pavements bodily; leave nothing to chance. Then examine, and, if necessary, remake and relay all drains, both land drains and sewers. Then look to the cubic content and superficial area. The roof may be raised with advantage, or a reduction in number of stalls may give all the superficial and air space that is required; then devote attention to the ventilation. This done, my remarks on new stables may be followed.

Stable fittings are matters of choice. It is hardly necessary to say that every owner of horses has his pet clothing for his favourites—clothing for one season of the year and clothing for another—and the health of the animals is no doubt preserved by the care taken in the judicious use of stable clothing, preventing chills and coughs, and rendering the horse more comfortable in its hours of rest. I have used many descriptions of horse covering, both when exercising and for the stable, and I have only words of praise for Jaeger's horse clothing in their varied forms and classes, the materials being scientifically woven, and prepared with every care in respect of healthy ventilation and warmth.

Coach-houses and harness rooms—These should be lofty and dry; well paved with cement, and well-ventilated; otherwise "must" will soon show itself. They should contain all the accommodation requisite to the demands that will be made upon them, and the fact must be borne in mind that the initial outlay of a few pounds may save money in the long run.

AUBREY WALLIS.

STILTS—In some parts of Switzerland and in several districts in France, especially in the Landes, walking on stilts is not only an amusement, but the usual way of locomotion. By means of these crane-like legs, men and women, and even children, transform themselves into the order of "Waders," emulate the long-legged storks and herons, and are able to cross over marshes and flooded grounds without wetting their feet.

There are various forms of stilts and modes of using them. Some, such as those employed by professionals, are strapped to the ankles and have no handles. Others have long handles, and the feet are received into leathern loops nailed on the stilt; but by far the best are those which, like the stilts used in the Landes, are furnished merely with two wooden projections on which the feet can rest.

The easiest way of mounting the stilt is to stand against a wall, and then take the handles of the stilts under the arms. Next, place the right foot on the step of one stilt; raise yourself, with your back still leaning against the wall, and place the left foot on the step of the other stilt.

As the stilt-walker gets confidence and skill, he will be able to get on his stilts without needing the support of a wall, a short run and a spring being quite enough for the purpose.

In walking, raise each stilt alternately with the hands, lifting the foot with it. Having obtained some degree of proficiency, race with

other stilt walkers. I saw a race in the South of France; the distance was a kilometre and a half over uneven country. Eleven competitors started and nine reached the goal. The other two came to grief; they were both leading, and were reckoned the most expert, but their fatal jealousy led to their overbalancing themselves as they were racing along neck to neck, though, when falling, they nimbly lighted on their feet.

There are experts who can ascend and descend steps on stilts, or pirouette on one stilt, holding the other over their heads, then replacing the feet without coming to the ground. It is said that accomplished stilt-walkers can even ascend and descend ladders laid at a considerable slope. The height of the feet from the ground rather diminishes than adds to the difficulty of walking on stilts.

F. T. Pollok.

STOOL-BALL—The game of stool-ball was formerly a very popular game in England. Allusions are made to it in the writings of many authors in the seventeenth century, and it is probably of a much earlier date. Joseph Strutt describes it, and according to his description it was very much like what "rounders" is now. In his time it appears to have been dying out for he mentions it merely as "a pastime played to this day in the North of England."

The game probably never completely died out in the South of England, particularly in Sussex, and it has of late years changed considerably, owing to its increasing popularity. Thus, while formerly the hand was used to strike the ball, a bat is now used for this purpose. This bat is similar in shape and size to an ordinary fives bat, and is made of one piece of wood. The stools have been superseded by "targets," which are round boards, each one foot in diameter, fastened to posts, so that the lowest part of the target is four feet from the ground.

Judging from the references to this game, from the earliest to the latest, there seems always to have been a great amount of uncertainty about the rules, and this uncertainty has not ceased to exist, for there are still many differences as to the rules in different localities, even in Sussex, which is probably the county in which the game is most played.

The target has been described as being round, but many clubs have square targets. This instance alone will show that there is no very definite standard to go upon. However, it will be best to take what are apparently the best rules on each point, and treat them as being the general rules of the game. Most of the rules, of course, are generally accepted by all clubs, for it is only in small matters that differences still exist, and it is to be hoped that these differences will soon disappear.

The game is confined—in Sussex, at any rate, —to women, and there are eleven players on each side.

The targets are placed facing each other fifteen yards apart, and the sides toss for choice of innings. The striker's object is to guard the target from the bowler. The ball generally used is a tennis ball (not a lawn tennis ball). The bowler generally stands on a line half-way between the targets, but in some clubs the bowler stands beside the target, and bowls five times, when a change is made, and another bowler bowls five times from the other end, and so on, as in cricket.

If the ball is struck, the strikers are bound to run at least one run. To obtain a run, both strikers must tap the targets at their own end with the bat, run across, and tap the target at the opposite end. If one of the opposite side strike the target with the ball before the striker taps it with the bat, the striker who is nearest to that target is out. The striker is also out if the ball when bowled hits the target, or if the ball, after being struck, is caught by one of the opposite side before touching the ground. There is a rule, observed in most clubs, which is similar to "leg-before-wicket" in cricket. This is, that if the ball strikes any part of the body which happens to be in front of the target, excepting the hand holding the bat, the striker is out. The bowler must deliver the ball underhand, and may not throw or jerk it.

It is hardly necessary to say that the object of the game is to make runs, the side which makes the most being the winner.

To strike the ball, so that it will travel any distance, is extremely difficult, as will be seen on considering that the ball reaches the striker at a height of four feet from the ground. Besides this, the bowler is fairly close to the striker, who, as a rule, has not time to get the circular swing necessary for a hard hit between the delivery of the ball and its reaching the target. The difficulty of getting this swing is also increased by the striker being obliged to stand very close to the target, for if the target is not touched with the bat after the ball is bowled, and one of the opposite side touch it with the ball, the striker is out. If the striker stands sufficiently far from the target to get a good swing with the bat, and miss the ball, and if one of the opposite side standing behind the target caught the ball, there would be ample time to touch the target with it before the striker has time to touch it with the bat.

Notwithstanding this difficulty of striking hard, if the ball is hit, a run must be made or the striker is out, so it is not to be wondered at that the runs scored are not, as a rule, very numerous, and that the striker is not generally anxious to hit balls that are very wide.

It appears, however, that it is not wise to be too chary of hitting, but to strike the ball downwards, if possible, between the fielders.

Judging by the keenness shown by the players, stool-ball is evidently a very exciting and charming game, and, as it gives womankind another opportunity of combining outdoor exercise with rivalry, there is every probability of its maintaining a lasting position among the games of England.

CHARLES WALKER.

STUD BOOKS—**Horses**—*The Thoroughbred*—The originator of stud books, in connection with the breeding of the race-horse, is understood to have been Mr. Joseph Butler, of Killamarsh, Derbyshire, who in the "seventies" of last century had charge of the studs of Lord Fitzwilliam and Lord Lowther. He, in fact, prepared the material for a stud book prior to the publication of a volume in 1791, entitled *An Introduction to a General Stud Book*, and the latter was followed by the *English Stud Book*, in the preface to which it was stated that the "substance was collected solely for the private amusement of the editor." The editor was an ancestor of the Messrs. Weatherby, the officials of the English Jockey Club, and for very many years compilers of the present *Racing Calendar*. Coming to the present century, a volume appeared in 1803, containing pedigrees from as far back as the reign of Charles the Second. It was, however, in 1808 that the first volume of the present *General Stud Book* saw the light, embracing pedigrees, as set forth on the title page, "From the earliest accounts to 1807." This volume has run through several editions, the fifth having been published as recently as 1891. This, then, is the progenitor of the many stud books, devoted to the genealogy of the thoroughbred, which are circulated in other countries. It is compiled and issued every four years by the Messrs. Weatherby, and has reached eighteen volumes, not to mention annual supplements. A desire has been expressed that the interval between publication should be two years.

On the Continent, France has for many years had a stud book; while in Germany are the *Allgemeines Oesterreichisches und Ungarüsches Gestübuch* (Vienna), and the *Norddeutsches Gestut-Buchs* (Berlin). In Berlin also we have Freutzel's *Family Tables of English Thoroughbred Stock*. There is further a stud book, periodically published in St. Petersburg; and in Rome the *Libro Genealogico Cavalli di Puro Sanque Importati o Nati in Italia*, and we may add the *Stud Book Belge*, in Brussels. In the United States, the first volume of the *American Stud Book* was published in 1873, and South America is distinguished for its *Stud Book Argentino*, the official publication of the Jockey Club in Buenos Ayres; there is also the *Stud Book de la Republica O, de Uruguay*, belonging to the Jockey Club of Monte Video. Turning to Australia, as far back as 1859, a single volume was published by a Mr. W. Levy in Melbourne. This was followed by the late Mr. W. C. Yuille's *Victorian Stud Book*, which was eventually merged into the present *Australian Stud Book*, edited by his son, Mr. A. Yuille. The sixth volume, of over 600 pages, was issued in 1897, and was embellished with a large collection of tabulated pedigrees. Nearly thirty years ago there was a stud book published in Sydney, first edited by Mr. Fowler Boyd Price, and then jointly by Messrs. E. K. Cox and J. A. Scarr, both prominent New South Wales racing men. The little island colony of Tasmania is, as yet, content with a manuscript stud book; but New Zealand has issued the tenth volume, the present editor of which is Mr. G. Elliot, of Waganui, Canterbury.

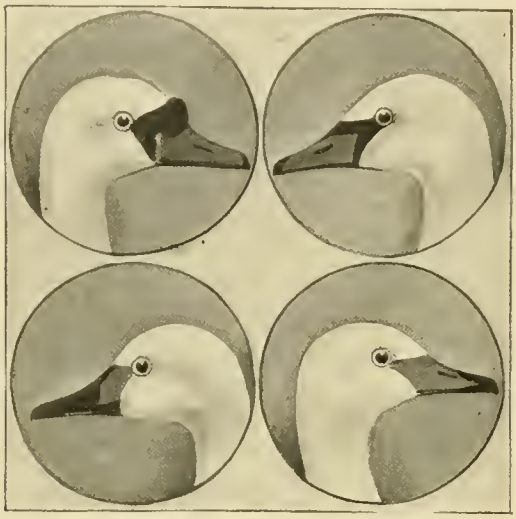
There are also volumes, officially published and otherwise, in connection with hunters, hackneys, clevelands, polo ponies, the Yorkshire coach horse, &c.

Dogs—The *Kennel Club Stud Book* is the official record of the institution of that name, having its headquarters at 27 Old Burlington Street, London. The book covers every known species of the canine race, sporting and otherwise, and was first issued in 1874, the secretary and then editor being Mr. F. C. S. Pearce, who was succeeded by the present official, Mr. W. W. Aspinall. Originally circulated every four years, the *Kennel Club Stud Book* is now an annual publication, Vol. XXIV. being the last volume. The *American Kennel Club Stud Book* is a New York publication, and has reached thirteen volumes. The compiler is Mr. A. P. Vandenburgh, secretary to the A.K.C. On the Continent there are the *Svenska Kennel Klubbens Stambok*, published at Stockholm, and the *Finska Kennel Klubbens Kalendarsch Stambok*, published at Helsingfors. The *Italian Stud Book*, first published at Milan, in 1897, under the auspices of a club, is confined to pointers and English black and tan and Gordon setters. Of stud books devoted to special classes of dogs the *Greyhound Stud Book*, the official publication of the English National Coursing Club, was started in 1882, with the late Mr. David Brown as its compiler. It has now reached seventeen volumes. Prior to this official publication, there should not be omitted a stud book printed for several years by Mr. Goodlake (the very first stud book for greyhounds), in the early part of the present century. It was followed by one by Mr. Thomas Thacker, whose annual *Courser's Remembrancer*, of more than half a century ago, still finds a place in many a present day courser's library. To the foregoing may be added Captain Ellis's erudite *Bothal Stud Book*, printed for private circulation. There is also a *Greyhound Stud Book* published yearly under the auspices of the American Coursing Board, the editor of which is Mr. L. F. Bartels, Denver, Colorado. The

third and last volume has an especial feature, namely, that the pedigree of every greyhound therein is displayed in tabulated form. Other stud books embrace foxhounds, harriers and beagles, fox-terriers, and breeds not connected in any way with sport.

W. F. LAMONBY.

SWAN, WILD—There are only about eight species of the genus *cygnus* known to naturalists throughout the world. They may be enumerated as follows:—The Mute, Whooper (sometimes spelt Hooper), Polish, and Bewick's swans; the Trumpeter and the Common American swan; the Black swan of Australia (*Chenopsis atrata*); and the Black-necked Swan of South America (*Cygnus nigricollis*). Of these the first four are claimed as British;



1, Mute Swan. 2, Polish Swan.
3, Bewick's Swan. 4, Hooper.

HEADS OF SWANS.

that is, as visitors occurring in the wild state, usually in the winter months only. It is not altogether improbable that the great North American bird, the Trumpeter swan, and also the lesser trans-Atlantic swan, *Cygnus columbianus* or *americanus*, have been similarly obtained; although in their case this would seem to be more open to doubt by reason of the fact that both species are kept in this country on waters where they are allowed more or less liberty. From such situations the cygnets are, of course, liable to escape, unless sufficiently early measures are taken to prevent them taking to flight. Neither is it unlikely that in severe winters, when their freshwater home has become untenable, they, like the semi-domesticated Mute swan, might occasionally be found on the tidal waters, in our estuaries, and even upon the open coast.

The Mute Swan (*Cygnus olor* or *C. mansuetus*)—As the semi-domesticated swan of our rivers and inland waters this bird is familiar to most people, and as its habits and life history are fully described in Mr. Harting's paper, it is unnecessary to touch further on these matters. It may, however, be as well to point out here that the Mute swan in a perfectly wild state is occasionally to be found on our coasts; indeed, the wonder would seem to be that wild Mute swans are not oftener found in British waters, seeing that they breed at large in the South of Sweden, in Denmark, and North Germany, much nearer, in fact, to our shores than any other wild swan. On being frozen out of the lakes and ponds, some of the semi-domesticated Mute swans do occasionally find their way to strange waters, where they are shot; but it is not quite fair to the wildfowler to assume that all the Mute swans he kills are birds that have escaped from protection.

The Mute swan has been introduced in the Outer Hebrides, and whilst visiting these islands last winter, the writer was informed by the gamekeeper on Benbecula that the swans were wild and bred on one of the lochs, but that they were sometimes molested by the boys, who took the eggs.

The Polish Swan (*Cygnus immutabilis*)—Naturalists are not agreed that this is a true species, specifically distinct from *C. olor*. Yarrell, however, described and figured this bird, and produced evidence which certainly carries the conviction that there are one or two clearly defined points of distinction. One of the most important is that the cygnets are white from the egg; whereas the young of the Mute swan are grayish-brown in colour. To compare the two species further, it may be pointed out that in the Polish swan the knob on the bill is not so large, whilst the feet and legs are ash or slate-gray instead of black. A strong argument, too, in favour of separation is the fact that Polish swans are occasionally shot out of strings flying Southward along the line of our East Coast, from Scotland to the mouth of the Thames. Yarrell lays stress on the circumstance of these herds being seen without any observable difference in the specimens obtained, all being distinct from the Mute swan, whilst the cygnets, so far as observed, were pure white, like the parent birds. The Polish swan is smaller than the Mute swan, its length being 4 feet 9 inches. The bill is reddish-orange, the nail, nostrils, and face black.

Is it recorded in the *Zoologist* of February, 1880, that a fine adult pair of Polish swans were shot on Wroxham Broad; both had perfect wings, and so presumably were wild birds, the male weighing 22 lbs., and the female 19 lbs., the former measuring 5 feet 2 inches, and the latter 5 feet in length. These weights and measurements accord pretty nearly with those given for the Mute swan. An immature female Polish swan killed at Wramplingham in March, some four or five years later, weighed 15 lbs.; measured,

n length, 4 feet 8 inches, and, from tip to tip of fully extended wings, 7 feet.

The Whooper, Whistling Swan, Elk (*Cygnus musicus* or *C. ferus*)—This bird is not quite so large as the Mute swan, from which bird it may usually be distinguished, even at some considerable distance, by its different pose and upright carriage of the head and neck (*see* illustration). A closer examination of the two species reveals the fact that the Whooper has no knob at the base of the bill, this basal portion being flat and of a deep yellow colour, whilst the tip of the bill is black. The Whooper is reported to have bred in some of the Scottish islands towards the close of the last century. It now nests in Iceland, within the Arctic circle in Scandinavia, and in East Russia. A winter visitor to Great Britain, it appears abundantly only when the weather is severe in Northern Europe. In mild winters the Whooper is seldom seen on our shores. It is most numerous in Scotland, but in Ireland its smaller congener, the Bewick's swan, is the more plentiful of the two. The Whooper is our true wild swan, deriving its name from its loud call-note. In adult plumage the Whooper is pure white, with legs and feet dull black. The young birds in first plumage are pale brownish-gray, and the basal portion of the bill does not at first assume the deep yellow or orange colour of the old birds, but instead is of a pale yellow or flesh-colour, whilst the feet and legs are dark brownish-black. The cygnets attain adult plumage by the second winter. The Whooper is the same length as the Mute swan, both measuring about 5 feet, but in consequence of a somewhat slighter form or more slender build, it does not attain to the weight of the more familiar species. The average weight of the adult male Whooper in good condition is about 21 lbs., and an adult female weighs two or three pounds less.

Bewick's Swan (*Cygnus bewicki*)—This bird is the smallest of the British swans, and it, too, is a winter visitor. In severe seasons it is frequently found on our East Coast: is tolerably plentiful in favourable situations on the West Coast of Scotland, including the warm seas of the Outer Hebrides, and also the Orkneys and Shetlands, but is usually much more abundant in Ireland than elsewhere in our islands. To the latter place Bewick's swan resorts in far greater numbers than the Whooper, for it has been found there in frosty weather in herds of some hundreds. Bewick's swan has, from all accounts, a more westerly breeding range than the Whooper; nesting above the limits of forest growth, on the tundras of North-west Russia and Siberia, and on some of the islands in the Arctic Ocean. Bewick's swan may readily be distinguished from the Whooper by size and weight alone. Adult specimens measure from 46 inches to 50 inches in length, and weigh from 9 lbs. to 13 lbs., this being fully one foot less in length than, and only about half the weight of, the Whooper. In addition to this the coloration of the bill serves as a means of identification; the deep yellow of the basal portion of the smaller bird does not extend below the nostrils, as it does in the larger swan; the rest of the bill is black, and the legs and feet are dull black. The plumage of the adult Bewick's swan is pure white, and the young in first plumage resemble those of the Whooper, the basal portion of their bills being also flesh-coloured.

The Trumpeter Swan (*Cygnus buccinator*)—This North American swan, sometimes called the Hunter's swan, has been included in the list of British birds on the strength of a statement that four were killed out of a small herd of five which appeared at Aldeburgh, Suffolk, towards the end of October, 1866. One of these, now in the Ipswich Museum, has been identified by Professor Newton as of this species. Still, as the Trumpeter swan has been introduced and

WHOOPER. TAME SWAN.

has reared its young in the Zoological Gardens, Regent's Park, and elsewhere in this country, it is just possible that these examples may have escaped from confinement. An American authority, Dr. Elliott Coues, remarks of this swan that it chiefly inhabits North America, from the Mississippi valley westward, from Texas to the fur countries, Great Lakes, Hudson's Bay, and Canada. It occurs casually on the Atlantic coast, breeds from Iowa and Dakota northward, and winters southward to the Gulf. The bill and feet are entirely black. Adults measure 5 feet or more in length, and the enormous extent of their wings reaches to about 8 feet. The plumage is white, and some birds have a wash of rusty-brown on the head. The cygnets are smaller, with feet and legs not so dark, and plumage greyish, with upper neck and head rusty-brown.

Common American Swan or **Whistling Swan** (*Cygnus columbianus* or *americanus*)—Another North American swan, which is said to have occurred a few times in Scotland. There

is, of course, nothing inherently strange or improbable in the supposition that swans breeding in Arctic America may reach this country. A slight divergence eastward from their usual line of flight, such as might be caused by wind or fog, when on their southward migration, would, in the case of birds of such powerful flight, soon see them well on their way hither. *C. columbianus* is rather smaller than his congener, the Trumpeter swan, being under 5 feet in length, and with a wing stretch of from 6 to 7 feet. Coues says that this is the species usually found along the Atlantic coast, and it is more numerous on either coast than in the interior of the United States. It is, however, somewhat rare in New England and eastwards, and breeds only in the high north. There is in this swan a yellow patch in front of the eye, but this is usually small and is not present in every specimen. The plumage of adults is white, and that of the young ashen-grey, with a reddish-brown tinge on the upper neck and head; the young have the bill in part flesh-coloured and the feet of a yellowish flesh colour.

With the Black swan of Australia most people in this country are now tolerably familiar; but as both it and the Black-necked swan of South America are not likely to travel to Great Britain of their own accord, neither need be mentioned further here.

SWAN-SHOOTING—All ardent wildfowlers are filled with the desire to shoot a wild swan sooner or later during their career; although, be it said, for the majority this longing never receives consummation. There is usually great excitement attendant upon the shooting of one's first wild swan, and once this is accomplished the true sportsman is generally content to leave the pursuit of these birds to others, whenever brent geese, duck, wigeon, teal, or any other better and more sporting fowl are about. Yet there is something very striking about the appearance of a herd of wild swans upon the waters, and certainly a company of Whoopers swinging along through the air in string or wedge-like formation is one of the grandest visions ever presented to the wildfowler. Then, too, the music of their cries is among the most inspiriting of sounds.

In their northern haunts wild swans are not so familiar with the sound of the fowling-piece or the sight of the gunner, and consequently on first appearing on our coasts they are somewhat careless in the matter of sentry duty, and are usually more or less easy to approach. The novice in swan-shooting should then with all speed make the most of his opportunities. At such times, by the exercise of a little judgment, and given a fair amount of good luck, he will be able to secure a swan or two before constant harassing by other gunners has rendered the birds perfectly inaccessible.

When the weather is exceptionally severe in Scandinavian waters and along the shores of the Baltic, the wild swans are much more abundant around our coasts and it is then that the best of the sport with them is obtainable.

The swan-shooter has two or three courses open to him, in accordance with the movements of the birds and their environment. He may elect to set up to them with the gunning-punt, when a well-directed charge of shot is certain to do some execution at fair range. Or, if the water is too rough to venture out in a punt, he may sail up to his quarry in some handy craft of light draught, with punt-gun fixed up with swivel or rope-breeching in the bow. If in this case the punt gun is not available, a heavy shoulder four-bore or double eight-bore will form a good substitute; the former throwing, perhaps, a quarter of a pound of AA or SSSG shot at a single discharge, and the latter 5oz. or so of smaller sizes of shot from the two barrels. If such means are not available, the gunner may have to make use of a sunken tub or a pit dug in the saltings where by patiently lying in wait he may now and again obtain a shot at passing swans. And lastly, where the situation will permit, he may attempt to stalk them along the shore of some loch or down the creek on the saltings, or the attempt may be made to secure a shot by driving.

When following swans, or indeed any wildfowl, amidst snow and ice it is advisable to put on a white cap and overall. That prince of wildfowlers, Colonel Hawker, taught us all these and many another dodge for getting at wary fowl.

Whilst going after swans in the gunning-punt, it sometimes answers to put two or three pieces of ice upon the fore-deck of the punt; this, however, requires careful manipulation, or the trim of the boat will be seriously disturbed. Still, something of the sort is more of a necessity in the case of Whoopers and their congeners than any other fowl for, by reason of their length of neck and height from the water, swans have an extended range of vision and thus are able to detect the movements inside a punt at some considerable distance. Over-anxiety has spoilt many good opportunities in swan shooting. Thus, when approaching swans in the water, the gunner should not be in too great a hurry to take a shot, for these heavy-bodied birds, unlike teal and some other ducks, cannot spring high into the air at one bound, but require both time and room to get under way. Thus there is ample time to tip the punt-gun and take a cool shot whenever they open their wings. It should, however, be remembered that swans rising from the ground are much quicker in getting well on the wing. In case the punt gun cannot be tipped, or the gunner doubts his ability to make the most of a flying shot, it is as well to remind him that the gun should be set high and that the heads and necks of sitting swans should be his target; moreover for this kind of shooting the mistake should not be made of using shot

Drawn by A. Thorburn — Swan Electric engraving &c

Wild Swan

too large in size—B.B. will usually be quite large enough.

In shooting at flying swans with the shoulder gun the novice is liable to fall into error in two ways, first as regards their rate of speed, and next, in estimating the distance. The flight of a swan is very deceptive; the idea of speed is scarcely to be associated with the slow and measured beat of his huge wings, and yet the bird may actually be travelling faster than wild ducks or sharp-flying Brent geese. Inexperienced gunners often innocently open fire upon swans at from one to two hundred yards distance under the impression that they are well within gunshot. This, however, serves but to wound and to frighten birds, and care should be taken to estimate distances, if on land, by the bird's surroundings, or, if on water, by its eye, the marking on its bill, and the general distinctness with which it may be seen.

The head or the hollow underneath the wing are the most assailable targets at which to aim when shooting at a swan flying past.

Colonel Hawker speaks of a dodge for making a going-away swan "haul his wind" and so come across the gunner, and this is quite possible, as the following incident will show. In January, 1895, the last swan year of any account, I was wild-fowling off the Essex coast. It was in the early days of the memorable frost of that year, and on coming aboard the yacht from morning flight, preparatory to going afloat for the day and whilst swabbing the mud off my wading boots in the dinghey alongside, my man called attention to two swans flying up against the steady north-east breeze then blowing. As it was evident that the line of flight they were pursuing would bring them across the bow of the yacht not more than eighty yards away, I called to my man to hand me the double 8-bore he had just placed in the cabin, with some big shot cartridges. This he quickly did, and I fired two shots at the leading bird, a huge fellow, whereat he gave a heavy lurch and appeared to be coming down, but recovering, he hauled round, and in two seconds both were close alongside the boat, offering the best possible opportunity for a double shot, but the gun was not loaded, and by the time more cartridges were got out of the cabin the birds were 150 yards away, and the error was not retrieved, at all events just then.

Guns and Ammunition—Although not at all times absolutely essential, success in swan-shooting is usually best assured by the employment of heavy guns of wide bore. Swans have now and again been killed with ordinary game guns and No. 4 shot, by shooting at the head and neck or underneath the wing, but in a general way the range is so great as to necessitate the use of more powerful guns and weightier shot. In a punt gun of, say $1\frac{1}{4}$-inch or $1\frac{3}{8}$-inch bore, suitable charges of Curtis and Harvey's Colonel Hawker's punt-gun powder, and of BB shot of 58, or A shot of 50 pellets to the ounce, will do good execution at the heads and necks of sitting swans at 80 yards. But for flying shots at longer range, mould shot, SSSG of 17 pellets to the ounce, will be required; and with this size swans may be killed at 100 yards or over. For heavy shoulder guns of 4- or 8-bore, AA of 40, or AAA of 32 pellets to the ounce, may be used at fair ranges, whilst the mould shot already mentioned can be requisitioned for the longer shots.

Bibliography—Any one desirous of gaining further information relative to the habits and life history of the Swans will doubtless find what he requires in one or other of the following works: *A History of British Birds*, by Henry Seebohm (Porter); Yarrell's *British Birds*, 4th edition, the 1st and 2nd vols. of which were revised by Professor Alfred Newton, and the 3rd and 4th by Mr. Howard Saunders; *A Manual of British Birds*, by Howard Saunders; *A Handbook of British Birds*, by J. E. Harting; *A Dictionary of Birds*, by Professor Newton.

Then as to the shooting of wild swans, full directions for pursuing the sport in Great Britain are to be found in one or other of the following books: *Instructions to young Sportsmen*, by Colonel Hawker (Messrs. Longman). This, the standard work fifty or more years ago, ran through several editions; although of course the section treating of guns is obsolete, many of the instructions with respect to punts, sizes of shot, and the general methods of procedure when wildfowling, are as applicable now as on the day they were written. *The Wildfowler*, by H. C. Folkard (Longmans), a delightful book, holds first place as a history of the sport. *The Fowler in Ireland*, as also the section on *Wildfowling* in *Letters to young Shooters*, by Sir Ralph Payne-Gallwey, Bart., are extremely useful. *The Art of Wildfowling*, by Mr. Abel Chapman, a sound work; and *Practical Wildfowling*, by the present writer (L. Upcott Gill).

HENRY SHARP.

SWAN, TAME—From its size, its dazzling whiteness, and the gracefulness of its movements in the water, few birds are more attractive than the Mute Swan (*Cygnus olor*), which, having lived for centuries in a state of semi-domestication, has become in consequence one of the most familiar of waterfowl. The snow-white feathers in the wing receive additional beauty by the muscular power which the swan possesses of raising them without extending the wing itself, a habit which is technically termed "busking."

Anciently proclaimed a royal bird, it was ordained that when at liberty in a public river or creek no subject could claim ownership in a swan except by grant from the Crown. The privilege of keeping swans seems to have extended back as far at least as 1483, as appears by laws and orders made in that year, and in 1496. In creating this privilege the Crown granted **Swan Marks** (*cygni notæ*), notches or nicks on the bill to denote ownership; and the books, or rolls, of swan marks that have come down to us are amongst the most curious relics of the past.

Formerly no one might keep swans who was not possessed of freehold land of the yearly

value of five marks (£3 6*s.* 8*d.*), and under a Statute of 22 Edw. IV., cap. 6, the swan, or cygnets, of any person not so qualified might be seized and became forfeited to the king. Every owner of swans, however, had to pay 6*s.* 8*d.* for a license to keep them, although this license did not require renewing, for it was available for the life of the holder. That being settled, the next point was to denote the ownership of every bird by causing a mark to be made upon its bill, and this had to be arranged with the royal swanherd, or, as he was then called the Master of the Game of Swans (*Magister deductus cygnorum*), who kept a book, or roll, for the purpose, in which the mark of every private owner was entered, and could be referred to at any time in case of dispute. From time to time commissions were issued for holding "Swanherds' Courts" or "Swan-mootes," at which orders were made "where and when they were fit and necessary for the preservation of swans." These orders were copied out and made known by proclamation in market towns; they purported to provide for every possible contingency that could arise in dispute regarding ownership and the proper protection of swans.

Swan Laws—The law relating to these birds, as appears by statutes of Edward IV. and Henry VII., was very severe. Any person killing a swan, or even driving one away from his own ground if it offered to breed there, was liable to a year's imprisonment, and fine at the king's pleasure of 13*s.* 4*d.*; and any one stealing the eggs incurred a penalty of 13*s.* 4*d.* for every egg taken. If a dog drove a sitting swan off her nest his master forfeited 13*s.* 4*d.*, and if the dog killed the swan, his owner had to pay 40*s.*, whether he was present or not.

Stealing the eggs of a swan from the nest was punishable under 11 Hen. VII. c. 17, by imprisonment for a year, and a fine at the king's pleasure; but this enactment was superseded by 1. Jac. I. c. 27, section 2 of which declared that any person so offending was liable upon conviction before two justices to be imprisoned for three months, unless he paid to the churchwardens, for the use of the poor, 20*s.* for every egg, or, after one month of his commitment, became bound with two sureties in £20 apiece never to offend again in like manner.

As to the present legal status of the birds themselves, the principle seems to be that when a swan is reduced lawfully into the possession of a private person, whether it be marked or not, he may be said to have a property in it for the purpose of an indictment at common law for larceny or otherwise; but that if the bird be at liberty, in the sea or in a navigable river, *prima facie* it belongs to the Crown. Although it is not larceny to take the eggs of swans, since the law has assigned a less punishment for the offence by statute, the eggs are protected under sect. 24 of the Game Act 1 and 2 Will. IV. c. 32, which enacts that "if any person not having the right of killing the game upon any land—nor having permission from the person having such right—shall wilfully take out of the nest, or destroy in the nest, upon such land the eggs of any bird of game, or of any *swan*, wild duck, teal, or wigeon, he shall on conviction thereof, before two justices of the peace, forfeit and pay for every egg so taken or destroyed, such sum of money not exceeding 5*s.* as to the justices shall seem meet, together with the costs of the conviction."

Cob and Pen—The origin of the names *cob* and *pen* for the male and female swan respectively, is traceable to those ancient "Laws and Orders for Swans" in which the sexes are invariably so designated. Thus, in 1598, we find it ordained that "if any brood be found being led by one swan, the swan and cygnets shall be seized for the king till due proof be had whose they are, and whose was the swan that is away, be it *cob* or *pen*"; for if the swan of one owner paired with that of another, there was a regulation as to the division of the brood in swan-upping time, when the cygnets were allotted and marked accordingly. (See "*The Orders, Lawes, and Ancient Customes of Swannes, caused to be printed by John Witherings, Esquire, Master and Governour of the Royal Game of Swans and Cygnets throughout England, published by August Mathewes*, 1632.") At the present day, in the case of a mixed brood, the cygnets are divided between the two owners.

Swan-upping—The practice of taking up swans at the end of July or beginning of August for the purpose of marking them so as to denote their ownership is a very ancient one, and originally was not, as now, confined to the Thames, but extended to all parts of England. Although no "Swanherds' Courts" are now held nor any proclamations made, and the office of "Master of the Swans throughout England" is abolished, many of the old orders are still adhered to for their own protection by those who keep swans upon the Thames. The owners thus privileged at the present day are Her Majesty the Queen, the Vintners' Company, and the Dyers' Company; and the old custom of marking the birds as soon as the young broods are sufficiently well-grown is annually observed. Each has his own swanherd, and at the appointed time they meet at London Bridge, and proceed up the river in boats by stages, the ceremony occupying four days, usually commencing on the third Monday in July. The stages are from London Bridge to Ditton, Ditton to Staines, Staines to Bray, and Bray to Henley: the number of swans upon the river is so great (between 400 and 500) that it is not possible to catch and mark them all in less time than four days.

The number of swans caught in 1897 between London Bridge and Henley was 481. Of

these 168 belonged to the Queen, 181 to the Vintners' Company, and 132 to the Dyers' Company.

The swanherds report that, as a rule, the swans on the Thames are well treated by the public, who feed them frequently, and do not molest the young or take the eggs. This, of course has an important bearing in maintaining their numbers. Casualties unavoidably occur, such as the swamping of nests, and the consequent addling of eggs: the destruction of newly-hatched young by pike, or by accident, and deaths from cold and starvation in winter, although at that season many of the birds get housed in barns and fed by those who live near the river.

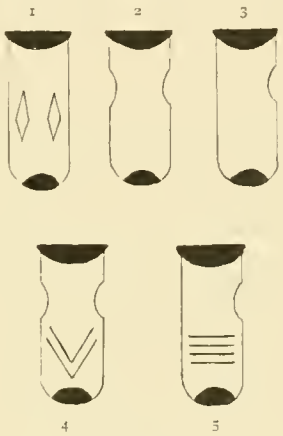
Nesting—Swans, it is said, pair for life, build a fresh nest each season, and if left unmolested, will keep pretty close to the same locality (Stevenson, *Birds of Norfolk*, vol. iii., p. 67). The same author remarks, "Young henbirds do not lay till their *second* year, some not until the third or fourth, and commence by laying from three to five eggs." The swanherd at Abbotsbury, after an experience of fifty years, declared in 1876 that they do not lay before their *third* year (Mansel Pleydell, *Birds of Dorsetshire*, 1888, p. 144).

The nest of a swan would fill an ordinary farm-cart. It is generally composed of a great mass of rushes, reeds, flags, and other coarse aquatic herbage, piled up in a heap at the water's edge, or carried for choice to some island for greater seclusion. On the top of this heap, and in a slight hollow, the *pen* will lay from five to ten greenish-white eggs, on which she must sit for six weeks before the cygnets are hatched. Although the nest is usually built of a sufficient height to escape the danger of a flood, many instances have been recorded in which swans have been seen to raise their nests suddenly when threatened by an unusually high tide.

During the time the *pen* is sitting, the *cob* is very pugnacious, boldly attacking any one who approaches the nest, and buffeting the intruder soundly. Although the late Mr. Stevenson has stated that he was never able to verify the assertion that a swan has been known to break a man's arm or leg, and that no such occurrence was known, even by tradition, amongst local Swanherds (*Birds of Norfolk*, vol. iii., p. 71), since his death a well authenticated case of this kind has been published. (See *The Zoologist*, 1896, p. 356.)

The *cob* is not merely the guardian of the nest he has helped to build, but usually sits for two or three days before the *pen* begins to lay, thus shaping and warming the interior at the same time. While the *pen* is laying her full complement of eggs, the *cob* sits upon them in her absence, appearing reluctant to leave them on her return; and although she will cover them with herbage when she goes off to feed, he will uncover them, wholly or partially, before taking his turn at incubation. Moreover, instances have been known in which, on the accidental death of the *pen* before the eggs were hatched, the *cob* has continued to sit, and in due course has reared the cygnets.

Cygnets—The colour of the cygnets is at first sooty gray above, the neck and under parts of the body not so dark, the bill lead colour, and the line at the margin of the base black. At the end of October, when they almost equal their parents in size, the colour of the bill changes to light slate gray with a tinge of green. The sooty gray colour prevails uniformly over the head, neck, and all the upper surface; while the under surface of the body is uniformly of a lighter hue. The gray colour vanishes



SWAN MARKS.

1, The Queen's; 2, the Vintners; 3, the Dyers; 4, the old mark of the Vintners; 5, the old mark of the Dyers.

almost entirely after the second autumn; and when two years old the cygnets have become quite white. In this respect the young of the mute swan (*Cygnus olor*) differ from the cygnets of the so-called Polish swan (*Cygnus immutabilis*), which are said to be invariably white from birth, a peculiarity which suggested the specific name *immutabilis*. Instances, however, have been recorded in which ordinary tame swans have been seen accompanied by white cygnets, and others which were followed by cygnets some white, the rest gray. (See the *Zoologist*, 1887, p. 463; 1888, p. 470.)

Swanneries—Anciently the Crown had an extensive swannery annexed to the royal palace or manor of Clarendon in Wiltshire, and another in the Isle of Purbeck (Hutchins, *Hist. Dorset*, vol. i. pp. 24, 171). In the Isle of Ely there was at one time a swannery belonging to the Bishop of Ely, whose swan mark appears in several rolls or books of swan marks compiled in the reigns of Elizabeth and James I. The Abbot of Glastonbury also, as appears by a sur-

vey of the temporalities of the Abbey after its dissolution in 1553, had a similar "game of swans" to the number of xl. couple upon a mere, which was five miles in circuit and a mile and a half broad. (See Phelps, *Hist. Somerset*, i. pp. 50, 578).

But the most famous swannery in the kingdom, and one which is still existing, is the swannery at Abbotsbury in Dorsetshire, at the western end of the Fleet estuary. There are records of a swannery here in possession of the abbot of the neighbouring monastery long previous to the Reformation. At the dissolution of the monastery, after some litigation it was surrendered to the king, who, in the thirty-fifth year of his reign, granted it to Giles Strangways, an ancestor of the present owner, the Earl of Ilchester. In April, 1878, the swanherd, who had held office there for more than fifty years, reported that the number of swans then under his charge was fully 1300 (*Zoologist*, 1878, p. 208). In the winter of 1880 a catastrophe reduced the number by nearly one half. The Fleet was frozen throughout during an extremely low spring tide, when the water plants growing at the bottom, becoming entangled in the ice, were torn up by the roots at the returning tide. Many of the swans, thus suddenly deprived of their supply of food, either died of famine, or migrated, and reduced the number to about 800, which average it now maintains. (Mansel Pleydell, *Birds of Dorsetshire*, 1888, p. 144.)

Swan-Pits—In former days, when no city banquet or marriage feast amongst well-to-do citizens was complete without a roast swan or two, the cygnets intended for table were placed in a swan-pit and carefully fattened for some time previously. An interesting example of the kind still survives at Norwich, where the governor of St. Helen's Hospital, from the ancient swan-pit long-established there, supplies not only the tables of the mayor and corporation, but many private owners who consign their cygnets to his care for the purpose of being fattened. An interesting account of this "pit" will be found in Mr. Stevenson's work above quoted.

Wild Swans—During the winter months, when private lakes and pools on which swans are kept become frozen over, and the birds are no longer able to find their natural food in the shape of submerged vegetation, they betake themselves to the open waters of creeks and tidal rivers, where they often fall a prey to wild-fowlers, who do not distinguish them from their wild relations. Of the latter three species, the Whooper (*Cygnus musicus*), Bewick's swan (*C. Bewicki*), and the so-called Polish swan (*C. immutabilis*) visit the British Islands in winter, and the plumage of all when adult being pure white the figures of the heads above given will afford the readiest means of distinguishing them.

J. E. HARTING.

SWIMMING—The exercise of swimming needs a regular action of all the muscles, for progress is brought about by the alternate movements of flexion and extension of the body and limbs. These movements begin in the legs, spread to the thighs, the vertebral column and the arms, promoting harmonious action between the muscles of both sides of the body, and consequently regular development and a straight figure.

The common idea is that swimming can be easily acquired. This in the abstract is true, but it is one thing to be able to keep afloat and propel yourself through the water, and quite another thing to do so correctly, with speed, and the least possible waste of power. Much depends on the teacher, for when once a bad style is contracted, it is with the utmost difficulty that improvement can be made. At the present time, any one can assume the title of "Professor of Swimming"; there is no recognised authority for testing the abilities of teachers, but hopes are entertained that the diploma examination instituted by the Life-Saving Society, which will be referred to later, will be the means of creating a much higher standard of education for the teaching of swimming than is now common.

Most persons who have learned to swim have a vivid recollection of the difficulties experienced in keeping themselves afloat when they first attempted the exercise. They especially remember the short, vigorous but flurried, misdirected, and consequently futile strokes which, instead of enabling them to skim the surface of the water, conducted them to the bottom. Impressed upon the memory, too, are the ineffectual attempts at respiration; the gasping and puffing and the swallowing of water inadvertently gulped instead of air.

Rapid progress is best secured by moving the limbs more slowly in flexion than in extension. Therefore, the general tendency of novices to bend the back, to make short sharp plunges with hands and feet and never to straighten the limbs, are faults which must be avoided by every one who wishes to become a swimmer. It should never be forgotten that every movement must be carefully executed, the circular sweep of the arms and legs properly defined, and all haste avoided.

The legs have the chief share in securing progress, and the greatest attention should be paid to this part of the stroke, so that the learner may be able to use his legs to the best advantage.

The best method of practising the leg stroke is to take hold of some support with both hands and bring the body into a horizontal position on the surface of the water, the legs extended close together and the feet turned slightly outwards, the heels touching. Then the legs should be opened and widened out at the knees, thereby

drawing the feet well up towards the body, heels kept touching all the time. This movement should be freely practised before the next is

Position I.

entered upon, and on no account must the knees *be drawn under the body*. They are simply to be widened out sideways. As soon as the beginner fully understands this movement, he should, when the feet are drawn up, kick them wide out to each side and then close the straightened legs back to their original, horizontal position, with a strong stroke.

These are the essential actions of the legs in breast swimming, and, before the combined movements are practised, the beginner should be able to accomplish them with regularity and precision.

It is astonishing what confidence a learner will gain as soon as he begins to understand that he can regulate the movements of his limbs, and that as long as he keeps moving his legs in the manner described, his body will remain on the surface. Into these leg-actions he will almost imperceptibly glide; the feet are drawn up, then

Position II.

the legs are swiftly extended and brought back together, with regular, rhythmical movement.

Expert breast-stroke swimmers, as they move the legs backwards, make a rounded sweep with the lower part of the leg and foot, causing a kind of flip or fin action, thereby adding to pace, by forming a series of irregular ellipses; as this comes with practice, the learner must first acquire the complete stroke.

Now for the arm movements. The arms should be flexed, with the elbows about four to six inches from the sides of the body; the hands should be brought up in front of the chin, thumbs touching and palms facing downwards. The hands should be near the surface and the body inclined forward, the head thrown slightly back. On no account must the hand be cramped, though the fingers should be fully extended and touching each other. In making the stroke, the arms should be shot out to their fullest extent, in line with the body; the hands then slightly turned outwards, the arms brought round by a steady pull until they are in line with the shoulder. The recovery is made by flexing the arms and bringing the elbows near the sides of the body, the hands coming almost naturally into position again in front of the chin.

Position III.

The combination of the arm and leg movements should next be practised.

The first difficulty will be that of breathing, but with a little careful attention that will soon be overcome. The inspiration must be made while the arms are being swept back from the extended position to the one in line with the shoulders: the expiration during the other portions of the stroke. Breathing should take place regularly every stroke, and not be suspended, as it very often is by beginners, during several.

When first attempting the combined movements, it is best to be held up by some one. At starting, incline the body to a horizontal position, with the back slightly hollowed, *not arched*, with arms and legs fully extended. Then the arms are brought backwards until in line with the shoulder; next, the elbows are flexed and the hands brought to the front in line with the chin. As the hands are brought to the front, the legs are drawn up and then quickly kicked out, swirled round and brought together again, as if in one motion, while at the same time the

arms are shot forward. When the arms are fully extended, the hands should be about three inches, and the legs, when closed, about eight inches below the surface. On no account must there be haste in any part of the stroke, for the more careful his action at the outset, the quicker the beginner will learn. As soon as a few strokes can be accomplished, he should take up his position on one side of the bath at the shallow end, push off, and try to reach the other side.

With the acquirement of the breast-stroke will come the desire to learn the higher branches of the art, and for this purpose it is, in my opinion, desirable to master first the principles which govern floating, as thereby the beginner will soon understand how buoyant the human body is, how easily it can be made to remain upon the surface, and the position in which it should be placed to minimise the resistance offered it by water when travelling. The ability to float comes to you when least expected, or, rather, you suddenly find your proper balance after vainly trying to discover it for weeks. Some people there are who can float but not swim; while there are thousands of swimmers who cannot float at all. Their ignorance is largely due to lack of patience. They try once or twice, find it difficult to learn, and then turn their attention solely to racing for the rest of their career. In brief, floating is the balancing of the body on the surface of the water, and what the swimmer has first to find out is the exact position in which his arms and legs have to be placed in order to accomplish it. The learner should first stand erect in the bath with legs close together and then lean backwards, at the same time extending the arms beyond the head. After closing his mouth and taking a deep breath, a slight push from the bottom should be made, sufficient to bring the body to the surface in a horizontal position. Then, gently inclining his head back, holding his breath, and without troubling if his face go under water, he should first note which part of the body sinks first. If the legs sink, then either the arms are not fully extended, the head not sunk low enough, or the chest not properly inflated. The merest alteration of one of the limbs may suffice to keep the body on top. A good way of practising is to place the feet under the rail of the bath and then lie flat on the back with arms extended beyond the head, the whole body being kept perfectly straight, but not rigid. In getting into position, every movement should be made slowly, and, if the body descend a little, there should be no alteration in its position, as in any case there is slight sinking at every expiration, followed by a corresponding rise at each inspiration. Two great faults must be guarded against, (*a*) the almost uncontrollable desire to lift the head, and (*b*) *the contraction of the muscles before the whole body is rigid.*

Sometimes "sculling" is taught first, as this is the chief of floating and other surface feats. The body is kept straight, as previously described, but the arms, instead of being extended beyond the head, are placed at the side of the body, the hands palm downwards. By slight semicircular, wave-like motions of the hands from right to left, the recovery being made as if feathering an oar, the body is kept on the surface and motion also imparted to it. If a swimmer acquire this he can always keep his body in position for floating practice. In salt water it is much easier to balance one's self than in fresh, owing to the greater density of the water.

When he has acquired a knowledge of breast-swimming and floating, the beginner can then turn his attention to the speed strokes. With that familiarly known as the side stroke I do not intend to deal. It is practically out of date now, having been supplanted by the over-arm and Trudgen methods of progression.

The "over-arm" movement, which is a development of the old side stroke, is now used by almost every racing swimmer. The leg-kick is entirely different from that used in the breast stroke, and is more like that of a runner. The over-arm, the lower-arm and leg strokes combine in so uniform a manner that the body moves forward with a regular swing. The swimmer lies on his side, the majority preferring to turn on to the right, with the under or right arm fully extended beyond the head. He then pulls the under arm down through the water towards the hips, at the same time keeping the hand flat and the fingers closed. As soon as the stroke is finished, the arm is flexed and the hand shot forwards, until it again arrives in front of the head, ready for the next stroke. When the lower arm has nearly completed the downward stroke, the upper arm, slightly flexed so as to work clear of the chest, should be a little in front of the face, with the fingers closed together and hand pointing downwards. The hand is then swept through the water close to the body until opposite the waist, when it is brought smartly out and carried rapidly through the air to the front of the face, ready for the succeeding stroke.

The legs commence to work as soon as the upper arm is opposite the shoulder. They are then opened widely and should be ready for the kick when the upper hand leaves the water, the kick being completed before the said hand is ready for the next stroke. In this kick, the left leg is placed forward, knee slightly bent, while the right leg is carried far back and bent double. Then the left leg is smartly straightened and the right brought back to it with a determined swish as of a whip. In this stroke, as the body is on the side, the hands are worked in nearly a vertical plane, above and beneath the trunk, and not on either side of it, as in the breast stroke; but with regard to the legs the movement is different, for these are worked in the horizontal plane. The extremities and the body are con-

sequently employed in the best possible manner for developing their power, reducing friction in the forward motion and preventing dead points.

In the over-arm stroke, three limbs move together in the same direction and keep time;

Over-arm Stroke.—I.

the fourth always moves in the opposite direction to the other three. The limbs which move together are the legs and over-arm; as the latter is advanced, the legs are drawn up and all three are forced backward with energy and rapidity, communicating to the body a forward impulse, and the body, being on the side, advances as on a keel to a considerable distance; the under-arm, which moves by itself, acts as a cut-water, assists in floating the body, and keeps up the momentum as the other limbs are getting into position for the next stroke, thus securing in a great measure continuity of movement. In order to get the greatest possible power from the kick, the legs should be made to diverge widely, and the greatest force should be imparted to them when pushed outwards and away from the trunk, the force being continued as the legs are converged upon each other, until the whole body is in a straight line.

Inhalation takes place during the forward movement of the over-arm.

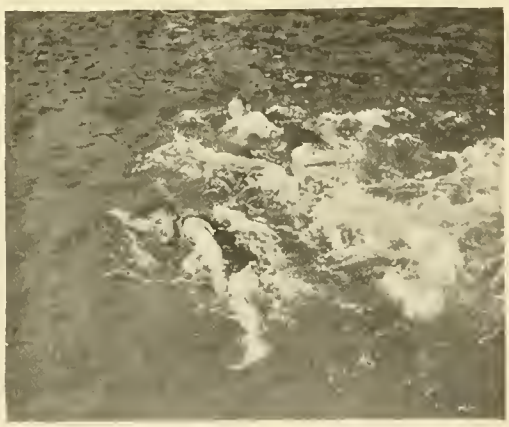
The "Trudgen" stroke is so called because it was made popular in this country in the "seventies" by a swimmer of that name who had learned it while among the natives of South America. Though a fatiguing stroke for a long swim, it is of eminent service in "water polo," and, for a short distance, is perhaps one of the speediest known. The leg kick is essentially the same as in the over-arm stroke, the body being on the side when it is taken, but instead of the under-arm being moved in the ordinary way, it is brought out of the water beyond the head and swept round to the side, thus causing the body to turn on the breast. Then the upper hand is pulled through the water in similar manner and the leg kick taken, the body turning once more on the side. Trudgen swam on the chest always, with both arms out of the water, and this style is used in polo when dribbling the ball, but the double over-arm is the less exhausting of the two and just as speedy.

Swimming on the back is not much cultivated, but ability therein is of great assistance in the saving of life from drowning. The movements are similar to those of the breast stroke, the leg kick being identically the same. The arms are extended beyond the head, and then, with the palms turned outward, swept round to the body, and carried back out of the water to position.

When bringing a drowning person to shore, the hands are of course engaged, and the back-swimming has all to be accomplished with the legs. These are sunk at a far greater angle to the surface, so as to give freedom of action, and are moved from the knees downward in semi-circular sweeps, which not only propel the swimmer at a fairly rapid rate, but also tend, through the consequent swirl of water, to keep up the body of the person carried. When practising this stroke, the arms should be folded across the chest.

Under-water swimming competitions are not encouraged by any of the governing bodies, several fatal accidents having resulted therefrom. The breast stroke is ordinarily used, the head being depressed and the arms kept downwards. As soon as the swimmer is becoming exhausted, a warning pain, often described by swimmers as "a headache at the back of the neck," comes over the *medulla oblongata*. *He should immediately rise*, or insensibility, and possibly death, will ensue.

With ability to float is also acquired a sense



Over-arm Stroke.—II.

of absolute control over the water, and the swimmer soon learns how easily the body can be kept on the surface. Then arises the desire to accomplish some of the feats performed by experts. One of the simplest is that of treading water, which is useful when playing polo in deep

water. The arms are extended at right angles, with palms downwards, and the downward action of the legs in the breast-stroke is used to keep the body off the surface, the hands being pressed down at each kick. When it is desired to move forwards, the legs are moved alternately, being thrust outward from the knees to the front and then drawn backwards, the sole of the foot striking the water; but the action is exactly the reverse when desirous of going backwards, the legs then being drawn alternately to the rear. When going forward, the hands are placed on the hips, but when returning they are folded across the chest. The "Pendulum" is a balancing feat which can easily be accomplished by one able to float. The body is first placed in a floating position, with the arms stretched out beyond the head, which is thrown well back. A good breath is taken, the head then inclined slowly forward, and the hands drawn very gradually and carefully towards the back of the head. As this action goes on the feet slowly sink until the body is perpendicular, with the face slightly out of the water. Then the head is sunk forward and the arms slowly extended, this bringing the legs to the surface in the backward direction, and causing the body to float face downwards. Similar actions in the reverse direction will cause the body to assume the perpendicular position, and ultimately float face upwards again, the body moving backwards and forwards like a pendulum, whence the designation of the feat. The "Propeller" and "Torpedo" feats are really variations of back-swimming—the one above, the other below the surface. For the propeller, the swimmer must first of all "scull," and then, when there is a little way on, swing the arms under the surface round to the head, beyond which they must be fully extended. The hands should then be moved from the wrists and fore-arms in wave-like sweeps, the palms being turned outwards, and the body can then be made to travel at a good pace. The body can be turned round by the slowing of the movement of one hand, the body turning to that side. The "Torpedo" feat is similar, except that the feet are raised above the surface, thus allowing the other portion of the body to sink slightly below the surface, while at the end of each stroke the palms are pushed slightly upwards and kept more in line with the body to prevent the head rising.

Revolving on the surface is allied to floating, as swimming actions are not required. The ordinary horizontal position is first assumed, the thumbs being locked. Then the lungs are fully inflated, the face is turned gradually to the right, and the muscular force of the right side slowly exerted. This will cause the body to turn over on to the face, and as soon as it does so the muscular force of the left side is so used as to cause it to revolve on to the back again. Once the body is in motion, the revolutions can be made in quick succession, but they must be performed neatly and without splashing.

Somersaulting, when properly performed, is very graceful. In the ordinary single backward somersault, the head is bent back as far as possible, and the legs drawn right up to the body, which is first of all steadied by the arms being carried out in a horizontal position and in the same straight line as the shoulders. The body is then turned on the back, the bent up legs being out of the water. A semicircular sweep of the hands towards the back, bringing them from palm downwards to palm upwards, turns the body completely over in a circle, the head sinking first. In the forward single somersault, the legs are doubled up and arms extended as before, but this time the chest is under the surface and the head well forward. Then a similar movement to that in the backward somersault is made with the arms, except that it is towards the front and not the back. This causes the body to rotate, the arms being the axis. Double somersaulting is rather more difficult. One swimmer stands on the bottom of the bath with legs extended and arms out at right angles. The second swimmer, after inflating his lungs, sinks, places his head between the legs of the first, and then brings his legs up until they can clasp the first swimmer's head, and also extends his arms, the two swimmers being back to back. As soon as the two are fixed, the backward somersault movement of the arms is commenced, and the men, if they know how to regulate their breathing sufficiently, can turn five or six times in this position, the head of one emerging from the surface as that of the other disappears.

Sinking to the bottom and rising again to the surface, without apparent motive power, is a feat which illustrates the difficulty experienced by an expert in staying under water, owing to the buoyancy of the body. First placing himself in a floating position, the swimmer, after carefully inflating his lungs, lifts his head slightly, at the same time slowly dropping the hips. This causes the body to sink gradually, and then, as the head goes under the surface, a small quantity of air is expired and the body descends to the bottom. In order to rise, the legs should be straightened, the abdomen contracted towards the chest, and the head inclined back. The body will then ascend slowly. As soon as the face appears above the surface a quick breath should be taken.

Diving, like floating, is not extensively practised in this country, and one has to go to Sweden to see this beautiful branch of the art displayed to perfection. There, somersaulting from great heights, and swallow-like flights of a whole team are common, but it is only of late years that such graceful forms of diving have been practised in England, and then only by particular clubs. More attention is now, how-

ever, being paid to the subject, and the general cultivation of this branch, and the inclusion of it in all tests of proficiency, is only a matter of time. The common forms are the "low dive" and the "plunge." The best way to learn is to stand on the side of the bath behind a towel held in front of the legs by two other swimmers,

SWEDISH DIVE.

this giving the learner an idea of lifting his legs as he makes the dive. He should then stoop the body forward until it is nearly double, stretch out his arms until they are in front of the head, and drop the latter between them. For the first dive he can let the body gradually fall forward and, as it goes over, throw up his legs. The swimmers holding the towel can assist him by raising it so as to throw up the legs properly. After a little practice, the nervousness consequent on the initial going into the water head first will be overcome, and the learner will soon be able to make a clean dive. Then he should stand erect on the edge of the bath with the legs close together and the arms swinging. After a few short inhalations, the arms should be swung forward and a spring made from the side. As the feet leave the edge they should be thrown above the head level, and the body straightened, while the head is sunk between the arms, which are kept fully extended, the thumbs touching and palms turned downwards. As soon as the water is entered, the hands should be turned towards the surface, and the diver will immediately rise.

Plunging is a standing dive from a firm take-off, the body, after entering the water, being kept motionless, face downwards. No progressive action is imparted to it other than the impetus of the dive, and the plunge terminates when the competitor raises his head above the surface. The ability to plunge is of good service to racing men and in saving life, as the body skims along the surface with speed for the first thirty feet, and is, soon after entering the water, in the right plane for fast swimming. Moreover, it is of service when entering water which may possibly be weedy, or whose depth is unknown. For this form of diving the swimmer first stands erect on the edge, then raises himself on the forepart of the feet, swings his arms from backward to forward, and then inspires deeply until the lungs are fully inflated. The body is shot out over the water, towards which it is only slightly inclined, and as the spring is made another deep breath is taken. The body should, when entering the water, be in one straight line, the head well sunk between the arms, and the feet turned back, so that when the body rises to the surface the soles should be nearly face upwards. During the first portion of the plunge, the body should not go more than a couple of feet below the surface, and the angle of entry should be such that it rises slowly at a very slight angle and not sharply. Otherwise much of the impetus gained by the dive will be lost, owing to the resistance of the water. After the first forty feet the body, as a rule, travels slowly along the surface, but there are several plungers capable of extraordinary performances.

In a plunging contest, where a time limit of a minute was imposed, Major W. Taylor, of Bootle, in 1897 covered 74 feet 11 inches, while in 1896 at Lewisham Bath Mr. W. Allason, of the Otter Club, traversed 80 feet 8½ inches in 98 seconds.

Sometimes plunging feet first is practised, the swimmer standing as before, first bending his knees and then leaping well out over the water. The arms are then quickly extended beyond the head, thumbs locked, and the body straightened and thrown back. The water is entered feet first and the body travels onward, face upward.

For high diving, coolness and keen judgment of the angle which the body should take when descending are essential, and these can be acquired by gradually increasing the height of the dive, a foot at a time. English divers commonly

SPRING-BACK DIVE.

drop the body from a height and throw up the legs in so doing; but this is a clumsy style and very often leads to the swimmer landing on his back. The better form is to leap into mid-air with the body almost horizontal, and then quickly decline the head and arms towards the water, so that the body comes down at so neat an angle as hardly to cause any disturbance when the entry is made. But the most graceful

is that termed "swallow-diving," the body being shot out from the board, horizontally as in the style just described, but with the arms extended

SWALLOW DIVING.

at right angles. It is allowed to descend in that position until within about six feet of the water, when the arms are closed together under the body, the head smartly inclined into them and the legs thrown up. If performed properly this is a very pretty dive. Experts dive in this fashion from heights varying from forty to sixty feet, and when a body of them do it together, it greatly resembles the action of the swallow. Running headers and spring board diving can easily be learnt by those who can dive well from any height over six feet; but somersaulting, back-diving, cross-diving and the various other methods of entering the water, which are such charming features of a display by experts, require a considerable amount of careful practice, and should not be attempted until the diver is admittedly a good performer in the common styles.

SOMERSAULT DIVING.

Organisation.—The management of amateur swimming in England is vested in a body known as the **Amateur Swimming Association**, and similar organisations exist in Scotland, Ireland, Wales, New South Wales, New Zealand, &c. The English body, which is the oldest of them all, was formed in 1869 with the ostensible object of promoting championships and legislating for the government of amateur sport. For many years its authority was not much recognised outside the southern counties; but since 1889, when England was divided into three districts, each of which has self-governing powers, it has become an important body and its suspensions are recognised by the governing associations of kindred sports. No person can be a member of its Council, or an officer, unless he be a dele-

NEARING THE WATER, SOMERSAULT DIVE.

gate from one of its three branches, *i.e.*, Northern, Midland, or Southern, and the representation in the Council of the district bodies is based on the number of clubs affiliated to each of them, so that, unlike several of the kindred associations, it is purely elective throughout. Its objects are (*a*) to promote and encourage the art of swimming and the game of water polo among both sexes; (*b*) to stimulate public opinion in favour of providing proper accommodation and facilities for acquiring and practising the art of swimming; (*c*) to promote and hold amateur championships; (*d*) to promote the uniformity of rules for the control and regulation of amateur swimming and water polo and the management of all competitions therein; (*e*) to enforce the observance of the laws and rules of the Association, and to deal with any infringement thereof.

Each district association is represented by its

president, six vice-presidents, hon. secretary and treasurer, and one delegate for every ten clubs affiliated, while the committee is composed of two representatives from each association and the officers *ex officio*. The annual meetings are held in each of the districts in rotation, and all resolutions adopted at the said meeting are binding upon every amateur swimmer, and apply to all districts. Sentences of disqualification are binding on all clubs, and are also recognised by the Amateur Athletic Association, the National Cyclists' Union, the National Skating Association, and the Scottish, Irish, and Welsh Associations, whose suspensions are in turn similarly recognised by the Amateur Swimming Association. In the event of a swimmer desiring to appeal against a sentence by either of the District Associations, he can do so to the Committee, whose duties include the hearing of such appeals, the passing of all amateur records, the selection of teams for the International and trial Water Polo Matches, the appointment of delegates to the International Water Polo Board, and the general management of the Association. The definition of an amateur is as follows :—

An amateur is one who has never competed for a money prize, declared wager, or staked bet ; who has never taught, pursued, or assisted in the practice of swimming or any other athletic exercise as a means of pecuniary gain ; and who has not, knowingly, or without protest, taken part in any competition or exhibition with any one who is not an amateur.

A swimmer ceases to be an amateur and becomes a professional by—

(*a*) Engaging in swimming, or any other athletic exercise, or personally teaching, training, or coaching any person therein, for pecuniary gain.

(*b*) Selling, realising upon, or otherwise turning into cash, any prize won by him or her.

(*c*) Accepting remuneration by way of expenses over and above the third class railway fare or otherwise.

(*d*) Accepting remuneration for swimming in public, or by being employed for money or wages in a swimming bath, or elsewhere as an attendant on swimmers.

There are, however, several vital exceptions to these rules ; but the Association reserves full power to prevent any abuse of them. They are—

(*a*) Amateur swimmers shall not lose their amateur status by competing with or against professional football players in ordinary club matches, for which no prizes are given, or in cup competitions permitted by the National Football Associations or Rugby Unions of England, Ireland, Scotland, and Wales.

(*b*) Schoolmasters or school teachers giving instruction in swimming to their school pupils, and as part of their school duties, and receiving no extra remuneration therefor, shall not thereby endanger their amateur status.

(*c*) The fact of any payment being made to an instructor of life-saving shall not endanger the instructor's status as an amateur ; but no such instructor can receive any fee or expenses for any meeting at which he competes for a prize of any description.

(*d*) A bath manager who is not a personal attendant on swimmers in a swimming bath (or otherwise ineligible to compete as an amateur under A.S.A. laws) does not, as such, endanger his amateur status.

By the laws of the Association every meeting, except those held by affiliated clubs, has to be registered and advertised as under their laws. Any amateur competing at an unregistered meeting is liable to disqualification.

Racing—As previously mentioned, the responsibility of dealing with and passing records rests with the Committee of the Association, who during the last few years have had to exercise constant care in checking times, owing to the vast improvement in speed rates.

The increased facilities for bathing and the great number of competitions which are now held have to a certain extent been the cause of this, for a swimmer has now far more opportunities of displaying his ability when in condition than was formerly the case. A mile race is considered the best test of swimming, and that is always the distance agreed upon for the World's Championship. For many years the record of 29 mins. 25½ secs. made by Mr. Horace Davenport, of the Ilex Club, remained the best known ; but in 1892, S. W. Greaseley, of Leicester, who afterwards turned professional, swam the distance in 28 mins. 18⅖ secs. at Exminster. Since then it has been lowered to 26 mins. 46½ secs. by Mr. J. H. Tyers, of Manchester ; while the professional, Joseph Nuttall, in a race at Rochdale on August 29th, 1893, against the American champion, J. McCusker, covered a mile in the marvellous time of 26 mins. 8 secs. In 1886 the half-mile record was 14 mins. 17½ secs., made by Mr. H. C. Schlotel, of Surbiton, in the championship of that year ; but in 1891 S. W. Greaseley lowered it to 13 mins. 42⅖ secs. at Exminster. In 1895 Mr. Tyers was credited with the present record of 13 mins. 20 secs. The times for short distance races have been marvellously improved, no doubt largely through the better conditions for racing in baths which now prevail. In 1878 the hundred yards amateur championship was won in 1 min. 16¾ secs. ; the standard time alone now is 1 min. 12 secs. J. Nuttall (then an amateur) won ten years later in 1 min. 6¼ secs., and this record was at the time considered extraordinary, but the time was gradually lowered until in 1896 Mr. Tyers swam a hundred yards in 1 min. 1⅖ sec. Similar improvements are noticeable in the times for the other championship distances. All amateur records must be made in A.S.A. or university costume, and in still water. For all distances up to and inclusive of 500 yards, baths of not less than 25 yards in length can be used, but records for distances over 500 yards must be made in open water over courses not less than 220 yards in length.

The present amateur records are :—

RECORDS.

Distance.	Time.	Made by	Club.	Date.	Venue.
YDS.	M. S.				
100	1 1⅝	J.H. Tyers	(Manchester) Osborne.	June 11, '96	Burslem.
150	1 39	,,	Farnworth	Sept 25, '97	Warrington
220	2 38⅘	,,	,,	June 26, '97	Nottingham
300	3 56½	,,	(Manchester) Osborne.	Sept. 30, '93	(Bethnal Green.
440	5 53⅘	,,	,, ,,	Sept. 15, '94	Swindon.
500	6 45	,,	,, ,,	Aug. 20, '94	Sunderland
880	13 20	,,	,, ,,	July 13, '95	Bradford.
1,000	15 2	,,	,, ,,	Aug. 18, '94	Southport.
1 mile	26 46½	,,	,, ,,	July 11, '96	Walsall.

A record can only be made in a scratch race or in an individual race against time duly fixed and advertised before the day, and included in the printed programme of some public gala or entertainment, upon which programme the name or names of the entrant or entrants must appear together with the name of the timekeepers. No competitor can start whose name is not printed, and no one, whether entered or not, can join in the competition after it has started. Records made in handicaps are not recognised.

Hints to Swimmers—1. When turning in a bath (swimming with over-arm stroke) place the hand of the lower arm flat against the side under water, and then take breath, swing the other arm round, dip the head and draw up the knees. This will turn the body. Then place both feet against the side, shoot the arms forward and push off, the head being under water as the turn is made.

2. When bathing in open water, look out for weeds and undercurrents. In the event of getting accidentally into weeds, stop kicking and simply move the hands as if "sculling." If you swim, the weeds will entangle round legs and arms.

3. If a current or tide be too strong for you, swim diagonally across it to a spot on either bank, or on shore.

4. Do not dive deep into strange water, especially a lock pool, unless you be an expert, or some one who knows the place be present.

5. To take a straight course in open water, pick out some prominent object on the bank and guide yourself by it.

6. Beware of broken bottles, tins, &c., in river beds.

7. When racing in the sea, you can ascertain the set of the current, and the best course to take, by throwing in a cork, or similar floating object, and closely watching its progress. The swimmer who swims straight from point to point, although perhaps speedier than others, very often loses by getting into slack water.

8. When stung by jelly fish, rub the juice of a lemon well in, or use glycerine and rose water. When seized with cramp, turn on the back and rub the limb affected and kick vigorously. At the same time call loudly for help.

9. When in a rough sea, swim through each wave, not over.

10. Beware of barnacles, when pushing off from an old ship, the side of a pier, or sunken rocks.

11. When diving from a boat always go off the stern. When getting in a boat, lay hold of the stern close to the gunwale with one hand and catch the gunwale with the other. Kick hard and raise the body sideways until it rests on the edge of the stern, then quickly move the hand from the stern to the seat, and slide backwards into the boat.

12. Rub yourself well and take a brisk walk after every swim. When in good condition, bathe every day, and in open water for preference.

The diploma examination of the Life-Saving Society has been previously mentioned in relation to the teaching of swimming and the qualifications which should be possessed by instructors. The examination is divided into two parts, the one theoretical, the other practical. In the theoretical examination the candidate has to write an essay on the following subjects :—

(*a*) Importance and advantages of the knowledge of the art of swimming.

(*b*) Effect of swimming as an exercise upon the growth and development of the body.

(*c*) A short description of the lungs and respiration ; the blood and its circulation.

(*d*) The effect of excessive exercise or over-fatigue, and the physiology of breathlessness.

(*e*) Precautions as to loss of heat, and how to avoid cramp.

(*f*) The best method of teaching swimming.

In the practical examination (which may be taken in one or two parts) each candidate must perform in the presence of the examiners the following evolutions, in fresh water.

(*a*) To carry—dressed in a swimming costume, shirt, tie, collar, socks, boots, trousers, waistcoat, and jacket—a person by the second or third method of rescue a distance of at least 15 yards.

(*b*) To undress on the surface of the water.

(*c*) To swim continuously (*i.e.*, without any pause or rest) for twelve minutes in the following four positions : (1) on the breast, (2) on the back, using arms and legs, (3) on the back, the arms being folded on the chest, (4) overarm side stroke. Three minutes allowed for each position.

(*d*) To dive from the surface of the water to a depth of at least 5 feet and raise a weighted object.

(*e*) To float motionless on the surface of the water for at least 30 seconds.

(*f*) To dive from heights not exceeding 5 feet and 20 feet.

(*g*) To plunge a distance of not less than 40 feet.

(*h*) To swim by means of the propeller a distance of 30 feet.

(*i*) To turn from the surface of the water two somersaults forwards and backwards.

(*j*) To perform three voluntary movements illustrating fancy and scientific swimming.

(*k*) To illustrate, as may be required by the examiners, the best method of teaching swimming, diving, floating, and life-saving.

A maximum of ten points is allowed for each subject and movement. Any candidate failing to obtain 50 per cent. of the maximum for each subject or movement is disqualified.

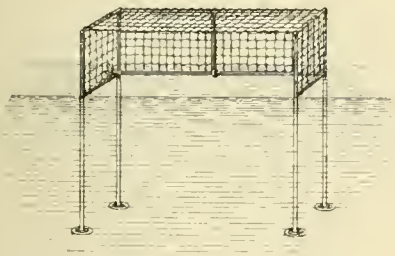
ARCHIBALD SINCLAIR.

WATER POLO—Since the recognition of this sport in 1884 by the Amateur Swimming Association, it has become very popular, and, in addition to various national championships and league competitions, there is now established a regular series of annual international matches in which England, Scotland, Ireland and Wales all participate. On the Continent and in New Zealand, Australia, Canada, India, the United States, &c., it is also played, the English rules being those generally adopted.

The game is played with an Association football in a bath, or open water, the latter for preference, as the general idea of water polo is to increase the staying powers of a swimmer. In a shallow bath he can rest when not in possession of the ball, but in open water he cannot, and must exercise his knowledge of floating, treading water, &c.

A team consists of seven players, three of whom generally play forward, one at half-back, two at full-back, and the other in goal. The distance between the goals must not be more than thirty yards, or less than nineteen, and the width of the field of play not more than twenty yards.

The goal posts, which are fixed at each end of the field of play, must be ten feet apart, and when the water is over five feet in depth, the cross bar must be placed three feet above the surface; but when the water is less than five feet in depth, the cross bar must be placed eight feet from the bottom. In baths the goal posts are provided with flat metal foot, so as to rest firmly on the bottom, and the goals, which are usually of a permanent character, with goal nets attached, are drawn up by pulleys to the roof, when not in use. When in the water they are

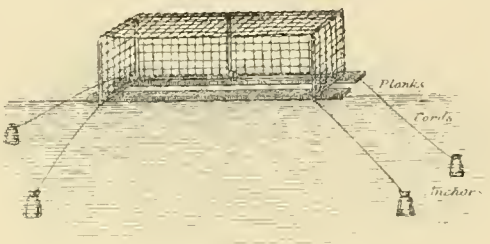


GOAL-POSTS FOR BATHS.

braced to the end of the bath by means of iron back stays and thereby made rigid.

In open water, in cases where the water is too deep to allow of the uprights being wedged firmly in the bottom, a different plan has to be adopted. Then a floating platform about twelve feet in width and four feet in depth is used. From the front of it project two stout pieces of battening, ten feet apart, and on them the uprights are raised to a height of three feet, with the cross bar fixed at the top, and from the two ends of the cross bar a frame-work is fixed to carry the goal net. The platform is moored securely at each end of the course, and the field of play marked out by flags on buoys, or poles lashed together along each side and end.

The game is started by the referee throwing the ball, which must measure between 26½ inches and 28½ inches in circumference, into the centre of the field of play. The teams, who have been

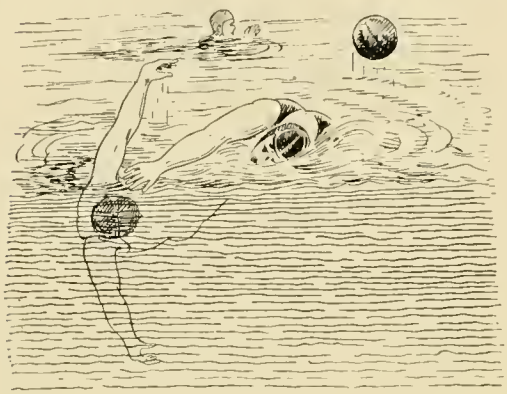


GOAL-POSTS FOR OPEN WATER.

previously lined up at their respective ends, immediately swim hard to their places, the centre-forward of each team usually going straight for the ball, and, if successful in reaching it first, passing back to one of his own side. The ball can be hit or thrown by any of the players, provided they are not standing and do not use both hands, and it can also be dribbled. For standing when playing the ball, touching the ball with both hands, holding the rail or side during any portion of the game, ducking an opponent when he is not in possession of the ball, retaining possession of the ball when ducked, holding, pulling back, or pushing off an opponent, or turning on the back and kicking off an opponent, fouls are awarded, the penalty being a free throw for the opposing side from the place where the foul occurred; but a goal cannot be scored from the said free throw, unless the ball has touched at least one other player. For fouls which the referee considers to be wilful, he can order a man out of the water after one caution, but many authorities are of opinion that for fouls committed close to goal, in order to prevent an almost certain score, a penalty throw, similar in character to the penalty kick at Association football, should be instituted. Beyond those just detailed, the rules are very simple. The duration of the game is fourteen minutes, seven each way, but time occupied in disputes or fouls, and the time from the scoring of the goal to the restarting of the game, are not reckoned in the time of play, so that a match with plenty of scoring often lasts close upon half an hour. A goal is scored by the entire ball passing beyond the goal posts and under the cross bar. Each side has then to line up at its respective end again and another goal cannot be scored after restarting until the ball has touched more than one player. Goal and

corner throws are allowed on the same principles as Association football, and the goal-keeper is exempted from the rules relating to standing, using both hands, or jumping from the bottom when playing the ball, but he must not throw more than half distance under penalty of a foul to the opposing side, and can be treated as any other player when in possession of the ball.

The speediest swimmers and most reliable



TACKLING A PLAYER.

shots should be picked as forwards, while the captain, who should be good at passing, should play at half-back, the place of honour and hard work. Sturdy and cool players, with plenty of stamina, are best as backs. Each member of the team should have a knowledge of the "Trudgen" stroke, or be able to swim fast on the breast, as these accomplishments are of extreme value when dribbling. A good knowledge of swimming, and the proper methods of placing the body so as to get the best possible purchase when throwing the ball in the water, are indispensable before a man can rank as a good player. Constant practice is necessary, and this every captain should see that his team obtains.

Next to shooting, practice in passing is of most importance. Above all, a team should be a combination and not a mere collection of swimmers, each desirous of scoring. In shadowing their opponents, players should always be on the alert for possible passes, and when tackled should make quick short passes to one another. There must be no hesitation, for the man who is quick to see an opening and take advantage of it is the skilful player. One golden rule all players must observe, and that is never to pass direct to a covered player, for he is certain to be tackled, and their own goal may be in danger before they are aware of it. The proper place to pass is some distance from a covered player, particularly if he is known to be speedy, for then by superior swimming he can usually reach it quicker than his rival and possibly shoot a goal, or pass back, before his *vis-à-vis* is aware of the move. If the forwards are good swimmers, they will always keep in position for a few swift strokes, which at critical moments change the fortunes of the game and outwit opposing backs. Quick turning of the body and swift dribbling are of the highest importance. When dribbling, the forwards should work to the off side of the backs, so as to draw them wide of their goal, and when tackling seems imminent, pass sharply away. They should keep as far as possible from the opposing backs, except when the ball is on the goal line, when they should try and force a corner. On the half-back devolves the direction of the game. Against him he has opposed the centre-forward of the other side, and, as a rule, the most speedy swimmer in it. He must never let him go uncovered, and must also keep well in touch with his own backs. Except under special circumstances, he should never attempt to shoot goals, preferring rather to feed his forwards, or, when strongly attacked, to pass behind to his backs farthest from goal.

To the backs are relegated the duty of checking the play of the wing-forwards of the other side, who will try to swim round them, dribble, or pass just as they are being tackled. The backs must be alive to all these styles of play, as well as in touch with each other. Above all, they must avoid fouling, for so close to goal a foul is almost a goal thrown away. Rather should they concede a corner than duck an opponent when he is not in possession of the

BACK THROW.

ball, for this offence is likely to be considered by the referee a wilful foul.

The goal-keeper, though not necessarily a speedy swimmer, requires to be very quick; must know when to fist out, catch, or concede a corner, and what distance to throw out.

The ability to pass and throw accurately can only be developed by constant play and the careful watching of good men; but some useful hints can, however, be given on recognised

styles of passing and throwing. First of all the player has to know how to dispose of his body, for on that depends to a large extent the force of his throw. In what is known as the forward shoulder throw, the ball is lifted from the water to the side of the head, the left arm is stretched out in front and the legs drawn up; then, as the ball is shot forward, the legs are forced rapidly down. When shooting at goal in this style, the player should be uncovered and make what is known as the *ricochet* throw, the ball touching the water with force a couple of yards in front of the goal-keeper, and rising over, or at the side of, him into goal. But for ordinary shooting the "back throw" is more commonly used. In this method the player seizing the ball turns rapidly on his back, brings his legs to the front, and, as the body advances, the ball can be shot forward with great force. But if the leg kick be not properly made, the body will sink and the throw prove abortive. It is when an opponent is making this throw that scientific tackling comes to the aid of the opposing side, effort being made to seize the upraised arm, or tip the ball out of the hand. Good passing is more difficult of accomplishment, particularly that termed the "Pass back." This is made when the player is in difficulty; but it is a style which should never be adopted unless the player can depend upon his own accuracy, for he does not see whither the ball is travelling and can only guess the position. Yet it is a common pass, and to such perfection has it attained that many men can place the ball behind them within a yard of where they judge their men to be. The hand should be placed under the ball and the latter quickly raised above the surface. Immediately it is clear, the ball is thrown back over the head, the disengaged hand being forced down into the water and a leg stroke taken. It is possible to make this throw with either hand, as well as to send the ball by deflections of the hand to right or left, high or low.

Then there are two other passes, developments of which come by practice. These are the "breast stroke" and "over arm." The "breast stroke" can be made with either hand, and is used when a player desires to pass to the right or left. When, for example, in dribbling up there is a likelihood of being tackled, the player passes on the side opposite to that on which the tackle is likely to occur, and so skilful can a player become with either hand, that while passing he is able to continue his swimming. In the "over arm" pass the ball is taken with the uppermost hand and passed either in the line of sight to the rear, or behind; but it is perhaps the most difficult of all to cultivate, though very useful to a half-back. By far the best passes are those which can be used with the "Trudgen" stroke, for, when that stroke is employed, the opponents can be seen all through the game, a matter of impossibility when the over arm stroke is used. It is invaluable when dribbling, as the ball may be driven along rapidly, passes made quickly, and either hand used. When a player is dribbling, the ball is allowed to drift between the arms, striking them or the chin as the player progresses, but never being actually held. The opposing side cannot then duck the swimmer without fouling, and must pick the ball out from between his extended arms.

The rules of the game, so far as Great Britain and Ireland are concerned, cannot be altered, except at the Annual Meetings of the International Board, which represents the English, Scotch, Welsh and Irish Amateur Swimming Associations. The first international match was one between England and Scotland at Kensington Baths, London, in 1890, when Scotland won easily. The same country's team proved successful the following year, but from that time until 1897 they never again managed to defeat England. Ireland first began to play International Matches in 1895, and Wales the following year. Inter-Varsity Matches, between Oxford and Cambridge, are now also annual fixtures. The results of the Internationals to date are here appended:—

ENGLAND *v.* SCOTLAND.

Played 8. Won 5. Lost 3.

1890, London,	S. 4—0	1894, Nottingham,	E. 4—1
1891, Glasgow,	S. 2—0	1895, Edinburgh,	E. 3—0
1892, Liverpool,	E. 4—0	1896, London,	E. 4—2
1893, Glasgow,	E. 3—0	1897, Edinburgh,	S. 2—1

ENGLAND *v.* IRELAND.

Played 1. Won 1. Lost 0.

1895, London, E. 12—0.

SCOTLAND *v.* WALES.

Played 1. Won 1. Lost 0.

1897, Newport, S. 3—2.

WALES *v.* IRELAND.

Played 2. Won 2. Lost 0.

1896, London, W. 3—0.
1897, Swansea, W. 3—2.

The English Championship competition was started in 1888 and was won in that and the following year by the Burton-on-Trent Club. In 1890 Hanley proved successful, but the previous holders once more came to the front the next year. Nautilus, a London club, won in 1892, and Tunbridge Wells in 1893. Since then Manchester Osborne have always proved successful.

In Scotland this game is named Aquatic Football.

WILLIAM HENRY.

AMATEUR SWIMMING ASSOCIATION.

INTERNATIONAL RULES FOR WATER POLO.

1. *Ball.*—The ball to be round and fully inflated. It shall measure not less than 26½ in., nor more than

28½ in. in circumference. It shall be waterproof, with no strapped seams outside, and no grease or other objectionable substance on the surface. The ball to be furnished by the home team.

2. *Goals.*—The width of the goals to be 10 feet, the cross-bar to be 3 feet above the surface when the water is 5 feet or over in depth, and to be 8 feet from the bottom when the water is less than 5 feet in depth. The goal-posts to be furnished by the home team.

NOTE.—Whenever practicable, nets should be attached to the goal-posts.

3. *Caps and Flags.*—One team shall wear dark blue caps and the other team white caps. Each goal-scorer shall be provided with a red flag, and the referee with a dark blue and a white flag and a bell.

4. *Field of Play.* The distance between the goals shall not exceed 30 yards, nor be less than 19 yards, the width shall not be more than 20 yards, and shall be of even width throughout the field of play. The goal-posts shall be fixed at least one foot from the end of the bath, or any obstruction.

5. *Depth.*—The water shall not be shallower than 3 feet.

6. *Time.*—The duration of the match shall be 14 minutes, 7 minutes each way. Three minutes to be allowed at half-time for change of ends. When a goal has been scored, the time from the scoring of the goal to the re-starting of the game, or time occupied by disputes or fouls, shall not be reckoned as in the time of play.

7. *Officials.* The officials shall consist of a referee, a timekeeper, and two goal-scorers.

8. *Referee.*—The referee's duties shall be to start the game, stop all unfair play, decide all cases of dispute, declare fouls, goals, half-time, and time, and see that these rules are properly carried out. He may proclaim a foul, without its being claimed by any of the competitors, and shall decide upon and declare all goals, whether signified or not. The referee's decision is final.

9. *Goal-scorers.*—The goal-scorers shall stand at the side near each goal, and when they consider that the ball has passed through the goal, at their respective ends only, they shall signify the same to the referee by means of a red flag. They shall not change ends, and shall keep the score of goals of each team at their respective ends.

10. *Teams.*—Each side shall consist of not more than seven players, who shall wear blue and white caps respectively, and drawers or costumes with drawers underneath the costumes. In baths no grease, oil, or other objectionable substance shall be rubbed on the body.

11. *Captains.*—The captains shall be playing members of the teams they represent; they shall agree upon all preliminaries, and shall toss for choice of ends. If they are unable to agree upon any point, the referee shall decide for them.

12. *Starting.*—The players shall enter the water and place themselves in a line with their respective goals. The referee shall stand in a line with the centre of the course, and, having ascertained that the captains are ready, shall give the word "Go," and immediately throw the ball into the water at the centre. A goal shall not be scored after starting or re-starting until the ball has been handled by an opposing player or by a player on the same side, who shall be within half-distance of the goal attacked. The ball must be handled by more than one player before a goal can be scored.

13. *Scoring.*—A goal shall be scored by the entire ball passing beyond the goal-posts and under the cross-bar.

14. *Fouls.*—It shall be a Foul: (*a*) To touch the ball with both hands at the same time; (*b*) To hold the rail or side during any part of the game; (*c*) To stand on or touch the bottom during any part of the game, unless for the purpose of resting; (*d*) To duck an opponent, unless he is holding the ball, or to retain possession of the ball when ducked; (*e*) To jump from the bottom or push from the side (except at starting or re-starting) in order to play the ball or duck an opponent; (*f*) To hold, pull back, or push off from an opponent; (*g*) To turn on the back and kick at an opponent; (*h*) To assist a player at the start or re-start.

NOTE.—Dribbling or striking the ball is not holding, but lifting, carrying, pressing under water or placing the hand under or over the ball when actually touching, is holding. Dribbling the ball up and through the posts is permissible.

15. *Penalties.*—The penalty for each foul shall be a free throw to the opposing side from the place where the foul occurred. A goal cannot be scored from a free throw unless the ball has been handled by at least one other player.

16. *Wilful Fouls.*—If, in the opinion of the referee, a player commits an ordinary foul wilfully, he shall be cautioned for the first offence, and for the second the referee shall have the power to order him out of the water until a goal has been scored. It shall be a wilful foul to start before the word "Go," to deliberately waste time, or for a player to take up a position within a yard of his opponents' goal.

17. *Declaring Fouls.*—The referee shall declare a foul by blowing a whistle and exhibiting the colour of the side to which the free throw is awarded. The player nearest to where the foul occurred shall take the throw. The other players shall remain in their respective positions from the blowing of the whistle until the ball has left the hand of the player taking the throw.

18. *Goal-keeper.*—The goal-keeper may stand to defend his goal and must not throw the ball beyond half-distance; the penalty for doing so shall be a free throw to the opposing side from half-distance at either side of the field of play. The goal-keeper is exempt from clauses (*a*) (*c*), and (*e*) in rule 14, but he may be treated as any other player when in possession of the ball.

19. *Goal Line and Corner Throws.*—A player throwing the ball over his own goal line shall concede a free corner throw to his opponents, but if the attacking side throw the ball over it shall be a free throw to their opponents' goal-keeper.

NOTE.—In the event of the ball having become dead by being thrown over the goal-line, it must not be considered in play until it has left the goal-keeper's hands.

20. *Out of Play.*—Should a player send the ball out of the field of play at either side, it shall be thrown in any direction from where it went out by one of the opposing side, and shall be considered a free throw.

21. *Declaring Goals, Time, &c.*—The referee shall declare fouls, half-time, and time by whistle; goals by bell.

22. *Leaving the Water.* A player leaving the water, or sitting or standing on the steps, or sitting on the side of the bath in which the match is being played, except at half-time or by permission of the referee, shall not re-enter it until a goal has been scored, or until half-time. Should a player leave the water he can only re-enter at his own goal-line.

AMATEUR SWIMMING ASSOCIATION.

HINTS FOR THE GUIDANCE OF REFEREES.

A (Rules 1 and 2, 4 and 5). See that the ball is of proper size and in accordance with Rule 1. See that the dimensions of the goal-posts are correct, and that they are fixed at least one clear foot from the end of the bath or any obstruction. Check depth of water, and measure the length and width of the field of play. See that the half-distance is clearly defined on both sides of the bath by towels or some visible marks.

N.B. Goal nets simplify the work of the Referee, and, wherever practicable, should be used.

B. (Rule 3). Distinctive coloured caps, as per Rule 3, should in every case be enforced.

C. (Rule 6). Be careful to have a proper time-keeper who is thoroughly conversant with the rules. An ordinary stop watch is the only one with which the time can be accurately taken. Note that when a goal has been scored, the time from the scoring of the goal to the re-starting of the game, and time occupied in disputes or fouls, must not be reckoned in the time of play.

D. (Rule 8). The absolute control of the game is in the hands of the referee. All cases of misconduct by players should be reported to the committee having control of the competition, so that they may be dealt with by the governing body. Further, any swimmer who may interfere with or insult the referee, either during or after the game, should also be reported.

The referee should, if possible, have one side of the field of play kept clear so as to be able to follow the game from end to end of the bath.

E. (Rule 9). See that the goal-scorers are in their places, and instruct them that their duties are to signify, by means of a flag, when the entire ball has passed between the uprights and under the cross-bar (no matter how passed through), and to keep the scores of each team at their respective ends.

F. (Rule 11). Ascertain that the captains have agreed upon all preliminaries: if not, give a decision as per Rule 11.

G. (Rule 12). Pay particular attention to see that the latter part of Rule 12 is not infringed. A goal shall not be scored after starting or re-starting until the ball has [also] been handled by an opposing player, or by a player on the same side (*i.e.*, the same side as the player who first handled the ball) who shall be within half distance of the goal attacked. The words within the brackets are explanatory, the spirit of the rule being: that until an opponent has handled the ball, a goal cannot be scored by the side which first gets the ball, except from within half-distance of the goal attacked.

H. (Rule 14). Be careful that no player other than the goal-keeper touches the ball with both hands. See that the "resting" clause be not abused. The rules only allow standing on the bottom for the purpose of resting, and players must not be allowed to walk about, stand with arms extended, with the object of shadowing or molesting any player, or be allowed to jump from the bottom.

Clause D. deals with the foul most often committed. Do not, on any account, allow a player to be interfered with unless he is holding the ball For definition of "holding" see note at foot of Rule 14.

See that no player holds the rail or side during any part of the game. If this rule be infringed, no matter in what part of the field of play the ball may be, it must be brought back to where the foul occurred.

I. (Rule 16). Be particularly stringent with regard to Rule 16. Only caution the player once, and for a second offence enforce the penalty.

When advantage is taken of Clause D, Rule 14, in order to prevent the scoring of a goal, do not allow the goal, but caution the player, and for a second offence order him out of the water.

When once a decision has been given, do not allow any player or spectator to question the ruling: the laws of the Association definitely state how protests shall be made.

K. (Rule 18). When a free throw has been awarded, the ball must be considered dead until it has left the hand of the player taking the free throw, and on no account allow any player, other than the one taking the throw, to change his position.

L. (Rule 17). Goal-keepers must not be allowed to throw the ball past the half-distance mark. If the ball when thrown by the goal-keeper travel past the half-distance, even if it touch the water before reaching half-distance, the rule is thereby infringed.

M. (Rule 19). It is a corner throw when the ball is thrown by or passes off any player over his own goal line.

In the event of the ball having become dead by being thrown over the goal line, it must not be considered in play until it has left the hands of the goal-keeper.

N. (Rule 20). When the ball goes out of play, the last player it touches must be deemed to have sent it out.

O. (Rule 22). Note Rule 22 as to leaving the water and sitting or standing on the steps.

LIFE SAVING—It will not be out of place to give here a brief description of the methods of rescue, release, and resuscitation, recommended by the Life-Saving Society, and the special circumstances under which each should be put in practice. It must be remembered, however, that in order to qualify for the award of the proficiency medallion and certificate, and above all, to render himself thoroughly competent to put these methods into practical use should necessity arise, it is essential that the swimmer attend a class of instruction. He should by diligent practice endeavour to perfect himself, not resting content until quite efficient, giving particular attention to the water-drill.

Prior to the formation of the Society, the only attempt made to teach life-saving was by means of dummies. A heavy doll was made up of old clothes, &c., pushed a few yards out into the water, and the pupils jumped in and brought it to shore as best they could. The method of instruction advocated by the Life-Saving Society is conducted throughout with living subjects, giving the pupil a practical experience of what he has to do when called upon to render aid to those in danger of drowning.

The first method of rescue is for use when the drowning person is not struggling. Supposing the rescuer to approach him from in front, he grasps him by the arms just above the elbows and turns him round until he faces the same way as himself; then, passing his hands up to the side of the face, with the palms over the ears, and holding him firmly so, he swims on the back, drawing the patient after him. It will be found that there is but little difficulty in carrying a person in this manner.

In cases where the drowning subject is struggling it is, of course, necessary to obtain a firmer hold. In the second method, supposing the rescuer to have turned his patient as before, he then grips him by the arms just above the elbow, fingers inwards, thumbs outwards, and drawing the patient's arm up at right angles to his body, he swims on his back as before, keeping his own elbows to his sides. By this method, although not so easy for the rescuer, the drowning person is much more under his control, and he can to a great extent prevent him struggling.

The third method of rescue is for use in cases where the patient's arms are difficult or impossible to hold, owing to his violent struggles. It is somewhat similar to the second, but the rescuer's arms are, in this instance, passed under the patient's armpits and his hands folded across his chest; by squaring the elbows out the rescuer can prevent any danger of the patient, who is practically helpless, breaking away or clutching him; but the position renders his own task rather more difficult.

The fourth method has been devised to enable a swimmer to render assistance to another attacked by cramp or overtaken by fatigue; the rescuer in this case swims with the breast stroke, while the person in difficulties places his hands on his shoulders close to the neck, leaning his head well back and straightening his arms. His body floats easily under that of the rescuer, who can

RESCUE BY SECOND METHOD; SWIMMING ON THE BACK.

himself swim with as great freedom and almost as little exertion as he could had he not another dependent on him.

It sometimes happens that before the rescuer reaches the drowning person the latter has sunk and has not risen again. In that case the rescuer should look for air bubbles rising to the surface, before diving. In still water the bubbles rise perpendicularly and in running water obliquely. In diving from the surface in running water the rescuer must look for the body higher up the stream than where the bubbles appear. It is also possible that the body may be carried along by the stream, and the best plan is to look for it in a straight line in the direction in which the current is running. On reaching a person who has sunk to the bottom, the rescuer should seize him by the shoulders and push off smartly from the ground, when both will easily rise to the surface. When swimming back to shore, it is of vital importance that the face of the person in danger be kept above the water. The rescuer should swim with a wide, powerful kick and avoid tugging, so that the person assisted may be able to breathe freely. Care should be taken not to waste power by attempting to swim against the tide or stream.

It is difficult to over-estimate the danger incurred even by a skilful swimmer when clutched by a drowning person; but a knowledge of the Society's methods of release will render the task of getting free comparatively simple. Supposing the rescuer to be seized by the wrists, he should turn both simultaneously against the thumbs of the drowning person, and with a quick jerk bring his own arms at right angles to his body; by remembering to press against the thumbs, it is easy to break away, however firm the hold.

If clutched round the neck, the rescuer should lean well over the drowning person, place his left hand in the small of his back, and, raising his right arm in a line with his shoulder, pass it over the left arm of the drowning person, pinch his nostrils with his fingers, place the palm of his hand upon his chin and push him away from him until his head is under water. The nostrils being kept closed, the drowning person in attempting to breathe is compelled to open his mouth, water rushes in, choking ensues, and the rescuer will quickly find himself released.

The third method is for use when grasped round the arms and body. The rescuer should lean well over the drowning person and, withdrawing his arms in an upward direction, place his left hand on his opponent's right shoulder and the palm of his right on his chin, then, raising his knee as high as possible and placing it against the lower part of the drowing person's chest, he should simultaneously push hard in an outward direction with his knee and both hands, throwing himself back at the same time to increase the strain on the drowning person's arms to compel him to relinquish his hold. There should be no hesitation in adopting this method of release should necessity arise, for the rescuer's position is a perilous one, and to cope with the danger severe measures must be resorted to. It should be added, as a general rule for a swimmer's guidance, that in attempting a rescue he should utilise his knowledge by endeavouring at all times to keep above his antagonist, and whenever opportunity presents itself take a deep breath, for, if the struggle be severe, he will in all probability be forced under water.

Life-Saving Drill at Framlingham.

There are three methods of resuscitation taught by the Life-Saving Society—the Silvester, Howard, and the Marshall-Hall ; of these the Silvester is most strongly recommended for various reasons, among which may be mentioned the fact that it can be put in practice by one person without assistance ; it is easily learned and the patient is not liable to injury while being operated upon.

The Howard method is used should the patient have lost an arm or his arms be injured ; or should it be deemed necessary to put in force a more vigorous method than the Silvester. The Marshall-Hall is probably the least efficacious of the three methods, and as it requires considerable practice and care to be successfully put into operation it is not proposed to give a description of it here.

If a body has been recovered from the water, in which possibly life is not extinct, it is first necessary to clear the throat and then to ascertain if natural breathing is suspended ; the clothing should be loosened at the neck and chest and the patient turned over until he is lying on his side with his head resting on his forearm ;[1] the operator then removes any mud, weeds, or water which may have collected in the mouth and throat ; afterwards the operator turns the patient on his back ; he covers his thumb and forefinger with a handkerchief, draws forward the patient's tongue, and fastens it with a piece of string, or strip of cloth, to the lower jaw in order to prevent its falling back and so blocking up the air passages. This may also be accomplished by turning the patient's head well to one side. The tongue will then rest in the hollow of the cheek. The former is rather a difficult operation, but the position of the tongue should always be attended to. To ascertain if natural breathing is suspended, the operator places his ear to the patient's mouth and chest and listens for any signs of respiration, or a better way still, should a piece of bright metal (such as the inside of a watch-case) be at hand, is to place it just over the patient's mouth, when, if he still breathe, it will become clouded by moisture. Assuming that no signs of breathing can be detected, the operator, taking a coat or other garment, or a towel, makes a roll about 18 inches long and 3 in thickness, and places it under the shoulder-blades ; he should then kneel down at the patient's head, lean forward and grasp his arms just below the elbows (fingers inwards, thumbs outwards) and draw them in an upward direction towards himself until they are in a line with the patient's body ; they should then be bent and brought back to the chest and pressed firmly against the ribs and top for two seconds. The operator should continue these three movements at the rate of twelve to fifteen times a minute, and steadily persevere undeterred by the fact that a considerable time may elapse without any apparent success crowning his efforts.

After natural breathing has been restored, promotion of circulation and warmth are the next care ; this should be done by rubbing the patient's limbs and body with a cloth or flannel, and by placing hot water bottles or heated bricks to the soles of the feet, between the thighs,

[1] This position is shown in the photograph of over 100 boys under the direction of Mr. E. W. Lynch, who, as Hon. Life-Saving and Swimming Instructor, is teaching the boys resuscitation on the lawn at Framlingham College.

and at the armpits; the rubbing of the limbs should always be towards the heart.

In the Howard method there are but two movements: the operator, after clearing the throat and drawing forward and fastening the tongue, places the roll of clothing (which should be somewhat thicker than that used in the Silvester) under the lower part of the chest, draws the arms at full stretch above the head in line with the body, then kneels astride the thighs, and placing his hands upon the patient's lower ribs throws himself forward, pressing firmly in an inward and upward direction; he then springs back to his original kneeling position, removing his hands to allow the ribs to expand. The movements should be continued at the rate of fifteen times a minute. Care should be taken not to press the thumbs into the pit of the patient's stomach, and it should be remembered that too forcible pressure might result in some internal injury.

W. Henry.
F. Wyman Byles.

TAHR—Nomenclature—Tahr or Ther (*Hemitragus jemlaicus*) are the names by which this distinctly Himalayan wild goat is most generally known to sportsmen; it is called *Jharral* in Nepaul; *Jagla* on the Pir Punjab range, and *Kras* in more northern and eastern parts of Kashmir, and by other strictly local denominations.

Although much smaller in body and in length of horn than its Himalayan congeners the ibex and markhor, the tahr is, in the writer's opinion, one of the most game of all Himalayan game animals in every respect.

Description—An old buck stands well over three feet. Hair very long and shaggy, especially about the neck and shoulders. Its colour ashy brown, growing much deeper brown on the croup, hind quarters and sturdy limbs, and, when viewed from a distance, looking almost entirely black. Face longish, smooth-haired, and very dark brown, with paler markings about the muzzle and around the eyes. Ears small and tail short. No goat-like beard depends from the chin. The full-grown black horns of the buck are comparatively short but handsome withal. They seldom much exceed thirteen inches in length and about nine inches in girth, flattish on their sides but thick and rounded at the back. They are creased up to about two-thirds of their length, each crease terminating in a small sort of head on the angulated front margins of their horns, which rise in a line with the forehead and slightly diverge until they abruptly curve backward and rather downward for several inches in smooth and sharp points, which incline slightly inward. When viewed from the front the horns somewhat resemble a high coronet.

The female, called *Tehrny*, is smaller, lighter coloured and less shaggy than the full-grown buck. She carries horns of the same shape but of a much smaller size. She is said to have four teats instead of two, like the other female wild goats and sheep; but as the writer has seldom, if ever, shot a Tehrny he is unable to corroborate this statement.

Habitat—To find the old, black-looking bucks, one must hunt for them among the dangerous precipices and the steep, craggy, more or less pine and birch-clad gorges just below the limits of perpetual snow.

These old fellows live apart from and higher up than the females and young bucks from about February until October, when they promiscuously congregate in smaller or larger herds up to about twenty or so in number. On being disturbed or even shot at, they often stop to look back before getting beyond range of a second chance. It is best to stalk them from above, if possible, as they seldom look upward for danger.

The old bucks are much given to fighting

Tahr
Ht. at shoulder, 38 *in. Max. horn. meas.* 14⅝ *in. Av. horn meas.* 12 *in.*

among themselves during the rutting season in autumn, when numbers are said to be killed by falls. Some idea of the ground they usually affect may be formed when the writer mentions his having shot a buck that was standing on the brink of an almost sheer precipice, down which it fell so far that the aid of the glass was necessary to distinguish its form among the detached lumps of rock below, on which it lay dead. When with difficulty it was reached, the carcase was found all mangled and torn, and one of the stout horns was broken off at the root.

The tahr is more or less abundant along all the higher Himalayan ranges, and just below the snow-line, eastward from Cashmere, where the writer has found it on the Pir Punjab range on the same ground as the markhor. And on

one occasion in October he shot a solitary "kras" on the same ground as the Hanjul or Kashmir stag, but the tahr was evidently a stranger in the land. It may sometimes be seen about the high, craggy crests of the middle ranges, but the bucks are never so big and black there as those of the higher regions.

The flesh is dry and coarse even to the taste of the hungry hunter, except perhaps when small fresh scraps of it are merely frizzled on the red-hot embers of a camp fire. The more eastern Himalayan Mountaineers, however, consider the meat to be an efficacious medicine for rheumatism, and transport it, when dried, and even the bones, to the plains of India as a remedy for that complaint.

Ammunition—A double ·450 bore express rifle, with its hollow fronted projectiles plugged with copper tube or bit of wood, is well adapted for shooting tahr, and boots or shoes, having their thick soles well studded with large hobnails, are absolutely necessary for foothold on the ground which must always be worked over by those who expect to secure such a really handsome trophy as a big black tahr.

DONALD MACINTYRE.

TAPIR—The tapirs are a pachydermatous group of animals distributed over parts of America and Asia. They have short and movable trunks, at the extremity of which are the nostrils, and by the trunk they convey food to their mouth. The skin is hairy and very thick, the tail all but rudimentary. They inhabit vast forests, are nocturnal in their habits, and live principally on vegetable matter, though they are also said to be omnivorous, swallowing almost anything they come across.

The skull of an American tapir, seen in profile, somewhat resembles that of a hog, but whilst that of the pig has four faces, the tapir's has only three. The bones of the nose are articulated to the base of the triangle formed thereby, and here there is a point which penetrates between them. A deep furrow, produced by the upper border of the orbit, descends from the two sides above the orbit, which, approaching the sub-orbital hole, serves for the insertion of various muscles connected with the proboscis.

The skull of the Asian tapir differs from that of the American, the forehead being convex and rising higher than the back of the head. It is accompanied, in its rise, by the nasal bones, which give space for the comparatively large proboscis and add length to the furrows where the muscles are inserted. This organisation, according to Cuvier, explains why the Indian tapir has a more powerful and more extensile trunk than the American. There is also in the former, on the base of the nasal bones at their junction with the frontal bones and on each side, a deep fossa, or depression, which does not exist in the American. This elevation of the forehead is accompanied by a depression of the occipital crest, which, far from forming a pyramid, as in the American species, rather descends backwards. The aperture of the bony nostrils, enlarged by the prolongation of the maxillary bones, terminates below and forwards in more elevated premaxillaries, which are fused together in early youth, as in the American. In the upper jaw there are, in the adult tapir, on each side three incisors, one canine, four premolars, and three molars. In the lower jaw, on each side, there are three incisors, one canine, three premolars, and three molars; altogether making forty-two teeth in number. The bones of the extremities are very large and strong, resembling in many respects those of the rhinoceros.

There are three species of tapirs—the American (*Tapirus americanus*), the hairy tapir (*T. villosus*) and the Asiatic (*T. malayanus*). Of the three species the American is the best known, and it is found extensively from Buenos Ayres to Central America, and from the Andes to the Atlantic. It spends the whole day in the shades of the densest forests, coming out to feed on the surrounding vegetation towards dusk. As it is a powerful beast, it forces its way with comparative ease through the brushwood and undergrowth of the forest, and it has regular paths which often assist the traveller in passing through the vast woods of the country it inhabits. It has a keen sense of smell, and will rush away into thickets where it cannot be followed. It is inoffensive and never comes to bay unless wounded and hardly pressed. It wallows a good deal, is very fond of water, and is a most expert swimmer.

AMERICAN TAPIR.
Ht. at shoulder, 39 in.

The skin of the American species is of a deep brown approaching to black; but the sides of

the lower lip, the under and middle part of the chin, upper edge of the ears, and the naked line at the bottom of the hoofs, are all snowy white. The scanty hair of the body is very short, and is hardly distinguishable at a short distance. The skin is of great density, and is seven lines thick on the back, but it offers no resistance to the bullets of a modern rifle. On the back of the neck there is a thick rounded crest, which extends from the forehead as low as the level of the eyes to the shoulders, and is beset with a comparatively thin mane of stiff blackish bristles.

The American tapir's flesh is not relished by Europeans, though it is by the natives; but the hide is valuable.

Although the lasso is the most popular instrument for hunting in South America, it is of very little use against the tapir, for their habitat almost precludes its use. A few have been captured by it, but even if the ground be favourable, its immense strength and impetuous rush often enable it to break the strongest lasso and to escape. The Guachos find out the animal's track, and with their dogs lie in wait until the tapir comes out for its evening meal and bath, and then interpose themselves between it and its bathing resort. It is not easily captured, and often kills several dogs during the encounter. Another mode of killing the tapir is to imitate its call and to shoot it on its approaching. This beast is easily tamed and is permitted to run at large in the streets in some of the towns of Guiana. It wanders into the forests to rest during the day, but returns again in the evening to the house where it is kept and fed. As it is capable of considerable attachment to its owner, it might be turned to good account as a beast of burden, possessing as it does docility, strength and patience.

The second of these species, the hairy tapir, inhabits the inner range of the Cordilleras; it has no mane, but its hair is longer and there are no wrinkles on the proboscis. In structural conformation it more resembles the Asiatic than the American, and is less common than the latter animal.

The third species, the Malayan, is found in the Tenasserim provinces of British Burma, in Malaya, Sumatra, Malacca, and the South West provinces of China. It is reported to exist in Borneo, which is more than likely, but the report requires confirmation. In size it is the largest of the tapirs known to exist, standing from 3 to 3½ feet at the withers and about 4 inches more at the rump; its length is about 8 feet. It has no mane, the hair is glossy black on the fore-part, but the back, rump, and sides of the belly are white. In its habits it is similar to its American relative, and in captivity it is mild and inoffensive and becomes as tractable as a dog.

There is a similar looking animal in the lagoons of West Africa, below the Congo. I saw one or two, but failed to bag them; but Captain Bailey mentions it in his book on sport on the Congo. Dr. Mason, a well-known naturalist, states that the natives assert that, when taking to the water, the tapir plunges in and walks along the bottom instead of swimming.

It has only one calf at a birth, but very little is known as to its breeding habits. The newly-born young are velvety black, marked with spots and longitudinal streaks of brownish yellow on the sides, and of white beneath; the change from the young to the adult coloration takes place between four and six months after birth. The chief sound uttered by the tapir is a shrill whistle of but little volume in comparison to the size of the animal.

F. T. Pollok.

TARPON—Habitat—The Tarpon (*Megalops thrissoides*), one of the Herring family, is a large sporting fish found in the Gulf of Mexico and its neighbouring waters. Its usual range is from Northern Florida down along the coast of South America. In summer it is sometimes caught in nets, even so far north as New York. It is, however, distinctly a warm water fish and prefers southern latitudes. It is known under various names, such as "Silver King," or "Grand Ecaille," along the Texas and Louisiana coasts; "Savalo" and "Sevanilla" in Cuba and along the Central American States to Venezuela.

Description—The tarpon ranges in size from the baby tarpon of 18 inches in length and 4 lbs. in weight, which can be caught on a fly, to the full grown fish of over 200 lbs. in weight and 7 feet and more in length. Roughly speaking, the average size caught by sportsmen is about 6 feet in length and 100 lbs. in weight. The scales on a 6 feet specimen are about 3 inches in diameter, and on larger fish as much as five inches. These scales are tough, like thin horn, and are covered with a brilliant silver skin.

In addition to gills, it has two small blow holes on the top of the head, connected with what has been compared with a set of lungs.

The tarpon is a fish that spends a great deal of its time near the surface of the water, coming up often to blow, somewhat like a porpoise, but with less noise, although on calm days, or at night, this puff can be heard a considerable distance away.

Behind the dorsal fin, and forming part of it, is a long narrow fin, triangular in section, and about a foot long, looking like a bayonet, and so named. It would seem as if this long fin were meant for some special use, but no satisfactory explanation for it has yet been advanced.

Tarpon are supposed to run over 8 feet in length, but one of 7 feet 4 inches is the longest to my knowledge out of some 2,000 caught in the last ten years on rod and reel. I should think that 7 feet 6 inches or 7 feet 8 inches

would be nearer the limit in size. A male fish is a fine gamey-looking brute, with large tail and fins. The female is somewhat deeper and heavier in proportion to length, and when in roe becomes somewhat pot-bellied.

When freshly caught, the tarpon is a most beautiful fish in appearance. The belly and sides are of a most brilliant silver. Along the back, the scales become dark green, showing purple iridescent colours, like mother of pearl. A specimen properly preserved and mounted will retain a great deal of its natural silveriness if the fat has been entirely removed from the inside of the skin.

Habits—The gameness of a tarpon varies a great deal, according as it is caught in salt or brackish water, and hooked in the mouth or throat. Those that frequent the brackish water of the creeks become rather dull in colouring and seem to lose a great deal of their fighting quality. A tarpon in good condition, on the other hand, will, if hooked in the throat, give a strong angler a hard time, for from half an hour to an hour and a half; the time depending a great deal on the strength of the angler and on how often the fish jumps. If hooked in the mouth or jaws, as the fish always is when caught trolling in the passes, he is not apt to jump so often, for he feels very little pain, but, as he does not bleed, he lasts longer.

A tarpon may jump only once or twice and then devote himself to rushing, sulking and towing. Such a fish may last anywhere from one to four hours.

A good and strong angler has been known to give up such a fish from sheer exhaustion after three hours of hard fight. A tarpon that will not jump is a very difficult customer to handle, and can easily tire out the average angler. As a rule, though, fortunately for the tarpon fisherman, the fish as soon as hooked will jump five or six times or more, and before he is landed may have jumped over twenty times. Of course the last jumps are not clear of the water; sometimes only the head appears, as the fish becomes exhausted. There is no fixed rule for the way a tarpon will behave when hooked; as no two in succession ever behave in exactly the same way, the sport is all the more interesting.

A Morning's Catch.

Tarpon of 150 lbs. in weight have jumped twenty times inside of ten minutes and have been brought to gaff in twelve minutes all told; on the other hand, tarpon have been on the line for ten minutes without appearing once to let the angler know what he had hooked. It may take over an hour to land a fish, although he only weighs about 100 lbs.

As a rule the tarpon, as soon as hooked, comes out of the water with a great rush, jump and tumble, and continues to jump four or five

times, generally clear of the water, after which he settles down to some long rushes.

Tackle—There are two ways of angling for tarpon, one called "still" or "bottom" fishing, the other "trolling" or "pass" fishing. For "still" fishing a rod about 7 feet to 7 feet 6 inches long is the proper thing.

The tip should be in one piece, the butt or handle being about 18 inches long, the tip from 5 to 6 feet long. Greenheart, lancewood, or split bamboo is the best material. The rod should be pretty stiff.

For pass fishing, or trolling, a still stiffer and shorter rod from 6 feet 3 inches to 6 feet 6 inches is necessary. Stiffness is essential, for the hook has to be driven with a strong, heavy stroke into the hard cartilage and the bony parts of the jaw of the fish as soon as he seizes the bait.

Jumping Tarpon.

The line used in still fishing may be 12 to 18 thread linen line; 12 is quite strong enough, but as the strength deteriorates rapidly when in use through chafing and damp-rot, it is safer to use an 18 thread line. In pass fishing it is a good plan to double the end of the line for about 50 feet. There are special lines, of which the last 50 or 80 feet are made double thickness, but any line can be strengthened by simply pulling out about 100 feet off the reel, doubling it up, and winding the end on to the line with a small linen thread. This can be done rapidly and answers the purpose well. The hooks used in still fishing and in trolling are quite different. That for still fishing is about the size of a large cod hook, the point turned slightly outward so as to catch in the throat. For trolling, a somewhat larger hook is used. In this case the point of the hook should turn in towards the top of the shank, so that when a strong strike is made the point may be driven in straight and not pulled sideways, and thus be either broken or bent. The barbed part of the hook should be short from point to barb. The point of the hook should be sharp and strong. The reel should be of the multiplying type, large enough to hold 200 yards of line. A strong gaff is also very essential.

Even with the hook now especially made for pass fishing, with a strong point and a short barb, it is rare that the point of the hook is driven in far enough to cover the barb. Many a fish has to be played and caught on a taut line with not over an eighth of an inch of the point of the hook buried in the jaw.

In pass fishing, on an average, about one out of four fish that strike is hooked, and one out of four fish hooked is landed. In a month's trolling a man will not average more than one fish landed out of ten that strike at the bait. By "hooked" is meant a fish that has to jump several times to get rid of the hook. Of course an improved hook that could be driven into the jaw with more certainty would greatly improve this average, but such a hook seems hard to devise.

In still fishing, a snell, snood or trace of cotton, wound with thin nickel piano wire, is used. This piano wire is not wound around in close coils, but in spirals about an eighth of an inch apart. Some such arrangement is rendered necessary by the rough and file-like jaws of the

tarpon, which wear through any unprotected line. This snell works well. Leather and raw hide are also good. Snells should be about 3 feet long.

In pass fishing, no snell is used, but a piece of strong steel wire about 4 feet long is substituted. The reason is that the water where trolling is possible is generally clear, and the thick cotton snells are seen by the fish. Several swivels should be used on this 4 foot length of wire to prevent kinking.

The following is the usual method of making up a wired pass hook:—First the swivel is put through the eye of the hook; on to this a piece of steel wire about a foot long is fastened, and another swivel is put on; then a piece of wire about 3 feet long is fixed on, and then a third swivel to which the regular linen line is tied.

Some anglers use more than three swivels on the length, and some only use a wire two feet long. The long length of wire is chiefly of use in preventing the linen line from chafing on the scales of the fish.

A better method is to use a strong German silver chain with fine soldered links. About 6 inches of this chain is fastened to the eye of the hook, then a swivel, then 3 to 6 feet of steel wire, which may be divided into two pieces by another swivel. The chain should be tested to 50 or 60 lbs. strain.

Still fishing, or "ground" fishing, is carried on from a boat at anchor with cut mullet bait resting on the bottom. The fish is allowed to gorge the bait. This sort of fishing is generally done in the lagoons and up the estuaries and creeks.

Until 1895 this was the usual way of taking tarpon, as it was supposed to be impossible to get a hook to penetrate into the hard bony cartilage of the jaws and inner lining of the mouth.

For years in most of the Florida Passes (the narrow inlets from the Gulf of Mexico into the interior lagoons) large schools of tarpon could be found at times playing about and chasing small fish. The first tarpon ever taken was accidentally caught by a man who happened to be trolling in the Indian River Pass for channel bass, cravelle, or other fish. After losing large quantities of tackle, through tarpon taking the bait, he managed to hook and land one of them, much to his own amazement and delight.

Although tarpon were often seen in the Passes, and for years continued to walk off with spoons and other baits intended for small fish, no regular systematic pass fishing or trolling for them as a sport was known until 1895, when a couple of energetic anglers settled down at Captiva Pass with a large collection of different sorts of hooks and tackle and proceeded to experiment on the best method of hooking these big brutes in the mouth. It is largely owing to their experiments and perseverance that Pass fishing for tarpon has become practicable.

Landed in the Boat.

Pass fishing is far more exciting than still fishing, and much more of a sport. The excitement begins from the moment the bait is dropped over, and, as the fish has ten times the chance of escaping that he has in still fishing, the excitement lasts to the end. Still fishing is nevertheless much practised even now.

The Caloosahatchie River, in the neighbourhood of Myers, Florida, has so far proved to be the best tarpon fishing ground for bottom fishing, and it is the most convenient to reach.

It is forty-eight hours from New York; by rail to Punta Gorda, thence sixty miles by a small steamer.

There are several hotels at Myers where good guides may be engaged. The guide generally has his own rowing boat in which he rows to the fishing grounds. These are from two to six miles off. Most guides have a small sailing boat or sloop with which to tow the rowing boat backwards and forwards; this is the better way, as even an energetic angler becomes cramped after spending the day in a small rowing boat.

During the tarpon fishing season, which at Myers is March, April and part of May, there are regular bait men who catch mullet for anglers. A dozen to twenty mullet are sufficient for a day's bottom fishing. Tarpon grounds range along some fifteen miles of river, and the fish, as a rule, never stay more than two or three days in the same place.

Still fishing—The angler should have two rods and two reels, and use both when still fishing. Some use more, when tarpon are scarce, so as to increase their chance of a strike. Two rods are, however, all that one man should handle. If a strike is made the guide should immediately reel in the second line.

Jointed rods should never be used. An extra tip or two should be taken, as they are very apt to be broken when playing a jew fish, a saw fish, a shark, or any other of the brutes that may run to five or six hundred pounds in weight and often interfere with tarpon fishing. The quantity of tackle necessary depends upon the time the angler intends to devote to the sport. For a month's "still" fishing, eight 200 yard linen lines, two gaffs and eight to ten dozen hooks and snells are none too many, as the sharks and crabs cut off a lot of hooks and lines.

A start is made early in the morning. As a rule the guide will sail about for a while keeping a look-out for tarpon "signs," such as the blowing of the fish, and the swirl they make when seizing food on the bottom, or when scared by the boat passing near them. On a bright day one may see a tarpon sometimes a mile off, as he jumps clear of the water, his scales shining in the sun.

When a favourable position is reached the sloop is anchored. If the angler is not particularly energetic he may try fishing off the stern of the sloop, but generally the boat swings about a great deal. It is far preferable to get into the rowing boat and row off some distance from the sloop, until the water around is clear of any impediment, such as anchor ropes, which may interfere in playing a tarpon.

If the water is not over 8 feet deep, the guide will probably drive a pole into the soft bottom, which is generally sand, or mud mixed with sand, and fasten the boat to it; if deeper he puts out an anchor. The bait is the tail half of a mullet. and the hook is passed through the skin until the point emerges from the bait. The angler then casts out from one rod about 60 feet to the right of the boat, and from the second rod about the same distance to the left. Next he should from the tip of his rod pull off some 15 feet of line, which he can coil up on the stern seat, a small board placed across the stern of the boat; then he has nothing to do but wait. The waiting may last from ten minutes to ten days.

Were not every angler always confident that the next moment is going to be the critical one, this sort of fishing would be terribly slow. The excitement of expectation makes the time pass rapidly, especially if tarpon are blowing or swirling in the immediate neighbourhood. Then the cat fish, which in these creeks abound by thousands, and the crabs, which are there by hundreds, keep him busy renewing his baits and examining the line from time to time to see that it has not been bitten through. As a rule sharks do not interfere so much up the creeks. From time to time a jew fish or a bass, or even a large saw fish, may take the bait. Saw fish 14 feet long and 600 pounds in weight have been caught on tarpon rods and lines.

If it is good tarpon weather and the water is warm, and tarpon show themselves about, the angler may expect to get from four to ten strikes a day, sometimes even more. As a rule a tarpon, unless scared by some noise from the boat, takes the bait quite leisurely and swims off swallowing it. The angler should at once seize the rod, and as soon as the fifteen feet of slack have been taken out, and he feels the line grow taut, give a long steady strike.

The coiled up slack is used to give the tarpon time to swallow the bait, as he is apt to hold it in his mouth and swim off some feet before doing so. With the ordinary cut mullet bait and the hook used for bottom fishing, it is absolutely impossible to hook a tarpon in the mouth so as to hold. When the fish feels the hook in his throat he will at once rush the line off the reel at a great rate, and jump clear out of the water, fall back clumsily and continue to rush and jump for some time.

A cool head is all that is necessary for landing a tarpon in "still" fishing, as once hooked in the throat it is almost impossible for him to shake the hook out, and his only chance of escape is by breaking the line.

Trolling for Tarpon is quite another matter from bottom fishing, and is in every way far more exciting and sportsmanlike.

The Florida Coast is surrounded by a continuous line of long narrow coral islands covered witn mangrove trees and scrub growth. Inside these islands lie long lagoons connected with the waters of the open gulf and Atlantic by channels called passes, varying from 100

feet in width to a mile or more. These passes as a rule have, at certain times of the tide, a very swift current, sometimes over six miles an hour.

Tarpon are found to some extent in most of the passes. The best so far known in Florida is Captiva Pass, lying about half way between Myers and Punta Gorda. Undoubtedly there may be others quite as good or better along the Florida or Texas Coast, but they are somewhat out of the way and difficult to get at, and Captiva Pass remains the most convenient. The *modus operandi* is the same in all cases of pass fishing. A good stiff round bottom boat from 13 to 14 feet long is necessary. When the tide runs in or out strongly, the angler simply anchors his boat in the pass, for the tide runs swiftly enough to keep the small fish used for bait wriggling in the water as if swimming.

BEACHED AT LAST.

As a rule the tarpon are not all over the pass, but in certain fixed localities, either on the edges of eddies, or where the current sweeping in or out seems to carry the greatest amount of the small fish, crabs, &c., that float in and out with the tide.

At Captiva Pass, which is about half a mile or more in width, the best fishing is had in one channel, not over 200 feet wide, so that there is generally a rush for this place. An angler anchored over this stretch of water is apt to get ten strikes to an outsider's one, although the outsider may only be 50 feet off.

A long anchor rope about 70 feet long is necessary, as the water is deep, varying from 20 to 40 feet. The bottom being coral rock, a heavy weight is used in preference to an anchor, which is apt to catch in the rocks and stay there. A small buoy should be attached to the end of the anchor line so that, once a tarpon is hooked, the rope may be thrown overboard, as there is no time to haul it in.

The bait generally used is a small bright silvery fish. A small mesh net about 150 feet long should be brought to the pass for catching these small fish for bait. When small fish cannot be had, strips of larger fish, cut to imitate small fish, do very well. The white belly-skin of a small shark makes excellent bait.

If a small fish be used, the hook is passed through the end of the jaw and out at the top of the head.

The weight of the shank of the hook will keep the fish swimming, belly down, in a natural position. If the bait show a tendency to spin around, like a spoon bait, it should be stopped, for the tarpon will not strike such a bait so readily as a bait that merely wriggles steadily like a small fish swimming.

The best way to stop the spinning of the bait, which is generally caused by the fish getting stiff, is to cut the backbone in four or five places, then bend the fish backwards and forwards until it grows limp and will swim without revolving.

If the tarpon are seen swimming much below the surface, and if the current is very strong, it is a good plan to weight the end of the line with small strips of lead. Having anchored the boat, the angler drops his bait over the stern and allows it to fall back slowly with the tide.

If tarpon are plentiful, he is apt to get a strike before the bait has gone ten feet, if not, he should allow about 30 to 40 feet of line out, and then, with a firm hold on the rod, and his thumb on the break of the reel, he should be ready for the strike ; this may come at any moment, and is sudden and strong.

Tarpon taking the bait give a sensation like a giant hand seizing the line and giving it a long, hard pull. The angler must be ready to strike at the exact second that the tarpon touches the bait, and to strike hard, even at the risk of breaking his rod. Unless he strike at the identical moment the fish bites, his chance is gone. Often even a good stroke will not drive the point of the hook up to the barb.

It is possible with careful playing, combined with good luck, to land a tarpon with only the point of the hook in, but as a rule the fish after a few jumps throws out hook and bait.

For this reason pass fishing is exciting and exasperating work.

The angler never knows how his fish is hooked, and always feels that in the first minute or in the last minute the fish may throw

hook and bait into the air, without the least effort apparently. One is never sure of a tarpon in pass fishing until it is gaffed and hauled up on the beach.

As soon as the fish is securely struck, the guide should head the boat for the beach and row cautiously. There the angler lands and works the fish into the shallow water while the guide stands ready to gaff.

Tarpon may be on for forty minutes and during that time jump a dozen times or more, and may be got within a few feet of the beach several times, and after all the hook finally pull out as easily as if it had not a hold anywhere at all.

Of course this uncertainty adds greatly to the excitement of the sport. There are generally some pretty good-sized sharks on the look-out for tired tarpon, so that the angler even when he hooks his fish firmly, and plays him in the best of form, may end by supplying his quarry as lunch to a hungry shark.

Sometimes the point of the hook is driven right through the jaw of the fish, or works through it after playing him for a while. Often, just as a tarpon is hauled up on the beach, the hook drops out as he begins flopping about, showing that only the point of the hook had entered and not the barbed part.

The best time of the day for fishing in the passes is somewhat hard to decide upon. Tarpon seem very erratic in their habits. They have been known to stay in the pass and bite all day at both ebb and flood, and during slack tides. The best hours, though, for fishing at anchor in the pass seem to be the last three hours of the ebb. After that, as the tide slows down, trolling outside the pass at low slack water is good; then gradually working in as the flood begins, finally anchor again as soon as the current is strong enough to hold up the bait.

After the first hour or two of the flood, tarpon leave the pass and spread over the flats in the lagoons, coming back again towards the middle of the ebb tide. This seems to be the general rule. There are days, though, when the tarpon stay all day and night in the passes, and days also when none at all are seen there.

The best rods and tackle for tarpon fishing are to be obtained in New York. Some of the principal makers there have made a special study of the requirements of the sport, and their advice may be safely taken.

OTIS MYGATT.

TAXIDERMY AND MODELLING—Many people seem to think that taxidermy is but a higher sounding synonym of "bird-stuffing," but it has a far wider scope and includes the whole art of preparing or conserving skins throughout the vertebrate sub-kingdom. The word "bird-stuffing" is, or should be, a degrading libel on what is now an art which only the skilled modeller should attempt. It is easy to trace the genesis of the term "bird-stuffing," for no doubt the butchers and botchers had matters their own way formerly, and really "stuffed" or filled out skins by ramming the packing in until the bloated skin could hold no more.

The origin of taxidermy—*i.e.* the art of skin-preserving—lies in the very distant past. The earliest and most savage nations practised, and still practise, it for purposes of clothing or adornment. What profits the present article much more, however, is the consideration of what degree of antiquity can be assigned to the art of taxidermy as we now know it—the skinning, setting-up and mounting of mammals, birds, reptiles, and fishes as scientific objects or merely as trophies of the chase.

To quote from an article in the *Encyclopædia Britannica*, "Little is known of the beginning of the practice of the 'stuffing' or 'setting-up' of animals for ornament or for scientific purposes, and it is highly probable, from what we gather from old works of travel or natural history, that the art is not more than some three hundred years old. It was practised in England towards the end of the seventeenth century, as is proved by the Sloane collection, which, in 1725, formed the nucleus of the collection of natural history now lodged in the galleries at South Kensington."

It may be that a rhinoceros, originally set up for the museum of Ulysses Aldrovandus, removed from the Medicean, and still preserved in the Royal Museum at Florence, is the oldest specimen known, as it dates from the sixteenth century. Early in that century, about 1517–18, according to a French work of later date, some tropical birds were set up at Amsterdam.

In the University Museum at Pisa there are still preserved some fine groups of mammals, the work of Professor Paolo Savi in the beginning of the present century, which are as well executed as may be, and which have been commented on by English and other writers upon the subject. These are probably the first groups of animals portrayed in action which will bear criticism. After these came the work of Ploucquet, of Stuttgart, who contributed to the Great Exhibition of 1851 some finely-modelled groups of animals in action, which are still preserved in the Crystal Palace, but covered with dust through lack of proper glass protection. At the same time Ploucquet exhibited comic groups of animals engaged in impossible feats, which, it is sad to know, have been copied by others destitute of his humour and of his capacity for putting the proper half-human expression into their features. The province of taxidermy, however, is not to make hedgehogs play at cards in toy houses with toy furniture, nor rats engage in (toy) ball-room festivities, nor to find material for the antics of a "Comic

Naturalist." Such things may lend themselves to comic drawing, but they are distinctly out of place in taxidermic art.

Contemporary with Ploucquet were Jules Verreaux, John Wallace, and Edwin Ward, whose "Arab Courier attacked by Lions," "A Horseman attacked by Tigers," and "Lion and Tiger Struggle," were—the first especially—fine pieces of work, which vied with Ploucquet's in execution. Later came Rowland Ward's "Jungle" at the Colonial Exhibition, a large and ambitious work; and then museums awakened slowly to the need for more artistic and pictorial representations of natural objects. The small town of Ludlow had its birds mounted in its museum in a pictorial manner, and may have been, probably was, the first public museum to throw off the shackles which bound all museums to the principle that vertebrate specimens should be arranged on stands, or cross-sticks, all pointing one way, and all in one attitude; these essentials conducing, it was supposed, to British science, which should be, as every one knows, solid and severe. This was all very well, for no one supposes science can be anything but exact; but what was unnecessary to carry out the idea was the criminally inartistic and unnatural setting-up of the specimens, and the bounteous dust and dirt which rested upon and environed them, as if the custodians, with some dim and half-crazed idea of their functions as high priests of these sepulchres of the unnatural, had decreed that in the eternal fitness of things the dead should be carefully disregarded, and the funereal ashes sprinkled thickly around. In these days,—when, as is shown, the Italians first, next the French, and then the Germans have tried to teach the stupid and inartistic British taxidermist (with his American cousin) the way to be wise;—when one takes into consideration the example of foreign museums and the tardy yet thorough awakening of our own State museum to the principles which should underlie the presentation to the public eye of all natural objects, it will hardly be believed that any museums exist in which ill-made skins are fatuously wired bolt upright, and offered up in long rows of dreary monotony to a long-suffering people.

It might be of some avail to remind the inartistic or dirt-loving votaries of pure science, that it were far better that specimens should be left in cabinets than that well-made foreign skins (German, of course) should be dragged forth to be clumsily balanced upon sticks and chunks of wood, there to stare at vacancy with eyes too prominent for their attenuated and ragged outlines.

The literature of the subject is by no means meagre. In a recently published work of some 450 pages, foolscap quarto, over thirty pages are devoted to an enumeration of the abridged titles of works in almost every language, ranging in date through more than two and a quarter centuries, the earliest, by Bolnest, having been published in 1672. They are written from all points of view; from that of the man who knows nothing at all of any art or science, but who discourses fluently, as is his wont, upon any subject he can lay pen to, to that of the man who knows a great deal, but who either cannot or will not tell it. Intermediate are those who write up common or obsolete methods in a common and misleading style: the greatest offenders in this particular line of taxidermic infamy being our own countrymen and their American imitators. The reason is not far away: both strongly object to learning any language under the sun but their own, despise the teachings of foreigners, and generally avoid art and science in relation to all things, especially taxidermy, as if they were pestilences. Again, the exponents of this art seem sharply divided into two opposing factions—the scientific or semi-scientific men, who write taxidermic rubbish on their own account or for others, and the crassly ignorant "stuffers," who flout all teaching which does not travel on the lines of their respected, but obsolete traditions.

A remedy for this state of things has engaged the attention of educated naturalists from the days of Charles Waterton to those of the present. Early in the century Waterton wrote words of weighty warning and of import.

"Twenty years have now rolled away since I first began to examine the specimens of zoology in our museums. As the system of preparation is founded in error, nothing but deformity, distortion, and disproportion will be the result of the best intentions and utmost exertions of the workman. Canova's education, taste, and genius enabled him to present to the world statues so correct and beautiful that they are worthy of universal admiration. Had a common stone-cutter tried his hand upon the block out of which these statues were sculptured, what a lamentable want of symmetry and fine countenance there would have been. Now, when we reflect that the preserved specimens in our museums and private collections are always done upon a wrong principle, and generally by low and illiterate people, whose daily bread depends upon the shortness of time in which they can get through their work, and whose opposition to the true way of preparing specimens can only be surpassed by their obstinacy in adhering to the old method; can we any longer wonder at their want of sucess; or hope to see a single specimen produced that will be worth looking at?"

Years have passed, and the sting of his remarks is not blunted one whit by any special efforts which the Anglo-Saxon races have made to shake off the odium attaching to slovenly and unskilled work, and to justify themselves in the

eyes of the nations. Indeed, how can this state of things be avoided, when our national museum, so careful and so worthy of imitation in other matters, has no efficient taxidermic staff employed, and is content to "put out" its work to be botched up by cheap and inartistic men, so that, on going around the galleries, one is impressed by the fact that the taxidermic work is uneven and the work of many hands, and that for every good man who has made his mark there are nine others who have egregiously failed? It is not too much to say that many of the groups are only redeemed from the contempt which their amateurish and careless handling calls forth by the beautiful modelling of the flower and foliage accessories, although, without being hypercritical, one might suggest that some of these accessories are more conventional than natural.

In these pages an attempt will be made to condense all that is known of the present state of taxidermy, with its little-known but indispensable ally—modelling. Needless to say, the future of the art will not be in the hands of the ignorant or pretentious, but will tax the fullest powers of a trained intellect, to which is wedded the manual dexterity of the artist and modeller. That—perhaps partly due to the writer's insistence and teaching—there is growing up a cohort of young men pledged to these principles, is a pleasing augury for success, and it may be, as a writer in the *National Observer* said:—

"Those who know good work will not be at all disposed to ridicule as exaggerated the contention that the good taxidermist should be an educated artist, designer, modeller, sculptor, biologist, and naturalist. The truth of the matter is that it creates a new career for youths with the necessary taste."

Methods of Setting-up and Mounting Mammals—In an article of this nature, it is a matter for grave consideration where to condense and where to expand, and at which end of the vertebrates to commence. For the purposes of convenience let the strict biological rule be ignored, and a beginning be made with the mammals, which are, after all, or rather *before* all, the most dear to the sportsman's heart. Lovely and lithe as most of them are in life, and graceful even in death, great skill is required to give even a semblance of life's vigorous reality to a skin by ordinary methods; so difficult, indeed, is it, that there are probably not more than six men, of various nationalities, who could satisfy a really competent and critical judge of the proper contours and finer shades of expression peculiar to any given mammal. Even the very best of those selected six will fail in some particular, or in some mammal not his forte; for one man may excel in the treatment of the Carnivora, and fail, say, in that of the Ungulata, whilst another may reverse those conditions, and so on. The secret, perhaps, of the success of the few and the failure of the many is two-fold. The first element is the undoubted fact that taxidermists are not usually well educated, and are usually very jealous and secretive: with no *esprit de corps*, and no inter-communication for purposes of teaching or criticism, as in the case of pictorial artists, their art must suffer. The second disturbing factor is that the general public is quite hopeless in artistic matters, and is inanely content with the crudest absurdities.

Antelopes with half-opened mouths, a general air of brazen defiance, and six well-defined and evenly-spaced ridges and depressions distributed on the neck like the gills of a shark; tigers smiling placidly, or bearing up bravely under the weight of unadulterated paint and putty which should, in all decency, choke, instead of accentuating, their ghastly grin; foxes with one eye nearly on the top of the head, the other near the angle of the jaw; domestic animals with one side bloated, the other atrophied; limbs placed in any position convenient, not to the animal, but to the tastes of the operator: these are criminalities which the public does not recognise, is satisfied with, or condones. Thus what should be an exact art is ruined by the ignorance of its exponents and their clients.

Failures in the treatment of mammals result from several causes, the most fruitful being the ignorance or want of special training of the operator. One need not imagine that, when one can set up a bird which is not absolutely a ragged bundle of feathered incongruity, and which may indeed be fairly natural in pose, that such slight knowledge assists with a mammal, which is, unfortunately for the student, not provided with a mass of comfortable fault-hiding feathers, but which has "points" all over its anatomy, and has a certain facial expression to be correctly represented.

Anatomy is the great stumbling-block. The ordinary "bird-stuffer" will not learn his bones, nor their relation to soft parts, and so long as a thing has a head and a tail and four limbs—one at each corner—that is sufficient, and any other points may be ignored.

The very rough and ready traditional methods of "setting up"—copied or translated *ad nauseam* from one old tome to another—have not smoothed the path, and the unfortunate student who attempts to put these directions into practice, very soon finds a skin far too long and wide, and wonders what he is to do with sundry flaps and bags of tegument which he had not previously noticed, and which do not appear to belong to the carcase before him. In the end he creates a boneless, but lumpy bag, and his admiration for his first effort is tempered with a growing awe for so supernatural a work, which can neither stand, sit,

nor lie down, but holds an uneven and painful compromise between all three.

Perhaps something can be done for him in the following pages, and the preliminary is correct skinning, and by skinning is meant something in contradistinction to flaying. This latter is a butcher's method of removing the skin, and with some slight modifications its practice is good enough for those big-game hunters who wish merely to preserve skins as trophies, without reference to their subsequent "setting-up."

To skin a lion, tiger, or any big-game specimen, strong knives of suitable lengths and shapes, with a pair of strong shears, are all the tools absolutely necessary; but if a rope, pulley and beam can be provided in the case of weighty mammals, so much the better. In the field even, these may form a part of the outfit, but the comfort of a dissecting table must in most instances be dispensed with.

The subject—if it be impossible to skin it whilst warm, which is the easiest—should, as soon as *rigor mortis* has disappeared, be laid upon its back, the point of a knife should be inserted at the throat, and a cut be made extending in a straight line to the tail, care being taken not to cut into the flesh too deeply, if at all, and certainly not into the bowels.

As the operation of skinning a large mammal—when properly performed—adds no little to the subsequent correct setting up, some little detail will be necessary. Commence, therefore, by getting the carcase, when possible, upon a dissecting table, and let a beam, pulley and rope be provided, and fixed in a suitable position above. The subject being laid upon its back, a cut should be made, extending on the median line from the throat to the tail; another incision must be made from the chest to the arm-pit of each of the fore-limbs, and thence nearly to the end of the humerus, exactly following the course of the fore-limbs and running along just inside (in order to hide the finishing stitches) down to the manus, splitting the large central pad. At the hind-limbs the cut must follow the inner line of the limb, and divide the central pad. A rope tied to each fore-limb helps to stretch it out, and the first step towards the removal of the skin is made by flaying it back, and by carefully working around—cutting towards the body, to prevent the slipping of the knife and consequent cutting of the skin. When the skin is loose enough underneath, the foot of one side is disjointed at the second joint of the toes, as also is the fore-limb, the innermost toe being first detached. When skinned on one side, the operator continues the process on the other, extreme care being required in the management of the skin at the thin part of the flank.

When the skin is loosened sufficiently along both sides, and has been considerably relieved on the back, the lower parts, and the tail itself, must be carefully skinned around. In the case of small mammals, it may be pulled out without any cutting; if it should refuse to come out clearly, cut it near the tip, underneath, and flay towards the body. The hind-quarters should next be slung by a rope, and, the skin having been pulled from underneath them, the rope should be shifted to the fore-quarters, in order to raise the head from the ground or table. Skin the neck and throat, and, if there be reason why the skull should subsequently remain within the skin, which is not necessary with the skilled operator, disjoint it at the atlas vertebra; otherwise let it remain attached to the trunk. In either case, the ears, after being skinned a little distance towards their tips, should be detached close to the skull, leaving only small orifices, and one should be careful not to cut to their outsides.

One rule must be stringently observed, that, as there are many attachments in the region of the ear, the pupil must not cut on to the skin, but on the flesh, for any superfluous flesh left on the skin is very easy to remove, but holes are not so easily remedied. The same care must be used when skinning down to the eyes; the left-hand fingers must feel for the eye, and the skinning around the orbit of the eye must be done close to the bone, so as not to sever the membranous coats; that under the eye must be cut quite close to the eyeball, on the bone of the opposite ridge of the orbit. When this skin is freed, the next point is the loosening of that along the face underneath.

The other eye having been attended to in the same manner, the upper lip must be severed quite close to the teeth and the skinning carried on as far as the cartilage of the nose, which must be completely severed, causing the skin to drop and leave the front teeth uncovered. There now remain only the lower jaw and its large mass of muscles around the canine teeth, to be detached.

This being done, the skin falls entirely off, taking with it some of the inner skin of the lips, nose and eyes. The carcase being removed, and the skin replaced on the table, the lips should be "split." This operation must be commenced either at the side or under the nostrils, where the membrane of the lips reveals itself as a shiny skin, as the two skins meet. One must be skinned away from the other, quite close to the edges of the lips, until they are attached only by a thin edge and form a perfect bag. The under-jaw, nostrils and eyes are "split" in the same way, also the middle cartilage of the nose, to make less difficult the process of skinning out. Lastly the ears, on which some flesh was left as a safeguard, must be relieved of it, and must be skinned along the edges until they are turned completely inside out.

For a lengthy description of the skinning of

other and smaller mammals and horned heads, with their attendant differences, the reader may be referred to a recently published work.[1] Suffice it to say here that lesser mammals are not split up the limbs, and that their skulls are usually, although properly "trimmed," left attached at certain points to their skins.

Avoiding a poisonous preservative—usually inefficient—perhaps the best is that adopted by the present writer, viz.:—

Burnt alum	4 parts
Saltpetre	1 part

mixed and used dry or made into a paste with warm water, and in either case well rubbed into *all* the inside of the skin, and on all soft parts of the outside. The addition of a *small* quantity of carbolic acid, and also a small quantity of bichromate of potassa for very thick skins and in hot countries, is often beneficial. In all cases, the washing of the skin, *if quite fresh*, in strong salt and water (a saturated solution) to remove the blood, inside and out, before rubbing in the preservative, is of the highest importance. When not quite fresh, acetic acid (vinegar is a weak form of this) in varying strengths should be used with the salt and water.

The setting-up and mounting of mammals is, as may be conceived, determined by circumstances, and is varied in its methods.

To keep to the lion or tiger; such subjects are often mounted upon "mannikins," which are structures built up of board and iron rods covered with tow or with wood shavings (not hay nor straw, which probably mildew) worked into some resemblance of the carcase and finished up with modelling clay. The present writer invented what has been considered a more scientific and more correct method of getting the contours of all animals, by arranging the hardened carcase into the required attitude and casting therefrom, either as a whole or in parts, in plaster of Paris, and from the resulting moulds making paper models, upon which, when joined together, the skin is placed. These processes are substantially the same as those described in the following pages, dealing with the setting-up of an ostrich; but those who desire fuller information about the various processes connected with the modelling of mammals are referred to pages 116—160 of the work previously mentioned.

When the mammal's skin is sewn and pinned (with pointed wires) upon the model, the finer work of the colouring and insertion of the glass-spheres which replace the staring glass eyes—sold at so much a gross—and, after that, the filling and waxing of the soft parts takes place, and finally comes the question as to the "mounting," whether the animal shall be upon "rock-work" or what not.

Methods of Setting-up and Mounting Birds—Of all animated beings, birds have been the most hardly dealt with. The killing of the poor bird is not the worst fate that can befall it; it is its lamentable perpetuation as a highly embalmed caricature.

There are also, unfortunately, some clever colourists and draughtsmen who are unconscious of their absurdities. When dealing with feathered life, they will, with very few exceptions, copy from the ragged, moth-eaten, and limp mummies of the average bird-stuffer, instead of going direct to nature. When, as is often the case, flowers are correctly and beautifully drawn, as accessories to these bird studies, the incongruity is all the more painfully evident.

In five years, if the student works hard, he will recognise how little he knows, and in fifty he will know no more, *unless he learns how to draw correctly birds in any position*. That is the great secret, and the pupil, if he will not, or cannot, go to nature and draw creditably, will be a "bird-stuffer" all his life. In a greater degree, perhaps, this dictum applies to mammals, although with them there are the aids of casting and moulding which, except in the instances of large birds such as the ostrich, are unattainable.

As with mammals, so with birds—correct skinning is of the highest importance. Let a starling or a rook (both tough birds) be procured, or, if neither of these can be obtained, let a pigeon, which is easily purchased, take its place, the only drawback being that this latter bird is by no means so suitable for untrained fingers, and is indeed distinctly tender in such parts as those over the back and tail. Now, provided with the necessary scalpel, knives, and scissors, get to work by plugging the nostrils and mouth of the specimen with cotton wool. Lay the bird upon its side, with the head pointing to the right, and open it, *not* on the breast as most teachers and books recommend, but *under the wing*.

Skinning on the old lines is utterly incorrect both in theory and in practice, and is without one single recommendation, the disadvantages being that the bowels may be cut into by the learner, and so soil a white breast, and usually the skin is torn at the edges and stretched; afterwards comes the greater difficulty of shaping, and then the cut must be sewn up. After a time a rusty line of grease, drawn out of the skin by capillary attraction, declares itself.

With a pair of pliers in the right hand, take hold of the quill feathers with the left, draw out the wing as far as it will come, and, where it joins the body, put the nose of the pliers and break the bone. Do likewise with the other wing. Pick out that side of the bird which is the most badly muti-

[1] *Artistic and Scientific Taxidermy and Modelling*, by Montagu Browne. (A. and C. Black.)

lated and on it make the first cut (the state of the head should first be taken into account, as the head gives the bird nearly all its character). Turn the head diagonally toward the front, and, with the knife in the right hand, divide the feathers under the wing at the side of the breast and make a cut about half an inch long, through which the flesh of the body may be seen. Turn the body round in an exactly opposite direction, so that the tail points away, slip the point of the knife between the skin and the flesh, and cut as far as the femur, taking care to cut upwards, for fear that the skin may be damaged. With the knife-edge directed towards the flesh, relieve the skin over the back for about half an inch, do likewise along the opposite edge of the wing, breast and femur, and place some wadding between the skin and the flesh to keep the feathers clean. Loosen the skin around the broken wing bone, and detach it. If a little flesh still remain on the bone and skin in spite of all the care bestowed on it, it must be carefully removed to avoid making any holes. Leaving the wing, disarticulate the leg or cut the bone through at the junction of the femur and the tibio-tarsus; in the latter case the femur will remain joined to the body, and the tibio-tarsus will fall away with the skin. Pull the crop-membrane carefully back towards the body, take hold of it with the right hand, and with the left push the neck within the skin. Cut through the neck and windpipe, at the same time holding away the skin and feathers from the flesh. Let the head fall out of the fingers of the left hand and put a little wadding around the neck, or push a wire through it, in order that it may be the more firmly grasped. The skin is still attached to the wing, leg and tail. Take hold of the body with the left hand, and, while keeping the feathers from contact with the flesh, relieve the skin on the uncut wing and back. The student should notice that the skin on the back is exceptionally thin, and therefore must be scraped away and not pulled. This done, that on the breast or side may be loosened so as to come away easily from under the wing; and the knife being slipped in, the upward cut may be made which detaches the bone where broken. When the femur is exposed, push it up from the outside and cut through with the shears, being careful to exclude any skin.

The skinning of this part is a tiresome task until the tail is reached, as the skin is so very thin that, to detach it, it must be scraped from the bones. At the abdomen also it clings very tightly, and the knife must be used very sparingly, or the membrane over the bowels may be damaged, thereby endangering the feathers.

All this scraping and scarcely appreciable cutting over these parts will probably take a quarter of an hour, and must be continued until the pubes are passed. At this point it will be wise to let the bird lie supine on the table, merely supporting the tail above and below, and scraping until, in front, the vent is reached, and the oil-gland at the tail.

Slipping the knife underneath, and around, the final cut may be made which completely severs the skin from the body. Before the body is finally disposed of, it will be as well, of course, to take all the usual measurements and also determine the sex.

The skin being entirely detached from the body, it is necessary to start with the trimming of all flesh from the legs, wings, head and tail; the last, being already in the hand, may be operated upon first.

Carefully take away all flesh and fat with the scissors from both the tail and the skin which surrounds it. Now free the legs from skin down to the junction of the tibio-tarsus and the tarso-meta-tarsus. Take care not to pierce through to the outside when cutting away the ligaments; after the latter are cut away with a knife-point, the flesh may be removed from the bones with the finger and thumb.

The wings have now to be considered, and are decidedly the most troublesome. The flesh and pieces of broken bone must be removed, but the part still attached to the wing must be left untouched, as it furnishes something to take hold of.

The skin on the under side of the wing must be loosened until the flesh can be seen around the radius and ulna. Take away the broken bone, and remove all the flesh from the radius and ulna by cutting and scraping with scissors and knife. The head and neck now remain. Take the latter in one hand and press the skin over it, towards the beak, with the other, until coming to the place where the skin is found to adhere firmly to the ears, dip the finger and thumb in plaster or sand, and—preferably—pull the ears right out from their attachments, or, if they will not be persuaded, trim them out.

The skin around the eyeballs must be very carefully detached by cutting towards the back of the head, and when it is quite free a brain-scoop may be put into the orbit, pushed under the eyeball, and the latter pulled out without being burst. A plug of wool must be pushed into the orbit to clean it. The skin on the top of the skull must be loosened with a knife or the brain-scoop, well up to the base of the beak. Under and in front of the orbits, and at the side of the face, a little more skinning is required, to free the head from skin to the base of the beak.

If the tongue be not wanted within the beak, put the knife between it and the skull, then pull forward, when tongue and windpipe will come away. Where the neck joins the head disconnect it, but do not cut away the back of the

skull, as the brains may be easily removed from the back of the eye-sockets.

Now take a preservative, and, if the student is wise, he will use a non-poisonous preservative in those initial stages which necessitate the handling of the skin, and afterwards follow with a mercurial solution. This is highly poisonous, and the only efficient protection known against the ravages of insects. It is applied with a brush *after* the specimen is "set-up," and permeates the skin, but is not handled by the operator.

The first is :—

Non-poisonous preservative soap—

Whiting or chalk	1½ lbs.
White Windsor soap (common curd soap) . . .	½ lb.
Chloride of lime	½ oz.
Tincture of musk	½ oz.

The price of musk of late years is so prohibitive that unless it becomes cheaper it must be replaced by Eucalyptus oil. The finishing wash, to be labelled "Deadly Poison," is :—

Alcoholic solution of mercury—

Methylated spirits of wine 90 per cent.	1 pint
Bichloride of mercury 50 grains	2½ scruples.

Paint every part of the skull and skin and the bones of the wings, legs, and tail well, but do not paint the feathers. Turn the skin back again to its normal position, with the feathers outside, and then proceed to "make a skin."

Through the opening made by the removal of the brain, fill the skull with chopped tow ; and fill the orbits with wadding. (Note that where wadding is used the sharpest wire will fail to penetrate it.)

To prevent shrinking of the head, and to allow of any correction in shape that may be necessary when the head is returned, plaster it over thinly with soft pipe-clay or a modelling composition, forcing it in well above the beak and the sides of the face. Partially fill the throat with tow also.

Gather up the skin of the neck in the fingers of both hands and return the head through the neck, but be careful not to catch the bill in the skin and so tear it. This may be obviated in great measure by previously passing a thread through the nostrils and tying it around the bill. With care and by gentle pulling with the fingers, the head will, in the end, be in its natural position. Arrange the feathers with a fine needle and, if any ridges have been formed and held by the clay inside, bring them backwards, usually, sometimes forwards, by the aid of the needle. The hollows in the wings, caused by the removal of the flesh, are filled with tow, and a threaded needle is passed through between the radius and ulna, and around the radius of each wing, the ends of the thread being drawn until the wings are at their proper distance apart.

Around the leg-bones (tibio-tarsi), wrap tow to replace the flesh, and then pull them back into their proper places.

The next process is to make a false body—preferably of tow—about the size of, or a little less than, the natural one. This is done by taking a piece of wire of suitable gauge, long enough to reach from the inside of the skull to the beginning of the tail, and upon this wrapping tow at one end to form a neck, leaving unwrapped, however, as much wire as is represented by the depth of the skull. When this is done, wind the tow lower and bind firmly, copying the shape of the natural body. At the end of the wire the tow must be very thinly wrapped, and come to an apex to represent the narrowing at the tail. That there may be no slipping, turn the wire backwards on to the body.

If the false body be ill-shaped, bind it with hemp, and occasionally flatten it, until it becomes of a pear-shaped form.

To put the body into the skin, take it in the right hand, raise the skin with the left, put the uncovered point of the wire—unsharpened, if possible,—followed by the artificial neck into the palatal part of the skull, and then, with a little management, insert the whole body into the skin. Let the breast feathers lie over the breast of the false body, and let the tail touch the apex, settle the wings properly, distribute the feathers as in nature, get the whole of the back into good order, and fasten the wings in position by pins which pass from one to the other through the artificial body.

A trough should be made of board, with the sides of a height according to the size of the skin, and over it a piece of straw-board should be tacked. Place in the trough a thin layer of wadding, and on this lay the bird upon its back, so that the breast may be attended to. Settle the feathers properly (for this is final), cross or tie the legs, and arrange the head naturally, turning it to one side should it be long-billed. Any feathers which are untidy may be bound in place with cotton or hemp.

In place of this trough, skilled taxidermists use a paper strip, arranged around the bird after the final disposition of the feathers, and pinned at the ends.

There are other methods which the clever skin-maker will probably discover for himself, such as wrapping the skin in wadding or using two or three cross bands of tissue-paper, but, in any case, it is imperative to correct all irregularities before the skin becomes dry. A label should of course be attached to the legs, giving all information as to name of specimen, sex, locality, date of capture, name of collector,

and colour of eyes and soft parts generally. A well-shaped skin should be indistinguishable from a dead bird, with feathers perfectly smooth, wings closed and legs crossed.

The skinning and making of a skin being disposed of, the important process of "setting up" comes next. Ordinarily, it is done either by wiring the legs, the wings, the head, and the tail, and filling in and shaping by cotton wool or tow—*i.e.*, the "soft-body" method—or by carving peat or cork into some semblance of a body, and thrusting wires therein, inserted from the outside through the legs and so on, or by making a "mannikin" of tightly bound tow or wood-fibre, placing it within the skin as a fictitious body, and arranging the wires in the best manner to do their supporting work. This "hard-body" method is, or should be, superseded, either by one adapted or by one invented by the present writer. The first deals with the question of retaining the whole of the skeleton of a small bird as a guide to its form, which has much to recommend it, especially as most taxidermists retain the bones of the legs, the wings, the tail and the skull, within the skin, thus leaving only the skeleton of the carcase or the "cage" undealt with. This, when freed from flesh, washed with strong carbolic acid and otherwise cured, worked over with tow and perhaps a little clay to replace the flesh removed, becomes the semi-artificial body to be replaced within the skin, and on this the skull, wing-bones, leg-bones and tail are wired in their exact positions, as in nature. Thus, if moderate care and skill follow in the final "setting up," the bird should be more life-like than it would become by ordinary methods. It has been urged against this process by those who have never tried it,—first, its difficulty, next, its liability to the attacks of insects. The first may be disposed of by saying that nothing is done, which is well done, or worth doing, without difficulty, and that it is not really so difficult as would appear; the second contention is disposed of, by the fact that all the bones are washed with carbolic, or creosote, or the non-poisonous soap, and the skin itself, *after* the bird is "set up" and finished, is washed by a solution of bi-chloride of mercury in spirits of wine. This, it need hardly be observed, is a deadly poison, and should not be touched by the hands. Arsenical or other poisonous soaps are painted *inside* the skin, and must be handled in "setting up," but the mercurial wash is applied *outside*, after the subject, be it bird or mammal, is finished, and therefore necessitates no handling.

This method of using the whole of the skeleton is, in the case of large birds, superseded by the other plan mentioned—the modelled body, which is used in the Leicester Museum for all mammals. The following description of the modelling and "setting-up" of an ostrich will, with modifications, do duty for the treatment of the vertebrate sub-kingdom.

At the outset, the specimen to be "set up," was measured, the colour of its soft parts and other details noted, and the feet, legs, thighs, neck, head, and other soft parts were washed in methylated spirits seventy per cent., to harden the skin generally, and also to fix the scales of the legs, which might otherwise have "slipped" in handling.

The bird was placed on its back on a dissecting table, being propped under the thighs, &c., with blocks of wood to maintain it in proper position. As it was intended that the bird should be mounted looking towards the left, an incision was made along the right margin of the central feathers, so that the ultimate stitching should not be seen. This was continued backwards to the tip of the tail, and forward, still following the edge line of feathers right round the sternum, down the under surface of the wing to the tip. Skinning was comparatively easy, until the masses of fat at the breast and round the base and sides of the tail were met with. As it was intended that a plaster cast of the body should be made, no more fat was left on the skin than was unavoidable. The whole side being laid bare, with the skin freed before and behind to its utmost limits, skinning was continued over the knee and down the leg to the junction of the heel, where it was disarticulated by means of an incision made from the outside. The skin of the leg was not in any way split except at this point. The tibio-tarsus was removed from the body at the junction of the femur, with all its relative muscles attached.

The same process was gone through with the other side, the whole front of the breast being laid bare without any necessity for dividing the skin further. In undercutting the cloacal aperture, it was found necessary to plug it with wadding and to tie the end of the intestine freed by this process. Having skinned down both sides, further operations were greatly assisted by partly hoisting the bird with a pulley, tail upwards, and commencing at that part, the skin by its weight assisting the process of freeing the back.

The neck was turned back as in small birds, the knife, however, being in constant use, to free it from the enveloping skin, and it was found necessary to make an incision on the side of the head near the top and to continue it for an inch or two up the neck to free and disarticulate it, after which the neck was easily got at. The left wing was cleaned by slitting it underneath from the tip to the point where it had previously been freed from the inside, thus avoiding the division of the skin across the breast. The wing-bones and head, the whole of the skin, and such bones as were attached, were thoroughly cleaned of flesh and fat, then well rubbed with the mammal preservative and left for some little time.

Afterwards, the toes and feet were slit up vertically, also the legs on their insides; the sinews, &c., were removed, and the bones and skin well rubbed with preservative. Next two iron rods (half an inch or five-eighths of an inch thick), tapped at one end for about six inches, were passed down the hollows of the leg-bones and out through the feet, the tapped portions protruding for some distance. The removed sinews, &c., were now replaced with pipe-clay, modelled to shape, and the skin carefully sewn up. A board or block of suitable size and thickness was now provided, having two holes bored for the reception of the protruding irons of the feet in such a position that these stood each four and a half inches from the median line, *i.e.*, nine inches apart, the right foot, however, being posed about six inches behind the left.

Whilst the skin was curing, the mould of the body was proceeded with, but owing to its bulk it was necessary to cast it in three separate parts, viz.: (1) neck: (2) body; and (3) right and left tibio-tarsi together. The first and third operations will be described later; the second is as follows:—

Three sacks of plaster—which were all used—were

obtained, and a galvanised iron bath with a handle at each end, holding about a pailful and a half, was found very convenient in which to mix the plaster with water. Another bath of water stood near for the necessary rapid washing and rinsing of hands and utensils, whilst the work was proceeding. Two operators were required, one to supply the mixing bath with the proportions of water and dry plaster, and the other to do the hand-mixing and actual casting.

The form of the specimen being studied, with a view to its proper relieving from the mould subsequently, it was found expedient to place the bird upon its back, raised from the bench by a small piece of wood, one inch

Headless Model (by the Direct Paper Process) of an Ostrich.

deep, placed under the lowest angle in the lumbar vertebral region. A four-sided wooden frame was constructed around, which cleared the specimen inside by an inch each way, and rose an inch above the level of the ventral surface; here n the carcase was temporarily propped in a manner similar to a vessel dry-docked. Cracks between boards were stopped with putty, and the inside of the frame was well oiled.

All being ready, the plaster was expeditiously mixed in successive bathfuls and poured into the box until the back was embedded, and until it reached the mid-level of the horizontally-placed tail and femora on both sides, leaving the top half of each exposed.

This constituted the first section of the cast, which, after a short time allowed for setting, was well oiled on its surface, and the next proceeded with.

First the spaces between the sternum and pelvis and their respective ends of the frame were divided by pieces of wood cut to shape and stopped with putty; these, of course, together with the exposed portion of the specimen, dividing the box longitudinally.

Into one of these divisions plaster was again poured to within three or four inches of the top of the ventral surface of the specimen, the wooden partitions were removed, and the other side similarly treated. A single cast was now made over the remaining exposed portion, similar to the back, although of course of much smaller bulk. Several hours were allowed to elapse before delivering.

The casting of the neck and tibio-tarsi was a more simple process. Wooden frames to hold them having been loosely constructed, so as easily to knock apart, plaster was poured in to a depth of from two to three inches, and, when this had set to a suitable density, known only by experience, the objects were gently laid upon it and pressed down to a level of half their thicknesses or more, according to necessity. When hardened, keyed, and oiled, the top cast was made, completing the operation.

Some little time elapsed before operations connected with the making of the paper model could take place, as all plaster moulds when first made are exceedingly damp, and, when required immediately, especially if in winter, must be artificially dried by placing near a fire or furnace, though not so close as to cause cracking, which would certainly result from overheatiog. In summer, however, exposure to sun and air would probably be sufficient, assisted by fire if wanted for immediate use. Into these moulds, when oiled, were pressed series of layers of paper in this order.

(1) A layer of white tissue-paper, pasted on under side only.

(2) Layers of cap or newspaper, pasted on both sides.

(3) Layers of moderately thick brown paper, pasted on both sides.

(4) Layers of stout brown paper, pasted on both sides.

By applying alternate layers of two differently shaded brown papers unequal distribution was obviated, thus ensuring uniform thickness and strength. After drying a few days the paper casts were relieved; irregularities of surface, caused by adhesion to the plaster, pasted down into place, overlapping edges trimmed, and the vertebral, or back portion, and two sides joined together with glued calico and paper strips, converting them into one piece.

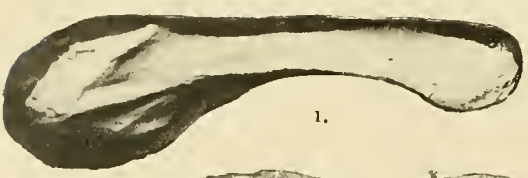
The two neck-pieces were next joined together; they contained a stout wire, gauge nine, around which sufficient tow had been bound to fill the hollow model. This wire protruded at the lower end about eight inches for insertion and fixing in the body, which was effected by cutting a hole in the model and fastening the inserted portion with glued tow and calico strips. At the other end of the neck, about six inches of naked wire was left exposed as a subsequent head-support. The sternal portion was then fixed, thus completing the neck and body.

Next, the block on which the legs were fixed, with their long irons protruding upwards, was placed squarely under a beam which ran across the ceiling, from which was suspended the body at the correct angle and proper height from the surface of the block on which the feet rested, care being taken that the central axis of the body corresponded with the median line between the feet, the vertical position of the neck being ensured by a plumb line.

Next, the end of each leg-wire was pushed through the thickened end of its respective femur and filed off; and these irons, when bent at proper angles, severally formed the central axis and support of each tibio-tarsus, the inside half of which was first fixed in position and secured, and then the outer one. In the hollows of the thighs between the legs and the body was wedged glued tow, also well packed round about the irons, espe-

cially at their extremities. The model, now complete, received a coat or two of turpentine and flake-white and was allowed to dry.

Lastly, the skin, which during all the preceding processes had dried as hard as a board, was soaked in warm water, often changed, for two or three days, and was then scraped throughout to remove all fat and the hard inner layer of skin, until after some time it became as pliable as a glove. The feathers, cleaned somewhat by the soaking, were wiped down with benzoline and plaster



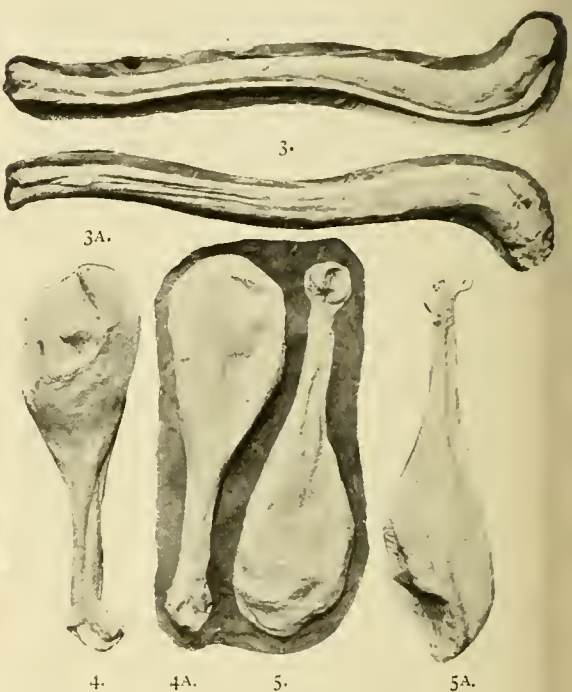
1.

2A. 2. 2B.

FIG. 1.—Represents a model, by the "direct paper process," of the sternum.
FIG. 2.—That of the back. FIGS. 2A AND 2B.—Those of the sides.

missing, replaced by modelling-composition, and the legs and all soft parts coloured according to the notes primarily taken.

Methods of "Setting Up" and Mounting Fishes—If mammals and birds have been badly used by the "stuffer," surely the fishes can bitterly complain of the indignities piled upon them by an attempt to resuscitate them by taxidermic processes, for no known processes of taxidermy, which necessitate the removal of cartilage and its substitution by a foreign material, can ever reproduce the gelatinous appearance which certain parts of fishes present. Supposing any fish be



3. 3A. 4. 4A. 5. 5A.

FIGS. 3 AND 3A.—Those of the halves of the neck.
FIGS. 4, 4A, 5, AND 5A.—Those of the legs.

All are untrimmed, excepting 4 and 5A. The moulds, being merely intaglios of the models, are not figured.

thrown on to clean and dry them still further. This done, all imperfect parts, or those not of a good shape, were modelled over with pipe-clay, worked very smooth with paste, and retained in position on the model by means of "cap-paper" pasted over all. The skull, still attached to the skin, was modelled up and placed upon the neck of the model, the skin of the neck being gradually drawn over it, and the remainder drawn over the model, one leg, the right, being further split for that purpose. The skin of the wings, legs, and body having been pulled into position and nicely adjusted, were carefully sewn together with skin-needles and strong thread. Then followed the adjusting of the face and eyes, and, more difficult still, the bringing together of the edges of the cut skin of the femur and reconciling it by means of a wax composition with the scutes of the tibio-tarsal joint. Finally, the feathers were cleaned and dried by being wiped down with benzoline followed by plaster of Paris, and well beaten out. All sewn edges were worked over with the wax composition, the scutes of the legs, where skinned as recommended in most books, what is done with the face? Literally nothing, for there are certain parts which resist any tools, however cunningly fashioned, in their attempts to coax out the flesh, and the cleverest taxidermist, who fancies he succeeds, never awakens to the fact that, *outside* the head and other parts, great shrinkage and shrivelling of the tegument result upon drying, and therefore a stuffed fish is the most unnatural thing in the whole range of taxidermy, even if done in what is called splendid style. Such "splendour" means a nicely varnished and very plump body, with shrivelled bases to the fins, and wrinkles all over the skull. Wax superimposed is only a partial success, and if fishermen would be content

with the actual form of their capture, correct in every particular, and with the finest markings shown upon the scales as in nature, and not "hanker" after the actual skin, with all its manifest imperfections and absurdities, there would be no taxidermic piscine mummies. The remedy for all this is casting from the actual subject as soon after capture as may be, which faithfully reproduces the exact form.

Really, taxidermy is powerless to represent fishes correctly, and the only method to secure exactitude is making a model in plaster or other media, and reproducing from that. In the first place a casting box should be provided, and this is quite simple in its construction, being merely four pieces of wood of any suitable lengths, two of which are not quite so wide as the others, the widest being slotted sufficiently at one end to allow the two narrower pieces to slide through them. By placing the wider pieces parallel to each other, slots downwards and at the contrary extremities, and then inserting an end of one of the narrower pieces in each slot, with the other end touching the inner face of one of the wider pieces, a square is formed, the size of which can be diminished or increased at will by merely sliding the narrower pieces through, and along the faces of, the wider ones.

There are three prominent methods of making moulds in plaster, *i.e.*, direct casting, waste moulds, and piece moulds.

Probably the best method of casting fishes in plaster is the following :—

Keep the specimen in a hardening solution for a short time, and afterwards well wash it. If flat, lay it on a slab of slate or glass ; if not, on a board slightly larger than itself. Pu pieces of half-inch board underneath the dorsal, *lower* ventral, anal and caudal fins as a means of support, but not under the uppermost pectoral and ventral ones.

If any gaps occur between the ends of the pieces of wood, or where the sides of the fish do not quite touch the wood, fill up with putty. If the boards are too thin to hold up the fins to their ordinary height, elevate them with putty or by means of a second board of suitable thickness.

It is obvious that boards—used in preference to glass, cardboard, or slate—admit of the specimens being pinned to them, to prevent their being floated up by the plaster.

The pins used must be cut off quite close to the fins, in order that there may be no difficulty in removing them when the specimen is turned over, and all boards must be wetted or oiled and the fish kept damp—with water, or glycerin and water, put on with a soft brush—and clean, by taking off all dirt and putty.

If the pectoral or ventral fins are to lie flat on the fish when finished, they must be made to do so now ; if to be raised, they must be held up, until set in the position decided on.

At this stage, build either wooden or zinc walls, stop up all cracks with putty, damp the fish, and pour in the plaster carefully. When it is dry, take away the walls, the boards and the putty, and turn the parts of the mould containing the fish upside down.

If the work has been done satisfactorily, the under half of the fish can now be seen, and should be gently brushed and wetted. The remainder is still in the mould, on the surface of which, now visible, keys should be cut, and, most important of all, it must be oiled.

Again build up the walls, fill up the cracks with putty, and pour on plaster.

In about a quarter of an hour, by gentle persuasion, the halves will come away from one another, and the fish can be taken out of its shell—care being required that the fins be not torn by the pins.

If the fins were raised, they must be protected from injury by supporting the mould on pieces of wood.

To make a cast of the pectoral and ventral fins, wash the fish, and replace it on the board with another board under the fins. Surround it with a little wall of putty and pour on plaster as usual.

Sometimes it is only necessary to make a cast of one side of the fins, on the side which is to be shown, but it is usual to take moulds of both sides, and of both sides of each right and left paired fin.

If the skeleton be not required and the fish be not lent solely for the purpose of casting, the above operation is unnecessary, and the following is preferable :—

Remove the ventral and pectoral fins after a cast has been taken, and put them by the side of the fish, which is set for casting, the result being that both surfaces of the fins will be seen on the same block as the fish ; this is a capital safeguard against loss or error. In drying the mould, take care that it does not remain so long before the fire as to make it too brittle or too much like chalk, and, when dry, paint it over once or twice with colza-oil.

Many clever modellers think water preferable to oil with which to dress the mould, but oil at least obviates the difficulty of distinguishing mould from model when the edges are being trimmed.

A modification of "waste-mould" casting is to colour the plaster to be used for the first coat, and pour it very thinly over the specimen and let it set. Cover it with oil or soft soap and then pour on a thin coat of uncoloured plaster, oil and coat again, until of a thickness that will prevent the breaking of the mould when the specimen is removed. Remember how many layers were used, or introduce a different colour each time, soap or oil the mould, pour plaster into it, let it set, and then commence to take away—with a hammer, chisel, or with modelling-tools—the plaster layers one by one. When the last one is arrived at be very careful in removing it ; this done, the whole object reveals itself.

Where either a fish, snake, or lizard is concerned, the edges of the mould should reach beyond the specimen to be cast to provide a tablet on which the model should rest, and this should be flattened and smoothed by suitable tools.

On the other hand, casting from a large specimen by means of piece-moulds is a much more difficult operation ; and the subject, be it mammal, bird, or fish, must be carefully studied and looked over, with a view to "undercuts." These are certain portions that, when cast upon, would not "relieve" or come away without the breakage of the mould ; this method has been sufficiently explained in the article upon the casting of the body of the ostrich, and is rarely required for the reproduction of fishes, save the very largest. With reptiles, however, it is different ; they have limbs which do not readily relieve as do their analogues in fishes, and with them, and with many of the higher invertebrates, piece-casting must be resorted to, unless, indeed, they are sufficiently small to be covered with a glue, gutta-percha, or wax mould.

The first, or glue process, pre-supposes the possession of a good modelling-glue, and one adopted by the writer gives first-rate results :—

Glue (best Scotch)	6 parts
Water	1 part
Glycerin	7 parts
Linseed-oil	2 parts

The glue is wrapped in a cloth and broken very small, then melted in the ordinary manner in a glue-kettle, but with no more water added to it than the one part allowed. During the melting, the oil and glycerin

are separately made hot, also in a water bath, taking care of fire.

The glycerin is added first in small quantities, and, when the glue has taken it up, the oil is added gradually and the whole is stirred and boiled together. Six hours should be sufficient to cause the whole to become intimately mixed.

This admirable preparation is not only of service for the making of moulds, but is of the highest value for the making of models also.

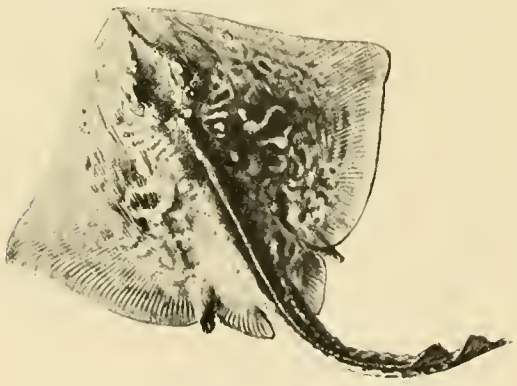
It has its limitations, however. It is not advisable to use it upon or within a damp object or mould, or upon either unoiled, and the size of the object to be represented must also be taken into consideration. It is not suitable for any natural objects of extreme size or over ten pounds in weight, but its advantages up to that are manifest in the ease with which, either as a mould or model, it "relieves." This is so marked that, as a mould, it is merely necessary to cover the object, and afterwards halve the glue covering wherever convenient.

As a model, its elasticity and toughness are such as to permit it to leave the most intricate undercuts with the greatest ease, and such things as frogs, snakes, and curiously-shaped fishes, fungi, and seaweeds are correctly expressed thereby, and when coloured to nature are indistinguishable from the originals.

Some few precautions are necessary, such as thinly varnishing the glue mould and letting the varnish set before plaster is poured in, and oiling a plaster mould with colza-oil before pouring in the glue, and, above all, painting the finished models as soon as may be with oil-colours. No change whatever takes place if this be done, and there are specimens finished and unfinished, the latter protected by a coat of oil-white, which have been in the Leicester Museum for five or more years without any shrinking or cracking.

For groups of small fishes, to be reproduced finally in plaster, paraffin wax is of the highest value, as it may be poured over a slightly damped surface, and, if it sets too rapidly, the addition of more wax causes it again to liquefy, and it flows over every part of the surface, and results as a perfectly hard mould with extreme definition in every part. When objects made of fine plaster do not readily relieve from a wax mould, it must be treated as a waste one, and be melted away from the plaster model by hot water, and the wax can be used again.

Up to the present, the processes described, with the exception of the passing mention of the glue composition, have dealt with the reproduction of forms in plaster. This, however, is heavy, and almost impossible to colour



Model (by the Pulped Paper Process) of a Thornback Ray.

so as to disguise its composition, and is, though of respectable antiquity and improved upon by modern methods, unable to bear comparison with methods invented or adapted by the writer.

"Carton-pierre" and its improvements are not limited by any considerations of size or weight, and the smallest and the largest objects can be perfectly represented, not only by exact form and definition but by colour.

There are several varieties of paper compositions, which the present writer has called the "Direct paper-process," "Pulped paper-process," and "Improved Carton-pierre." The first, used for representations of large fishes, reptiles, and for the models of the carcases of large birds and mammals, is that described when dealing with the model of the ostrich.

The second is made by taking certain proportions of flour mixed with water into a stiff paste, and flour mixed with linseed-oil, and combining them with tissue-paper by pounding in a mortar, the resultant mass being pressed into the oiled moulds and taken out when dry.

The very best of all paper pulps is the "Improved Carton-pierre," and this is of such extreme lightness

Model (by the Improved Carton-pierre) of a Lump-fish.

when the model is dry, that it weighs but half an ounce to every pound of the original specimen.

Thus a twenty pound fish weighs ten ounces only in the completed model, the definition being extreme, and it takes colour beautifully. Indeed, it is not too much to say, that this and the glue process should for ever dismiss taxidermic processes in the reproduction of fishes, reptiles, and soft objects generally.

The figures represent a Thornback Ray, modelled by the oil, flour and water, pulped-paper process, and a Lump-fish done in the "Improved carton-pierre."

Mounting Natural Objects—The ordinary "mounting" is merely a sanded board, or a perch of wood. Extraordinary "mounting" is when the object is mounted with modelled "rockwork" or finely and correctly-modelled foliage and flowers.

Supposing a large wall-case be needed to hold animals in different attitudes, make a false bottom and join to it some upright boards which will be of the heights suitable to the rockwork. Old cardboard, in fact anything of paper sufficiently strong, can be bent into rough shapes suitable to the design decided on, and nailed on to the board, and brown paper should be glued all over the cardboard. To form rounded edges, make them up by roughly gluing on pieces of crumpled paper, or by laying on pieces of cardboard, and cover with glued or pasted paper. When finished, no wrinkles should be shown —fill them in, if any, with pasted or glued wadding,— and the whole should be glued and sanded. An artist with a fertile imagination may "create" a rock with some success, but it is best to go to nature for inspiration, and to take a rock of any size and make an absolute copy therefrom, and the result should be, not a weak and erroneous imitation, but a reproduction which should deceive even a geologist.

Oil the natural object well, and use for the base that side of the stone which is the least important. Paste tough brown paper over one side of the stone, thus transferring from the stone to the first layer of paper all its characteristics. Follow this only by a sufficient number of layers to prevent the paper from collapsing when dry, removing the stone when the model is dry or nearly so. A better method, which reproduces all detail, is to cast the rocks in plaster of Paris, and, if too large to cast in

one piece, "piece-casting" is resorted to. When the mould is dry and oiled and the pieces are attached to one another, paste the paper inside the model; if necessary, the paper may be thickened considerably, for the finest markings are *on the surface* in this case, and not within the model as in the previous process.

If the original rock, from which models or copies were taken, have a sandy or rough surface, then glue and sand must be used to represent it faithfully, and the colouring may be accomplished by using tints of common powder-colours thinned with turpentine or linseed-oil. All finishing touches must be aided, if possible, by the rock itself as a guide.

If the rocks are smooth, they must be brushed over with a special preparation made by one part of each of powdered whiting and plaster of Paris, mixed with sufficient thin flour-paste and water to make it into a paint.

A white under-ground invariably adds lustre and purity of colouring, and, should the whiting develop small cracks, this may sometimes aid the general effect. If the stones themselves present a smooth surface, instead of whiting use dry flake-white mixed with turpentine, and, when dry, rub down with sand-paper till smooth; if it is inclined to crack, leave out the plaster altogether.

In reproducing rockwork the student should be careful not to cast from the *inner* and *newly-broken* faces of rocks to represent a weather-worn cliff face, nor to use plaster tablets, to be laboriously joined together, when the much lighter and more easily worked paper does so much better.

Artificial trees are ordinarily made by wrapping tow around wire until some kind of twig is fashioned; this, to make it more "life-like," is sanded or has sawdust glued upon it, and is coloured, sometimes a brilliant red, often a no less brilliant green, and results in a fancy conception utterly unlike anything in the botanical world. Sometimes a cylinder of paper is made, from which sprout excrescences intended to do duty for limbs; when, however—as is usually the case,—the "tree" does not measure more than a few inches in height, the absurdity is manifest, and the safer method is to take nature for a guide, and carefully copy from the tree or branch itself, making the foundation with cardboard or stiff paper, reproducing the "bark" by means of tissue-paper, and copying the colouring from the actual object. The only true representation, however, is that made in paper from a plaster of Paris mould—usually in several pieces—which is unmistakably correct in shape, and may be made correct in colour by any one possessing the requisite knowledge.

Natural trunks and branches of trees must be rigorously excluded from cases, as insects eventually appear, especially in birch trees, and are very destructive foes. They may be detected by the yellowish dust they make when boring through the wood. Mosses, used as accessories in cases, must be carefully dried, the dirt taken out of them, and they must be put into a bath of turpentine, to kill the larvæ of insects.

Sphagnum or bog moss, and beautiful lichens, of almost every colour, can be used advantageously for this purpose. Grasses, such as the sheep's fescue, several of the brome-grasses, the wall and sea barleys, and many other stiff kinds, dry without much shrinkage, and take colour well.

The colouring must be applied discreetly, and must be thinned with turpentine, and, if varnish be used, it must also be thinned, to give the grasses a silky appearance, but not a shiny surface.

Other grasses and reeds may be used, but bulrushes and sedges are of no value, and are distinctly out of place except in very large cases, and then they must be modelled in the art fabric used for flowers and foliage, the methods of which cannot, however, be described here for want of space, but are to be found fully detailed in the work previously mentioned.

No dried leaves, except as such, are permissible in cases; the fronds of fern (bracken) dry beautifully, and may with skill be made to look very well, if colour, as distinguished from paint, be discreetly used. Seaweeds are a hideous failure, unless cast from the original and modelled by the glue process; some of the corallines are permissible, and some sea-shells may be used, if the common error of making razor-shells adhere to rock, and such like absurdities, be eschewed.

"Groups," such as those in the British and the Leicester Museums, are the outcome of all taxidermic knowledge aided largely by the art of modelling—whether applied to the forms of the animals, or of their accessories, or both,—and their value, like that of a picture, depends upon a just conception and faithful delineation of form, colour, balance of light and shade, and composition, and, if these principles be properly taught and insisted upon, a great and glorious future awaits the art of taxidermy and its trained exponents.

MONTAGU BROWNE.

TEAL—Although one of the smallest ducks that fly, weighing no more than a partridge, the teal (*Querquedula crecca*) is one of the most attractive of wildfowl to sportsmen, not merely on account of the beautiful colours of the male bird, but because of the sporting shots it affords, and its excellence for the table.

Teal are generally easier to get at than ducks, and as they require but a slight blow to bring them down, it matters little what size of shot is used. Instead of rising head to wind like other wildfowl, they have an odd way of springing up vertically from the surface of the water, no matter what their position may be when discovered, and, the shooter not aiming high enough, the charge of shot often passes harmlessly below them.

Haunts and Habits—Quiet rushy pools which lie at a distance from any road, turf holes on a peat bog, and sluggish shallow streams with overhanging vegetation are favourite haunts of the teal. Of shy and retired habits, it shuns the more public ponds and rivers, and avoids the neighbourhood of man's dwelling.

On approaching the edge of a pond at a distance from a "spring" of teal (as a small flock of these birds is technically termed), they may be seen silently reposing on the water. Immediately the intruder is perceived, a harsh call is heard, and they jump suddenly into the air, wheeling round and about with amazing rapidity, now looking black, now white, according as the upper or under surface of their bodies is presented to the eye. Frequently, as though intending to alight, they fall through the air with a whistling sound, recovering themselves when apparently in the water, and rising again to a height. These manœuvres are repeated until the eye is strained in following them, and the entire flock at length settles down again in silence and repose as before. At such times it requires no small amount of caution to get near enough to them for a shot.

Col. Hawker, whose practical knowledge of wildfowl has rarely been equalled, has well described the habits of the teal in his *Instructions to Young Sportsmen*. "If you spring a teal, he will not soar up and leave the country

like a wild duck, but will most probably keep along the brook like a sharp-flying woodcock, and then drop suddenly down. But you must keep your eye on the place, as he is very apt to get up again, and fly to another spot before he will quietly settle. He will frequently, too, swim down stream the moment after he drops; so that if you do not cast your eye quickly that way, instead of continuing to look for him in one spot, he will probably catch sight of you and fly up, while your attention is directed to the wrong place. If the brook in which you find him is obscured by many trees, you had better direct your follower to make a large circle, and get ahead of and watch him, in case he should slily skim away down the brook and by this means escape from you altogether."

Description of Plumage—For beauty of colouring the cock teal has scarcely an equal amongst wildfowl. The chestnut head with a patch of glossy green on each side, edged with buff; the neck, back and flanks beautifully pencilled with black and grey; the bright green speculum on the wing, broadly bordered above and below with velvet black; and the black and buff undertail-coverts present to the eye a perfect picture of harmonising colour which defies the imitative pencil of the artist.

The hen teal, like the females of all ducks, is of the usual sombre colour, her dusky brown and grey plumage being peculiarly well adapted to her concealment during the time she is engaged in incubation.

Nesting—Although usually placed in the vicinity of water, the nest is sometimes at a considerable distance from it, and always rests upon dry ground. A hollow is generally scraped out at the foot of some overhanging bunch of heather, or tussock of dry waving grass, and lined with fine heath stalks and bents. Here eight or ten creamy-white eggs are laid, in April, and as the hen bird covers them, she plucks from her breast and sides the soft brown down which underlies her feathers, and places it entirely round the eggs, filling up all the interstices, thus forming a warm bed for the young as soon as they leave the shell.

The old duck is very attentive to her young, leading them from the nest to the marsh, where they paddle about on the soft ground and shallow pools, snapping up flies and beetles with their tiny bills. They swim and dive well almost as soon as hatched.

Migration—Great numbers of teal pass southward for the winter, returning in the spring on the way back to their breeding haunts. In September and October they collect in large flocks, and, being very sociable in their habits, may often be found in winter in company with wild ducks. But although they mingle together when on the water, on being disturbed the two species always separate, the teal going off in one flock, the ducks in another. During the winter months teal may be found on the coast, in company with wigeon, but they apparently prefer the neighbourhood of fresh water, especially large quiet pools well sheltered by reeds or trees, to screen them from the wind.

Teal in Decoys—Teal are amongst the tamest of wildfowl, and are generally the earliest to come into a decoy. The decoy-man, aware of their market value (for they are highly esteemed for the table), knows better than to capture the first comers. He allows them to remain undisturbed for some time, in order to attract others of their kind. This policy sometimes proves very remunerative. It is on record that at certain decoys in Essex, from 200 to 400 teal have been taken in one day. At the celebrated Ashby decoy in Lincolnshire it was not an uncommon thing to take 1800 or 2000 teal in the course of a season, and in the winter of 1852–53 no less than 3279 of these little birds were thus captured. Folkard relates that at a decoy pond at Mersea in Essex a flock of about 400 arrived, the greater number of which were taken within a few hours. The Rev. Richard Lubbock, also, mentions an instance which occurred at a Norfolk decoy of 220 teal being taken at once.

Formerly the decoy season was from the 1st October till the 1st June: the statute 10 Geo. II. cap. 32 prohibited the taking of any wildfowl "by hays, tunnels, or other nets" earlier or later under a penalty of 5*s.* for every bird so taken, but that statute has been repealed, and now by custom the season for working a decoy is from October to February.

It is true that a few ducks and mallards come into the decoys in July and August, but they are generally birds reared in the neighbourhood, and are left alone to entice others. Teal come in about the first week of September. [See DECOYS.]

J. E. HARTING.

TENCH—MEASUREMENTS, &c.—Length of head $4\frac{1}{3}$ to $4\frac{3}{4}$, of caudal fin $5\frac{3}{4}$, height of body $3\frac{3}{4}$ to $4\frac{1}{4}$ in the total length. *Eyes*—diameter $6\frac{1}{2}$ to $7\frac{1}{2}$ times in the length of the head (but comparatively larger in the young), $2\frac{1}{4}$ diameters from the end of the snout, and from 2 to $2\frac{1}{4}$ apart. Interorbital space flat. The thickness of the head equals its length excluding the snout, while its height equals its thickness. Snout obtuse, mouth anterior, jaws anteriorly of the same length, gape wide, cleft rather shallow; the posterior extremity of the maxilla reaches to beneath the hind nostrils. Lips thick. *Teeth*—pharyngeal, in a single row, 4 or $\frac{5}{5}$ or 4, sometimes 4 on one side and 5 on the other. *Gill-rakers*—short. *Fins*—dorsal commences above the end of the base of the ventral, and is continued almost to above the origin of the anal: all the fins are rounded. In the males the first or even more of the ventral rays are thicker than in the female. *Scales*—about 18 rows between the lateral-line and the base of the ventral fin. *Lateral-line*—at first gradually descends and above the base of the ventral is continued to the centre of the base of the caudal fin. From the thickness of its skin it is termed the "shoe-maker" in Holland. *Colours*—leaden or greenish, lightest beneath; fins blackish. (Day's *Fishes of Great Britain and Ireland.*)

TENNIS—For the tennis-player imbued with the antiquarian spirit, the early history of this ancient, beautiful, and complicated game—the charm of which is indeed largely due to its complication—has much fascination. But when space is limited, it is impossible adequately to investigate the "palæontology" of a game which was played in France in some form or other so far back as the thirteenth century. In the following century it was introduced into many French towns, and buildings were adapted, or constructed, for the purposes of the game. These were called *tripots*, and we hear of the erection early in the fifteenth century of a *tripot* in Paris in the Rue Grenier Saint Lazare, called Le Petit Temple, in which one Margot, a woman, used to play about 1427, with such skill that she could hold her own with all but the best players of the opposite sex. The game in which she was so proficient is spoken of as "hand-ball," and there is other evidence to show that, up to the beginning of the sixteenth century, the hand had not been entirely superseded by the racket, as the weapon with which the ball was struck. The French names for "Tennis" and "Tennis-player" (*La Paume* and *Paumier* respectively) also indicate that the game was, in early times, played with the *palm* of the hand. The popularity of the pastime was on the increase during the sixteenth and seventeenth centuries. Of the French kings, Henri II. had the reputation of being a great player, and in England Henry VIII. and Charles II. were "distinguished amateurs." About the year 1615, there were fifteen courts in London—at present the number is five—and it is stated, on the authority of the Dutch Ambassador, that, in Paris in 1657, there were "only" 114 tennis courts! Most of these must have been uncovered buildings, roughly constructed, and having but little in common with the highly-finished and well-appointed tennis-court of the present day, the cost of erecting which may be safely estimated to be not less than £2,000.

Counting the two courts at the Queen's Club, two at Prince's Club, and one at Lord's, which is shortly to be taken down and transferred to a site behind the pavilion, there are, at the present time, twelve tennis-courts in England, which are either public or belong to clubs, and, in addition, there are not less than twenty-one private courts. In France the number of courts available for play is much smaller. In Paris there are two; at Fontainebleau, one; at Deauville, one; at Pau, one; at Bordeaux, one: or six in all.

In America there are five well-known courts; two at Boston; one at Chicago; one at New York; one at Newport. In Dublin there is one private court, and in Vienna there is another, but it is stated by a high authority that, "there is no such thing as a court known in modern Italy, Spain, or Germany."

Of the professional tennis-players, who, in modern times, have attained the highest distinction in the tennis-courts at home and abroad, the name of J. Edmond Barre, the great French player, stands pre-eminent. Mr. J. M. Heathcote, an accomplished writer on tennis, and perhaps the greatest of all amateur players of the game, has placed on record his opinion of Barre as being "the finest *all-round* player the world ever produced, or is likely to produce." Barre, who died in 1873, appears, indeed, to have been much superior to any of his contemporaries, and to have enjoyed a special reputation as a match-player of extraordinary staying power, and a remarkable giver of odds. Another great French player is Charles Delahaye, nicknamed "Biboche," who, in his prime, was inferior only to Barre. He has long since been on the retired list; and the leading professional players in Paris, at the present time, are Ferdinand, and G. Lesueur, known as "Le Biscon." Amongst English professionals famous for their achievements during the last fifty years, the names of Edmund Tompkins, George Lambert, Charles Saunders, and Peter Latham, the present champion of the world, may be specially mentioned. The first-named, who was a contemporary of Biboche, was reported to be the equal of the latter, though he never actually defeated and was indeed thrice beaten by, the Frenchman in a formal match. But there is no doubt that he was the strongest of English players for more than twenty years. A similar reputation was enjoyed by George Lambert for some fifteen years, and, in the seventies, the dedans of the tennis-court at Lord's was often crowded by spectators of the matches in which he took a part, and which were lit up by the extraordinary brilliancy of his execution. In May, 1885, Lambert was defeated by T. Pettitt, an Englishman by birth, but domiciled at Boston, United States of America. The match, a memorable one, was the result of a challenge by Pettitt, who was victorious by seven sets to five. In the following year Charles Saunders, at the time a young player of great promise at Prince's Club, Hans Place, became champion of England, as he succeeded in beating George Lambert, who by the way was then in his forty-fifth year. In May, 1890, a match between Saunders and Pettitt for the championship of the world and a stake of £500 was played in Lord Iveagh's court at Dublin, and was won by the latter by seven sets to five. Pettitt thus, for the second time, proved that he was the best player in the world; but in September, 1890, he announced that he should not defend his title of champion, and as at that time Saunders was indisputably second only to Pettitt, he naturally claimed the title renounced by the latter. In March 1895 he was challenged to defend it by Peter Latham, of the Queen's Club. The match was played in the new tennis court ("Prince's")

at Brighton, and ended in a victory for the challenger, by seven sets to two. Saunders since then has been in failing health, and has not been able to take any part in public matches. He was never possessed of an exceptional physique, but he will always be remembered as an almost perfect exponent of pure tennis, the grace and finish of his play being especially memorable. Peter Latham, the present champion, is also champion at rackets. This supremacy at two quite distinct games is a special feature of his great reputation. Neither title is held merely because there is no one to dispute it. Last year (1897) the champion at rackets defended *his* title successfully in a home-and-home match with George Standing of New York for £2,000. This year the champion at tennis has been called upon to defend *his* title by F. Pettitt, and the match for a similar stake is to be played at Brighton about the middle of next October. It will be a great match, the result of which will confer, under the special circumstances of the case, an undying reputation on the winner.

For amateurs there are two competitions in which all tennis-players take a keen interest. One is known as the "M.C.C. Challenge Prizes." These were instituted in 1867 by the Marylebone Club. The prizes, known as the "gold" prize and the "silver" prize, are played for annually at Lord's in the months of June and July. In 1896 the competition, which up to that year had been limited to members of the club, was thrown open to the world. From 1867 to 1881 (fifteen consecutive years) Mr. J. M. Heathcote was the winner of the Gold Prize. In 1882 Mr. Alfred Lyttelton, who will always be remembered for his correct, graceful, and withal vigorous style of play, displaced Mr. Heathcote, only to be ousted by him in the following year. Mr. Lyttelton was, however, again the holder in 1884 and 1885, and from 1887 to 1895 retained the coveted distinction without a break. In 1896 he was defeated by Sir Edward Grey, but the latter, in 1897, had to lower his colours to Mr. E. H. Miles, who thus became the holder of the Gold Prize.

The following is a list of the holders of the Gold and Silver Prizes from 1867 to 1897 :—

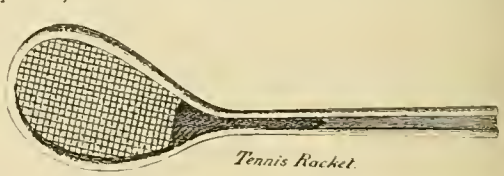
	Gold.	Silver.
1867	Mr. J. M. Heathcote	Mr. Julian Marshall.
1868	Ditto	Mr. G. B Crawley.
1869	Ditto	Hon. C. G. Lyttelton.
1870	Ditto	Ditto.
1871	Ditto	Ditto.
1872	Ditto	Ditto.
1873	Ditto	Ditto.
1874	Ditto	Mr. G. B. Crawley.
1875	Ditto	Ditto.
1876	Ditto	Mr. R. D. Walker.
1877	Ditto	Ditto.
1878	Ditto	Mr. C. E. Boyle.
1879	Ditto	Ditto.
1880	Ditto	Hon. Alfred Lyttelton.
1881	Ditto	Ditto.
1882	Hon. Alfred Lyttelton	Mr. J. M. Heathcote.
1883	Mr. J. M. Heathcote	Hon. Alfred Lyttelton.
1884	Hon. Alfred Lyttelton	Mr. J. M. Heathcote.
1885	Ditto	Ditto.
1886	Mr. J. M. Heathcote	Mr. B. N. Akroyd.
1887	Hon. Alfred Lyttelton	Mr. J. M. Heathcote.
1888	Hon. Alfred Lyttelton	Mr. A. J. Webbe.
1889	Ditto	Sir Edward Grey.
1890	Ditto	Ditto.
1891	Ditto	Ditto.
1892	Ditto	Mr. H. E. Crawley.
1893	Ditto	Sir Edward Grey.
1894	Ditto	Ditto.
1895	Ditto	Ditto.
1896	Sir Edward Grey	Hon. Alfred Lyttelton.
1897	Mr. E. H. Miles	Sir Edward Grey.

The other competition for amateurs is known as the Tennis Amateur Championship, which, since 1889 has been open to all amateurs. It is played annually at the Queen's Club, West Kensington, in the spring. The first prize goes to the winner, who earns the title of Amateur Champion, and the competitor who is unbeaten by any competitor, except the champion, is awarded the second prize. The following is a list of the winners of the first and second prizes since 1889 :—

	First Prize.	Second Prize.
1889	Sir Edward Grey.	Mr. E. B. Curtis.
1890	Mr. E. B. Curtis.	Sir Edward Grey.
1891	Sir Edward Grey	Lord Windsor.
1892	Mr. H. E. Crawley.	Sir Edward Grey.
1893	Ditto.	Ditto.
1894	Ditto.	Ditto.
1895	Sir Edward Grey.	Mr. H. E. Crawley.
1896	Ditto.	Ditto.
1897	Mr J. Byng Gribble.	Ditto.
1898	Sir Edward Grey.	Ditto.

Single-handed and four-handed matches at tennis between Oxford and Cambridge were begun in the year 1859, and, with the exception of the year 1864, have been annually played up to the present time. Up to this year (1898) Cambridge has won twenty-seven and Oxford twelve, of the four-handed matches; and of the single-handed matches Cambridge has won twenty-eight and Oxford eleven.

The Implements, the Court and the Game—The following is a drawing of the racket used at tennis. In the year 1857 a new method of stringing the racket was introduced, which materially increased its driving power, and was one of the first causes of the



Tennis Racket.

very fast play, which is perhaps the distinctive feature of tennis of the modern type. There is no restriction as to the shape or size of the racket. But its length is usually about 27 inches, and its weight, when properly strung, about sixteen ounces.

Tennis-balls, as used in England, are made, nowadays, entirely of woollen material, and are covered with melton cloth. According to the "Laws of Tennis" they should not be less than $2\frac{1}{4}$ inches and not more than $2\frac{3}{8}$ inches in diameter. Their weight should be not less than $2\frac{1}{2}$ ounces and not more than $2\frac{3}{4}$ ounces. French and American balls are lighter, softer, and

"slower" than English balls. It may here be mentioned that the great match, to take place next October at Brighton between Peter Latham the champion, and T. Pettitt of Boston, for the championship of the world and a stake of £1,000 a side, will be played with French balls.

The Court—The floors of the tennis courts at Lord's, the Queen's Club, and Prince's Club are made of blue lias, and as they have been

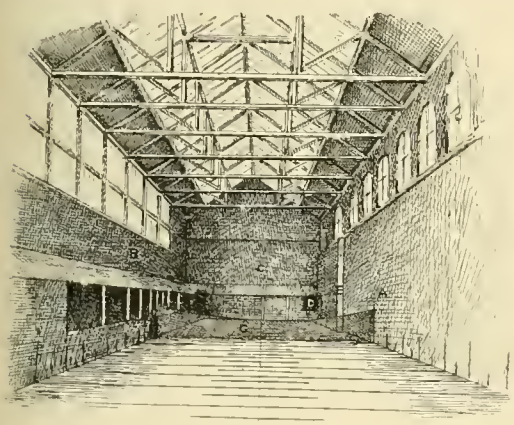


FIG. 1.—TENNIS COURT, LOOKING TOWARDS THE GRILLE.

much played on and have given general satisfaction, this limestone may be taken to be the most satisfactory material of which to construct the floor of a court. The walls can be built of brick, which should be coated about one inch thick with Portland cement, which need not be made as smooth as possible. It is the opinion of an expert in such matters, who was also a good tennis-player, that "both the floor and walls should have a high degree of elasticity, which is to be obtained by hardness and solidity; that the floor should be smooth, but not polished, and the walls should have a slight degree of roughness, sufficient to give full effect to cut and twist." A general idea of a tennis-court, which is usually a covered building, is given by the annexed sketches of the match court at the Queen's Club as it is seen from the room or hall in which spectators assemble to witness a match (Fig. 1) and also from the opposite end of the court (Fig. 2). The term "dedans" is a name for this room, and also for the spectators in it, just as the expression "the pit" denotes a particular part of a theatre, and also the audience there seated. The wall marked A is called the main-wall; that marked B, the side-wall; that marked C, the end-wall (Figs. 1 and 2). An inner-wall, usually seven feet high, runs round three sides of the building, and is connected with the side-wall and end-walls by a sloping wooden roof, called the pent-house. The portion of the inner-wall under the end-wall, marked C, is named the *grille*-wall (Fig. 1). In the latter is a square opening called the *grille* (D). Between the grille and the *tambour* (E) the main-wall is thickened. The *tambour* is a kind of buttress, or projection, which, when struck, deflects the ball, and thus gives variety to the play. The openings in the inner-wall, under the side-wall, are called *galleries*. The opening (Fig. 2) at the end of the service-side of the court in the inner-wall, opposite the grille-wall, is called the dedans (F), along the back of which runs a stout net, behind which the spectators sit, in the room above-mentioned. Across the court, at a point equidistant from the end-walls, and parallel to them, is hung a net (G), the height of which should be 5 feet at each end, and 3 feet at the middle. The half of the court between the end-wall over the dedans and the net is called the *service-side*: the other half is called the *hazard-side*. On the service-side the gallery furthest from the net is called the last-gallery, the one next to it the second-gallery, then comes the gallery called the "door," and then the first-gallery. In the space between the first-gallery and the post to which one end of the net is fastened, stands the marker. On the hazard-side there are corresponding galleries. Of these the one which is most remote from the net is often called the "winning-gallery," because a ball struck into it at once wins the

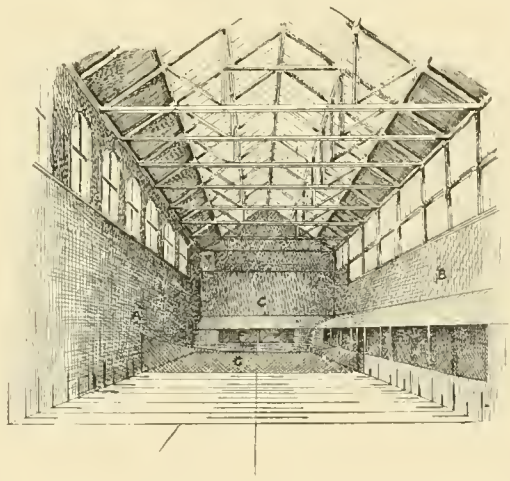


FIG. 2.—TENNIS COURT, LOOKING TOWARDS THE DEDANS.

stroke, just as it wins it when struck into the grille, or dedans.

Turning now to the floor of the court, the following lines painted on it deserve particular attention. (See ground plan.)

The half-court-line, drawn parallel with the side-walls, dividing the court lengthways into practically two equal parts.

The service-line, drawn parallel with the end-wall on the hazard-side, at a distance of 21 feet from it.

The pass-line, drawn from the service-line to the end-wall, parallel with the half-court line, at a distance of 7 feet from it. With reference to these lines, the service-court is the area enclosed by the service-line, the pass-line, the end-wall, and the side-wall. The pass-court is the area enclosed by the pass-line, the service-line, the end-wall, and the main-wall.

In addition to the above, lines are drawn on the floor parallel with the end-walls, which are termed the *chase-lines*. The number of these on the service-side exceeds those on the hazard-side, as there are none on the latter side, between

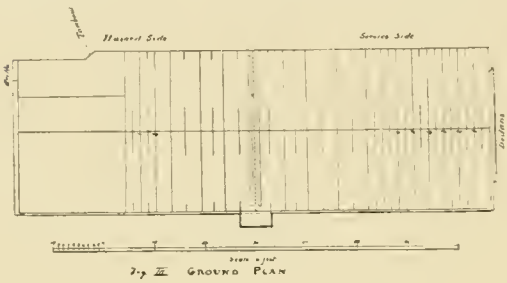


Fig. 3.—Ground Plan of Court.

the service-line and the grille wall. On the service-side the first chase-line is half a yard from the end-wall, the second one yard, the third a yard and a half, the fourth two yards, and so on up to six yards. With reference to the distance of each of these chase-lines from the end-wall, the "chases" themselves are named half-a-yard, a yard, 1 and 2, 2, 2 and 3, 3, 3 and 4, 4, 4 and 5, 5, 5 and 6, 6. The next chase is half-a-yard worse than 6, the meaning of "worse" here being "farther from the end-wall," just as the word "better" in connection with the chase means "nearer to the end-wall." The next lines are, one opposite the last gallery which denotes a chase equivalent to that opening, and another a yard beyond it, called chase a yard worse than last gallery. Similar lines are drawn opposite the second-gallery, the door and the first-gallery, which indicate chases equivalent to those openings, and between those lines are other lines, which enable the marker to pronounce whether a chase, for instance, is worse than the second-gallery, or better than the door.

The chases on the other side of the net are called hazard-side chases. They start from the service-line, and are named, the first half-a-yard, the second a yard, the third one and two, the fourth two. Then follow the lines which indicate chases equivalent to the openings, second-gallery, the door, and the first-gallery and, in addition, the line midway between those lines.

With regard to "the chase," Mr. J. M. Heathcote has humorously observed that it is "an expression which is to the uninitiated what the 'rule in Shelley's case' is to the law student." The expression is used with reference to the second contact of the ball with the floor, called the *fall* of the ball, at any point where chase-lines are painted, as distinguished from its first bound or contact, called the *drop* of the ball. A chase is also made if the ball enters any of the openings or galleries, except the dedans, grille and winning-gallery. Speaking of the chases on the service-side of the court, the author above quoted thus explains how they are played for and how the "winning" or "losing" of them affects the score.

"When the server mistrusts his ability to return the first or any subsequent stroke of a 'rest,' or when he perceives that the ball will 'fall' far before it reaches the main-wall, or will return far from it, making in either case what is called a 'long chase,' he makes no effort to return it; the marker observes where the ball 'falls,' and calls a chase at the spot where it has 'fallen,' *e.g.* if the ball falls on the 2 line, he calls 'chase 2'; if in the interval between '1 and 2,' and 2, he calls 'better than 2'; if in the interval between 2 and '2 and 3' he calls 'worse than 2,' &c.; no stroke is scored, but the opponents 'change sides,' and 'play for the chase.' The player who made the chase—now the 'server'—tries to 'defend' it; his antagonist, now the 'striker-out,' tries to win it. A chase is *won* if the ball enters the dedans, or it 'falls nearer to the end-wall than the ball which made the chase fell; it is *lost* if the ball 'falls' further from the end-wall than the ball which made the chase fell."

If the reader carefully reads the Laws of Tennis set out below, in connection with the above explanation and the description of the following illustrative "games," he will probably be able to understand and follow a match between two good players with little difficulty, and derive therefrom almost as much pleasure as if he were playing himself.

The three following "games" are meant for the "uninitiated," and are, therefore, not described in language of too technical a nature. They are intended to be fair specimens of games which might be played by any two players in a tennis-court.

Game I.

(*In which no chases are made.*)

The players X and Y enter the court from the side-passage, by a door, in front of which the marker stands. X spins his racket on the floor for choice of sides, and Y calls "rough," that being the name for the side of the racket which shows the knots of the strings, while "smooth" indicates the other side. X, having won the spin, usually chooses the service-side of the court, and delivers the first service. Y fails to return the ball over the net. The marker calls out "15–love." X serves again. Y returns the ball. X striking the ball, on the volley or after the first bound, makes it enter

the grille. The marker calls out "30–love." X now serves two faults. Y therefore wins a stroke, and the marker, who names first the last stroke won, calls out "15–30." Y now succeeds in striking the next service he receives into the dedans: 30 all. But in the next rest X "finds the winning-gallery," that is, succeeds in hitting the ball into that opening: 40–30. The next stroke, if won by X, would give him the game, but he loses it, as he hits the ball out of play (*see* Law 10) after Y has returned it. The marker therefore calls out "deuce." Neither player can now secure the game until he wins two consecutive strokes. The next stroke won by either player is called "advantage." If the same player wins the following stroke, the marker calls out "game." If he loses it the marker calls out "deuce." The score can thus alternate between "deuce" and "advantage" an indefinite number of times. X at last delivers a "nick-service," which Y cannot return, and then X finds the grille. The result is that X wins the game, and the players are left as they were when it was begun, that is, X is still the server and Y the striker-out.

Game II.

(*Illustrating "playing for chases" made on the service-side from the hazard-side.*)

X continues to serve. Y returns the first service so that X cannot reach the ball. The marker, seeing that it "falls" (*i.e.*, comes into contact with the floor for the second time) on the line numbered 2, calls out "chase 2." X serves again, and this time the ball from Y's racket enters the second-gallery. The marker calls out "chase second-gallery." Y has now made two chases, the first a good or "short" one, the second a bad or "long" one, and the players change sides to "play for them." Y is now the server, X the striker-out. The first chase made is the first played for, and the marker, to remind the players what they have to do, calls out, "chase 2." Y serves and X returns the ball. Y, watching the ball carefully, sees that it will "fall" further from the end-wall than 2. He therefore leaves it alone, and the marker calls out "lost it." This means that X has lost the chase, and Y's score is therefore credited with a stroke: 15–0. The second chase is now played for, and the marker again reminds the players what they have to do by calling out "chase second-gallery." This time X, either with his first stroke or (it may be) after several returns on both sides, strikes the ball into the "door." The marker calls out "lost it," and another stroke is added to Y's score: 30–0. Had X won both chases by succeeding in making his ball "fall" *better* (that is, nearer the end-wall) than 2, and better than second-gallery respectively, *his*—and not Y's—score would have been 30–0. With the strokes 30–0 in his favour, Y now delivers a service which X fails to return: 40–0. But off the next service X "lays down" or "makes" chase a yard. As the strokes are 40–0, and the next stroke may be decisive of the game, the players change sides again to play for the chase. The position now is that X is again the server, and Y has to try and win a very short chase. As X carelessly, or unskilfully, delivers a service which gives a good opportunity for finding the dedans with either a "straight" or "boasted" force, Y does not attempt to win the chase on the floor, but "goes for" the dedans, and if the ball enters it, he wins the chase, the stroke, and the game. If, however, X succeeds in "stopping" the ball, that is, prevents it from entering the dedans, and returns it so that his opponent fails again to return it, he is said to "successfully defend" the chase, and the marker calls the score 15–40. Assuming this to be the state of the score, X continues to serve, and Y establishes a short chase, viz., chase 1 and 2. With the strokes 40–15 in his favour, Y must now cross over to defend, and X to attack this chase. Y serves, and X's return of the ball "falls" in chase 2, that is, worse than the chase played for, and the marker calls out "lost it." Y therefore wins the chase, the stroke, and the game, in which his opponent has scored only one stroke.

Game III.

(*Illustrating "playing for chases" made on the hazard-side from the service-side.*)

At the beginning of the third game Y is on the service-side and X on the hazard-side. In the course of a rest, the former hits the ball hard on to the tambour. The ball is sharply deflected, and, after "dropping," rises from the floor, touches the battery-wall, that is, the wall under the galleries, and eventually "falls" on the line indicating chase a yard on the hazard-side. The marker calls out "chase hazard a yard." A similar stroke by Y results in the ball falling on the line which indicates chase half a yard on the hazard-side. The marker calls out "chase hazard half a yard." Two hazard-side chases have now been made by Y, and the players change sides to play for them. As was the case when chases on the service-side came to be contested, the marker, before X delivers the service, calls out distinctly the name of the first hazard-side chase, and when that is lost or won, the name of the second. Supposing that Y successfully defends both chases, his score stands at 30–0. He now, being on the hazard-side, makes chase better than 3, and X then from the service-side strikes the ball into the second-gallery hazard-side, thus making the chase so named. Though the first chase has been made by one player on the service-side, and the second by the other on the hazard-side, there are, nevertheless, two chases established,

and the players must change sides to play for them. The reader and the players must remember all this time that the strokes, as the result of the play in connection with the first two hazard-side chases, are 30–0 in favour of Y, who has now first to defend chase better than 3. This he succeeds in doing by delivering such a service that X can with difficulty return it, and indeed only just gets the ball over the net, so that the chase is easily lost: 40–0. Y has now to attack the hazard-side chase. This he can best do by endeavouring to deliver a "nick-service," and, if he does so, he wins the chase, the stroke, and the game, in which his opponent has failed to score a single stroke.

To players, as distinguished from spectators, the following is tendered as practical advice, which may be of service to them when they first begin to play tennis.

(1) Remember always to serve carefully with reference to the chase which is being played for, whether it be a chase on the service-side which you are defending, or one on the hazard-side which you are attacking.

(2) Be on your guard against forgetting altogether in the excitement of a long rest, the fact that you are *defending or attacking a chase.* When defending chases, especially, beginners are liable, in their excitement, to return, or attempt to return, a ball which would have "lost the chase."

(3) Remember that a chase on the service-side is successfully defended by striking the ball into any of the openings on the hazard-side, and that a chase on the hazard-side is successfully defended by striking the ball into any of the openings on the service-side.

(4) Do not attempt to play games at all until you have had at least a dozen lessons from a competent teacher, who will show you how to hold your racket, how to hit the ball with the proper "stroke," and (a matter of the greatest importance) how to serve in one or more of the orthodox modes of delivering the service.

G. E. A. Ross.

The Laws of Tennis—(In force at Lord's and published with the kind permission of the M.C.C.):—

THE LAWS OF TENNIS.

The tennis court at Lord's is of the following dimensions:—

Area of floor—			
Length	96 ft. 6 in.		ft. super.
Width	32 ft. 0 in.	=	3088
At the tambour	30 ft. 7 in.	Ddt. tambour =	23
			3065
Area of court, including penthouse—			
Length	111 ft. 3 in.	= 4338 ft.	9 in. super.
Width	39 ft. 0 in.		
Height of court (to tie-beam)		30 ft.	0 in.
Height of play-line		17 ft.	6 in.
Height of upper edge of penthouse		10 ft.	9 in.
Height of lower edge of penthouse		7 ft.	1 in.
Angle of penthouse roof		29	
Height of upper edge of openings		6 ft.	10 in.
Height of lower edge of openings		3 ft.	7½ in.
Width of dedans		22 ft.	7 in.
Width of grille		3 ft.	1 in.
Width of last gallery (service side)		9 ft.	9 in.
Width of second gallery ,, ,,		9 ft.	6 in.
Width of the door ,, ,,		3 ft.	5 in.
Width of first gallery ,, ,,		5 ft.	7 in.
Width of centre opening ,, ,,		7 ft.	11 in.
Width of last gallery (hazard side)		9 ft.	6 in.
Width of second gallery ,, ,,		9 ft.	9 in.
Width of the door ,, ,,		3 ft.	5 in.
Width of first gallery ,, ,,		5 ft.	7 in.
The net is hung exactly across the middle of the court, from the centre post to the wall; its height at each extremity is		4 ft.	7½ in.
In the centre		3 ft.	0 in.
The last gallery line	21 ft.	5 in.	from dedans
The second gallery line	30 ft.	4 in.	,,
The door line	36 ft.	2 in.	,,
The first gallery line	42 ft.	7 in.	,,
The line	47 ft.	4 in.	,,
The last gallery (hazard side) line	20 ft.	6 in.	from penthouse
The second gallery ,, ,,	30 ft.	10 in.	,,
The door ,, ,,	37 ft.	2 in.	,,
The first gallery ,, ,,	43 ft.	8 in.	,,
The line ,, ,,	48 ft.	4 in.	,,

The pass line is 7 ft. 8 in. from the main wall.

The fly nets are 8 ft. long and 4 ft. 7 in. high, with the exception of the one above the tambour, which is 10 ft. long and 4 ft. 10 in. high.

The racket is about 2 ft 2 in. in length; the head 9 in. in length and 5¾ in. in width.

The balls weigh 2½ oz., and are 2½ in. in diameter.

THE COURT, AND THE TERMS USED IN THE GAME.

1. The court is divided into two equal parts by a net, and a line painted on the penthouse. At one end is a gallery for spectators, open to the court, but guarded by a net, called the "dedans." The half court nearest the dedans is called the "service side;" the other half is called the "hazard side." The player on the service side is called "the server"; the player on the hazard side, "the striker out."

2. The court is also divided lengthways into two equal parts by a line painted on the floor and end walls.

3. The long side passage open to the court, and guarded by a net, is divided into a centre compartment, called the line (where there are the centre post, the marker's place, and the entrance to the court), and four other compartments on each side, divided by posts and nets. Counting from the line, the compartments are thus named—the first gallery; the door; the second gallery; the last gallery. Counting from the centre post, the posts are thus named—the line post; the first gallery post; the door post; the second gallery post.

4. Parallel lines for the purpose of marking the yard and gallery chases, and half lines for the half yard chases, are painted across the floor of the court.

5. The pass line is painted at right angles from the last gallery (hazard side) line to the end wall near the grille.

6. The "grille" is the square opening at the end of the hazard side of the court.

7. The "penthouse" is the sloping roof of the dedans, galleries, and grille, extending along three sides of the court.

8. The "main wall" is that opposite the penthouse.

9. The "tambour" is the projection in the main wall on the hazard side.

10. The line of play is defined by a painted line below the windows along the side walls. A ball which touches the walls above the line of play, or the roof or the rafters,

or the window nets (with the exception of the four double nets, called the fly nets, at each corner of the court), or the centre post, or goes over the rafters, is out of play.

11. In the following rules, the term "where a ball falls" is to be taken as meaning where the ball after being struck by one player falls untouched by the other on to the floor after its first bound.

12. To "return" a ball is to play it back over the centre net before it has touched the floor a second time.

13. The dimensions of the court and lines of play are given as they exist in the court at Lord's, but are not laid down as arbitrary.

The Game.

14. Tennis is played by the "set." The player who first wins six games wins the set.

15. A player who wins six games consecutively wins a love set, even though his adversary may have previously won one or more games.

16. The game contains four points, thus scored—15, 30, 40, game.

17. But if both players reach the third point or 40 together, the score is called "deuce." Another point called "vantage" is then introduced, and a player, in order to score "game," must win two points in succession, *i.e.*, "vantage" and "game." Otherwise, though he may have won "vantage," if he should lose the next stroke, the score returns to "deuce."

18. The vantage set is played on the same principle. When the players are at five games all, one player must win two successive games to win the set; otherwise, though he may have won the vantage game, if he should lose the next game, the score reverts to games all.

19. Vantage sets are only played with the consent of both players.

The Service.

20. The service shall be given from any part of the service side of the court.

21. The ball shall be served either directly on to the roof of the side penthouse, or the wall above it, so that it shall strike the roof of the said penthouse on the hazard side of the court, and shall drop on to the floor within the space formed by the penthouse walls and the "last gallery" and "pass" lines. It is otherwise a "pass" or a "fault."

22. If the service, though good in other respects, shall drop over the pass line, it shall be called a "pass."

23. A "pass" shall not neutralise a previous fault.

24. If the service shall bound untouched from the space above named and shall fall over the last gallery line or into any of the hazard side galleries (excepting the last gallery, when it shall be scored as a point to the server), a "chase" shall be called.

25. The server shall not serve until the striker-out shall be prepared, but if the striker-out shall take or attempt to return the service, it shall be treated as good.

The Chase.

26. When a ball shall fall on to the floor [excepting that part of it between the end wall and the last gallery "(hazard side)" line], a "chase" shall be called.

27. If a ball shall be struck, untouched, into any of the galleries [excepting the last gallery (hazard side)], a "chase" shall also be called.

28. The chase shall be marked according to the distance from the end wall, on that side of the court in which the ball shall have fallen, or the gallery into which it shall have been struck.

29. The nearer the ball shall fall to the end wall, the "better" shall be the chase.

30. The chase is a stroke left undecided until the players shall have changed sides and played for it.

31. The chase lines and half lines on the service side, counting from the dedans, shall be called in their order of merit:—

Half-a-yard.	Five and six.
A yard.	Six.
One and two.	Half-a-yard worse than six.
Two.	Last gallery.
Two and three.	Yard worse than last gallery.
Three.	Second gallery.
Three and four.	The door.
Four.	First gallery.
Four and five.	The line.
Five.	

32. Those on the hazard side, counting from the last gallery line, shall be called in their order of merit:—

Half-a-yard.	Second gallery.
A yard.	Door.
One and two.	First gallery.
Two.	The line.

33. When the ball shall have fallen on an intermediate space between any of these lines, the chase shall be called "better" or "worse" than the nearest line to which the ball shall have fallen, according as it may have been nearer or further from the dedans, or end wall on the hazard side. But with the exception of "better than half-a-yard" and "better than half-a-yard hazard side," chases shall not be called better or worse than the half lines.

34. When two chases shall have been made, the players shall change sides; but if one chase shall have been made when either player shall be at 40 or vantage, the players shall then change sides, because one point only is required to win the game.

35. To win a chase, a better chase (or a winning point) must be made by the player who did not originally make the chase which is being played for.

36. If the ball shall fall on to the same line, or into the same gallery as the chase which is being played for, it shall be called "chase off," *i.e.*, no point shall be scored, and the chase shall not again be played for.

37. If a ball shall be struck into the opposite court and, having touched the floor in that court, shall fall in the court from which it was played, it shall be called "chase the line."

Points.

38. The "server" shall win a stroke and score one point—

If the "striker-out" shall fail to return his service (unless it shall have made a hazard side chase).
If the "striker-out" shall fail to win a chase.
If the "server" shall strike a ball into the "grille," or hazard side last gallery, or so that it shall fall within or on the hazard side last gallery line.
If he shall win a chase.
If in serving the ball shall drop into the hazard side last gallery.

39. The "striker-out" shall win a stroke and score one point—

If he shall strike a ball into the dedans.
If he shall win a chase.
If the "server" shall make two successive faults.
If the "server" shall fail to win a chase.

40. Either player shall win a stroke and score one point—

If his adversary shall strike the ball in play without returning it over the net.
If his adversary shall strike a ball so that it shall be out of play, or shall strike the ball twice.
If his adversary shall strike a ball into the opposite court so that it shall return over the line without having touched the floor.
If a ball in play shall touch his adversary on the hand or any other part of his person or clothes.

General Rules.

41. The players shall toss for choice of sides before the first set. In subsequent sets, they shall continue to occupy the positions they held at the end of the preceding set.

42. No ball shall be played after it shall have entered the dedans, grille, or any of the galleries or doors or touched any of the posts, or any article which may be in the dedans, grille or galleries.

43. If a ball shall touch the post of the dedans, it shall be marked as if it had entered the dedans.

44. If a ball shall touch the post of a gallery, it shall be marked as if it had entered that gallery.

45. The marker shall call the state of the game as it proceeds, so as to give the players continuous information.

46. He shall call each "fault" or "pass" as soon as it shall have been made; and in all cases of doubt shall instantly call "Play" or otherwise, as the case may be.

47. He shall call the chases to the best of his judgment as soon as made or decided; and shall direct the players when to change sides, again calling the chases to be played for, and the state of the game before another service is given.

48. His decision shall be final in all cases, unless, before the commencement of a match, either player shall require an appeal in doubtful cases against the decisions of the marker.

49. The appeal shall be to the dedans, or to an umpire or umpires.

50. The appeal shall be made before play is recommenced.

51. The marker shall be entitled, if in doubt, to appeal to the dedans or umpires.

52. The marker shall in no case be allowed to bet on the game he is marking.

The Rules for Double Matches

shall be the same as those for single matches, with the following additions:—

53. Unless agreed to the contrary, the partners shall serve and strike out in alternate games.

54. The partner who begins to serve shall continue to do so through that game, and the same rule shall apply to the striker-out, but this shall not prevent the latter from leaving the service to his partner if it can be more conveniently taken by him.

55. In other respects the partners shall play as they may think most advantageous to them.

Odds.

56. The following odds may be given in a set at tennis:—

57. A "bisque"—One point, which may be taken at the option of the player receiving it at any time during a set. One or more bisques may be given in addition to other odds, or may be received in reduction of odds, *e.g.*, half fifteen for a bisque. A bisque shall not be taken after the ball has been served, nor after a fault.

58. Half fifteen—One point at the beginning of the second game and every alternate game.

59. Fifteen—One point at the beginning of every game.

60. Half thirty—One point at the beginning of the first and every alternate game, and two points in the intermediate games.

61. Thirty—Two points at the beginning of every game.

62. Half forty—Two points the first and alternate games, three points the other games.

63. Forty—Three points in every game.

Cramped Odds.

64 Round services—The service of the player who gives these odds must strike both the side and end penthouses.

65. Half the court—The player who gives these odds may choose into which half of the court on either side he will play, and must play each ball so that it shall drop into this half court, or a point is scored to his adversary. His service is not limited to this half court. The post of the dedans and the line which divides the court are included in this half court.

66. Touch no walls—The player who gives these odds must confine his play solely to the floor (service only excepted) on penalty of losing a point.

67. Bar the openings—The player who gives these odds loses a point if he strikes the ball into the dedans, grille, or any of the galleries.

68. Bar the winning openings—The player who gives these odds loses a point if he strikes the ball into the dedans, grille, or last gallery, hazard side.

69. Side walls—The player who gives these odds must confine his play to the floor, the end walls and end penthouses, and dedans, or grille, or a point is scored to his adversary.

70. In giving cramped odds, a player does not lose a point if the ball goes out of his limits after it has touched the ground a second time.

71. The values of the several kinds of cramped odds vary according to the proficiency or style of the players. The following may be considered approximately their values:—

Round services = Half fifteen.
Half the court = Half thirty and a bisque.
Touch no walls = Forty.
Bar the openings = Half fifteen and a bisque.
Bar the winning openings = Half fifteen for a bisque.
Side walls = Half thirty and a bisque.

(Signed) Spencer Ponsonby.
J. M. Heathcote.
E. Chandos Leigh.
W. Hart Dyke.
C. G. Lyttelton.

April 24th, 1872.

TIGER (*Felis tigris*)—**Habitat**—The tiger is peculiar to Asia. It is not found in Ceylon, Afghanistan, Beloochistan or Tibet. It occurs in Northern Persia, Burmah, Java, the Malay Peninsula, Central Asia, Siberia, Manchuria and China, and is generally distributed throughout India in suitable localities. It has within living memory been shot in Sind, but is now extinct there, as well as in a great part of Western India, including Cutch, Kattywar and many of the Bombay districts. In the Island of Salsette, close to Bombay, there are still a few, and one was shot there in January, 1898.

India is the country above all others where tigers have been pursued and their habits observed by generations of sportsmen, and whence our knowledge of the animal is almost entirely derived.

Natural history—Indian tigers appear to be smaller than the tigers which inhabit the colder climates of Central Asia and Northern China; the latter carry much longer and handsomer coats than those inhabiting a hotter country, and the male tiger has a ruff of long hair on the neck, which the female is without. The pug or footprint of an old male tiger can easily be distinguished from that of a tigress, not only by its size, but by its squarer shape, that of a tigress being more oval. The foot-

prints of a young male are of the same shape and size as those of an adult tigress. Those of a male cub are always a good deal larger than the footprints of his twin sister.

The period of gestation is stated to be fourteen or fifteen weeks, and I believe that more female cubs are born than males. There is no particular season for breeding, but in India most cubs are born from December to June. Tigers are monogamous, in the sense that they consort with one female at a time, but it is doubtful whether they live with the same tigress for any lengthened period. Though tiger and tigress are often together in a beat, they are more usually found alone. While the cubs are young, the male is not with them, indeed it is said that he will devour them; but when well grown, an old male will frequently be found with the tigress and cubs, though whether he is their father, or the expectant father of the next batch, it is difficult to say. A tigress seldom rears more than two cubs at a time. Occasionally they bring up three and still more rarely four. The late Major A H. S. Neill, of the Central India Horse, told me he once cut out six unborn cubs from the body of a tigress that had been shot. The cubs stop with their mother till they are nearly, if not quite, full grown, and she is supposed not to breed again during this period, but I know of an instance of a tigress having cubs while her former family was still with her. I once saw four old male tigers together, amongst the same mass of rocks, to which they had evidently been attracted by a tigress. When they were shot, it turned out, on a *post-mortem* examination of their stomachs, that two had the previous night killed and eaten a sambur, the third had eaten a bullock, while the fourth was quite empty: there were thus three different sets of tigers that had met. In the beat the two that had eaten the sambur came together, the others separately. The tigress was heard calling the same day, and was killed two days afterwards. I have several times seen fresh claw and tooth wounds on tigers, but this particular lot of four had not been fighting.

Dimensions—Sportsmen are by no means agreed as to the length of tigers: there are some who maintain that tigers attain the length of 12 feet or more; others, of whom the writer is one, say that Indian tigers over 10 feet are very uncommon. In measuring, the tiger should be laid flat on its side and pulled out so as to lie as straight as possible. The tape should then be run from the tip of the nose over the head between the ears and along the backbone to the end of the tail, and it is allowable to follow any slight curve there may be of the body. It may confidently be asserted that the vast majority of tigers in the south of Bengal are under 9 feet 6 inches in length. Many are under 9 feet and not one in fifty is over 10 feet. The tail usually measures a little less than a third of the total length. The skin of a 10-foot tiger will, when properly stretched and dried, measure 12 feet or thereabouts. The skin of a 12-foot tiger would be upwards of 14 feet when stretched. Can any one produce the skin of an Indian tiger that measures so much, or even 13 feet? A very few inches in length makes a great difference in the bulk, weight and general appearance of a tiger, and one of 9 feet 6 inches looks far larger than one of 9 feet. The tigress measures from 8 feet 3 inches to 8 feet 9 inches; she is rarely over 9 feet, and occasionally a full grown one may be a little under 8 feet The skull of an old tiger is readily distinguishable from that of a young one. The older it gets, the more prominent is the ridge of bone that runs along the top of the brain pan. In a young adult this is hardly noticeable; in a very old one it is prominent. In an old skull in my possession it is an inch in height.

The canine teeth are also a sure test of age. In the young adult they are hollow throughout and the base is open. In an aged animal the base gets completely closed, and the fang, so far as it protrudes from the gum, is almost solid.

The weight of tigers is not often taken, for the necessary appliances are too cumbrous to find a place in the equipment of most shikaris. The Maharaja of Cooch Behar, in a letter to the *Asian* in 1893, gave the weights of twelve tigers which varied from 445 lbs. to 536 lbs., the latter being the weight of a 10 feet tiger. Another 10 feet tiger weighed 453 lbs.; a 10 feet 2 inches tiger weighed 445 lbs.; two tigresses weighed 360 and 343 lbs. respectively. No two tigers are marked alike; young tigers are handsomer than old ones; their colouring is more vivid and the stripes darker and closer together. A very old tiger has fewer stripes and these are more faintly marked. The rich tawny orange colour, too, becomes of a pale yellow.

Man-eaters—Man-eaters are erroneously supposed to be old and worn out tigers that are unable to catch their ordinary prey, and the legend runs that a human diet has the effect of making their skins mangy.

No doubt some old tigers, or those that have been partially disabled by a wound, take to man-eating, but many man-eaters are in the prime of life and have splendid coats. Man-eaters do not confine themselves entirely to human food, but prey on animals as well, and are not more dangerous than any other tiger to beat for. They develop wonderful cunning, and evade pursuit in an astonishing manner. The natives believe that the ghosts of his human victims ride on the man-eater's head, to point out danger; and in one instance where a shikari had been a victim they were convinced that it was useless to try and circumvent the animal, as the shikari's ghost was up to all the dodges.

Methods of seizing the prey—Opinions

differ as to how a tiger seizes his prey, some alleging that he seizes by the throat, others by the back of the neck. My own view is that they usually seize by the throat, and occasionally by the nape of the neck. In the latter case the kill is of small height, such, for instance, as a pig. I only once remember seeing a bullock that had been seized by the back of the neck.

As might be expected, the throat is not always seized with mathematical accuracy. The holes made by the fangs on one side may be found close under the ear, while on the other side the holes will be near the bottom of the jaw.

Tigers occasionally attack powerful animals. I know an instance of an old solitary bull bison (the Gaur) killed by one, and I shot a solitary old bull buffalo that a few days previously had had a tiger on his hind quarters; in this case the tiger's teeth had been fixed into the back near the tail; and the claws on each quarter. Tigers frequently kill the wild boar, and cases have occurred where both boar and tiger have been found dead together. A tiger, when he kills, seldom eats at the spot, but drags away the animal for some distance. I do not think he ever lifts a heavy animal off the ground. He begins to eat at the hind quarters, and will often finish both hind legs of a bullock at one meal. The Indian bullock, however, is not a large animal. If there is good cover and water near, he will lie up all day close to the kill, but sometimes a tiger will go a long way from his kill to quite another jungle. The next night he returns and drags the remains of the carcass forty yards or more from where it lies, and eats most or all of what remains. He stops about in the neighbourhood for two or three more days, and does not trouble to hunt for some time, though, if he gets the chance, he will kill again. Tigers will eat a dead animal they may find, although they have not killed it themselves. Though this has been disputed, it is beyond doubt. They take readily to water, and are fond in hot weather of lying in shallow pools.

Tiger-hunting—When after tiger, it is usual to tie out bullocks or young buffaloes in several different directions within a radius of ten miles or so from camp. These are visited in the early morning, and news of a kill (if there be one) should reach the camp by 9 a.m. The best time for the beat is in the heat of the day. If the kill is in cover, the vultures will not have found it; if visible to them they will have collected. If they are on the kill, the tiger is sure to have gone, for they do not venture to descend if the tiger is anywhere near, but patiently wait on the trees around. The tiger sometimes kills a rash one that alights.

To arrange the beat properly is more than half the battle. The first thing to consider is the point for which the tiger is likely to make, for when moved he will not rush off aimlessly in any direction, but is sure to have some other resort, to which he will make his way, and he is more easily driven in this direction than in any other. The guns should therefore be placed on his presumed line of retreat. It is necessary to place stops on each side of the beat about seventy yards apart, so as to form a funnel, as it were, leading up to the gun. With a knowledge of the ground and the stops well placed, it is quite feasible to bring the tiger up to within twenty yards of a single gun, and that from a distance of half a mile or more. Of course, the more guns there are, the easier it becomes to bring the tiger within shot of one or other of them. (Trees will occasionally be seen clawed by a tiger to the height of ten feet or so. He rears himself against the tree, and draws his claws down through the bark, in order, it is said, to clean them, though I incline to think it is done in play.) The stops are men placed in trees, whose duty it is to remain silent as long as the tiger is taking the proper direction, but, should he attempt to pass through the line of stops, the stop he approaches gives two or three quiet taps with the back of his axe on the tree, which usually turn the tiger back; he may then try the other side, when, again hearing a tap, back he goes. Should, however, he persist in breaking out, the stops on the side through which he is going, set up a perfect rattle of taps and shouts, which often sends him back with a roar. Sometimes he breaks through and escapes: but if all goes well he comes up to the gun, probably at a walk or a slow trot, stopping every now and again to listen to the beat, affording an easy shot. Should he have been turned by the stops nearest to the gun he may pass at full gallop. The most difficult shot is when he comes full speed immediately under the tree in which the sportsman sits. As soon as the shot is fired, the shouts of the beaters redouble. They should then be quiet for a few minutes, so as to hear a whistle which the sportsman should blow, if the tiger is not dead, or has not passed him. If no whistle is sounded, they can safely come on and beat the jungle out. On no account should the beat be allowed to come on if the tiger has gone back, or is lying wounded between the gun and the beat. If the tiger is lying wounded beyond the gun, the beat should be stopped 150 yards from where one sits. No attempt should ever be made to beat out a wounded tiger, nor any beaters allowed to go near any jungle where he may be. Two or three men should have been placed in trees 200 yards behind, who will be able to give valuable information as to whether the tiger has gone on, or (as often happens when he is badly hit) lain down soon after passing the gun. When the beat is stopped, your head man will approach, and, standing far off, receive instructions in what direction he can safely come to you. Now comes the only dangerous part of tiger shooting,

—tracking a wounded one on foot. One should wait half-an-hour before commencing to do so, as this gives the tiger an opportunity of expiring. Some advocate following up a wounded tiger with a number of men in a close group immediately behind the gun, the idea being that a tiger will not charge home into a crowd. This is true enough, but at the first growl your group bolts. Personally I prefer three or four reliable men who will move on quietly with you. If a tiger has merely a flesh wound through the leg, or one that does not sicken nor partially disable him, he probably will not charge until he has been put up several times; he sees you long before you are near him, and moves quietly off, leaving a blood-stained patch where he has lain down. If shot through the stomach he is pretty sure to charge. As he sees you getting near where he is lying, he usually growls, the sound appearing to come from quite a different direction from the real spot. He may move on, but if not he comes at you with a "wouf, wouf" at full speed, and it is then that accidents happen. Sometimes a tiger will charge from 100 yards, but more frequently he waits till one is quite close before he charges. It is very difficult to see a tiger in jungle before he moves. Nine tigers out of ten are killed at the first shot, for they are usually fired at from a secure position at very close quarters.

When a tiger is shot at, he bolts forward in the direction in which his head points; and it is a safe rule, if on the ground, to let him pass you before firing, as he then goes straight on. If the shot knocks him down, he rolls about on the ground, and, if he is able to get up again, his head may be pointing in any direction and you may find yourself right in his path. This is one reason why the gun should always be posted on a tree or a rock if possible. Another reason is that when one is ten feet or so off the ground, one has a much better view of the jungle and is also more out of the line of sight of the tiger. If one is on the ground in front of him, he will see the slightest movement and turn off. As a rule they do not look upwards, but even in a tree a sudden motion may attract his attention, and I have seen a tiger that has been turned by stops standing and looking up into the trees before him as he came on. Again, if two guns are posted on the ground the one that fires the shot is safe, but the other may be directly in the path of the wounded tiger bolting.

A comfortable seat in the tree is necessary for good shooting, as one may be an hour or more in position before the beat commences. A native charpoy or bedstead tied up makes a good one. Another, which is put up easily and with less noise, is a piece of thick leather two feet square, in the middle of which is sewn a cushion of raw cotton covered with canvas. Eyelet holes are made in the edges, through which a rope is passed, leaving a long piece of rope four feet long at each corner, by which it can be tied to the branches. There is some art in tying it so as to be quite firm.

Here one can sit with the legs dangling until the beat commences, when the best attitude is to sit on the heels or kneel on one knee, so that one can wheel round to right or left as occasion may require. The beat itself is well supplied with tom-toms and other native musical instruments, and with the noise so made and with plenty of shouting and throwing of stones into the thick places as they advance, the tiger—especially if he is being beaten in the right direction—will come on a long way in front of the beaters. Sometimes it is advisable to have a silent beat, that is, the beaters do not shout, but merely tap the trees as they walk through the jungle. This plan is adopted for the first beat, if the jungle behind the guns is to be afterwards beaten. One great secret of successful shooting is to remember that one is not bound to fire at a tiger the moment one sees him. If he is going so as to pass one within ten yards, it is a mistake to fire at him fifty yards off. Should he be heading so as to pass closer to another gun, the rule is that you must leave him to the other gun. A shot through the lungs is fatal in a few seconds. A tiger so shot with a ·500 Express, the weapon always used by the writer, seldom drops on the spot, but gallops 100 yards or so, stops, falls over and expires with a growl or two. When shot through the liver they go rather farther before dropping. Tigers generally roar when hit, and often turn to bite the wound. Even when missed they often roar to the shot. If you are tracking a wounded tiger and take the track more than 300 yards you may be certain that the wound is not one that will be speedily fatal.

In hilly, rocky ground, tigers are very fond of lying up in caves. A cave, however, is not a large opening that can be walked into, but consists of one or more narrow tunnels barely sufficient to let the tiger through into a mass of rocks piled over each other. Somewhere inside, no doubt, there is more room, and hither the tiger, panther and bear retreat out of the heat.

The best way to start him out is to collect the beaters on the top of the rocks, usually at the summit of a hill. At a given signal tremendous yells, beating of tom-toms and other noises burst forth, and out darts the tiger with a roar. But sometimes he refuses to move, and in that case you can look into the different holes and crevices in the rocks; if he is to be seen, his two eyes, glowing like lamps, are plainly visible in the darkness. A curious effect is produced by his winking, as the two shining eyes are for a moment extinguished. The bullet should be placed about an inch above the eyes. He is generally, however, out of sight, and as a last resource an attempt may be made to smoke him out by filling one of the entrances with grass and firing

it, but I have never myself found this to answer. The gun should be placed at least 200 yards from the cave, to give the tiger time to subside into a walk, for he always comes out fast at first. Should a tiger go into a cave in the course of a beat he will never be driven out of it, if the cave is of any extent.

Sometimes accidents happen with an unwounded tiger: if he breaks back through the beat he may maul some one on the way. The cause of his so doing is that he is being driven in a direction away from the point for which he wishes to make, or, if he is often turned by stops, he gets suspicious, lies up, and charges the beat when it gets near.

An elephant is sometimes used to follow up a wounded tiger. In Bengal and Northern India tiger-shooting is always carried on with the aid of elephants, the long grass rendering their use a necessity. The beat is composed of a line of elephants, on some of which the guns are seated in howdahs. One or more guns seated on elephants may be posted in advance of the general line of beat to intercept the tiger making off, but, as a rule, the shots are fired from the advancing line. A good Shikaree elephant will neither run away from, nor attack a tiger, but stand still even if the tiger charges it. It is dangerous to be on an elephant that bolts in a tree jungle, as the howdah and its occupant may be swept off by the branch of a tree. An elephant that charges at the tiger is as bad.

Sitting up over a tiger's kill at night is very interesting, although frequently unsuccessful. As a tiger almost always returns to its kill when no one is there and often fails to turn up when you are waiting for him, the inference is that he finds you out and departs oftener than you suspect. A native charpoy or bedstead should be tied up in a tree over the kill, and a screen of grass or branches made all round it. This should be occupied about 4 P.M., for the tiger may return before sunset; the most usual time, however, for his return is about an hour after sunset, but he may not come till midnight or later, in fact it is quite uncertain when he will come. If there is no moon it is hopeless to try to shoot at night. Even if the tiger does not return, there is much to interest one before it gets dark. Sand grouse and peacock come down to drink at the water near which the kill probably is. The call of a cheetul or sambur breaks the silence. Every rustle of the leaves brings the heart into your mouth with the expectation that it is the tiger's tread. Sometimes the tiger himself will speak, with quite a different sound from that which he makes when charging. If he comes to the kill, you hear his footfall among the leaves, or on the gravel of the stream. He is by no means certain to come at once to the kill—he often lies down near it for a long time, or walks round growling to himself. When he seizes it he gives a "wouf." Sometimes he comes so quietly that not a sound is heard before he seizes the kill. The best plan is to lie perfectly still until he begins to eat, as any little sound you may make when getting into position is then covered by the noise he makes crunching. Should the tiger observe you he gives a roar and bolts. Instances have been known of a tiger returning to a kill the same night after being fired at on it, but, as a rule, the least thing which causes him suspicion will send him away for ever. Should you drag a kill a few yards to a more convenient place, if it is out of sight of its original position the tiger seldom comes to it; not finding it where he left it, he walks off. As a tiger always drags the kill away before eating, it should be securely tied by a stout rope to a tree, otherwise the tiger drags it off at once. You may also have a chance at a tiger by stalking the kill at dawn, when he may be on it, or, more likely, sitting close to it. It is better, however, to trust to driving him out during the heat of the day, for if disturbed in the cool morning, he may go off for miles instead of stopping near the kill. Tracking tigers up to the very spot where they are sitting, and shooting them as they get up, is rarely possible; when it is possible, there is great satisfaction in getting a tiger in this manner, but the ground in most places is too hard for continuous tracking. In April and May, the hot weather, the best time for big game shooting, a great deal can be done in locating tigers for a beat, by tracking. Year after year tigers occupy the same hill, the same ravine or other well-known spots in the jungle. If there is a tiger about, his tracks are in the river bed, along the jungle roads, and in the sandy bottoms of the nullahs. When you lose the track, you make a cast forward to the next nullah—half a mile each way will show if the tiger has crossed it. If not, you must try in another direction. The best part of a day can be spent in this way, often without success, often losing the track altogether, but sometimes the track leads into a hill or thick jungle, out of which there is no track, and you know the tiger is there. Many tigers can be got without a kill, by tracking them, and to my mind there is an additional charm in the sport where you have had to work for it. I am informed that in the Central Provinces, the authorities have made a rule by which one is prohibited from having a beat for tiger without a kill. A more vexatious and ridiculous rule it would be difficult to conceive.

When beating for tiger, the rule is not to fire at panther, bear, or other animal that may be in the beat, for the tiger may be turned by hearing a shot in front of him, or, worse still, may break through the beat and perhaps maul a man on the way. When the beat is over, the beaters should be paid at once on the ground; the usual rate of pay is 2 annas (*2d.*) a day, and

Tiger

double pay if a tiger is shot. They sit round according to their villages, and you should pay them yourself, for otherwise it is probable they will not get their due. A large supply of small coin should be taken.

When the tiger is skinned, the ground where the skin is to be pegged out should be covered with wood ashes to the depth of half an inch or so, as this is a sure protection against white ants, who will destroy a skin in a few hours if they can get at it. The skin is placed on the wood ashes hair downwards, always in the shade. Wood ashes should be rubbed on the inner side, which should be left covered with the ash till the skin is quite dry. The ashes absorb the grease out of the skin. The whiskers become very brittle and and are sure to break off. They should be pulled out and kept if it is desired to stuff the head. The lips and ears are the parts most difficult to clean; the ears especially should be skinned down to as near the tips as possible or the hair will come off them. Near the shoulder, embedded in the flesh, will be found a small bone, in the language of zoology a rudimentary clavicle, really the remnant of a bone once functional and useful in some ancestors of the tiger in bygone ages.

The Europeans at Amoy, China, have shot a good many tigers there. Mr. R. P. Bruce has kindly furnished to me some information about the tigers in that neighbourhood. He writes: "Tigers in the Amoy district lie up in rocky ravines, having long underground tunnels or caves, into which they penetrate even as far as 150 to 200 yards from the opening. There is no game; the tigers hunt round the farms and villages for any domestic animal. During these night hunts, they occasionally get men, cows, pigs, and goats, but much oftener dogs, for the more valuable beasts are carefully enclosed every evening. Tigers are numerous. All the tigers are man-eaters in the sense that they readily go for men, and as they hunt so near the haunts of man they have no regard for human scent. They are bagged in many ways, up a tree, or rock, in moonlight with a fastened goat. This last mode is very unsuccessful; with a bright moon the tiger does not come, but if the moon goes down he has the goat at once and the shooter cannot see. Another way is to take up a position at 5 A.M. or sooner, commanding the entrance of a cave where a tiger is known to live. If he returns from his hunt after daybreak you get a good chance. It is dangerous getting to the place in the dark, but we have got several this way. However, 75 per cent. of our tigers have been bagged since we discovered a party of Chinese hunters who would enter the caves behind a torch lashed to a 10 foot bamboo; about six of them go in, all armed with three-pronged spears. They are in no danger while the passage is small, but if it opens into a chamber they are very careful to see that the beast is not there before they pass through to the exit passage. Any bifurcations of the passages are either carefully explored by half the force or built up before they move forward. The tiger retreats before the glare of this unusual intrusion, and, if there is a bolt hole, he comes out to the guns and gives grand sport. Unfortunately, however, it happens oftener than not, the tiger retreats to a *cul-de-sac*, and there stands at bay. When this is notified to the shooter, he crawls in, gets in front, manœuvres the torch till he gets a good view and kills at 10 yards. The only thing calling for care is to kill dead by head or chest shot, for the concussions underground extinguish all lights, and a wounded tiger in the dark is no fun, however small the passage. As a novelty, this entering the cave business was very exciting, but as a matter of fact it is poor sport. The beast is completely cowed, and in a crawling hole can do nothing brilliant. I have known them show fight, but a couple of crossed spears with the butts jammed to the sides of the cave and the torch rammed into the tiger's face kept the men safe. The only accident was when the tiger rushed out before the men entered the cave.

"We measure straight from peg to peg at head and tail. In this way we have never got a tiger of 10 feet. I think 9 feet 6 inches is the biggest. The largest tiger I ever saw had a stump for a tail, and measured 9 feet 2 inches. They are said to be much larger in Northern China. I doubt if ours are bigger than, or as big as, some of the Indian tigers."

Mr. F. Leyburn of Amoy has sent me measurements of thirteen Amoy tigers. They vary from 7 feet 9 inches to 9 feet 5 inches; of these five are 9 feet and upwards; also of fifteen tigresses which vary from 7 feet $6\frac{1}{2}$ inches to 8 feet 4 inches; of these six are 8 feet and upwards. If measured in the Indian manner (by following the line of the body and not in a straight line from peg to peg, as seems to be the Amoy method), the measurements would be from 4 to 6 inches more. This bring out the size of the Amoy tiger to be very much the same as that of the Indian tiger.

Other Amoy measurements are, of the 9 feet 5 inches tiger, tail 3 feet 4 inches, shoulder height 41 inches, chest girth $45\frac{1}{2}$ inches, skull length $13\frac{1}{2}$ inches, skull breadth $9\frac{3}{8}$ inches, the skin 11 feet 7 inches. Of a 9 feet tiger, shoulder height 43 inches, chest girth $39\frac{1}{2}$ inches, skull length 13 inches, skull breadth $8\frac{5}{16}$ inches, skin 10 feet $10\frac{1}{2}$ inches. Of an 8 feet tigress, tail 2 feet $9\frac{1}{2}$ inches, shoulder height 35 inches, chest girth 35 inches, skin 10 feet.

The Maharaja of Cooch Behar gives, in the letter to the *Asian* previously quoted, the height of fifteen Indian tigers which vary from 36 inches to $44\frac{3}{4}$ inches, and of two tigresses 34 inches and $38\frac{1}{2}$ inches. The girth of the fifteen tigers varies from $48\frac{1}{2}$ inches to $54\frac{3}{4}$ inches, that of the

two tigresses being 41 inches each. These measurements are on the whole larger than the Amoy ones.

J. D. Inverarity.

TOBOGGANS AND TOBOGGANING

—The word "*toboggan*" is a corruption of the American Indian "*odabaggan*," a sled. No country in particular can claim to have been the first to adapt a vehicle for the express purpose of carrying heavy weights over snow; but the peculiar form of sled known as a "toboggan" owes its origin certainly to Canada.

The North American Indians recognised the difficulties which attended the transport of their goods across large areas of snow, and placed these goods upon long strips of thin wood, turned up at the ends, the better to enable them to glide over the frozen surface. On reaching a declivity the Indian allowed his toboggan to descend by means of its own gravity, and directed its course by sitting at one end and steering with sticks.

In recent years this gliding down hills has been indulged in as a pastime and sport. The original rough birch-wood sleds of the Indians, which were bound together by deer thongs, have given place to light and elegantly made toboggans constructed of birch, maple, hickory, or bass wood, in strips bound together by metal rivets.

In Canada, the United States, and Russia, special slides have been built with the view of directing the course of the toboggan, increasing the pace, and avoiding the unforeseen leaps and drops, or "*cahots*" as they are called, which upon the natural course frequently caused injury to the toboggan and its occupants.

These slides, which were copied from those in Russia, commence on a raised scaffolding so as to afford a steeper incline at the start, and continue over more gentle and natural slopes to the finish. The scaffolding rises from the ground to a height of 40 or 50 feet and supports the slide, which starts from a platform at the summit and descends at an angle of about 45° to the ground. The platforms of the Turque Bleue Club at Montreal, and that at Woodlawn Park, Saratoga, were raised 40 feet from the ground, the descent being 120 feet long.

The slides, for a considerable distance, are divided into two or more parallel courses or "*chutes*," which are separated from each other by low banks of snow, so that the toboggans can descend side by side without danger of collision. The breadth of each chute is only slightly greater than that of the toboggan, and very little skill in steering is required, except, perhaps, at the lower part of the course, which is not protected in the manner described. Now, whether these slides are constructed at more or less the same angle throughout as in Canada, or with alternate rises and falls, as in Russia, the ordinary type has a straight course with no corners. This, as we shall presently see, is the essential difference between these old-fashioned slides and the more recently constructed toboggan runs of Switzerland.

The slides, or chutes, are sometimes made of snow beaten down hard and iced so as to give a glassy surface, and sometimes of blocks of ice laid side by side and planed.

The Canadian toboggan is from 4 to 8 feet long, and from 16 to 24 inches wide, and will accommodate from one to six persons. It generally presents the whole under surface to the snow over which it glides, but some toboggans are made with low runners which raise them about an inch from the ground. Formerly two sticks were held, one in each hand, for the purpose of steering, but it was soon found that a recumbent position was the best for the steerer to adopt, and he now either kneels, sits low, or lies at the end of his toboggan and directs its course with the toe of one foot, trailing it behind upon the ice. It is remarkable how responsive the toboggan is to the slightest touch of the toe, and many riders are able to steer by merely swaying the leg from side to side without actually coming in contact with the snow. The pace attained upon one of these straight courses is very great indeed, being limited only by the weight of the toboggan, and by the resistance due to friction against air and ice.

It is probably owing to the fact that the sport, as it obtains in North America, does not admit of much opportunity for the exercise of skill, that tobogganing as a pastime is on the decline in the large cities of Canada and the United States. Within the last few years several of the chief runs have been closed, and the sport is in danger of extinction unless our cousins across the water introduce the same surmountable difficulties as, in the Engadine in Switzerland, have encouraged and improved the sport.

In Switzerland the sled most used by the country people is the "*schlitti*." This is a much shorter sled than the Canadian type, and is raised about a foot from the ground upon flat wooden runners shod with iron.

When it became fashionable for persons suffering from pulmonary complaints to spend the winter months in Switzerland, the English and American visitors to St. Moritz and Davos introduced tobogganing as a sport, and set to work to construct both toboggans and runs. Not content with the Canadian or the Swiss type of machine, they adopted the best qualities of each, and after continual experiment and thought, the present type of toboggan has been evolved. The Swiss type was found to be too short for steering and too high for stability, while the Canadian type was too long to be guided successfully round corners, and too low to admit of what is known as "body steering" or balance. Above all, experience proved that the curved

runner was the more resilient, and that the rounded runner was faster than the flat.

While the type of toboggan was being altered, the slide, or toboggan run, was at the same time undergoing a complete revolution, and there can be no doubt that the chief cause of the improvement in the sport is due to the substitution of a crooked run for a straight, and to the introduction of difficulties which call for an extra amount of skill on the part of the rider. The chief of these difficulties are the corners and the width of the course, for, with regard to this last, the chutes of the Canadian course have been discarded, and the rider is obliged to select for himself that particular route which affords him the highest rate of speed.

The Buol run at Davos was the first attempt at carrying out the new principles ; but owing to want of experience the engineers of this run constructed the corners too sharp and the banks too steep and high. A toboggan, if released from the top of this run, would, unless upset by the inequalities of the surface, find its way to the bottom. The Buol run resembled an exaggerated Canadian chute with the addition of corners. The engineers of the Cresta run at St. Moritz have worked on a different principle. It has been their aim to construct the banks at the corners in such a manner that, although a novice when travelling at a moderate pace will probably run off the course, yet a more skilled rider will negotiate the corners with safety, and the best riders will descend at a very high rate of speed.

The Cresta is a run of infinite variety. Throughout its entire length of three quarters of a mile, in which it descends 500 feet, there are no two corners alike, no two consecutive gradients which are similar, and no section which is actually straight.

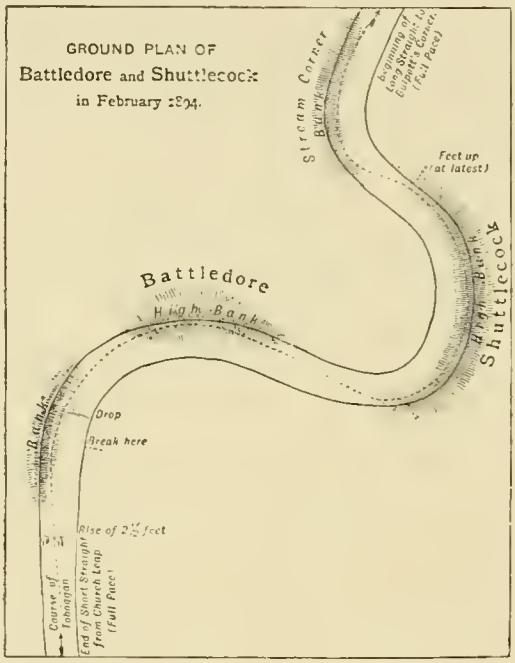
Of the corners, several are almost right angles, and one, at least, is hardly more than a prolonged curve. Where the corner is most abrupt, there we find the steeper and higher bank, which is accentuated if at the same place the course descends with greater rapidity : and, conversely, where the corner is comparatively flat, and the gradient slight, there we find little or no bank. The run is made of snow well trodden down and packed, and is afterwards covered throughout its entire length by a veneer of ice. This veneer is made by throwing water on the snow, and varies from an inch to several inches in thickness, being thinnest on the straighter sections of the run, where the friction is least, and thickest upon the banks at the corners. This run takes six weeks and more to build, but this length of time is due in part to the want of skilled supervision, the scarcity of labourers, and to the very great perfection of detail which is given to it.

Unless these difficulties can be overcome, the Cresta run itself bids fair to become a thing

SECOND BANK OF "CHURCH LEAP," ST. MORITZ.

of the past, and with it will go the perfection of tobogganing as a highly-skilled sport. The old Buol run erred in being under-constructed. The Cresta errs in the opposite direction. Each consecutive winter sees the corners made more mathematically perfect, and the straighter sections approximating more to the actual straight. The truer the curves and the straighter the course the easier becomes tobogganing, and the writer believes that the time has now arrived to say "enough." If we continue to "improve" we shall "improve" to excess, and ultimately revert to the Canadian "chute."

Now, what are the qualities of a good tobogganer? To quote from Mr. Gibson,



GROUND PLAN OF CRESTA COURSE.

"Tobogganing is a sport which appeals to all Englishmen, as it calls into play all those qualities for which England as a nation is famous. The decision quickly called for and instantaneously carried out, the opportunity of exercising pluck, nerve, resource, and activity, the quick eye for a curve, the necessity for hand and eye to work exactly together."

Great bodily strength is not necessary, although no doubt an advantage if accompanied by agility: and it is this fact which renders the sport possible both to the weak and to the strong, to ladies, children, and men of mature years.

In racing on the Cresta, the winner is not necessarily he who makes the fastest course. The prize goes to him who makes the shortest aggregate time on three heats. Now, as each competitor is obliged to run three times, his place in each heat being drawn by lot, and as the course varies, not only day by day, but hour by hour, owing to variability of temperature and other causes, a great deal of judgment is required on the part of the rider. Experience alone can teach him which of several toboggans to select on such and such a day, for a toboggan which will suit a very hard course will be useless upon a soft. Again, it must be remembered that the grooves which are necessary at the rear of the steel runners to enable the rider to get a grip upon a hard ice corner, and to prevent skidding or slipping down the banks, will be found to impede the pace when the course is soft. In order to give these grooves their full value, the rider should shift his position on his toboggan, getting back as far as he can, and thus transfer his weight to the rear of the machine. He will then be able also to jerk or swing the front part of the machine from side to side and force it to describe a different course from that which it would otherwise follow. This is known as head-steering, and is exceedingly difficult to do well.

As soon as a corner is turned and the course becomes somewhat straighter, the rider will distribute his weight the full length of his machine, or throw it perhaps into the bows in order to prevent the grooves, for which there is now no further use, from retarding the pace. In steering, the feet are seldom, if ever, used, but they are of the greatest possible service in steadying the toboggan on the banks, and in diminishing the pace when approaching a difficult corner.

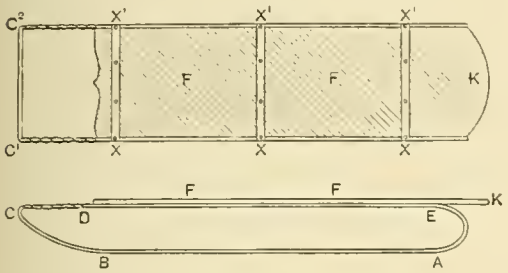
For this purpose a very strong iron toe furnished with sharp teeth is screwed on to each boot. In the judicious application of this power of breaking lies one of the chief differences between a good and a bad tobogganer, for we must remember that the winner seldom wins by more than a few fifths of a second, and that the loss of a fifth by over-breaking may prove fatal to the rider.

The selection of a toboggan is a thing of the greatest importance. It must suit the rider in every respect—in length, width, height, and weight.

For example, if too heavy, it will be unmanageable on the banks at the corners and run away down the straighter sections of the course. The runners, also, of the toboggan must be exactly parallel, and every part of the machine must be most carefully put together. The best rider upon a good machine ought to win his race; he will probably lose it if his toboggan does not suit him in every respect.

The type of toboggan now used upon the Cresta and other ice runs is known as the "steel *skeleton*." This will be best described by the engraving with its accompanying letterpress, which I borrow from Mr. T. A. Cook's book on tobogganning:—"Length over all on the top, including centre-board and 2 inches of

counter-board at the back, is 4 feet 1 inch. Length of runner on the ground, 3 feet 6 inches, *with a spring of about* 10 *millimetres*. Height of machine (without cushion on centre-board), 5 inches. Diameter of runners, 18 millimetres. These are the measurements which, after many trials, have produced the highest average of success, and are properly proportioned to a man of 5 feet 11 inches. Narrower machines may certainly be said to have failed. Lower ones are very difficult to ride. Longer runners are very hard to steer."



PLAN AND ELEVATION OF STEEL "SKELETON."

A to B, 3 feet 6 inches; total length, 4 feet 1 inch; C^1 to C^2, 12 inches; F, wooden centreboard; K, counterboard; X X^1, bars holding F and riveting runners.

The counter-board mentioned in this description is a device for the purpose of affording to the rider a greater power of leverage over his machine.

The toboggan is constructed entirely of English steel, the various parts being strongly riveted together.

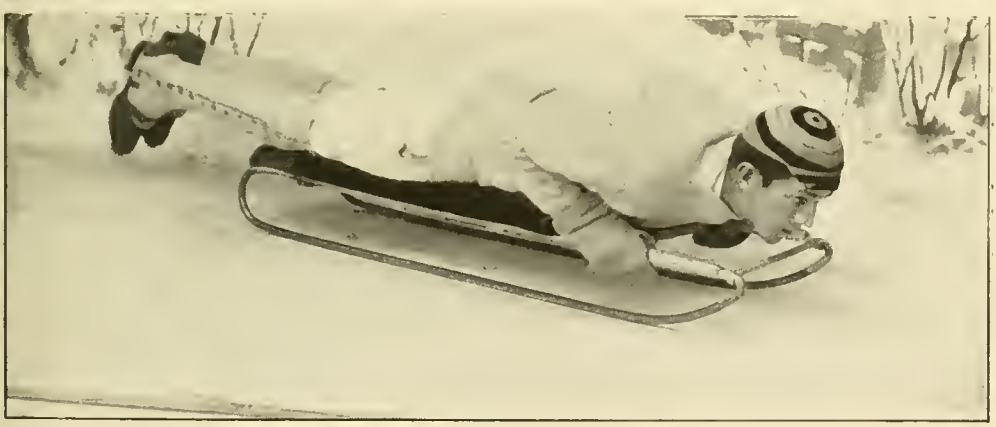
Upon such a course as the Cresta run it is not only too dangerous, but also next to impossible, for more than one rider to descend at a time. The racing, therefore, is judged entirely by time. Each tobogganer breaks or connects an electrical circuit automatically as he passes the starting and winning posts. The timekeepers have therefore merely to read off the results as given by the clock upon the circuit.

A good average run down the Cresta course takes 75 seconds, but during the winter of 1896–97 the record was made of 69·2 seconds.

Over the last 210 yards (and these contain at least two corners) the pace has been timed electrically at a fraction over 68 miles per hour.

The pace obtained upon a snow course or a road is necessarily not so great. The Klosters road, near Davos, winds down from an upper into a lower valley. That section of the road which is used for racing is two miles (less 160 yards) long, with a fall of 860 feet, and there is one bend at least which is at so sharp an angle as to compel the tobogganer to come nearly to a standstill to turn it. The record for this course is 4 minutes 34 seconds The type of machine used for road-racing differs from that used upon an ice course, in being much longer, and in being without grooves. To increase his pace, a strong rider will make use of his hands with which to thrust himself along, and will at times kneel upon his machine and punt with one foot. A weak rider is therefore at a disadvantage upon a road course, although his skill may be even superior to that of his more athletic opponent. For this reason, and because the surface of a road cannot be controlled to the same extent as can that of an ice course, tobogganracing on roads is not a satisfactory sport.

Bobsleighing, another form of tobogganing, is a very much more sociable amusement. A bobsleigh consists of a plank resting upon two small toboggans placed one in front of the other. The front toboggan turns upon a pivot and is used for guiding. From two to ten persons can sit upon the plank. The man in front steers, and the brake is applied by the man at the stern. Bobsleighing is usually indulged in upon a road, as an ice corner is undesirable, but a great pace is obtainable, and much dexterity is therefore required.



A RUN.

HAROLD W. TOPHAM.

TRAINING — Under the headings of the various sports there has already appeared the necessary information required by a man to become "fit" to excel in that particular department. All that is now required to fill in the gap is a general summary of the rules by which a man must be guided—rules bearing largely on his mode of life and surroundings; in short, the means by which he may "maintain his general health in the best possible state of efficiency."

First and foremost, his life must be one of absolute regularity. On this the success of all his efforts will largely depend. Of almost equal importance is moderation in all things, food, sleep, and muscular exercise. These two—moderation and regularity—form the keynote of all training.

Whatever be the particular form of muscular work to be undertaken, undoubtedly the best preliminary training is walking.

By walking, the muscles of the trunk and legs, the latter more especially, are hardened and rendered more efficient, the respiratory apparatus is stimulated and, perhaps of greater importance, the heart and blood vessels are braced up, and so prepared to withstand the more arduous labour presently to be thrown upon them.

An enormous difference can be wrought in the physical condition of a man by graduated walking exercise, of which fact advantage is being day by day more largely taken. By beginning on the flat and then taking more hill work into the daily routine, in a short time there will be a considerable increase in chest expansion and muscular development.

Walking, again, is far the best method for removing superfluous fat. Clad in thick and numerous woollen garments, a man may rapidly reduce his load of fat by brisk and continued walking.

Either at the very commencement, or as soon as walking has sufficiently raised the tone of the body, the aspiring athlete must strictly regulate his mode of life. This we may consider under the heads of *hours*, *food*, *drink*, *baths and clothing*, *surroundings*.

Hours—The vitality of the body is at its highest between the hours of 6—12 A.M., and at its lowest between 12 P.M. and 5 A.M., and from this we must conclude that "early to bed and early to rise" is a good rule, for the athlete at any rate. Bed should be left at 7 A.M. in summer and 8 A.M. in winter; and a bath, of which more later, should be taken at once.

Then should follow a smart run in flannels, at the end of which a rub down with a rough towel is a *sine quâ non*.

Three-quarters of an hour after leaving bed breakfast should be attended to. After this, as after every meal, should come half an hour's rest, but not a nap.

The morning should then be devoted to the serious business of the day, be it rowing, cycling, running, or what not.

In the height of summer these times may be advanced an hour, to avoid the extreme heat of midday. At 12.30 or 1.30, according as the day started at 7 or 8, the midday meal should be taken, followed as before by a rest of half an hour.

Then a portion of the afternoon should be devoted to work again, and finally the working day should end with a brisk walk, after which the evening meal should be taken. Bed at 10.30 at the latest.

In ordinary life many men are satisfied with 6—8 hours' sleep; but, in a course of training, there is far greater energy expended by the body. so that longer time of physiological rest must be given to it to repair the waste of the day's toil.

Food—At one time the diet was considered to be the most important element in a course of training, but modern theories rather tend to the belief that so long as the food is assimilated with no undue tax on the digestive apparatus it is good.

Too much insistence cannot be laid on the importance of meals being taken at regular times.

It is still a vexed question whether the morning run should be taken on an empty stomach or not, but probably an absolutely empty stomach is not the best.

Immediately after the bath a plain water biscuit, washed down with half a glass of milk, will prevent that giddiness which is a frequent source of trouble when exercise is taken on an empty stomach.

Breakfast—A plateful of porridge and milk, followed by some well and plainly cooked dish of meat. Should the appetite permit, a lightly boiled or poached egg may be added, and, to finish up, some stewed fruit or marmalade.

Hot rolls, fat bacon, or ham are to be avoided, and cold toast should be substituted for bread. Variety is of necessity to prevent the growth of distaste for food that rapidly follows too monotonous a diet; and to obtain this white fish may be substituted for the steak, chop, or mince.

Salt fish must be avoided, because of the thirst it is apt to produce.

Midday Meal—If a man is accustomed to take the chief meal of the day at midday, he should continue to do so throughout his training, and this should correspond to the evening meal to be described later. If, however, it is his custom to dine in the evening, his midday meal should be as follows. Some well-cooked cold meat with green vegetables in small quantity, or artichokes; potatoes, carrots, or parsnips are best left out of the dietary, for they take a long time to digest and are fattening.

For sweets, a milk pudding, with stewed fruit or jam, will suffice. Cheese should be tabooed by reason of its slow digestion. There is no objection to a cup of well made tea and a slice of bread and butter in the afternoon.

Evening Meal—Six to seven is the best time for this. It should begin with a small quantity of clear soup; thickened soup should be completely barred. White fish may be taken, but the oily sorts must not.

The principal dish should be "butcher's meat." This should be well cooked, but not dried up nor yet raw.

When muscular effort is demanded, there is no doubt that the average Englishman requires meat and meat in large quantities. It has again and again been proved by experiments on groups of men that the best work can be done on a diet that largely consists of meat.

The best is beef, and this should form the staple article of the chief meal, but it may be varied by mutton occasionally.

Dinner should end with a light pudding and stewed fruit. Of puddings, the best of all is ground rice.

Fruit can almost always be had, and when fresh fruit is not in the market prunes are always obtainable. Fruit should not be eaten raw, and nuts must be faithfully shunned.

The man who likes his principal meal in the middle of the day must follow the above rule, and for his evening meal should content himself, about 5—6, with a cup of tea and a slice or two of toast, and, an hour and a half before bed time, take a meal similar to the midday meal first mentioned. The other man should take a cup of unsweetened pure cocoa and a biscuit immediately before going to bed.

In general, food should be well cooked and plainly cooked. Spices, sauces, pickles, and relishes are to be avoided.

Pastry and heavy things are bad, for they are not easily digestible and cause considerable distention of the stomach, and so impede the breathing. Bread should always be at least one day old, and for the most part should be toasted. Butter may be taken in moderation.

Drink—The reduction of the quantity of fluid taken to the proper amount is a source of great discomfort to very many in training.

With care a balance may be struck between the amount taken and that lost by the ordinary natural means, so that the sweat glands are not called upon to exercise their function.

The ideal method is to drink nothing between meals

and nothing while actually eating, but to end each meal with a reasonable quantity of fluid.

This happy state cannot be reached at once, but by gradually tending that way it may be reached by all in a very short time.

Probably one large cup of tea or coffee at breakfast, one tumblerful of some fluid at the midday meal, a small cup of tea in the afternoon and 1½ tumblerful at the evening meal, added to the half-tumbler of milk or the cocoa, will be ample.

What to drink—It is certain that alcohol is not a necessity for training, and it is equally certain that it is not in many cases harmful.

The man who is not accustomed to the daily use of alcohol should leave it absolutely alone.

The man in whose dietary alcohol has a regular place may still continue to take it with his principal meal, but he must rigidly exclude it at all other times. As to the form, a light table beer or claret is the most suitable.

With alcohol we may consider tobacco. For the man in training tobacco is bad, in itself and from its haunts. Even in strictest moderation it causes the throat to be less moist than it should be, and so impedes respiration. Then again, the non-smoker seldom cares to stay in a room full of tobacco-smoke, and so the stuffy smoking-room atmosphere is avoided. Should, however, it be impossible to forego the weed, smoking should be strictly limited to the period of rest after meals, and, if possible, to the open air.

The best form of tobacco is a light flake, the pipe briar and freely drawing. Cigarettes and cigars are more deleterious than a pipe.

A pipe in the smoking-room before going to bed should be absolutely forbidden.

Baths—For ninety-five men out of a hundred the early morning cold tub is excellent. It should be taken immediately on rising, and a good rubbing with a rough towel given after it. The other five men who cannot stand a cold bath must take a hot bath.

A *warm* bath is bad, but a short plunge in a bath at a temperature of 112–115° is almost as beneficial as a cold bath; experience has shown that in hot climates it is even better. The danger of a hot bath is the tendency to stay too long in it, with the result that the bracing effect is lost and muscular slackness ensues.

For **clothing**, some form of woollen garment must be worn next the skin constantly.

After each period of exercise all clothing should be changed and the body rubbed dry with a rough towel, and the discarded clothing thoroughly dried and aired, in the open air if possible. In this way several sets of flannels may be required; but the advantage of always starting in dry, well-aired clothes is too great to be omitted in view of the constant danger of chills from damp clothing.

At night flannel pyjamas should be worn; the bed should be a reasonably hard spring mattress, and the bedclothes light.

Surroundings—Undoubtedly the final training should take place in the locality of the event to be competed in. By this means the system becomes accustomed to the difference in atmosphere and other local peculiarities, including the drinking water, which is of some importance to the digestive apparatus.

For the man who till shortly before his race has been confined to a town, a short stay at the seaside is an excellent beginning to a course of training, but to continue throughout at the seaside is unwise, in view of the less bracing air in towns situated inland. An important item is the ventilation of the bedroom. Within reasonable limits it cannot be too cool; a hot, stuffy room contributes as rapidly to staleness as any other single factor.

Finally the man in training should have some mental occupation, not too absorbing, in order to keep his mind from dwelling too constantly on his chief business of the moment; a game at whist or chess in the evening is an excellent aid to sleep, but this must depend on individual idiosyncrasy.

Staleness—Pages may be written on the various causes of this bugbear of training, and pages more on its course and treatment. In a few lines it is impossible to do more than hint at these. Of causes, overwork, monotony of work and mental worry are perhaps the principal. The last is largely out of control of the trainer, but a judicious man may with care prevent his pupil falling a victim to the other two.

As to treatment, probably the best is complete rest from the matter in hand.

By this is not meant doing absolutely nothing, but the boat or track, or whatever it may be, should be left alone for a day or two, and some form of exercise different and less arduous taken up. For instance, the boating man may try a round of golf or tennis and so on, and equally valuable is a change of scene.

In conclusion, it must be remembered that no two men can train in absolutely the same way, but the general laws here laid down will form a guide by which any man may hope to achieve success.

HORACE C. COLMAN.

TRAPPING—Fur-bearing animals have enormously decreased in the more civilised portions of America, but, taking the Canadian Pacific Railway as a rough boundary, they are steadily on the increase to its north and west. This satisfactory state is owing principally to the fact that the Indians, their former persecutors, have for many years forsaken ancestral pursuits for the more remunerative occupation of packing provisions into the ever-increasing mining districts. The old time trapper is almost a thing of the past, only represented here and there by a frozen out miner whiling away the winter with a dozen or so of steel traps.

Along the coast-line, most fur is coarse, light-coloured and comparatively worthless, with the exception of that of the bear, which appears to thrive on the abnormal rainfall of the North Pacific coast.

The **Sea-otter**, the most valuable of all fur-bearing animals, deserves some mention. Although now rare, it is still found along the coast of Alaska and about the Aleutian Isles.

Its capture was formerly only undertaken by Indians under perilous conditions. During a gale, a crew of Indians in a dug out canoe would put to sea, making for some well known rock where sea-otters sheltered; on approaching this, a single Indian armed with a club would make a jump for it. If he missed his footing, one more "good Indian" would be the inevitable result; but, if successful, he would club to death perhaps six otters, and secure a prize he considered well worth the risk.

The present mode of killing sea-otters is to chase a solitary individual with three canoes arranged in a triangle, one canoe being on either side of the otter, and the third behind it. Whether within shot or no, every time it comes up to breathe it receives a volley and dives again with shortened breath. The pursuit is prolonged until, being thoroughly exhausted, it finally receives at close quarters either shot or bullet. This form of hunting necessitates a fairly calm

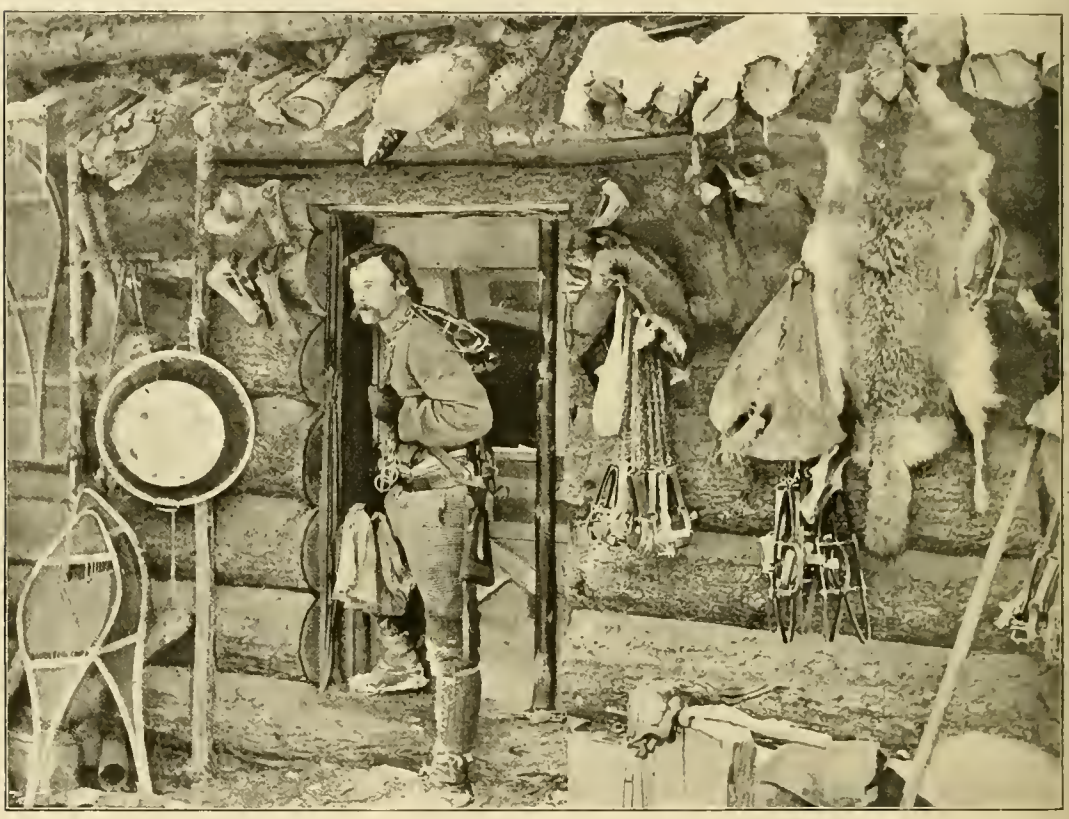
sea, otherwise so small a mark could not be kept in view.

The skin is sufficiently elastic to stretch to double its natural size, which has caused an erroneous impression as to the dimensions of this rarely observed animal.

The primest fur is only to be obtained in the interior, and the best and darkest Marten or Sable will be found among the densest and largest timber. The trapper therefore selects what he considers the most likely looking country for a winter's campaign, and, after building himself a shanty, gradually sets out some fifty miles of traps over mountain and valley, composed of deadfalls, snares, and steel traps at intervals of a third of a mile apart, with a rough lean-to every twenty miles to sleep under and to *cache* a few provisions in. The trapping season lasts from November to April, but January and February are the least productive months.

Taking in rotation, somewhat according to their market value, those animals likely to be obtained during a winter's trapping, we commence with the **Silver Fox** which, like all its tribe, dreads the smell of iron, and is most difficult to capture in a steel trap. A successful capture may be effected, and all scent obliterated, by setting the trap just under water in one of the numerous warm springs often found in the north, and covering the pan with moss. Beyond the trap a grouse should dangle from an upright stick, and the fox, rather than wet its foot in this cold climate, will, in order to reach the bait, place it upon the deceptive moss and become caught.

The **Cross** and **Red Fox** may be captured by the spring pole, which consists of any convenient young tree cut of sufficient weight at the butt to suspend the animal for which it is set. This should be fixed to another tree beside the trail in such a position that the string loop, attached to the lighter end, hangs above the trail at the height of the animal's head. The pole is held there by a portion of the noose attached with a jam round a peg driven in the ground ; on a tug at the noose, this releases itself and the pole, which immediately hoists the animal aloft to choke.



Leaving the Hut.

Beaver can be taken in steel traps throughout the winter, but autumn and spring are the times when every beaver in the district may, with a few exceptions, be secured by a competent trapper.

A beaver trap is a very formidable instrument with double springs. It needs considerable

experience to set, especially in deep snow, where feet, hands, and a man's entire strength are called into force. Like all American traps, although formerly constructed in England, they far excel anything of the sort in use by us both in strength and lightness. They are toothless, and consequently it is very exceptional for any animal but a beaver to twist off a foot. They, owing to their great weight, of sixty pounds and upwards, almost invariably, if caught by a fore foot, wrench it off and escape.

Beavers, in their constant excursions ashore after tree limbs and berries, wear deep grooves in the banks, and the trap should be set under water at the foot of one of these. A pole fourteen feet long should be inserted through the ring of the chain and pushed into the mud far out in the lake, with the upper end fastened to the shore, so that when the beaver dives on being caught, the ring slips down the pole and he becomes anchored to drown in deep water; the pole must be of dead wood, for otherwise it will be cut off and carried away as food, beaver and all.

A Captured Marten.

A very attractive bait is beaver castor, the secretion from which is sprinkled on land above the trap and the earth scratched up. All footmarks and the taint of anything handled must be thoroughly effaced by water. If this is attended to, with a properly set trap there is no difficulty in taking beavers, which may also be trapped in the dead of winter by chopping through the ice and fixing a trap on a platform close to a beaver house. A piece of willow thrust under the ice above the trap will, on being discovered, induce the beaver to seek a footing on the trap while gnawing it off.

If a portion of their dam be chopped away, the beavers, on finding the water lowering, will soon seek out the break and may be trapped when repairing it.

Another method of trapping beaver is to set beneath the ice, in front of their play-holes situated in the bank, a raw hide net of about 12 yards in length with a bell attached. The net is set by chopping holes through the ice and passing it in a straight line with the bank from one hole to another by the aid of a long willow.

The nearest "house" is sought, and by hammering or chopping the roof, the alarmed inmates are driven out to take refuge in their play-holes and become entangled in the impeding net. The bell rings, and the trapper hastily hauls up the net and gaffs the beavers, finally clubbing them to death. A very short period suffices for a beaver to cut itself free and escape. Beavers' pelts take time and trouble to clean from fat, and are opened and stretched on willows fixed hoop fashion. All other pelts are cased, that is, they are cut from one hind leg to the other and the body drawn out, a split board being inserted in its place and wedged open.

Where beavers exist, the **Musk rat** or **Musquash** of the fur dealers is often plentiful. They cause constant disappointment by taking the place of more valuable fur in the traps.

Under certain conditions of early ice, much sport may be experienced by driving these rats out of their houses and chasing them as they swim beneath the ice, striking a sharp blow with the back of an axe above them every time they stop to renew their breath, which they effect by blowing out a bubble of air from the lungs, and waiting until it regains its oxygen before again inhaling it; on being driven away they quickly become exhausted and sink; a hole is then chopped and the body recovered with a gaff.

Musk rats may also be speared by driving the weapon through their houses, or they may be caught in traps set inside them.

The Otter may be taken in several ways with steel traps. But the most successful is at the slides where they play in winter, at the outlet of some warm mountain-stream where it flows into the main river and remains unfrozen. Here, if there be a steep cliff, they will form a

slide from the top into the water, whence they emerge at some easier grade to re-ascend and again slide down. Where they leave the water is the best place for the trap, which should be set as for beaver, but they may be taken at the top of the slide. Twigs or branches should be arranged to guide them into the trap, which should be placed well on one side, for otters walk very wide. After the trap has been carefully covered over, all taint must be obliterated with water.

A specially constructed claw trap is made for catching otters across the centre of the body as they slip down their slides, with fore-feet tucked backwards under them, in which position no ordinary trap would be of service. They can also be trapped by constructing a nest of twigs fixed to the top of a pole driven into the bottom of the river, and standing a few inches above the water close to the ice, with the trap in the centre and a sliding ring on the pole. They make use of this nest as a means for gaining the ice. Although otters do not habitually eat animal flesh, there is little doubt that they sometimes do so, and a trap baited with meat will often catch them.

Ermine in Steel Trap.

Wolverine or **Glutton**—This ravenous animal will certainly put its foot on the first opportunity into a reasonably placed trap in front of any bait; travellers' tales of its cunning are mere inventions devoid of foundation. Much the same may be said of the *Fisher*. They are together a couple of lawless tramps, robbing the trapper of valuable fur on every occasion, and invariably paying the penalty.

The **Lynx** is a stupid and harmless cat, which willingly thrusts its handsome head through a noose, or its woolly paw into a trap, although it be unbaited, except for a covering of feathers, which it always tries to scrape away. Feathers make a good covering for traps, and often, in deep snow, nothing else is available; but when these do not exist, a good plan is to lay a piece of thin paper over the trap and sprinkle it lightly with snow.

The majority of animals secured during a season's trapping will usually consist of **Martens**, which are easily caught with any description of bait, be it even one of their own kindred. The trap should be set at the foot of a pine or cedar in a small house constructed of bark or boughs; in fact all traps should have, when practicable, some covering, both as a guide to the animals and to keep off the snow and hide the bait from jays, whiskey jacks, Clark's crows or squirrels. The lighter the fabric, the better; for should a larger animal come along, it will trample through the frail structure where something more formidable would prevent it placing a foot in the trap, and a little Marten trap will well hold a Wolverine or Lynx, even though it grip but two toes.

Martens are easily taken in deadfalls constructed as follows. A house of bark about a foot high is built strongly against a tree, and across the opening of this is laid a pole six inches in diameter, fixed with four long pegs. On the top of this is laid another similar pole, one end of which is raised sufficiently to admit the animal, and is kept in position by an upright stick about six inches long from pole to pole. Between this stick and the lower pole is placed another stick, of about seven inches in length, protruding into the house, where a bait is tied to the end of it, which, when pulled releases the upright stick, when down comes the upper pole across the victim's back.

A less troublesome trap on the same principle can be arranged by laying the poles at an angle from the ground to the fork of a tree about ten feet high. In this trap the bait is fixed as before, but high up, and as there is no house it sticks out on one side in the open.

A somewhat brutal Marten trap is constructed by boring a hole in the foot of a tree with a two and a half inch auger, and hammering a long French nail through the top at an inward angle into the hole, through which it protrudes about an inch; the bait is placed far back in the hole, and the marten, thrusting in its head, is unable to withdraw it on account of the nail, which penetrates the nape of the neck further and further the more it struggles.

Carnivorous animals very rarely bite off a foot, and then only when it may have become so frozen as to be mistaken for the trap. In deep snow, martens seldom appear above the surface, being enabled to travel below among the fallen timber, where mice are plentiful.

Mink frequent the banks of rivers and lakes, and are captured by the same means as marten;

but after the river is frozen up, they travel between the ice and the river bed. Traps may advantageously be set in these places.

Skunks are mostly found on low lands and caught in steel traps baited with any meat and flesh. Needless to say they are very objectionable to skin, but all animals appear fond of their flesh.

Wolves and **coyotes** are the most difficult to trap, and are, on account of their enormous destruction to deer, the only animals it is really legitimate to poison; but too much care cannot be exhibited when poisoning. Every bait should be accounted for, and even then endless harm and destruction may ensue.

Wolves are sometimes destroyed in a most barbarous fashion. A knife blade, sharpened back and front, is fixed upright in the ground or snow, and smeared with grease which freezes on the blade; the wolf, in licking this off, so lacerates his tongue as eventually to cause death.

Raccoons may be easily trapped. They often frequent lakes, rivers, or sea-shores, where, if a small hole is scooped out and allowed to fill with water, the trap being placed at the bottom, they will be certain on discovering the hole to poke down a hand and begin feeling around for a crab or a clam. Traps set in the ordinary way, baited with fish for preference, will surely take them.

Ermine constantly get caught in traps set for all other sorts of fur, but scarcely repay the trouble of skinning.

Bears are captured in snares, deadfalls, box traps, and steel traps, baited with deer, salmon, or almost anything. Snares must be set on much the same principle as those previously described, but proportionately larger. The noose should be composed of twisted entrails or hide, and frequently examined to see that no squirrel has gnawed it half through. Instead of a pole a heavy tree is used, poised in a forked branch of some birch or other tree conveniently near the trail. The heavy end is supported by two poles, but, as a bear is too heavy to be hoisted bodily into the air, it is sufficient to raise him off his fore legs, when he will quickly choke himself. A deadfall must be set on the ground and constructed of trees as large and heavy as can be fixed in position. The object is to catch the bear across the back, and not across the neck; in the latter case he might pull himself out.

BEAR WITHDRAWN FROM DEADFALL.

Box traps are built of heavy logs dovetailed at the ends, like a small flat roofed hut, with a falling door, mouse trap fashion.

The iron spring traps used for bears are not so cumbersome as might be supposed. They should be fixed to a heavy log by the chain to lessen the strain of the Bear's plunges. An entire deer makes a good bait in all cases, but they have no objection to one of their own species, if it be not a grizzly, which scarcely anything will touch.

Skins, when prime, peel off white and clean, needing no further cleaning. They must not be dried by sun or fire, but must be hung in a dry draughty spot. Beaver and bear skins require much care and labour to remove all fat, which, if allowed to remain, will cause the hair on the opposite side to slip ; they should be stretched on a frame or between trees until dry.

J. TURNER TURNER.

TROTTING—As a sport trotting has always occupied in Great Britain a very minor and subordinate place among the recognised pastimes of the people, it having been overwhelmingly overshadowed by thoroughbred racing. In America the positions are almost reversed for, though the thoroughbred is popular, the national race horse is the trotter. As all foreign countries which need thoroughbred blood for racing purposes send to England for it, and use English racing rules as the foundation of their turf law, so all countries that desire to introduce trotting sport and blood go to America for their foundation stock and take its trotting rules for their guidance. The American trotter at all distances is the fastest horse at his gait and, having been bred for half a century on well established lines of blood and performance, has become a distinct breed with a stud book which has already reached its fourteenth volume and which goes back to the foundations of the race. As every incident in connection with trotting sport down to the minutest details receives the same attention that thoroughbred sport does in England, trotting sport in America will occupy the principal space in this article.

To secure a high rate of speed, science has been brought to bear in the construction of the tracks or courses on which trotting races are held, so as to reduce to a minimum the friction and resistance to extreme speed. A modern trotting track requires not only a competent surveyor but an experienced track builder. A regulation track must be either exactly a mile from wire to wire, measured three feet from the inside fence, or exactly half a mile with the same measurement. A plot of ground as nearly level as possible is selected, and the natural ground is cut down a foot. The level is regained by packing ordinary grass sod 12 × 4 inches upright. On the top of this natural sponge and spring six inches of earth is placed, which, if of too loose a nature, is mixed with clay. The result is a track smooth and elastic, yet so porous that it quickly absorbs water, retaining it in the sod and thus preventing the upper crust from getting hard. A careful track master sees, however, that by the aid of a track harrow, roller and a leveller the surface is kept as smooth as a billiard table. A half mile track of the best class is constructed in the same manner.

In many cases where an association cannot afford the expense the surface is simply ploughed up and levelled, but in all cases the surface is earth. There are no grass tracks in America. The illustration, with measurements, shows a regulation American half mile track. In all cases the track must conform to the imperative rule of being exactly one mile, or half a mile, measured three feet from the inside fence.

The modern sulky is the lightest and at the same time the strongest that modern mechanism can devise. The old high wheel sulky weighed in 1860 about 75 lbs., but was gradually reduced in weight to 40 lbs., while the wheel with steel tire had a diameter of 54 inches. The modern bicycle-wheeled sulky weighs about 25 lbs., and the wheel has a diameter of 28 inches. The general consensus of opinion is that a horse can go five seconds to the mile faster with a bicycle sulky than he can with the old vehicle. The smaller bicycle wheel can hug the fence closer, has less resistance, and is therefore faster.

The American method of conducting trotting races is by heats, and, unless otherwise specified, a horse has to win three heats to win a race. In order to prevent a race from being too long, horses in a race who have not won one heat in five are out of the race. The winners of the heats then trot till one of them has won three, which terminates the race. The following summaries of races illustrate the system.

FRANK FEHR STAKE, value $1,000 ; 2.11 class, trotting.

Elloree, chestnut mare, by Axtell, dam Flora McGregor, by Robert McGregor—Sanders	1	1	1
Fred B., brown gelding—Whitney	4	2	2
Grace Hastings, chestnut mare—Spears	2	4	3
Athanio, brown horse—Geers	3	3	4
Pilot Boy, grey gelding—Wells	dis.		
Dick Hubbard, grey gelding—Macy	dis.		

Time, 2.10½—2.12¼—2.09¾.

NEW YORK, Oct. 21 and 22.—Purse $300 ; 2.30 class, trotting.

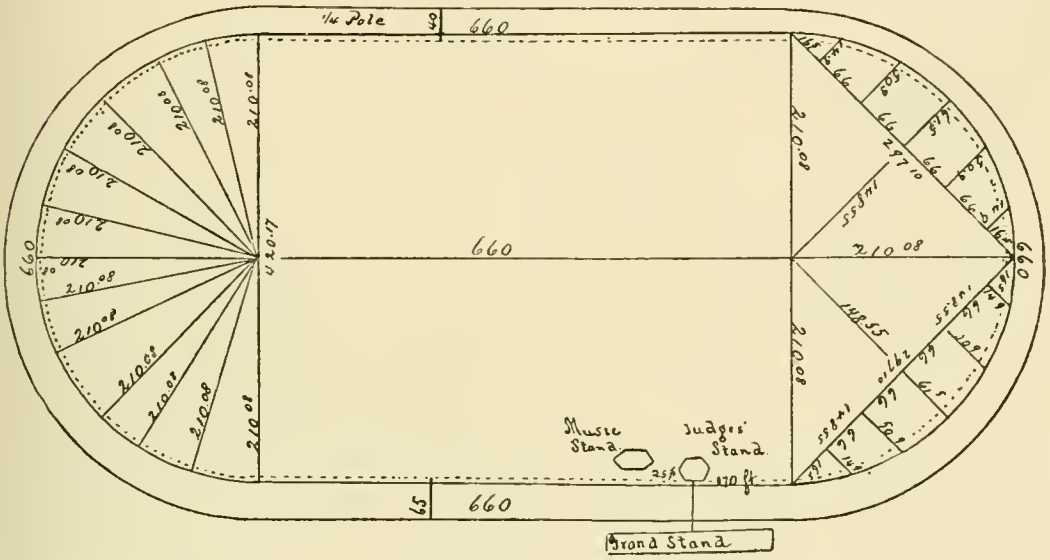
Allie Tare, black gelding, by Alcantara—Devy	3	1	3	2	2	1	1
Lucy M., chestnut mare, by Repetition—Rathbun	5	2	2	1	1	3	3
Legend, chestnut mare, by Melville—Coates	1	4	1	4	4	2	2
Harry P., black gelding—Hurd	2	3	4	3	3	rd.	
Lonely Girl, black mare—Whelpley	4	9	6	7	6	rd.	
Hazel, black mare—Wilkinson	6	7	9	5	5	rd.	
Hattie D., black mare—Miller	7	5	5	6	dr.		
Highland Girl, chestnut mare—Doncourt	8	6	8	8	dr.		
Formosa, black mare—McGuire	9	8	7	9	dr.		

Time, 2.22½—2.22¼—2.25—2.23¼—2.24¼—2.24¼—2.24½.

In the first race Elloree won in straight heats and the four moneys in which a purse is usually divided, 50, 25, 15, and 10 per cent., go to the horses in the order in which they appear. In the second race it will be noted that at the close of the fifth heat no horse had won three heats

and three horses were retired, the other three having been previously drawn. In this case, as only three horses were left to fight the race out to a finish, Harry P., though not allowed to compete further, got fourth money.

In all trotting and pacing races the time record of the horse is his handicap, and indicates the class to which he is eligible. A horse with a record of 2·30 can compete in any faster class, but he cannot be entered in a slower class, but all horses are allowed a margin of three-quarters of a second. For instance, a horse with a record of 2·29¼, is eligible to the 2·30 class. A horse with no record, who has not been started in a race, is naturally entered in what are called the slow classes, *e.g.*, the 3·00, 2·50, or 2·40 classes. There are also classes



HALF MILE TRACK.

Left End: Method of Laying Out recommended to Amateurs. Right End: Method recommended to Surveyors.

where age determines the eligibility to enter, *e.g.*, two, three and four year old classes, but these are rare. Two year old races are usually decided in mile heats, best two in three. The vast majority of races and matches against time for a distance of over a mile have been decided in one effort.

The government of the trotting turf is provided for by two organisations, respectively called the National and the American Trotting Associations, and under their control are fifteen hundred trotting associations and driving clubs, ruling off for fraud being recognised by both. Ruled off horses are not eligible to compete either in England or the Continent, English and European expulsions being equally effective in America. Every reputable trotting club is a member of one of these associations, and is entitled to send a delegate to a biennial congress which makes such amendments to the rules regulating trotting races as it may deem advisable. The Congress also elects a Board of Review, of which the president of the association is the chairman. This board sits twice a year, in May and December, and decides on all questions in dispute which have been appealed from the trotting meetings. About $5,000,000 (£1,000,000) are annually competed for in purses and stakes.

While to America belongs the credit of having made trotting a great national sport, the honour of providing the foundation blood of the breed belongs to England, and, strange to say, the pedigrees of the vast majority of the fast trotters and pacers may be traced directly up to the thoroughbred horse Messenger, who was imported to America in 1788. He appears in the English thoroughbred stud book as a grey, foaled in 1780 by Mambrino, dam by Turf; second dam by Regulus, etc., though many able writers have maintained that he was not strictly thoroughbred. One important fact strongly favours this contention. Messenger as a progenitor of thoroughbreds was a distinct failure, so much so that the line is extinct, while he is the founder of the greatest trotting family in the world. A second fact is that contemporaneous with Messenger were a large number of thoroughbred sires in America, which had the same facilities as Messenger, yet not one of whom has left any impress upon the trotting breed. In the male line Messenger is without a peer. He died in 1808.

The two great descendants of Messenger, from which the modern trotting family principally comes, are Hambletonian and Mambrino Chief, and an examination of their pedigrees

will show how far the blood of Messenger predominates. Hambletonian's tabulated pedigree is as follows :

Hambletonian (Founder of the Hambletonian family).	Abdallah I.	Mambrino Thoroughbred.	Messenger.	
			Daughter of Sour Crout.	
		Amazonia	Son of Messenger.	
			Unknown.	
	Charles Kent Mare	Imp. Bellfounder	Bellfounder, an English Norfolk trotter.	
			Unknown.	
		One Eye	Bishop's Hambletonian, thoroughbred son of Messenger.	
			Silvertail, daughter of Messenger.	

It will be seen at a glance that Abdallah, the sire of Hambletonian, was a grandson of Messenger, and that his dam, Amazonia, was by a son of Messenger. The dam of Hambletonian was by Bellfounder, a Norfolk trotter whose name is found in the top crosses of many leading hackneys, both in England and America ; but her dam was One Eye by Bishop's Hambletonian, a son of Messenger and Silvertail ; the dam of One Eye was also by Messenger. It may also be pointed out that Bellfounder was a failure as a speed producer, when his blood did not mingle with that of Messenger. The enormous influence which Hambletonian has exercised as a producer of trotting speed is shown in the following results. At the close of 1896, 148 of his sons had produced 1,398 trotters and 155 pacers, with records from 2·04 to 2·30, while 80 of his daughters produced 104 trotters and 8 pacers, who have taken records of 2·30 or better. Up to the close of 1896, 16,207 trotters and pacers have made records from 2·00½ to 2·30, and at least 80 per cent. carry the blood of Hambletonian by from one to five crosses. Later on the Hambletonian blood in the trotting and pacing champions will be discussed.

Mambrino Chief, by Mambrino Paymaster, he by Mambrino, son of Messenger, is the founder of a great brood mare's family, the mares to the cover of the male descendants of Hambletonian producing the highest speed results. There are several other minor families, such as the Bashaws, descended from a horse called Grand Bashaw, imported from Tripoli early in the century. American Star, Pilot Champion and Norman, all native horses of obscure or unknown pedigree, had daughters who to Hambletonian or his male descendants produced notable trotters, but as they failed to produce any sires of note who in the male line founded families, the racing success of their offspring must be placed to the credit of the predominating virility of the Messenger family.

America for the last fifty years has devoted attention and capital to developing the trotter. In the early days of breeding, performance was the sole test, and only those trotters or pacers who obtained records of 2·30 or better, or horses or mares who had produced trotters who had made such records were declared standard.

Trotting Pair Owned by Mr. W. Winans.
Blackstone, 2.20. Lake Erie, 2.13¼.

This test of performance is the condition for registration in the stud book and its practical effect has been to make a distinct breed which has shown a continuous speed progress to the present time.

In this connection it will be interesting to note by decades the progress obtained by breeding and training. In 1845 the grey mare, Lady Suffolk, trotted in 2·29½, being the first trotter to get a record below 2·30. She was by Engineer II., a grandson of Messenger, while her dam was by Plato, a son of Messenger. In 1859, Flora Temple, by One Eyed Kentucky Hunter, dam by an Arabian horse, trotted in 2·19¾, and was the first horse to trot below 2·20. In 1867 the brown gelding Dexter cut the record to 2·17¼. He was by Hambletonian. Between 1870 and 1880 there was a notable reduction in the record. The bay mare, Goldsmith Maid, trotted in 2·14. She was by Alexander's Abdallah, a son of Hambletonian, her dam being a daughter of Abdallah, the sire of Hambletonian. This remarkable mare made her record when seventeen years old, and during her racing career had to her credit 332 heats of a mile each on 2·30 or better. Between 1880 and 1890 St. Julien, by Volunteer, a son of Hambletonian, put the record down to 2·11¼; Jay-Eye-See, a black gelding by Dictator, another son of Hambletonian, cut it to 2·10, and the chestnut mare, Maud S., by Harold, also by Hambletonian, placed the trotting record at 2·08¾. The record of Maud S. deserves special mention as it was made to a high wheel sulky over a regulation track, and has not been beaten under the same conditions. The dam of Maud S., Miss Russell, was by Nutwood, a great grandson of Hambletonian.

The bicycle-wheel sulky came into use in 1892, and a general reduction in records ensued. On September 28th, 1892, the brown mare Nancy Hanks put the trotting record at 2·04. This mare is inbred, for her sire is Happy Medium, and her dam Nancy Lee, by Dictator, both sons of Hambletonian. This record has been only beaten by a quarter of a second, the present champion being Alix (2·03¾), by Patronage, dam Atlanta, by Attorney. This pedigree traces up to Mambrino Chief and Hambletonian. It will be noted that in fifty-two years the trotter has progressed from 2·29½ to 2·03¾. As the best judges place the speed limit at the trot at 2·00, the perfection of the breed is a question of the near future.

How do values compare between the trotter and the thoroughbred? An absolutely accurate solution of this question is impossible, but a few simple figures will give a good idea of the value of the high-class trotter. The two-year-old colt Arion, after he made his record of 2·10¾ (which is still the champion record for that age), was sold for $120,000 or a little over £25,000. The three-year-old colt Axtell, also a champion, was sold for $105,000, or £21,000. Bell Boy at three years old sold for £17,000; Stamboul (2.07½) for £10,000; Nancy Hanks for £9,000; Maud S. £8,000; Dexter £6,000; while £2,000 for a high-class performer or a brilliant prospective one was an average figure up to 1893, when the financial depression caused a heavy fall in all prices.

An article on the trotter would be incomplete without a reference to the pacer, for with many horses the gaits are interchangeable, and the vast majority of trotting sires begat a certain proportion of pacers. The pacers, with a few notable exceptions, are all trotting bred. Star Pointer, the champion pacer, with a record of 1·59¼ is the grand exception, as he is a member of a pacing saddler family long famous in Tennessee, but he is the one exception to a thousand pacers, who are by trotting sires out of trotting

Mr. L. Winan's Moxie.
Mile Record, 2.12

dams. John R. Gentry 2·00½, ex-champion, traces on both sides of the line to Hambletonian. Joe Patchen, 2·01¼, is by George Wilkes, son of Hambletonian, while on the dam's side he is strongly inbred to Mambrino Chief. It is also a common incident for a trotter, when he has got to the limit of his speed at the trot, to be put to pacing, and there are many horses who can go at either gait, as the following sample list will show :—

	Trotting.	Pacing.	Average.
Jay-Eye-See	2.10	2.06¼	2.08⅛
Heir-at-Law	2.12	2·07	2.09½
Ottinger	2.10⅜	2.11½	2.11⅛
Direct	2.18¾	2 05½	2.12¼
Connor	2.13½	2.11¼	2.12⅜
George St. Clair	2·15¼	2.10½	2.12⅞
San Pedro	2·14½	2.10¾	2.12¾
Red Bud	2.14⅜	2.12⅝	2.13½
Bert Oliver	2·19½	2.08⅞	2.14
Monbars	2.11⅛	2.16¼	2.14¼
Vassar	2.21¾	2·07	2·14⅝

and there are scores of others.

Trotting in England, as a racing pastime, is in its infancy. Of late years, under the fostering control of the Trotting Union of Great Britain,

the sport is assuming a higher plane, and at Manchester, Liverpool, and many northern cities, in Scotland and Ireland, meetings are held, but with the immense hold which the thoroughbred has upon the British public, it is questionable whether it will ever become a leading sport. This is to be regretted, as, with the finest roads in the world, the trotter should be a popular horse in England, and if the breed were carefully cultivated, as it is in America, and tested at the race track, it would be a vast source of wealth to the breeder. As in America, the fast performers after their racing days are over are sold for road purposes, while the large and handsome slow ones are sold for the carriage, the inferior individuals going into the ordinary avenues of commerce; thus the English breeder would find no absolutely bad stock on his hands. But trotting races must became popular before it will ever be profitable to breed trotters on a large scale.

Breeding the trotter and trotting races in France are fostered and encouraged by the Government, which contributes a certain sum of money annually for purses and stakes, to be competed for at the various meetings. The majority of the races take place on grass race-courses at various distances, and, as the tracks are not constructed for speed, fast time is out of the question. The French Government encourages the sport, as it relies largely upon trotting-bred horses for the cavalry service. In many purses which it offers it reserves the right to purchase the winner at a price stipulated in the conditions of the purse or stake.

Russia is the only country in Europe which can claim that it has a distinct trotting breed. It is called the Orloff, after Count Orloff, who, after defeating the Turks in 1772, on his return home brought with him some Arab stallions and mares. He also imported from England twenty thoroughbred stallions and thirty mares. By breeding with native mares and applying the doctrine of selection, the Russians have developed a breed of trotters which has not the speed of the American, but is possessed of great endurance, and is a very superior carriage horse. The great season in Russia is in the winter, and the races take place on the ice. These races were originally on sleighs but, as the rubber-tired wheel is faster, sulkies are now used.

Germany and Austria have taken kindly to trotting sport, and at Berlin and Vienna spring and autumn meetings are held, the purses ranging from £100 to £1,000 each. In Europe the fastest time has been made in the international races, and the European record is now held by the brown horse, Colonel Kaser, who on October 3rd, 1897, at Vienna, Austria, won the Prix d'Automne, worth 10,000 crowns, his fastest heat being $2{\cdot}14\frac{1}{10}$. Colonel Kaser was bred in America, and is by Stranger, by General Washington, dam Goldsmith Maid by Alexander's Abdallah; second dam by Abdallah, sire of Hambletonian. In Europe the majority of races, as in England, are distance handicaps, the handicap being based on the records or the sizes of the contestants. The majority of the international races are decided in heats, best two in three, or three in five.

In the British colonies trotting flourishes in Canada, and it has numerous stock farms, but its leading sires and dams are bred on the same blood lines as those which flourish in the United States. In justice to Canada it must be said that, in the early days of breeding the trotter, it contributed more than its share of brood mares. In Australia and New Zealand the sport is in its infancy, the local record being held by a horse called Fritz, with a record of $2{\cdot}14\frac{1}{5}$. He is native bred, but is by an American sire and dam.

Below are tables which show the highest rate of speed at various distances, with all the dates and minor details which it is possible to obtain.

Fastest Records—At the trotting and pacing gait at all distances up to the close of 1897, the fastest authenticated records in the world.

TROTTERS.

FASTEST YEARLINGS—COLT AND FILLY.

Adbell, brown colt, by Advertiser, dam Beautiful Bells, by The Moor; San Jose, Cal., Sept. 28, 1894; time, regulation 2.23
Pansy McGregor, chestnut filly, by Fergus McGregor, dam Cora, by Commander; Holton, Kan., Nov. 18, 1893; race, kite 2.23¼

TWO-YEAR-OLDS—COLT AND FILLY.

Arion, bay colt, by Electioneer, dam Manette, by Nutwood; Stockton, Cal., Nov. 10, 1891; time, kite track 2.10¾
Jupe, bay colt, by Allie Wilkes, dam Annie Patchen, by Mambrino Patchen; Boston, Mass., Sept. 29, 1896; race, regulation 2.13¾
Janie T., bay filly, by Bow Bells, dam Nida, by Monon; Lexington, Ky., Oct. 15, 1897; race, regulation 2.14

THREE-YEAR-OLDS—COLT AND FILLY.

Fantasy, bay filly, by Chimes, dam Homora, by Almonarch; Nashville, Tenn., Oct. 17, 1893; race, regulation 2,08¾
Arion, bay colt, by Electioneer, dam Manette, by Nutwood; Nashville, Tenn., Nov. 12, 1892; time, regulation 2.10½

FOUR-YEAR-OLDS—COLT AND FILLY.

Directum, black stallion, by Director, dam Stemwinder, by Venture; Nashville, Tenn., Oct. 18, 1893; race, regulation 2.05¼
Fantasy, bay filly, by Chimes, dam Homora, by Almonarch; Terre Haute, Ind., Sept. 13, 1894; time, regulation 2.06

FIVE-YEAR-OLDS—COLT AND MARE.

Ralph Wilkes, chestnut stallion, by Red Wilkes, dam Mary Mays, by Mambrino Patchen; Nashville, Tenn., Oct. 19, 1894; time, regulation 2.06¾
Fantasy, bay mare, by Chimes, dam Homora, by Almonarch; Des Moines, Ia., June 27, 1895; time 3.07

WORLD'S RECORD.

Alix, bay mare, by Patronage, dam Atlanta, by Attorney; Galesburg, Ill., Sept. 19, 1894; time, regulation 2.03¾

STALLION RECORD.

Directum, black stallion, by Director, dam Stemwinder by Venture; Nashville, Tenn., Oct. 18, 1863; race, regulation 2.05¼

GELDING RECORD.

Azote, bay gelding, by Whips, dam Josie, by Whipple's Hambletonian; Galesburg, Ill., Sept. 5, 1895; time, regulation 2.04¾

RACE RECORD TO SULKY.

Directum, black stallion, by Director, dam Stemwinder, by Venture; Nashville, Tenn., Oct 18, 1893; regulation . . 2.05¼
Alix, bay mare, by Patronage, dam Atlanta, by Attorney; Terre Haute, Ind., Aug. 17, 1894; regulation 2.05¼

TO WAGON—RACE.

Elloree, chestnut mare, by Axtell, dam Flora McGregor, by Robert McGregor; Cleveland, O., Aug. 28, 1897; regulation 2.10

To Wagon—Time.

Guy, black gelding, by Kentucky Prince, dam Flora Gardener, by American Star; Detroit, Mich., July 18, 1893; regulation 2.13

Under Saddle—Race.

Great Eastern, bay gelding, by Walkill Chief, 330, dam by Consternation; Fleetwood Park, New York, Sept. 22, 1877; regulation 2.15¾

Fastest Race in Straight Heats.

Alix, bay mare, by Patronage, dam Atlanta, by Attorney; Terre Haute, Ind., Aug. 17, 1894: time . . . 2.06, 2.06¼, 2.05¼

Team Record—Race.

Sally Simmons, brown mare, by Simmons, and Roseleaf, black mare, by Goldleaf; Columbus, O., Sept. 27, 1894; regulation 2.15¼

Team Record—Wagon Time.

Honest George, bay gelding, by Albert, and Belle Hamlin, bay mare, by Almon Jr.; Providence, R.I., Sept. 23, 1892; regulation 2.12¼

Trotter with Running Mate—Wagon Race.

Frank, bay gelding, by Abraham, dam by Green Mountain Boy; Prospect Park, L.I., N.Y., Nov. 15, 1883; regulation 2.08½

Trotter with Running Mate—Wagon Time.

Ayres P., chestnut gelding, by Prosper Merimee, dam by Rustie; Kirkwood, Del., July 4, 1893; kite 2.03½

Tandem—Time.

Mambrino Sparkle, bay mare, and William H., bay gelding; Cleveland, O., September 16, 1886; regulation 2.32

A Team of Three Trotting in Harness Abreast—Time.

Belle Hamlin, bay mare, by Almont Jr.; Justina, bay mare, by Almont Jr.; and Globe, bay gelding, by Almont Jr.; Cleveland, O., July 31, 1891; regulation 2.14

Four-in-Hand—Race.

Frank Rose, roan gelding; Peculiar, bay gelding (leaders); Rumps, bay mare; Tom Bradley, brown gelding (wheelers); Cleveland, O., Sept. 7, 1882; regulation 2.40¾

Four-in-Hand—Time.

Damania, Bellnut, Maud V., and Nutspra, all by Nutmeg; Chicago, Ill., July 4, 1896; regulation 2.30

Six-in-Hand—Time.

Fleetwing, Lamar, Flora, Hugie, Dexter, and Pete; New York, N. Y., Nov. 9, 1896; regulation 2.56½

Two Miles—Race.

Nightingale, chestnut mare, by Mambrino King, dam Minnequa Maid, by Wood's Hambletonian; Buffalo, N.Y., Aug. 9, 1894; regulation 4.36½

Time.

Greenlander, black stallion, by Princess, dam Juno, by Hambletonian, 10; Terre Haute, Ind., Nov. 4, 1893; regulation 4.32

Under Saddle—Race.

George M. Patchen, bay stallion, by Cassius M. Clay, dam by Head 'em; Fashion Course, L.I., June 18, 1863; regulation 4.56

Three Miles—Race.

Fairywood, black gelding, by Melbourne, dam Gona Fay, by Fairygift; Minneapolis, Minn., July 1, 1895 . . . . . 7.16½

Three Miles—Time.

Nightingale, chestnut mare, by Mambrino King, dam Minnequa Maid, by Wood's Hambletonian; Nashville, Tenn., Oct. 20, 1893; regulation 6.55½

To Wagon—Race.

Prince, chestnut gelding, by Woodpecker; Union Course, L.I., N.Y., Sept. 15, 1857; regulation 7.53½

Under Saddle—Time.

Dutchman, bay gelding, by Tippoo Said Jr.; Beacon Course, N.J., Aug. 1, 1839; regulation 7.32½

Four Miles—Race.

Senator L., bay stallion, by Dexter Prince, dam Fanny Bayswater (thoroughbred), by Bayswater: San Jose, Cal., Nov. 2, 1894; race (walk over); regulation 10.12

Time.

Satellite, chestnut gelding, by Tempter, dam Lucy; Keokuk, Ia., Aug. 12, 1887; regulation 10.52½

Five Miles—Race.

Bishop Hero, roan gelding, by Bishop, dam Lida Kendall, by Hero of Thorndale; Oakland, Cal., Oct. 14, 1893; regulation 12.30¾

To Wagon—Race.

Fillmore, chestnut gelding; San Francisco, Cal., April 16, 1863; regulation 13.16

Ten Mile—Race.

Controller, bay gelding, by General Taylor; San Francisco, Cal., Nov. 23, 1878; regulation 27.23¼

Time.

Pascal, black gelding, by Pascarel, dam by Leamington New York, N.Y., Nov. 2, 1893; regulation 26.15

To Wagon—Race.

Julia Aldrich, chestnut mare; San Francisco, Cal., June 15, 1858; regulation 29.04½

Twenty Miles—Time.

Captain McGowan, roan stallion; Boston, Mass., Oct. 21, 1865; regulation 58.25

Thirty Miles—Time.

General Taylor, grey stallion, by Morse Horse, dam Flora; San Francisco, Cal., Feb. 21, 1857 . . . . . 1.47.59

Fifty Miles—Time.

Ariel, bay gelding, Albany, N.Y., 1846 . . . . . 3.55.40½

One Hundred Miles—Time.

Conqueror, bay gelding, by Bellfounder (Latourette's), dam Lady McClare, by Imp. Bellfounder; Centerville, L.I., Nov. 12, 1853 . . . . . 8.55.53

PACERS.

Yearling Colt and Filly.

Belle Acton, bay filly, by Shadeland Onward; Lyons, Neb., Oct. 14, 1892; time, kite 2.20¾

Rosedale, bay colt, by Sidney, dam Rose Leaf, by Buccaneer; Stockton, Cal., Nov. 8, 1893; time, kite 2.22

Two-year-olds—Colt and Filly.

Directly, black colt, by Direct, dam Mabel, by Naubic; Galesburg, Ill., Sept. 20, 1894; time, regulation 2.07¾

Lena Hill, brown filly, by William M. Hill, dam Possum Pie, by Octoroon; Dallas, Tex., Oct. 28, 1893; race, regulation 2.12¾

Three-year-olds—Colt and Filly.

Search Light, black colt, by Dark Night, dam Nora Mapes, by Furor; Santa Anna, Cal., Oct. 30, 1897; time, regulation 2.05¾

Miss Rita, chestnut filly, by J. J. Audubon, dam Lady Garfield, by Jupiter; Galesburg, Ill., Aug. 31, 1895; race, regulation 2.09¾

Four-year-olds.

Online, bay colt, by Shadeland Onward, dam Angeline, by Chester Chief; Sioux City, Ia., Oct. 12, 1894; time, regulation 2.04

Aileen, bay filly, by Gazette, dam Hernia, by Nuncio; Freeport, Ill., July 26, 1895; race, regulation 2.07½

World's Record.

Star Pointer, bay stallion, by Brown Hal, dam Sweepstakes, by Snow Heels; Readville, Boston, Aug. 21, 1897; time, regulation 1.59¼

Stallion Record.

Star Pointer, bay stallion, by Brown Hal, dam Sweepstakes, by Snow Heels; Readville, Boston, Aug. 21, 1897; time, regulation 1.59¼

Gelding Record.

Robert J., bay gelding, by Hartford, dam Geraldine, by Jay Gould; Terre Haute, Ind., Sept. 14, 1894; time, regulation 2.01½

Mare's Record.

Lottie Lorine, bay mare, by Gambetta Wilkes, dam Lady Yeiser, by Garrard Chief; Terre Haute, Ind., Sept. 30, 1897; race, regulation 2.05¾

Bessie Bonehill, grey mare, by Empire Wilkes, dam Arab Girl, by Crittenden; Terre Haute, Ind., Sept. 30, 1897; race, regulation 2.05¾

Race Record to Sulky.

Star Pointer, bay stallion, by Brown Hal, dam Sweepstakes, by Snow Heels; Springfield, Ill., Oct. 1, 1897; race, regulation 2.00¼

To Wagon—Race.

Joe Patchen, black stallion, by Patchen Wilkes, dam Josephine Young, by Joe Young; Boston, Mass., Nov. 3, 1896; half mile track 2.11

To Wagon—Time.

Joe Patchen, black stallion, by Patchen Wilkes, dam Josephine Young, by Joe Young; Joliet, Ill.; Oct. 20, 1897; regulation 2.04¾

UNDER SADDLE.

Johnston, bay gelding, by Joe Bassett ; Cleveland, O., Aug. 3, 1888 ; time, regulation 1.13

TEAM RECORD—TIME.

John R. Gentry, bay stallion, by Ashland Wilkes, dam Dame Wood, by Wedgewood ; and Robert J., bay gelding, by Hartford, dam Geraldine, by Jay Gould ; Glens Falls, N.Y., Oct. 8, 1897 ; regulation 2.08

PACER, WITH RUNNING MATE—TIME.

Flying Jib, bay gelding, by Algona, dam Middletown Mare, by Middletown ; Chillicothe, O., Oct. 4, 1894 ; kite . 1.58¼

TWO MILES—RACE.

Defiance, bay gelding, by Chieftain ; and Longfellow, chestnut gelding, by Red Bill ; dead heat ; Sacramento, Cal., Sept. 26, 1872 ; regulation 4.47¾

TWO MILES AGAINST TIME.

Chehalis, black stallion, by Altamont, dam Tecora, by Cassius M. Clay Jr. ; Salem, Ore., Oct. 6, 1897 ; regulation 4.19½

UNDER SADDLE.

James K. Polk, chestnut gelding ; and Roanoke ; dead heat ; Philadelphia, Pa., June 30, 1850 ; regulation 4.57½

THREE MILES—RACE.

James K. Polk; chestnut gelding ; Centerville, L.I., N.Y., Sept. 13, 1847 ; regulation 7.44

TIME.

Joe Jefferson, brown stallion, by Thomas Jefferson ; Knoxville, Ia., Nov. 6, 1891 ; regulation 7.33¼

UNDER SADDLE—RACE.

Oneida Chief, chestnut gelding, by Kentucky Hunter ; Benson Course, N.J., Aug. 14, 1843 ; regulation 7.44

TO WAGON—RACE.

Longfellow, chestnut gelding, by Red Bill ; Sacramento, Cal., Sept. 21, 1868 ; regulation 7.53

FOUR MILES RACE.

Longfellow, chestnut gelding, by Red Bill ; San Francisco, Cal. 1869 ; regulation 10.34½

TIME.

Joe Jefferson, brown stallion, by Thomas Jefferson ; Knoxville, Ia., Nov. 13, 1891 ; regulation 10.10

FIVE MILES—RACE.

Fisherman, bay gelding, by Lightning ; San Francisco, Cal., Dec. 19, 1874 ; regulation 13 03½

TO WAGON—RACE.

Lady St. Clair, by St. Clair ; San Francisco, Cal., Dec. 11, 1874 ; regulation 12.54¾

FASTEST RACE IN STRAIGHT HEATS.

Star Pointer, bay stallion, by Brown Hal, dam Sweepstakes, by Snow Heels ; Indianapolis, Ind., Sept. 18, 1897 ; regulation 2.04¼, 2.03, 2.01

HALF-MILE TRACK RECORD.

Joe Patchen, 2.03, black stallion, by Patchen Wilkes, dam Josephine Young, by Joe Young ; Combination Park, Boston, Oct. 28, 1896 . . . . . 2.04½

In explanation of the above table, unless otherwise stated, the records have been to sulky. The term wagon means a four-wheel skeleton buggy. Time means that the record has been made against the watch, and not in a race, and "regulation" that the track is a regular mile track, three feet from the inner fence. All records made since 1891 have been made to bicycle-wheel sulky unless otherwise specified.

AUTHENTIC ENGLISH TRACK TROTTING RECORDS TO DATE, OCT. 8, 1897.

Miles.		Time.
¼	Lake Erie, by Cadmus Hambletonian, dam Daisy Dayton (American bred); Crystal Palace, Sydenham, May 28, 1898	42 sec.
½	†Rowley, black gelding, by Clear Grit, dam thoroughbred (bred in Canada); Alexandra Park, London, May 1, 1893	1.09½
1	†Rowley ; Greenwich Park, Liverpool, March 20, 1893 .	2 24¾
1½	Rowley ; Alexandra Park, London, June 10, 1893 . . .	3.41½
2	Rowley ; Greenwich Park, Liverpool, April 24, 1895 .	5.00½
2½	*†Rowley ; Alexandra Park, London, June 12, 1895 .	6.27¾
3	Benny C., black gelding, by Indianapolis, dam Clipper, by Albert (American bred) ; Manchester Racecourse, April 16, 1897	7.49
4	†Ellia McKay ; black mare, by Ansonia, dam Shelburne Girl, by Highland Boy (bred in Canada); Manchester Racecourse, June 1, 1896	10.37¾
5	†De Brino, black gelding, by Detractor ; Ashtown Park, Dublin, Sept. 1, 1895	13.13
6	*†Lady Combermere, chestnut mare (Canadian); Manchester Racecourse, July 16, 1894	17.46½
7	Do. do. do. do.	20.46¼
8	Do. do. do. do.	23.45
9	Do. do. do. do.	26.45½
10	*†Benjamin, brown gelding (Canadian bred); Paisley Recreation Ground, Sept. 19, 1896	28.30
11	*†Lady Combermere ; Manch'r Racecourse, July 16, 1894	32.44½
12	Do. do. do. June 10, 1895	35.47½
13	Do. do. do. do.	38.46½
14	Do. do. do. do.	41.50¾
15	Do. do. do. do.	44.48
16	Do. do. do. do.	47.51
17	Do. do. do. do.	50.50¼
18	Do. do. do. do.	53.49¼
19	Do. do. do. do.	56.55
20	Do do. do. do.	59.59⅝

(Records not marked made in races.

† Flying starts. * Against time.

E. B. ABERCROMBIE.

Pacing—Four modes of progression are natural to the horse: the walk, the trot, the pace and the gallop, the so-called "canter" being only a slow gallop. The pace, though known in some Welsh breeds, is, curiously enough, not distinguishable by the average Englishman from the trot, with the result that for some years American pacing horses were allowed to compete in English trotting races as trotters.

Yet the distinction is patent. A horse trots when his off fore and near hind legs strike the ground simultaneously, and it paces when the legs *of a side* move in unison, like those of two riders on a tandem bicycle.

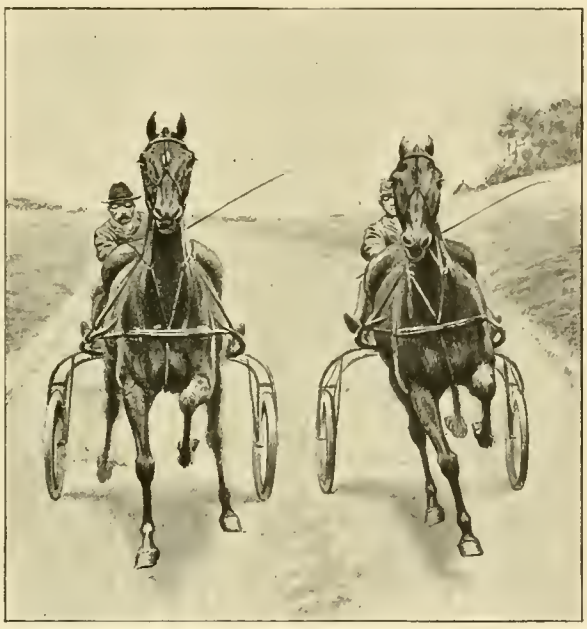
Certain drawbacks attach to either action. Thus, a trotting horse is apt to "over-reach," that is to say, the hind heels may step on those in front, which is obviously impossible in pacing, where the fore foot moves out of the way as the hind foot of the same side advances. It is for this reason that the speed of pacing is so far above that of trotting, so that the pacing record stands at 1 min. 39½ secs. (Star Pointer's time), as against a trotting record for the world (Alix) of 2 min. 3¾ secs.

Although, however, a pacer cannot "over-reach, he is more apt than the trotter to "knee-bang," *i.e.*, hit his knees or fetlocks (a proceeding against which he is protected by "booting"), as well as to "cross fire," or hit the heel of his off fore with the toe of the near hind foot.

Pacing has two forms. In one, the whole animal rolls from side to side, after the fashion of a skater doing the Dutch roll: and such a pacer can be distinguished when in motion even with no more than the top of his body visible. The other kind of pacer (to which belongs Mr. L. W. Winans' Jack Bowers, with a record of 2 min. 9¼ secs. for the mile, trial 2 min 7 secs.)

keeps the body still, merely swinging the legs slightly from side to side. It is this sort of pacer that looks to the casual observer as if it were trotting. It should be sufficiently apparent from the tables appended to this article that the faster records have almost invariably been held by the pacers, and it may fairly be inferred that the trotters will never have their chance in English trotting races until a separate class altogether is made for pacers.

Pacing is no modern artificial action, as some would have us believe, but may be traced in the horses of many nations of antiquity that rode without stirrups (examples may be seen in the casts of Egyptian sculptures, at the Crystal Palace), and is perhaps identical with the "ambling," so freely alluded to in the literature of the Middle Ages, while it is noticeable today in many of the Cossack horses. Of late years a great number of American pacers have been imported into England, and they may be seen any day in cabs and carts; indeed, the writer has even seen a pacer and trotter, both high steppers, in a phaeton in the Park, the coachman being under the impression that he had to handle a pair of trotters, and marvelling no doubt at the "rolling" of his near horse. It is important to bear in mind that many American horses are able to move with either action, a set of lighter shoes often sufficing to convert a trotter into a pacer, indeed it is customary to force such animals to keep to the pace by hobbling the legs of a side with elastic cords. Pacing is, in fact, less wearing to the animal's feet, as was proved in the case of Jay-Eye-See, which made a pacing record of 2 min. 6½ secs. after its feet had given out in trying to beat its own trotting record of 2 min. 10 secs. In the accompanying drawing of a trotter and pacer, it may be pointed out that in the pair coming towards the spectator the pacer is purposely made to incline rather more to one side than would actually be the case, in order to emphasise the difference between the two modes of action.



TROTTING. PACING.
(*From a sketch by Mr. W. Winans.*)

TABLE SHOWING EACH HORSE THAT HAS HELD THE "PACING" RECORD FROM THE BEGINNING OF THE CENTURY TO DATE, FOR A MILE.

(All these records were made "in harness," *i.e.*, to two-wheeled sulky, driver weighing 10 st. 10 lbs., except Pocahontas, who went to "wagon.")

The first pacer to do a mile in three minutes is not recorded, as the pacer is so fast that that rate of speed would be too slow to attract any attention.

The first pacing record which has been preserved is in 1835, when Oneida Chief, chestnut gelding, by Kentucky Hunter, dam unknown, went in 2.31.

Four years later, in 1839, Drover, black gelding, pedigree unknown, went the mile in 2.28.

In 1845, James K. Polk, chestnut gelding, pedigree unknown, went in 2.27.

Next year, in 1844, Unknown, chestnut gelding, pedigree unknown, went in 2.18½.

In 1852 Pet, roan gelding, pedigree unknown, went in 2.18½.

In 1855 Pocahontas, chestnut mare, by Iron's Cadmus, dam by Big Shakespeare, went in 2.17½.

In 1868 Billy Boyce, black gelding, by Corbeau—McGinnis Mare, by Tom Hal, went in 2.14¼.

In 1879 the blind horse, Sleepy Tom, chestnut gelding, by Tom Rolfe, dam by Sam Hazard, went in 2.12¼.

In 1881 Little Brown Jug, black gelding, by Hal Jr. — Lizzie, by John Netherland, went in 2.11¾.

In 1884 Johnstone, black gelding, by Joe Bassett, dam Cary Mare, by Ned Forrest, went in 2.6¼.

In 1892 Hal Pointer, black gelding, by Tom Hal—Sweepstakes, by Snow Heels, went in 2.4½. Later in 1892 Mascot in 2.4.

In 1894 Robert J., black gelding, by Hartford—Geraldine, by Jay Gould, went in 2.1½.

In 1896 John R. Gentry, black horse, by Ashland Wilkes, dam Dame Wood, by Wedgewood, went in 2.0½.

And in 1897 Star Pointer in 1.59¼, which is the record to date.

W. WINANS.

TROUT (*Salmo fario*)—Omitting the roach, so dear to the artizans of London and the great midland towns, the trout is beyond question the most popular and sport-giving of our fresh-water fish. It was a craze with the older naturalists to divide him into numerous species, but the modern, and without doubt the better, opinion is that all the different forms of trout found, at any rate, in fresh water, belong to one species; and high authorities now unhesitatingly assert not only that sea-trout and our common river

and lake trout both sprang from one common ancestor, but that they are very closely allied to the salmon.

From the sportsman's point of view, which is, after all, the one with which we are more immediately concerned, these fish divide themselves up into two large classes :—(1) Sea or salmon-trout (*Salmo trutta*), called *white trout* in Ireland, with their variety, the bull-trout (these fish are dealt with in a separate article), and (2) the brown-trout, called yellow-trout in Scotland (*Salmo fario*), which varies a good deal in its appearance and habits, according as it may be found in large rivers, brooks, large lakes, and small lakes. Food, age, sex, growth-rate, and the soil over which it swims also have their effect on its colouring, spots, and general markings. With age, for instance, the spots often become almost imperceptible, and the fish grows long, lank, and ugly. Many such a trout has been foolishly returned to the water by well-meaning anglers, who thought it was merely out of condition, and would grow into a lusty, silvery-sided, big-spotted, small-headed fish later on in the season.

TROUT.

The variations in the size, number, and position of spots on trout are very remarkable. I have taken fish on the sides of which were two rows of spots placed at equal and regular distances, while the very next fish which found its way into my creel would be covered with spots as if they had been sprinkled over it out of a pepper pot. In quickly grown, healthy, lake trout the spots are often few and very large, with a kind of halo round them.

The colours on the scales of the fish depend very much on its surroundings. A trout taken off a muddy, weedy bottom will often have a general shade of rich yellow over its sides and belly, while even in the same lake a trout taken from the opposite shore which, let us say, is rocky and sandy, will be of a steely blue colour. A trout swimming in deep water over a peaty bottom will have a dark back, while fish which inhabit shallow, bright, gravelly streams, will have a light brown back, in fact almost gravel colour. This is without doubt a provision of nature to disguise the fish as much as possible from the keen eyes of herons and other fish-eating birds.

The life history of the trout is now well known. It commences, of course, with the egg, which is deposited by the female on a gravelly shallow in a river or brook. Its size may equal that of a pea if deposited by a large, healthy, and not too old fish, while the eggs from small burn trout are a good deal smaller. As the female sheds her eggs, the male fish extrudes a few drops of milt in the water, which may, or may not, reach the eggs and fertilize them. The fish, with a vigorous sweep of the tail, then throw up some gravel behind them, which is intended to, but does not always, cover up the eggs which have just been laid. The waste, of course, is enormous. A trout yields roughly about 1,000 eggs for every pound avoirdupois of its weight, but of these probably not one-tenth hatch and ultimately produce adult fish.

The fish culturist, on the other hand (see PISCICULTURE), hatches out ninety-five per cent. or more of the eggs which he takes from the hen fish, and with good luck will rear fifty per cent. of the young fry. With him the great mortality is in the fry stage. In due course the eggs deposited by the trout hatch. If the temperature of the stream is sixty degrees, the period of hatching will be about sixty days; but in lower temperatures longer. Out through a crack in the shell of the egg struggles the alevin, a little fish which has a preposterous bag of yellow-looking fluid attached to its stomach. This feeds it for some weeks, during which it lies hidden among the stones. Then by degrees it begins to feed itself, and at the end of a year may be a fish of any size between two and ten inches in length, the latter, I need hardly say, being an extremely large yearling. In a Devonshire brook or Highland burn, the little fish may never exceed four or five inches in length, but in a large lake or river, and particularly if placed

in a lake which has never before contained fish, and in which fish food has therefore increased to an enormous extent, it will grow in the course of a very few years to weigh four or five pounds, or even more.

Trout can now be bought so cheaply from half-a-dozen or more firms of pisciculturists, that almost any river, lake, or pond can be stocked with them at more or less expense, provided only that there is no pollution which will destroy the fish. But the advisability of turning rivers which produce quantities of excellent coarse fish into trout preserves is open to question. At the same time, it should be mentioned that many a river in which, owing to pollution, no trout can *breed*, can be made to afford sport by re-stocking it from time to time with fish obtained from the fish-culturists. The Wandle in its lower reaches is an instance of what has been, and can be done in this direction. The pollution in that stream is sufficient to destroy the eggs of trout, but not the fish.

Every fly-fisherman should have some general idea of the habits of trout, which vary somewhat according to the nature of the water and the size of the fish. Trout feed on the bottom, in mid-water, and take flies and insects from the surface; but generally speaking large trout are not ready feeders on, to them, such insignificant items of food as are found floating on the face of river or lake. To this rule, however, there are several exceptions. Where flies hatch out and come floating down stream in great numbers, large trout leave the bottom, and, poising themselves in the water, suck down hundreds of the insects which are passing over them, though the flies may be very small indeed. This is the case in the chalk-streams of Hampshire. In some other rivers which are very similar in character, the larger trout rise very badly to the fly, because there is not a sufficient quantity of flies to tempt them to the surface. Thus, while in the Test a fly-fisher will stand a fair chance of hooking trout weighing three or more pounds on a minute imitation of the Blue Dun, on some portions of the Kennet he may fish a whole season without getting a fish of this size, unless he resorts to larger and more substantial baits, such as a small gudgeon or bleak. The second exception, which is a very similar one, occurs in the season of the May-fly, when, on those rivers which produce this beautiful insect, large trout come to the surface during the May-fly carnival, and become fly-takers then, but at no other period of the year. Sometimes, too, large trout may be caught at night close to the sedges by fishing with a very large imitation moth or sedge-fly.

In the smaller and shallower streams, unless food is exceptionally abundant, trout run small, and take the fly readily enough when in the humour. And that trout humour is a very strange thing. During a portion of the day the fish lie hidden in holes in the bank, under the shelter of rocks and stones, or under overhanging bunches of weeds, and the cleverest fly-fisher in the kingdom will fail to obtain any sport worthy of mention. But suddenly some mysterious change takes place; quantities of fish leave their hiding places and commence to feed, and for a time the sport may be fast and furious. These feeding times of trout may be owing in a large measure to changes of temperature. They may, too, be connected with some subtle electrical or other atmospheric condition of which we know nothing. In fly-producing rivers, if the term may be allowed, the rise of fish very often commences with the rise of fly. The word seems to be passed round that there is a banquet being spread on the surface of the water, and up rise the trout to partake of it.

Generally speaking, the morning and the evening are the best times of the day for fishing; but here again much will depend on the weather. In early spring a sharp frost in the small hours of the morning may prevent the fish from feeding much before ten o'clock. On the other hand, I have often known a morning in spring when all the fish were caught between seven and eleven and no sport worthy of mention was had during the rest of the day, though the evening seemed suitable enough for it. In lakes, this uncertainty of feeding-times is much more pronounced than in rivers. It is least noticeable of all in small brooks or burns where the trout are small, numerous, and hungry. A cold mist spreading over the water in the evening usually causes the trout to stop rising.

Fly-fishing for trout is, broadly speaking, divided into two branches: fishing with the Wet Fly; and fishing with the Dry or Floating Fly. For both forms of fishing I should recommend a rod not more than ten feet in length, fairly powerful in the top joint, and not too stout in the butt, playing well down to the hand. The best tackle-makers have devoted such pains to improving the fly-rod of late years that the reader can safely place himself in their hands, but may, with advantage, take an experienced friend with him when making his purchase. One of the best and cheapest forms of fly-rod is made of green-heart. Still better, but very much more expensive, is a rod of solid pieces of cane built up in sections. But whole-cane rods are also a good deal used, and may be recommended to ladies for their lightness. The rings should in every case be upright, and err, if anything on the side of largeness.

The line is a matter of some considerable importance. It should invariably be tapered—at both ends for preference—and be of eight-plait silk, round, solid, and dressed with linseed oil which has been forced into it by placing the line in the oil under an air-pump, and exhausting the air. Several dressings are necessary, and

many rubbings down to obtain that beautiful smooth surface which is so invaluable when shooting the line through the rings in order to make an extra long cast. A guinea is not an extravagant sum to pay for 45 yards so prepared. The stoutest part of the line should be nearly as stout as a salmon line. This size is of course not necessary for the purpose of holding a fish, but to give the weight which ensures great precision in casting and enables the angler to get out a fly in the teeth of a considerable breeze. Where the line joins the gut it is, of course, tapered very fine, and there is nothing to alarm the fish. I have not much doubt, however, that these very heavy lines do have the effect of scaring other fish than the one the angler is intent on catching. In dry-fly fishing the line is greased with kidney suet of the red deer or the sheep—the former for preference—vaseline, or other grease, and floats on the surface of the water; but in wet-fly fishing, where the line sinks slightly, there are not a few anglers who use an undressed line which, on getting soaked with water, is sufficiently wet to enable satisfactory casting to be done with it, with the additional advantage of not flailing the water over much.

With regard to the reel, or winch, I personally have a strong preference for one of the Nottingham type with what is termed a "Bickerdyke" guard, or one of Slater's guards, and fitted with a light check. It has all the advantages of the ordinary check brass winch, but, thanks to its large diameter, it enables the angler to wind up the line almost as fast as if he had a multiplying winch, which is often of immense importance when playing a difficult fish. By placing a finger on the rim of the reel the check can be increased when needed.

At the end of the line comes the gut cast. This should always be tapered from medium gut to a very fine point, and be made of long pieces of gut —fifteen inches or so between the knots. The usual length is three yards, and this is a good length for wet-fly fishing where two, and sometimes three flies are used; but for dry-fly fishing, where a single fly is used, two yards and a half is sufficiently long, and when it becomes necessary to cast against a strong wind it is sometimes desirable to reduce the length of the cast to as little as a yard.

With a proper rod and line the beginner will soon learn to cast a fly fairly well, but with a weak, whippy rod and a heavy line, or a very light line and a stiff rod, even the most experienced fly fisher will make bad practice. Perhaps the best way to commence is to omit the cast, and, standing in an open meadow or grass-plat, wave the line backwards and forwards over the head, fully extending it, or endeavouring to, at each backward and forward cast. The wrist then soon acquires the knack of *making the rod do the work*, which is a point of considerable importance. The length of line can be gradually increased, and, when eight or nine yards of line can be extended straight on the grass, then the gut cast with the fly at the end of it may be added.

A common mistake of beginners is to make the forward cast too quickly, with the result that the line behind snaps like a whip, and the fly is cracked off. In making a backward cast the rod should be pointing a little towards the right, and then be brought forward almost perpendicularly over the shoulder. This causes the line to follow an abrupt curve, and the more abrupt this curve is, the longer it is necessary to give the backward cast. A common method of casting in Ireland is to make a very bold curve with the point of the rod, giving no time whatever for the backward cast. This is done by bringing the rod backwards almost horizontally with the earth, and without hesitation casting it forward perpendicularly over the shoulder—in short, something like the Spey cast. But there is no cast by which the fly can be placed so accurately as the one I have first described. The secret of allowing the fly to alight softly on the water is to aim at an imaginary point in the air about three feet immediately above the point on the water where it is desirable to place the fly. The fly will then reach this point, stop for a fraction of a second, and descend by its own weight.

Wet Fly-Fishing—I personally never use more than two flies for this branch of fly-fishing, and when the water is low and bright find I have infinitely better sport with a single fly than with two. What is called the dropper-fly should be placed on the cast about three feet, or a little less, from the tail-fly (less in small streams, more in large streams or lakes). For stream fishing the following is a useful list of flies:—march brown, hare's ear, red spinner, alder, cochybondhu, red palmer, black palmer, black gnat, sedges, may-fly, spent gnat. *Special flies for Yorkshire*:—Broughton's point, waterhen bloa, woodcock, dark snipe, march brown, iron blue dun, orange partridge, brown owl, poult bloa, knitted midge, yellow dun, dark needle, fog black. *Devonshire flies*:—blue upright, cowdung, silver twist, red upright, march brown without wings, etc. *Derbyshire*:—the cockwinged dun, darkwinged coachman, honey dun and other bumbles, and the flies recommended for dry fly-fishing.

Speaking generally, larger and brighter flies may be used at the commencement of the season than in July or August. Hackled-flies with *soft* hackle obtained from the neck of the hen, are preferred for wet-fly fishing, but many good trout are caught with winged flies sparsely hackled by cock's hackles.

Years ago controversy raged round the great question whether up-stream fishing or down-stream fishing leads to the best basket. Without the least doubt up-stream fishing is best where the water is bright and the fish educated, but in

a Scotch or Irish rivulet, or in Norway, or any places where the fish are very unsophisticated, and rise freely, most fish will be killed fishing down stream provided a sufficiently long line can be cast. The difficulty in up-stream fishing is to strike the fish when it rises, and, indeed, to see or feel the rise, for the flies, as soon as they reach the water, are brought back by the current towards the angler, and the line sags. The experienced fly-fisher will keep one eye on the line and one eye on the water, and on the slightest check to the line or break of the surface, will strike.

Wet-fly fishing is by no means a "chuck-and-chance-it" operation, as it has been somewhat foolishly described. The angler must have a considerable knowledge of the most likely places to find the fish before he will have much success, and even then must cast with considerable accuracy, behind rocks, in tiny runs, on the edges of eddies, under overhanging trees and bushes. He must in addition have a very sharp eye for the rise of the fish, and a very keen sense of touch. Fishing up-stream is best done with a short line, and, when the water gets low, by pitching a single fly into tiny pools and runs between rocks, good sport may sometimes be had when the angler of average ability will declare it absolutely impossible to catch trout owing to the state of the water.

Wading is often necessary to enable the angler to keep sufficiently low. When standing on the bank he is probably in sight of the fish, while when he is knee-deep in water they hardly notice him. By entering the water the angler can also, of course, reach portions of the river which are beyond his casting powers so long as he remains on the bank.

The waterproofers now turn out such excellent goods that advice on waders is hardly required; but men of middle age and upwards, or those subject to rheumatism, should bear in mind that though waders made of light material are less fatiguing to carry than heavy ones, those of stout material, particularly if lined with tweed or some other woollen substance, afford very valuable protection from the cold, and are advisable in streams rising at considerable elevations. What I may term lowland streams often reach such a temperature in summer that very thin waders may be worn with impunity. Stockings are, generally speaking, better than boots, because they can be turned inside out, and they are all the better for being washed inside occasionally, and then dried, as the perspiration from the feet rots them very quickly. Thick woollen socks or stockings should always be worn inside the wading stockings, and another pair over the stocking to prevent any stones or grit which may enter the brogue, or shoe, from cutting into the indiarubber and causing a leak.

When fishing down, or across the stream, the dropper-fly can be worked to great advantage. Unless the cast is a very long one the dropper-fly may be dribbled along the surface of the water, and will often catch fish when the tail-fly is useless. On other days the fish may show a preference for the tail-fly, which is sunk an inch or two below the surface.

Dry-Fly Fishing, or fishing with a floating fly, may be carried on successfully wherever the water is fairly smooth and the trout are rising. It will kill fish on calm days when the wet-fly is absolutely useless. In those southern streams which are much fished, and where the trout feed mostly on flies such as duns, which float on the surface, a wet-fly is of little use except in the rapids below weirs and in mill tails, at night, during rain, or when the water is roughened by a strong breeze.

Dry-fly fishing is almost a cult in itself, and enthusiastic users of the floating fly are apt to condemn, and somewhat look down upon other methods; but a long experience of every kind of fly-fishing has taught me that the amount of skill and knowledge of the habits of the fish required is about equal whether the dry or wet fly be used. In dry-fly fishing it is usual to mark down a rising fish before casting the fly on the water, and then approach him very cautiously. On arriving within casting distance, being careful to be somewhat below the fish, a few false casts are made in the air. When the angler is confident he has the right amount of line out, the fly is dropped lightly as thistledown about a yard in front of the fish, and allowed to float over him without the slightest drag. The water in our southern chalk streams is usually clear, and as likely as not the fish will be seen if the light is right, and immediately on his taking the fly he is struck and played. It is of great importance that the line should not drag, but float naturally down the stream; and in selecting a fish, one rising close to the bank should always be preferred to one rising in the centre.

Greasing the line to make it float I have already described and recommended. It is also the custom to touch the body and hackles of the fly lightly with odourless paraffin, which is now kept in suitable bottles, fitted with cork and brush, at most tackle-shops. Any excess of paraffin on the fly should be removed with the pocket handkerchief.

Considerable difference of opinion exists among fly-fishers of experience as to whether a fish should be cast over repeatedly, or given up as hopeless after three or four casts. When fish are very numerous, and rising freely, if one is disinclined to take the artificial fly he may be regarded as shy, and best left alone (his mouth may be decorated with a fly or two), and it will be good policy not to waste time over him, but to seek another less sophisticated. But in the generality of rivers I have always observed that the fishermen who stick persistently to a rising trout, assuming that they can cast sufficiently

well not to put him down—that is to say, frighten him and make him cease rising altogether—eventually get their fish. I remember spending the best part of two hot sunny days over a large trout in the Kennett. There was a great glut of May-flies, and he was rising freely all day long. I was rewarded for my patience by eventually catching him. He weighed between four and five pounds, so was worthy the trouble.

There are many points of great importance to be borne in mind when fishing with the dry-fly. In the first place it is most important not to allow the gut attached to the fly to float over the fish. In other words, it is better to make an over-short than an over-long cast. In selecting a fish care should be taken to cast over one that is really feeding on flies, and not merely "tailing," that is, burrowing its head in the weeds searching for fresh-water shrimps and other insects, while the tail, its head being depressed, breaks the water and gives the appearance of a rise.

"Bulging" is another term used by dry-fly anglers, and means the commotion in the water caused by a fish as it swims after and seizes the larva of the fly on its way to the surface. When the fish are "smutting," or rising at swarms of tiny black midges which are sometimes found on the river, they are often very difficult to catch with the artificial fly.

Both on wet and dry-fly streams trout are usually caught in the late evening, and even at night, with big flies dressed to imitate sedges and night moths. There is also a well-tried artificial fly, the Coachman, which is not only useful at night, but often accounts for a good fish in the day time. The following is a useful short list of flies for chalk streams :—*Small flies :*—Gold ribbed hare's ear, dark olive dun, iron blue, medium olive quill, red quill, blue quill, detached badger, Wickham's fancy, black gnat, little chap, and on some rivers the grannom. *Large flies :*—Orange sedge, silver sedge, alder, May-fly, spent gnat.

Loch Fishing—In well-stocked lochs, trout frequently swim in shoals, and are found mostly at the mouths of the streams, or at the outfall of the loch, over shallows and projecting rocky points, or spits of land, and in particular where the shallow water of the loch suddenly breaks into deep water. All these places can be fished from a boat which drifts broadside with the wind, one angler being in the bows, the other in the stern ; and the speed of the boat may be retarded if needful by a stone attached to a rope, which drags along the bottom. Sometimes what is termed a floating anchor is used for the same purpose. If the best spots cannot be fished by drifting, the angler must of course be rowed to them, and the boat checked so long as appears desirable. On very rough days I have had my boat worked from the bank by a gillie, letting it out by means of a rope, and have so obtained fishing when it was almost impossible for a man to row against the wind and waves. Where there is no boat, salmon waders are often extremely useful. A great variety of loch flies is not required, but the size varies in different lochs. Where the water is dark and peaty, strong contrasts of colour are desirable, nothing showing better in such cases than the fly called the zulu. I prefer those with seals' fur body (dyed various colours). On calm days the dry-fly may be used. It should be cast into ripples left by rising fish. Another method, when there is no ripple, is to cast out the fly, let it sink to the bottom, and then draw it slowly to the surface, in which process the trout will often take it. Some lake trout rise very well at night. I never used more than two flies myself, nor do I advise them, but three are very commonly used.

Spinning for Lake Trout—This is generally done by rowing the boat and trailing the spinning tackle after it. The best baits are minnows, gudgeon, loach—in fact, any fish which will spin well, and is not too large. Probably the best artificial bait is the well-known phantom minnow. The Devon minnow is also very successful. For mounting the natural bait there are many forms of spinning flights sold in the shops, most of which I have carefully tried, and have come to the conclusion that none is so useful as some form of the Chapman spinner which, for this purpose, should have no lead on its spike. It never fails to spin a bait, unless the bait is too large for the fans. The tail triangle should be at least level with the tail of the bait. The archer spinner, the Bedford spinner, and crocodile spinner are all good forms of this tackle. About 36 inches from the spinning-bait should come a small double swivel—of brass for preference—and then a small lead hung *below* the level of the line. Then 24 inches more of gut, at the end of which the line is made fast. The spinning line, by the way, should be of solid, eight-plait silk, dressed, and as fine as can be used, having regard to the size of the trout likely to be caught.

Dapping the natural May-fly is carried on in some of the Irish lakes and elsewhere. It only lasts a few weeks. The tackle consists of a light 18 foot rod, a long and very fine undressed silk line, about two yards of fine undrawn gut, and a single hook, on which one or two May-flies are impaled. The angler sits in a drifting boat, the line is carried out by the wind, and success depends on keeping the May-fly just touching the water, without allowing any of the gut to alight on the surface. As the wind increases the rod must be lowered ; as it decreases it has to be raised.

Thames Trout Fishing is a thing of itself. The fish grow to a great size, very rarely rise to a fly, and are mainly got by live bait, or spinning bait. In the early part of the season suc-

cess depends in a large measure on knowing where to find individual fish. Later on, the trout work up into weir-pools. The most successful trout fisher I know uses exactly the same spinning tackle as that I have described for loch trout-fishing, but in the Thames it is not trailed, but cast out some distance, and then drawn rapidly in with alternate draws of the line and pulls of the rod, so as to keep the bait continually moving. The spinning should be done far more rapidly than for pike. The comparatively quiet waters of a reach are soon spun over, but the rough waters of the weir may be worked for a long time without disturbing the fish, and with some chance of success. One of the best spinning baits on the Thames is a small bleak or dace, and gudgeon are also used with much success.

Live-baiting for Thames trout requires more skill than most people would imagine. The line should be fine, and greased to make it float. At the end of it should be two yards of fine round gut, terminated with a small triangle. Above the triangle is the lip-hook. The lip-hook is put in the upper lip of a small bleak, gudgeon, or dace, and the triangle caught in its side not far from the tail. At the other end of the gut is a single shot, which keeps the tiny fragments of lead from slipping down the line, and a foot above this the line passes through a slit in a small cork, taken from a six-ounce medicine bottle.

In quiet reaches, the boat or punt is moored thirty or forty yards above the spot where the fish is supposed to be, and the live-bait is taken down over the fish by the stream. Then the angler waits patiently, reeling up slowly if he sees a fish feeding. In the weir pools the live-bait is worked into every eddy and spot likely to contain a fish, and is kept for ever moving. In rather calm water two minnows on single hooks will sometimes succeed better than the bait mentioned, but very large fish usually show a preference for a very large bait.

"Fly-tying" is dealt with in a separate article, and I would recommend those who seek to know further of this, the most delightful form of fishing which we can enjoy in British waters, to read the subjoined books on the subject.

JOHN BICKERDYKE.

Dry-fly Fishing, F. M. Halford; *Angling*, Francis Francis; *Angling for Game Fish*, John Bickerdyke; *Yorkshire Trout Flies*, T. E. Pritt. *Book of the Dry Fly*, G. A. B. Dewar.

TROUT—MEASUREMENTS, &c.—Length of head 4¼ to 4⅔ (in old breeding males 3½), of caudal fin 7 to 7½, height of body 4¼ to 5 in the total length. Head much more pointed in some forms than in others. *Eyes*—diameter 4½ to 6 in the length of the head, varying with the size and age of the specimen, 1¼ to 2 diameters from the end of the snout and the same apart. In old breeding males the eyes are comparatively smaller, and as much as 3 or 3½ diameters from the end of the snout and also apart. *Teeth*—in a double zigzag row along the body of the vomer, and in a transverse row across the anterior portion of that bone where it is joined with the palatine arch. *Fins*—the first dorsal (except in old breeding males), as a rule, commences somewhat nearer to the snout than to the base of the upper caudal ray; the height of the anterior ray usually exceeds the length of its base. Origin of adipose dorsal fin about midway between the anterior insertion of the base of the rayed dorsal and the posterior extremity of the upper caudal lobe. Pectoral as long as the postorbital portion of the head, or even of the entire head excluding the snout, in some examples it is more pointed than it is in others. Ventral inserted beneath the middle or last third of the base of the dorsal fin. Caudal forked in the very young, emarginate in those of a medium size, becoming square in large examples, or even rounded. *Scales*—from 13 to 15 rows between the hind end of the adipose dorsal fin in a row passing downwards and towards the lateral-line. About 26 or 27 rows from the lateral-line to the base of the ventral fin. *Cæcal appendages*—these differ considerably, apparently being influenced to a great extent by the locality they inhabit and the food which they can obtain. *Colours*—these vary, as has already been observed, not only with locality but also owing to changes of food. Those from Wales and along the S.W. coast are of a somewhat darker appearance than those from the Midland counties and towards the north, and have rather more black but less red spots.

Day's *Fishes of Great Britain and Ireland.*

TROUT, RAINBOW—There are several varieties of the rainbow trout (*Salmo irideus*), but the rainbow of pisciculturists, which has been acclimatised in the Southern States of Eastern America, in the North Island of New Zealand, parts of Germany, and which is now being tried in England, is the *S. irideus* var. *Shasta*, which is found in the McCloud river.

It differs from our own trout principally in having smaller scales, a shorter head, a smaller mouth, and in being differently coloured. The gill covers are brilliantly coloured with carmine, and this colour extends along the middle of the side of the body in a broad line. The back is very dark, and is covered with black spots. The abdomen is almost white and is also spotted with black, though these spots are very much smaller and less numerous than those on the back. The head, tail, and fins are also spotted, and the ventral and anal fins are usually tipped with white, as are also sometimes the other fins. The eyes are larger than those of our own trout.

The rainbow probably rises more freely to the fly than any other salmonoid. It is extremely game, and has retained its high sporting qualities in all the countries into which it has been introduced. The opinion of most fishermen who have caught it in its own home, in the Eastern States, in New Zealand and in Germany, is that it fights better than the *fario*, Loch Leven or American brook trout. It is also "an excellent and delicate table fish."[1] It seems to attain a maximum weight of about 9 lbs, in New Zealand, America and Germany, and fish

[1] See Report of Rainbow in Bulletin of United States Fishery Commission, 1897.

of 5 lbs seem to be fairly common. It shows very little tendency towards cannibalism.

The rainbow trout is much more easy to rear than any other salmonoid which has come under my observation. They are practically free from attacks of fungus, and the young fish feed more freely than any other fry. They seem to be altogether the hardiest of any trout. This is a great recommendation to the pisciculturist, for the percentage of deaths among them should be less than with any other trout.

Angling writers seem to differ very much as to whether this fish will prove a success in our own waters, which fact is probably due to the very contradictory reports concerning it which come from the different places in the United Kingdom where it has been introduced. But little discrimination has hitherto been shown as to the relative value of these reports. Wherever the matter how small, running in, seem to be the most favourable kind of waters. A good supply of food and of suitable weeds is absolutely necessary in a water which is to be stocked with rainbows.

In favourable waters, however, it should be a boon to the fisherman, as it thrives in waters where the *fario* would not do nearly so well, if at all. A mere trickle of water through a pond seems to be all that is necessary to its well-being, and it grows much more quickly than other trout.

The same patterns of flies as are used for other trout should be used for the rainbow, and in the waters stocked with them in England they seem to rise freely and boldly.

As the rainbow spawn usually in February and March, they should not be fished for from January to June. They recover from spawning,

RAINBOW TROUT.

rainbow has been tried, the same results have followed. When it has been introduced into warm waters, as in the North Island in New Zealand and in the Southern States of Eastern America, it has done well; when it has been put into cold waters, as in the South Island in New Zealand and in the Northern States of Eastern America, it has disappeared. It seems also to disappear from shallow swift streams when introduced into them.

Were these facts kept in mind by those who stock waters, and those who publish and comment upon the reports of such attempts, much of the confusion and mystery which now apparently surrounds the rainbow would disappear. The probability is that in warm lakes and ponds and deep sluggish rivers, which do not get a rush of snow water in the winter, this fish will do well in the South of England, but it is still more probable that it will never thrive in the North. Lakes and ponds of from four to six feet deep with a stream, no however, much more quickly than *fario*. This fact as to the time of their spawning has been brought forward as an argument against their introduction into our waters. There is no doubt that they would probably eat the spawn of the *fario* if they had an opportunity, but it is improbable that they would have one, as they would not go up stream to the spots where the spawn of the *fario* was deposited until most of the ova of the *fario* were hatched out. Besides this, the rainbow will probably thrive best in waters which are not suitable for the *fario*.

CHARLES WALKER.

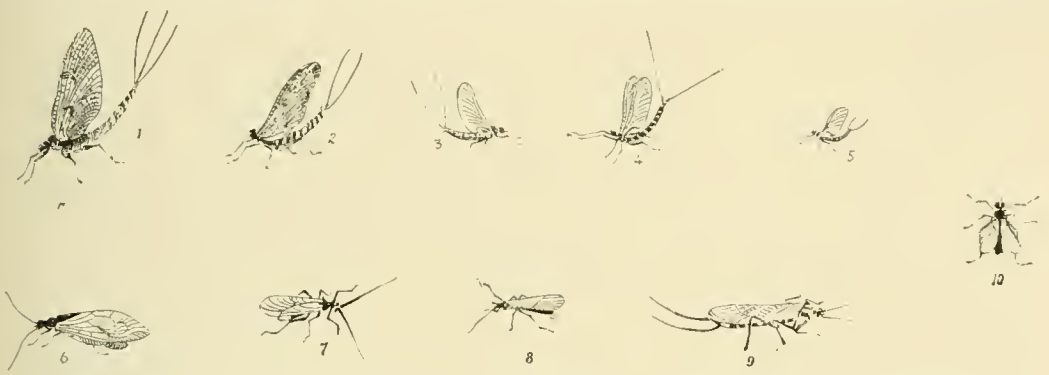
FLY DRESSING FOR TROUT AND GRAYLING—WET-FLY AND DRY-FLY—The dressing of flies is not a modern invention. Ælian, writing about the end of the second century of our era, describes fishing with the artificial fly as practised in Macedonia; and Oppian, writing about 176 A.D., refers to the practice of flyfishing for a sea-fish called the scarus. And though the next reference to the subject in literature occurs in the book *On Fysshynge with an Angle*, published in 1496, and ascribed to the legendary Dame Juliana Berners, yet

judging from what was known of it in Izaak Walton's day, the art was even then encrusted with tradition. It had probably been introduced into England by the Romans, and had come down from mouth to mouth, or from manuscript to manuscript, largely, no doubt, through the monks.

On Fysshynge with an Angle gives certain particulars of dressings of flies, but no instruction in the methods of tying. Walton himself, in his first edition (1653), gives a transcript of the instructions in Barker's *Delight* (1651); and in his second edition (1655) he falls back on Leonard Mascall's *Booke of Fishinge with a Hooke and Line* (1590), and copies Mascall's instructions verbatim. Walton was therefore no inventor or refiner.

The advance in the art during the succeeding centuries has been slow, many writers who pretended to authority contenting themselves with merely copying from previous authors. In the *Compleat Fisherman* of James Saunders (1724) there is the first mention of silkworm gut. Successively there followed Bowlker's work, *The Universal Angler* (1766), Best's *Concise Treatise* (1787), T. F. Salter's *Angler's Guide* (1814), Geo. C. Bainbridge's *Flyfisher's Guide* (1816), Ronald's *Flyfisher's Entomology* (1836), Hewett Wheatley's *Rod and Line* (1849), which advocates eyed hooks; and several other crude, was made to imitate natural insects, yet Ronald (*Flyfisher's Entomology*) was the first, in 1837, to set side by side upon the same page pictures of the natural flies and the dressings claiming to represent them, and to append to the descriptions the scientific names of the various insects depicted. Bainbridge's work in 1816 had given certain coloured pictures, more or less meritorious, of some of the natural insects, but not of the dressings representing them. Theakston's work gave minute verbal descriptions of some ninety different insects, with a careful

LARGE AND SMALL PHRYGANIDS.
(Two-thirds natural size.)



1. GREEN DRAKE. 2. MARCH BROWN. 3. OLIVE DUN. 4. RED SPINNER. 5. IRON BLUE.
6. ALDER. 7. FEBRUARY RED. 8. WILLOW FLY. 9. STONE FLY. 10. HAWTHORN FLY.
(Two-thirds natural size.

improvements much in advance of his time; John Jackson's *Practical Flyfisher* (1853), Blacker's *Art of Flymaking* (1855), Stewart's *Practical Angler* (1857), and Theakston's *British Angling Flies* (1862). In Francis Francis's *Book of Angling*, published first in 1867, the art of fishing with a dry-fly is first touched on by a standard author, though a century earlier the method had been suggested for casual use. Indeed, in the same century appeared eyed hooks and the Pennell jam knot. In 1876 appeared *A Quaint Treatise of Flies and the Art of Artyfychall Flee Making*, Mr. Aldam's reprint of an old Derbyshire manuscript describing the dressings of some twenty-five flies, with addenda by Mr. Aldam. The feature of this work was that a representation of every fly described was mounted in sunk panels, with examples of the materials from which it was made. It is said that there are several old manuscript copies of the same original MS. transmitted from father to son in the midland and northern counties.

In 1885 appeared Mr. F. M. Halford's *Floating Flies and How to Dress Them*, a work in which the first serious and adequate attempt was ever made to describe the minute processes of fly dressing. And although it purports to be confined to giving instructions in dressing floating flies, yet it is so clear, so careful and so exhaustive that the art of dressing sunk flies may readily be picked up from its pages. An extension of the subject, bringing it down to date, entitled *Dry-fly Entomology*, has lately been published.

Though doubtless from the first some effort, more or less black and white life-size drawing of each. These works gave a great stimulus to the study of angler's entomology, and led incidentally to a steady improvement in the dressing of flies.

The classes of natural flies imitated are :—

I. The Ephemeridæ, comprising the Green Drakes, the March brown series, the blue, olive, and yellow dun series, the blue winged olives and the iron blue series with their respective spinners.

II. The Sialidæ, comprising the Alder fly.

III. The Phryganidæ, the caddis or case flies.

IV. The Perlidæ or stone flies.

V. The Tipulidæ or saw flies.

VI. The Cecropidæ, comprising only the Froghopper.

VII. The Empidæ, comprising only the Early Black Gnat.

VIII. The Tenthredinidæ, comprising only the Great Dark Drone.

IX. The Hemerobüdæ, comprising only the Gold-eyed Gauze-wing.

X. The Diptera, comprising house-flies, blue-bottles, and the like.

XI. The Coleoptera or beetles.

XII. The Hymenoptera, comprising ants, bees and ichneumons.

In addition, anglers dress imitations of caterpillars and of some of the above insects in their larval and pupal stages, and flies typical of a class which we may call general flies, and flies which may be termed fancy flies, resembling no insect except in shape; for even

where no particular insect is imitated, the aim of the dresser is to suggest an insect of some sort. The cuts have given an idea of the shapes of the principal natural flies. The methods of imitating them are very various; and in deciding whether to adopt one method rather than another the dresser should ascertain the character of the water to be fished with it.

The aim being to suggest some living insect, the dresser must seek to present to the fish the colours, the shadings, the harmonies, the attitudes and the motions of life. Thus, where the surface of the stream is smooth, so that the natural flies float down on it without danger of immersion, the best imitation the angler can offer to the fish is one as precise in colour, size, shape, and attitude on the water as can be contrived consistently with strength and durability. Motion must be omitted. Here what is known as dry-fly fishing comes into play. In tumbling, shallow mountain streams, the colour and action of life only can be suggested, as any

attempt to portray the attitudes of the natural insect as it is when at rest would be thrown away; and the action of something struggling for life in a boiling torrent is much more likely to be attractive to the fish. Hence the Yorkshire school, addicted to the use of soft hackles and discarding wings, and the Devonshire school, which employs brilliant cock's hackles, again without wings. For big heavy waters, such as Tweed and Clyde in spring, strongly built flies with divided wings of several thicknesses of feather are often employed. Derbyshire affects lightly built floating flies and bumbles; the Usk, big spare lightly dressed winged flies with a very knowing rake. There are in fact endless varieties in detail in the dressing of flies to suit the various rivers of these islands; and that is why it is well to get flies of a local dresser, or, better still, to be master of all modes of dressing them. Above are seven styles of dressing the common blue dun.

Implements.—It is only possible to few to make firm work on small eyed hooks without the assistance of a vice; and most amateurs will find a vice an advantage in dressing sunk as well as floating flies. The form is not very important, provided that the jaws are strong and well tempered, yet small enough to allow the forefinger and thumb to come down upon and grasp the hookshank in the operation of winging. The vice should be provided with a clamp for fixing it to a table. The most beautiful vice is Mr. Hawksley's, made by Messrs. Holtzapfel, of Cockspur Street, price 35s. In addition, the operator needs a pair of straight fine-pointed dissecting scissors, a pair of curved oculist's or manicure scissors, one or more pairs of hackle pliers, a watchmaker's pliers, a sharp penknife, and a dubbing needle. A stout needle, fixed in a wooden shaft, makes an efficient dubbing needle.

Materials—The dresser must have tying silks of various colours, wax, gut, hooks, varnish, floss silk, dubbings, herls, tinsels, wires, hackles both from poultry and other birds, wings and other feathers of various birds, and dyes.

Tying silks—Pearsall's gossamer silk, spun for the purpose, are the most convenient on the whole. Naples silk and glover's silk are also used by many. The essential colours are cream, straw, primrose, yellow, orange (two shades), crimson, and (for north country streams) purple. It is well to have also green, ash, black, brown, and Mr. Aldam's Indian yellow. All these silks darken very much when waxed.

Wax—It is therefore desirable to have some transparent wax in addition to some ordinary harness maker's wax.

Gut will be required, if the flies are not dressed on eyed hooks, and of fineness appropriate to the work in hand.

Hooks—These are either eyed or ordinary, and are to be had blue, bronzed, or japanned. The bends used are Limerick, Sneck, Kirby, and Round, and the sizes run from 000 new scale (the smallest) to No. 4, and very occasionally to a larger size for trout, grayling, and dace, but much larger sizes are used for chub. Eyed hooks have either upturned or downturned or straight eyes. Sizes under No. 4 are not found to hook well in wet fly-fishing, and it is better for this purpose to dress flies on gut. On the other hand, for dry-fly fishing eyed hook present enormous advantages. Mr. H. S. Hall's

Snecky Limerick bend with upturned eye is probably the best bend for this style of fishing.

Varnish—A small bottle of ordinary spirit varnish, very thin, and stoppered with a cork rubbed with mutton fat to prevent it from sticking to the bottle, answers all purposes. The varnish is applied with a fine porcupine quill, or a needle mounted like the dubbing needle.

Floss Silks—These must be bought of tackle-makers, and a large variety of colours is of service. The essential colours are white, primrose, yellow, orange, and claret. All shades of green and olive, ash, red-brown, and purple are desirable. Floss silks are used for wrapping round hooks to imitate the bodies of flies.

Dubbings are used for similar purposes, only they have to be spun on the tying silk to make them adhere. Crewels, wools, baize, furs of various animals (hare, rabbit, fox, squirrel, mole, water-rat, opossum, &c.), mohair, seal's fur, and pig's-wool. The function of dubbing is to represent the filmy semi-transparent covering which modifies the base colour of the natural fly. Thus the mole's fur or water-rat's fur, with which the iron blue dun is dressed, serves to indicate the soft inky envelope which in the sub-imago covers the delicate claret spinner within. So this fly is properly dressed with a plum or claret coloured silk, which shows through the envelope of dubbing. It should be noted that in a wet-fly, where the body is dubbed, it is of great importance that the tying silk should be of the right colour, for when the fly is wet, the silk will, especially in bright sunlight, show right through the dubbing in a most incomprehensible manner ; and if the colour of the silk be wrong, the fly will not do. It is better to be wrong over the dubbing than over the base colour.

Waxing has a very modifying influence upon the colours of silk, greater or less according to the nature of the silk and the wax. With ordinary harness-maker's wax, white silk becomes dark leaden dun, cream a dark olive, primrose and yellow other and lighter shades of olive, olive nearly black, orange a dirty yellow brown, and crimson a deep red. Dubbings cannot, unless they be composed of one fur only (and even then not always), be successfully described on paper. The dresser should, if possible, match the dubbing with the natural fly, wetting the material and holding it to the light. If dubbing be made of more than one material, it should be well mixed by pulling and tearing until the colour is uniform throughout. This process is called "testing."

The dubbing is applied thus. A sufficient portion and a little over is taken in the hand and picked out so as to form a long fine taper. This is rolled in the palm of the left hand with the two middle fingers of the right. The taper roll is then placed along the tying silk, with the fine end towards the fly, close up to the hook, and is rolled on to the silk with the forefinger and thumb. The silk is then twisted tightly from right to left (assuming that the dresser is winding over the hook and away from him), until it has taken hold of the dubbing for a sufficient length. The silk with the adhering dubbing can now be wound on to the hook. The object of twisting the silk from right to left is to prevent the dubbing from working off the silk. If twisted in this way, each lap of the dubbed silk serves to fix the dubbing tighter. In some flies only a little dubbing is put under the breast or round the shoulders. In other patterns the dubbing is used to represent the legs of the fly only. In dressing duns, it is well to pick over the dubbed body with the pliers to remove any inequalities.

Herls—Green and bronze peacock herls, including the eye feathers, and black ostrich herls are essential, with wing and tail feathers of adjutant and condor for those who can get them. Strips from the tails of golden pheasant, cock-pheasant, turkey, blue macaw, magpie, and others, breast feathers of the common goose, wing and back feathers of the heron, lapwings' toppings, and many more, are useful at times.

Tinsels—Flat gold and silver tinsel of two widths, fine gold wire, fine gold and silver twist of two thicknesses, and (for chub flies) stouter oval gold and silver twists should be procured.

Hackles are the most important part of the fly-dresser's equipment. They are procured from the necks and saddles of poultry, and from the necks, breasts, backs, rumps, and wing coverts of numerous other birds. The following are the most important :—corncrake (shoulder and under wing), young curlew (shoulder), dotterel (shoulder), golden plover (shoulder and breast), red grouse, moorhen (under wing), brown owl (shoulder), partridge (breast, back, and rump), pheasant, cock and hen (neck and breast), sea gull and sea swallow (shoulder), snipe (shoulder and under wing), starling (neck, crest, back, shoulder, and under wing), thrush (under wing), and wren (tail). They are all easily procured, except the young curlew, the dotterel, and the sea swallow. Many others are mentioned in books on fly-dressing, but are only of occasional service.

Poultry hackles are had from the necks and saddles of domestic fowls, both cock and hen. The colours needed are badger (black centre and cream-coloured points) to be had from Dorkings, black, blue (the smoky dun colour known as blue by fishermen), and as many shades as possible from nearly black to the palest smoke colour, to be had from Andalusian and blue game fowls ; cinnamon, cochybondhu (a hackle with black centre and list, and red in the interval), cream, cuckoo (a freckled hackle from the Plymouth rock), furnace (black centre and red points), ginger (a series of shades from cream to light red, including ginger cuckoo), grizzle (a freckled or spangled sandy or rusty blue dun), honey dun, yellow dun, and copper dun (blue duns of all shades edged or freckled with sandy or rusty ginger or red of all shades), from cross-bred Andalusians and blue game fowls, red of all shades, from a hot orange, ginger to deep mahogany, and white.

In addition, white, ginger, or blue hackles dyed in canary, onion dye, green olive, brown olive, and medium olive (a good variety of shades), and white and black hackles dyed claret.

Blues, honey duns, sandy gingers, and badgers are the most difficult to procure good.

Few hackles approximate to perfection, but there are innumerable useful hackles falling short of that degree of excellence. Good hens' hackles are easier to get than good cocks'. Hackles, and indeed all birds' feathers (except rusty duns), are in best condition from December to March. For floating flies, cocks' hackles are immensely superior to hens'. Cocks of two years old and upwards yield the best hackles for that purpose. For wet-fly work softer hackles are better than stiff ones. Poultry hackles should be fine and clean and bright in the fibre, and as much as possible of the same colour back and front.

The large saddle hackles of cocks, their beard hackles, and the broad glossy hackles on their shoulders are used for representing the whisks or tails of upwinged flies (Ephemeridæ). These are also represented by the white and blue feathers from the neck and breast of a guinea fowl, dyed or plain as required.

Other feathers—Wings of the hen, blackbird, bullfinch, chaffinch, coot, corncrake, fieldfare, grouse, common gull, jay, lark, partridge, peahen, cock and hen pheasant, snipe, jacksnipe, starling (old and young), thrush, and woodcock should be had. Also tails of the great tit, partridge, pheasant (cock and hen), some broad glossy feathers from under a cormorant's wing, and some loose fibred feathers from a moorhen's breast.

Dyes—Crawshaw's dyes or the Diamond dyes in the following colours : magenta or wing, red spinner, orange, canary, green olive, brown olive, and medium olive, green drake, slate, and iron blue.

With the above equipment the amateur will be well set up. Few more feathers are required, but a piece of bottle rubber should be procured, some white horsehair, and some tawsy ends of gut for dyeing, some chaffinch quills, and some pike scales to wing black gnats.

General Principles—In spite of the numerous

insects imitated and the innumerable patterns to be found described in books, there are structurally only two types of artificial fly, viz., (1) those hackled at the shoulder only, with or without wings, and (2) those hackled all down the body, or the palmer or bumble class, again with or without wings. These are the essential characteristics, and whether the hackle be soft and mobile or stiff and glassy, whether the fly be winged or wingless, fat, thin, or medium, whether it be heavily or lightly dressed, whether it has quill or herl or dubbing for body, ribbing, tag, or whisk, are matters of detail. The tying silk is the structural basis or skeleton of the fly. The rest, wings, hackle, whisks, dubbing, quill, floss, and what not, are all accessories which are fitted into the silk at various stages according to the type of fly to be dressed. Experience only, and the study of good models, can teach the novice how and when to fit these accessories to the best effect for the special purposes of the water for which the fly is required.

Processes in Outline—A fly may be begun in four different ways, viz. :—(1) At the shoulder, (2) at the middle of the hook, (3) at the tail, and (4) in the case of an eyed hook only, at the head. And it can be finished in three places, viz. :—(1) At the head, (2) at the shoulder behind the hackle, and (3) at the tail.

Beginning at the shoulder one can work to the tail and back to the head and finish there, or return to the shoulder and finish there, or the process may be reversed. Beginning at the middle one can work to the head and back to the tail and finish there, or return to shoulder or head and finish there. Beginning at the tail one can work to the head and finish there or at the shoulder. Beginning at the head of an eyed hook, one can work to the tail and finish there, or return to shoulder or head and finish there.

In any case these two rules should be observed. (1) That there should be no knot or hitch in the tying silk from the start until the finish, and (2) that that finish should be the whip finish here described. It is the only safe finish, and is executed as follows.

The Whip Finish—The fly being finished all except the fastening of the silk, take the silk between the forefinger and thumb of the right hand, about two inches from the hook, bring the loose end round the little finger of that hand and over the backs of the fingers, and lay it along the hook so that it will be tied down by the next lap of the silk. Then go on winding the silk for three or four laps over the loose end, extricate the gut, if any, from the successive turns of the silk, and taking the loose end of the silk in the left hand, draw it towards the left till all the silk has been drawn through and the finish is quite firm. Then varnish the finish. The varnish may also be applied by putting a drop on the silk near the fly just before pulling through.

The dressing of flies upon eyed hooks is dealt with separately from dressing upon gut. The dressing of flies on gut is primarily for wet flies, and that of flies on eyed hooks for dry flies. But if any one desires to dress floating flies on gut or sunk flies on eyed hooks, he can do so from the following descriptions, the difference between wet and dry being largely a matter of the amount and quality of wings and hackle.

The Parts—Wings for Wet-flies—Wings are of many types. They are either split, solid, or rolled; single, double, or treble, or even thicker; and they either show the upper or under surface of the feather on the outside. They can, within limits, be of any degree of fineness or breadth. Rolled wings, reversed wings, Tweed upright wings (to coin a term), Irish wings, and Drake wings require special methods of tying. All other wings are here classed as ordinary. Wings are usually cut from the quill feathers (primary or secondary) of birds, but in some birds, where the primaries and secondaries are of too coarse a texture, smaller feathers of suitable quality are found.

Split wings, and indeed most wings, are best dressed from corresponding feathers taken from opposite sides of the same bird; but many dressers merely double the fibre cut from one feather, and coax it into shape when tied on. Ordinary wings are tied in at the head projecting over the bend of the hook; and where feathers from opposite sides of a bird are used, the part of the feather which was nearest the root of the stalk should be nearest the head of the fly.

In tying on ordinary wings the fibre used for the wing is grasped firmly in the forefinger and thumb of the left hand, and brought down on the hook so that the fibres are nearly as possible parallel with the shank. The silk is then brought up between the thumb and the hook, over the silk and down between the hook and the forefinger; the fibre and the hook are again grasped firmly and the silk is brought down with a firm pull, and round again and over the fibre lapping, three or four turns closely towards the head.

Rolled wings, reversed wings, and Irish wings are tied in, projecting over the head of the fly.

Rolled wings are made of two little rolls of fibre from the wing of a bird, and it is distinctive of this method that they must be tied on on a silk basis, all other wings being tied on the bare hook.

Reversed wings are merely ordinary or rolled wings tied on projecting over the head of the fly.

What are here called Tweed upright wings are made of two or more thicknesses of feather laid one over another, doubled, and then tied on as ordinary wings. The fibre is then divided into two equal parts and the silk passed between the two parts and round under head and shoulder to keep the wings apart. Rolled wings and reversed wings are kept apart in the same way.

Irish wings are made of a doubled slip of feather tied in projecting over the head of the fly. The rest of the fly is then dressed and the wing feather is then brought back to slope over the tail, and bound down with the silk and secured by the whip finish.

The wings of May-flies or Drakes are from the breast feathers of mallard, Canadian wood duck, Rouen drake, or Egyptian goose, and are tied in by the stalks.

Wings for Dry-flies—Wings for floating flies are of three kinds besides May-flies—all split and all put on more or less upright—ordinary, reversed, and rolled. They are also single or double (except the rolled, which are manifold), and they present either the upper or under side of the feather on the outside. The upper side is the more usual side to show, as the outward curve of the feather thus tied makes the wings sit like a V, and they serve as a parachute to let the fly down cocked upon the water. The detailed manipulation of these wings is dealt with later in the section devoted to dressing floating-flies on eyed hooks.

Bodies—The bodies of flies are simulated either with plain tying silk waxed with dark or colourless wax, or with the same covered or partly covered with dubbing, floss silk, quill (so called—the strands from the eye or tail herl of a peacock stripped of its metallic flue or the enamel of the stalks of feathers), herl and tinsel, and are ornamented with ribbings of silk, gold or silver wire or tinsel, or with tags of gold or silver tinsel. The method of winding-on dubbing has been previously described. The material for winding-on for bodies is usually tied in at the tail projecting to the left, and is thence wound to the shoulder and secured. Herl is usually tied on three or four or more strips together, and then the strips are twisted from right to left round and so as to adhere to the tying silk, and so wound up the body and secured at the shoulder.

Legs—These are simulated either with hackles, or by picking out dubbing. Poultry hackles require no preparation except the stripping of the down at the root. But the soft hackle of other birds must be stroked backwards to enable the fibres to separate freely as the hackle is being wound. Cock hackles are sometimes doubled by drawing all the fibres to one side of the stem, the stem being held by one end in the vice and the other in the hackle pliers. Soft hackles, if too thick or of irregular shape, are often stripped of the plume on that

side which will be under when the hackle is wound. Every hackle should be tied in so that it can be wound on its edge, and with the best side towards the head of the fly.

Hackles are tied in by either the stalk or the point. Most modern dressers tie in the stalk and wind the hackle by the point, which is seized in the pliers for the purpose. Every hackle should be wound in the same direction as the silk is wound. Thus if the silk is whipped over the hook and away from the operator, the hackle should be wound in the same direction, and *vice versâ*.

Whisks.—Three or four fibres of saddle or beard hackle of a cock, soft and flexible for wet flies, stiff and glassy for floating flies, or two or three fibres of a gallina neck or breast feather dyed or plain for floaters, are taken in the left hand when the whipping approaches the bend of the hook, and the butt ends being passed under the hook the silk is brought over the hook and round underneath again ; then under the whisk fibres, close, to make them sit up.

PROCESSES IN DETAIL.—DRESSING FLIES ON GUT.

First Series.

To Tie a Hackle Fly hackled at Shoulder Only.—*Process I*—Fix your hook firmly in the vice by the barb and the lower part of the bend, with the shank end projecting to the right. Double 15 or 18 inches of tying silk round the hook and twist the ends lightly together, and then wax the silk by rubbing the wax up and down the doubled and twisted length two or three times. Then separate and untwist the silk at the eye and draw it apart against the hook. Take a length of gut and bite one end so as to make a few indentations for the silk to grip. So far the process is alike for all flies to be dressed on gut. Then, holding one end of the silk in the left hand and taking the silk in the right 3 or 4 inches from the left, pass it over the hook, and holding firmly by the left hand, whip under and round the hook, beginning where the shoulder of the fly should be (leaving about one-sixth of the shank bare to take the hackle and the head), and bind down the short length of the silk with three or four successive lappings, close together, but moving towards the bend of the hook. The short end may now be taken off by a smart twitch towards the head of the hook. Next pass the bitten end of the gut athwart under the hook, bring the silk firmly round it for the next turn, and it will lie straight under the hook. Pull it until the bitten end is under the middle of the hook, and then whip in close firm turns to near the bend. Bind on the whisks, if any, as described. Then the silk or floss or quill or herl for the body and the rib, if any, or roll on the dubbing as described, and lap firmly back to the shoulder. Then take the hackle, prepared as described, a little longer in fibre than the hook shank, and lay it face downwards on the hook with the stem towards the bend, and the plume projecting over the gut, and bind the stem down firmly with two or three turns of silk. Twitch off the stump of the stem, wind the body material or ribbing or both to the shoulder and secure them with two turns of silk, and cut away the waste. Then taking the point of the hackle in the hackle pliers, and passing the middle finger of the right hand through the ring of the pliers, hold the stem of the hackle at right angles to the hook, and turn the hackle on its edge in the same direction as the silk is wound, two, three, or four times round the hook, each turn close in front of or behind the last. Wind the silk through the hackle so as to bind down each successive turn and, having reached the head, either finish with the whip finish, or, after three or four turns to form the head, whip back through the hackle and finish with the whip finish behind the shoulder. Cut away the point of the hackle and varnish the finish, and the fly is complete. A variant of this method of finishing behind the shoulder is, after binding on the hackle to whip under the hackle up to the head, to take two turns back from the head, wind the hackle up to the silk, whip the silk through it, and finish behind the hackle.

Process II—Commence as before, but in the middle of the hook, lay the gut under, whip in close turns to the head, binding down the hackle stem on the bare hook, pass the silk under the hackle and whip to the head. Thence whip to the hackle, turn it as before, and whip carefully through it. If the body is to be plain silk, the dresser may now either whip to the tail and finish there or return to the shoulder and finish there. If the body is to be dubbed and finished at the tail, the dubbing can be rolled on immediately after the hackle has been wound, care being taken to have the dubbing thickest at the shoulder, and tapered to the tail. Or if the body is to be floss or quill, the material can be tied in at the shoulder, projecting over the head, and wound to the tail and secured, the waste end cut off, and the fly finished with a whip finish. But if the body will not be made too thick, it is better to whip the bare silk from the shoulder to the tail, and there bind in whisks and body materials as may be, and thence work back to the shoulder and finish behind the hackle. This method makes a strong and workmanlike fly, and is preferable to the finish at the tail because (1) the latter is liable to be torn by the trout's teeth, (2) the former is susceptible of more elaboration in the way of body materials than the other.

Process III—Laying the bitten gut under the hook, hold it there with the forefinger and thumb of the left hand, and beginning near the head lap in open folds to the tail, and take one or two turns back towards the head. Bind in whisks, quill, herl, or other body material, and whip in close laps to the shoulder. As soon as the first two turns over the gut are taken, the open coils of silk may be unwound and twitched off as waste. The hackle is then tied on, and the body material is wound to the shoulder and made fast, the hackle wound and the fly finished at head or shoulder as before.

Second Series.

To tie a Fly hackled all down the Body—a Palmer or Bumble.—*Process I*—Beginning at the shoulder and whipping to the tail, bind in at the tail, projecting to the left the tinsel wire or other ribbing and the body material (unless it be herl, which will be rolled on as described), and whip to the shoulder. Bind in the hackle or hackles by the stalk firmly, and cut or break off the waste end. Wind the body material to the shoulder, secure and cut off waste. Wind the hackle in close coils at the head and more open coils to the tail, and leave the pliers hanging to the end. Then bring the ribbing in even open coils through the hackle, secure at shoulder and cut off. If two hackles are used, the front one may now be turned and the silk wound through to the head, when the whip finish completes the fly.

Process II—Commence at the middle of the hook and binding in the gut, whip to the shoulder, tie in the hackles, whip to the tail, and complete as in Process I.

Process III—Before whipping to the tail, bind in body materials and ribbing projecting to the right. Whip to the tail, wind on the body material, secure at tail with two turns, and cut off neatly. Turn the hackle to the tail as before, secure with turns of the ribbing material, and cut off, neatly finishing at the tail with the whip finish.

Stewart's Scotch spider patterns are a variant of Process II. The hackle being soft is rolled round the silk before being wound. The silk is then whipped to the tail and the fly finished there.

Third Series.

To dress a Winged Fly hackled at Shoulder only.—*Process I*—Is identical with Process I of the First Series, except that a little more space is left at the head for the wings, and as a last step before the whip finish, a pair of ordinary wings are whipped on with several firm turns of silk, and the fly is finished with a whip finish at the head or behind the hackle, and the wing stumps are cut off close.

Process II—Is identical with Process II of the First

Series, except that a pair of ordinary wings or Tweed wings are whipped on before tying on the hackle.

Process III—Is identical with Process III of the First Series, except that a pair of ordinary Irish or Tweed wings may be tied on before the hackle is tied on, or a pair of ordinary wings may be tied on just before the whip finish.

Process IV—Commence at the middle and whip to near the head, tie in rolled reverse or Tweed upright wings as before described, bind on the hackle behind the wings, whip to the tail and back to the shoulder, putting in any necessary materials as before. Turn and secure the hackle, and finish at the shoulder. Or Irish wings may be used with the finish at the head.

Fourth Series.

To dress Winged Palmers or Sedges.—*Process I*—This is identical with Process I of the Second Series, except that ordinary wings are whipped on before the hackle is bound in.

Process II—Beginning in the middle of the hook, wind to the head, binding in the gut. Here tie in rolled, reversed, or Tweed upright wings, cut away the stumps, form the head, and tie in the hackle or hackles behind the wings. The rest of the process is identical with Process III of the Second Series.

Substantially and in principle the foregoing are all the methods for tying small flies on gut. May-flies do not differ in principle from small flies, and the methods of tying on eyed hooks can readily be learned by discarding so much of the above processes as is devoted to securing the gut to the hook, and by a modification of the processes described next for dry flies.

Floating Flies—For floating flies, eyed hooks present such advantages that it is proposed to treat the subject as synonymous with floating flies on eyed hooks. For those who prefer to dress them on gut, it is only necessary so to bind on the gut as to leave the silk in position to proceed with the rest of the fly in the same places, as one begins on an eyed hook in the following methods.

The insects imitated are the same in both methods save that the March brown is never seen on many dry-fly waters. The artificial patterns differ from wet-fly patterns (1) in being more thickly dressed in hackle and wing, (2) in being as far as possible so constructed as to absorb little water and to throw it off readily in drying, and (3) in the winged patterns in the wings being split and so built as to let the fly down on the water with the wings upright and cocked.

The types are four, viz., (1) wingless flies hackled at the shoulders only, (2) winged flies similarly hackled, (3) palmers or bumbles, and (4) winged palmers or bumbles, usually called sedges.

Types 1 and 2 have sometimes detached bodies.

May-flies differ somewhat in detail, but in no essential point of principle from smaller flies, but the spent gnat requires a special description.

It will be convenient first to describe the process of winging, of which there are several varieties, but all are available for every kind of winged floater except May-flies.

Beginning near the eye, but leaving room for the head and wings, whip towards the tail six or seven turns, binding down the short end and thence back to the starting point. Twitch off the short end. Take corresponding feathers from opposite sides of the same bird, and cut slips from each to form single or double or rolled wings as the case may be. If the wings are to be double lay two slips from the same feather or from adjoining feathers from one wing and lay one on top of another so that the points and edges correspond. Do likewise with the other wing. Then lay the feather for one wing precisely on the top of the feather for the other, and take them up in the pliers, place them crosswise between the finger and thumb so that, if the wings be ordinary, they slope backwards with the natural curve of the feather towards the tail, and if they are to be reversed or rolled they project over the eye and bring down the feather on to the hook. Bring the silk up between the thumb and the feather, down again between the feather and the finger on the far side, hold the feather firmly with the finger and thumb and draw down the silk firmly, pass it once round, and behind or in front of the wing according to the nature of the wing, and release the feather. The wings should now set apart in a V shape. Bring the silk up between the near stump and the metal, pass between the wings and down on the far side, round under the hook, back between the wings, and down between the wire and the further stump, then back to the other side of the wing. If the wing be ordinary, draw back the stumps, bind them under the hook, and in any case cut off slantingly so as to taper the body towards the tail. There are many variations in this method for which space is not available.

To dress a Wingless Fly hackled at Shoulder only—Fix the hook in the vice as before. Wax a length of silk, commence whipping near the shoulder and whip to the shoulder, leaving space to wind the hackles on bare metal, and finish at the eye. Bind on one, two, or three hackles according to need, and whip back to the bend, taking off the stumps so as to taper the body. Here bind in whisks if they are required, quill, floss, or herl for the body and any ribbing material required. If the body be dubbed, roll on the dubbing. Whip to the shoulder, wind in the body and ribbing, and secure it. Then wind the hackle or hackles, the hindmost first, securing them by bringing the silk through each, binding down the successive turns of hackle. Finish at the eye with the whip finish.

To dress a Palmer or Bumble—This is dressed precisely like the last, except that the last hackle, instead of being turned at the shoulder, is wound in open folds to the tail, and there secured by two turns of gold or silver wire or twist. The twist is then wound in similarly spaced laps to the shoulder and there secured, and the waste end cut off. The remaining hackles or hackle are then wound at the shoulder and secured, and the fly finished with the whip finish at the eye. That is the soundest method. But another plan is to tie in body materials and ribbing at the shoulder, wind and secure the front hackle, whip the silk to the tail, wind on the body material and secure it at the tail, bring down the last hackle in open laps to the tail, and secure it. Wind the ribbing down the body so as to support and secure the turns of the hackle ; secure it at the tail, cut off the waste end, and finish at the tail with the whip finish.

To dress a Winged Floating Fly hackled at the Shoulder only—Having tied on the wings as previously described, next tie in at the shoulder so as to pass when wound either in front of the wings or immediately behind them one cock's hackle, in the former case face or bright side downwards, in the latter case with bright side flat against hook and wing. Tie in a second cock's hackle to wind behind the wing, whip to near the bend of the hook, breaking or cutting off the roots of the hackle *en route* so as to taper the body. Bind in the whisks at the tail and take one turn under them. Then tie down herl, quill, floss, tinsel, or whatever the body material is to be (except dubbing), and the ribbing, if any, and whip back to the shoulder. If dubbing be used, spin on the dubbing before whipping back. Wind the body material and ribbing, if any, to the shoulder. Make fast at the shoulder with two turns of silk. Wind the hinder hackle so as to force the wings upright and bring the silk through so as to secure the turns. Wind the front hackle, secure it in like manner, and finish at the head with the whip finish. Some dressers only use one hackle wound altogether in front of or altogether behind or partly before and partly behind the wings, and they finish with the whip finish, or two turns behind the wings. The latest novelty is to use yet a third hackle, a hen's or other soft plumaged bird's in front of the wings, or, in wingless hackled floaters, instead of them.

To dress a Winged Palmer, Sedge or Rail—

Drawn by A. Sherburn

Wild Turkey

Having tied on the wings as before described, tie in two cocks' hackles as described in the last method, and a third for winding down the body, whip to the tail, tie in the body material, unless it be dubbing, and some fine wire, and twist and whip back to the shoulder. Wind on the body material and secure at the shoulder, cutting off the waste ends. Wind the hindmost hackle in open laps to the tail, secure with a turn or two of the wire or twist, and bring that through the successive turns of the hackle to the shoulder. Here secure it and cut away the waste. Wind the second hackle close behind the wings, and the first close in front securing each as before described, and finish with the whip finish.

To dress Detached Bodied Flies—Detached bodies are usually of india-rubber, gut, or hair wound on a split hog's bristle, doubled round a hook, the whisks being bound in at the tail. The bristle is subsequently set astride the eyed hook, behind the wings if the fly be winged, otherwise behind the hackle and there bound on and the binding covered by the body material. The waste ends of bristles are cut off and the fly is then finished in the ordinary way.

But detached bodies are of less importance than they were, for almost as good an effect can be had by using dyed or plain horsehair or gut on the bare hook, tying it in at the shoulder and winding to the tail, binding in the whisks in so doing, and thence winding back to the shoulder.

To dress Floating May-flies—These are either hackled at shoulder only or down the body and are either winged or wingless. If they are winged the winging is performed just as in the case of small flies, substituting the stalk of the mallard breast or other similar feather for the stumps of the small feather. The methods of forming the body and putting on the hackles, ribbing-tags, &c., do not differ in principle from those applied to similar ends for small flies. Straw bodies used to cause much heart-breaking, but rofia grass can be wound like a quill and serves the same purpose.

Spent Gnats (representing the dying or dead spinner of the May-fly) are hackled all down the body and are winged with two pairs of dark blue or black glossy cocks' hackles, tied so as to project horizontally to right and left of the hook, with a slight backward slope from the shoulder.

G. E. M. Skues.

TSINE (*Bos sondaicus*)—The tsine are true wild cattle, and extend from the hill tracts of Chittagong downwards, and are found in Java, Sumatra, Borneo, and the Celebes. They are very wary, graze in the open *quins* or plains, and are not easy to circumvent.

A bull tsine that Captain Chas. Hill and myself once killed, was very handsome, of a deep red colour (the old bulls get almost black in their second childhood), with white rings round the eyes, white under the belly, under the tail, and along the buttocks. Below the knees they have dirty white stockings, somewhat similar to those of the gaur and gayal. A slight hump, which is lost in the ridge, a slight dewlap, not always apparent, is also characteristic of them. The head is very like that of a wild stag, the facial angle being quite straight. They are fairly plentiful in Burma, and the native shikaries, although forbidden by their religion to take life, and though all cattle are particularly sacred, often pot them by sitting in the branch of a tree overlooking a path along which they travel to and fro from their feeding grounds, and sell the meat to the villagers. I often tried to get near them, but seldom succeeded, but in one of my wanderings in Burma I came across an open space on the Yomah range of hills and found that a herd of tsine retired to a belt of the jungle in it daily. Getting up at 3 a.m. one day, I walked to the grove, getting wet through for the dew was very heavy, and the grass long. There were many tigers about, too, which did not make it the more pleasant to go through such jungle. We ensconced ourselves in the brushwood, and sat there shivering for hours before the tsine appeared. At last several cows came and then later on two bulls, but I did not get a shot till near 11, for the day was cloudy and the cattle in no hurry to take their mid-day siesta. I killed one and wounded the other. In following him up I found he had turned off near a nullah with a steep bank; the grass was not heavy, and I thought I should see the beast as soon as he could see me. I came to a river bank, steep and with fully ten feet sheer drop to the water, at which there was a fallen tree alongside. I was about to sit down, when there was a rush and the head and pair of horns of a tsine were all but on me. I threw myself backwards, holding on to a branch of the prostrate tree, and so hung over the bank. The impetus of the bull carried him clean over me and he fell with a splash into the pool, where he was speedily killed.

F. T. Pollok.

TURKEY—The wild turkey is the king of the game birds of North America. It was formerly very abundant throughout most portions of the United States, but it is almost as eagerly followed as the deer, and is less well able to protect itself, so that it has now been practically exterminated from most of the Northern States. In the Southern States, however, there are still plenty of places where excellent wild turkey shooting can be obtained. The sport is carried on in several different ways. Sometimes the shot-gun is used, and sometimes the rifle. The birds are sometimes baited, corn being scattered about in some place until they get into the habit of going there, and the shooter then lies in wait for them. More often they are called, a peculiar little whistle being used, and the hunter lying concealed while he imitates the notes either of the gobblers or of the hens. In its essence this is a repetition of moose calling on a small scale, and almost as much skill is necessary, for the wild turkey is an extremely wary bird, and only an expert can call an old gobbler up to a blind.

In the wildest regions it is still possible to enjoy the fun of shooting turkeys on their roosts. Frequently large flocks will make an habit of going to one place to roost, and the hunter can, by taking proper precautions, lie hidden there until they have settled down and night has fallen The turkeys are then very loth to leave, and

frequently a goodly number can be shot, especially if those lowest on the branches are selected, before the others will take flight.

The most sportsmanlike way of killing turkeys, however, is by fair still-hunting with a small calibre rifle. Turkeys are quite noisy, especially in the early morning, and if the still-hunter is out early enough, he can hear them as they fly off from their roosting trees or settle on their feeding grounds. Extreme caution is necessary, for the turkeys are very wary, and the man must be both a good and a quick shot with the rifle.

An even more sporting way of chasing wild turkey is with greyhounds. This is of course only possible in country which is open, interspersed here and there with groves, or gullies filled with brushwood; and of course turkeys are much more quickly killed off in such places than in regions of dense forests, so the sport is necessarily evanescent. It was at one time followed a good deal by the Army officers, and some of the ranchmen, in Texas. The method was to start out quite early in the morning to some ground where the birds were known to be feeding away from thick timber, and to get between them and the cover. Then all possible care was used to bring the dogs as near the birds as possible before the latter took alarm. As the turkey sprang into the air the greyhounds raced after him, for they speedily grew to understand their work, and kept an eye on the bird in front of them. If the turkey managed in his first flight to get to cover, or if he crossed such difficult country that the greyhounds were thrown out, the hunt was over; but if the ground was open and fairly level, and the dogs good, they kept him in sight until he lit. The heavy bodied, short winged turkey is not a bird of strong flight; it gets very tired after going about a mile, and lights. If the greyhounds had been favoured by fortune they were near enough to see the bird as it lit. The turkey then began to run along the ground, but in a minute or so the greyhounds were on him and put him up again. His second flight was always much shorter and slower than the first, for he was now tired. Probably, however, he still kept ahead of the dogs. If he did not distance them at the outset they gained on him towards the end of his flight as he came toward the ground, and ran underneath, making wonderful springs at the spent bird as he sailed along fifteen or twenty feet above their heads. Sooner or later, as the bird became exhausted and sank nearer the ground, one of these springs would be successful, the sharp teeth would close on the old gobbler, and the chase would be at an end. Even if the turkey distanced his pursuers the second time, they would be on him again very soon, and the third flight was so weak that only the close proximity of cover gave the quarry any show at all. It was usually too exhausted to try a fourth flight.

In some old European hunting book I have read of taking the great bustard with greyhounds, and I have elsewhere seen it stated that this was an impossibility, as the bustard was a bird that flew well; but on reading Mr. Abel Chapman's very interesting book on Wild Spain, I was struck by his account of his experience with bustards, and how he followed them on horseback, with the result of finding that after one or two flights the usually wary birds would lie close to the ground and seek to escape observation instead of trusting again to their wings. Under such circumstances it is evident that good greyhounds might take them just as they take wild turkeys.

THEODORE ROOSEVELT.

TURTLE COURSING—In the lagoons of the Laccadive Islands of the Arabian Sea, the turtle is coursed in a sporting fashion that could doubtless be followed in all coral islands. On a still day, when there is no breath of air to ripple the surface and hinder one from readily seeing to the bottom of the clear water of the lagoon, a line of well-manned light rowing boats is formed, with a steersman in the stern, steering with a paddle, and a spearsman standing in the prow. Slowly and silently the line advances, the boats abreast at short distances, and keeping the strictest line, an erect spearsman in the prow of each peering diligently into the clear depths ahead, till he sees a dark object on the white sand of the bottom, and points the direction with his spear. At the same moment the turtle, seeing the boats against the light, makes off, but being clearly visible against the white sandy bottom of the clear lagoon, the viewing spearsman gives the equivalent to a tally-ho, and the pursuit is commenced. Every oarsman strains at his oar with all his might, and the steersman, taking the direction of the turtle's flight from the pointing of the spear in the hand of the prominent figure standing in the prow, follows every turn in the turtle's flight just as if he saw it himself, the spearsman the while excitedly gesticulating, and shouting out whether they are gaining on the turtle or the reverse. Meanwhile, at the first tally-ho, all the other boats have taken up the chase and are racing like greyhounds for the lead, till a turn in the course gives one or other of the boats an advantage, and one and another fresh spearsman takes up the view, his steersman then being guided by his gesticulations. And so the chase proceeds, every oar pulling its very best, or they will hardly keep the turtle in view, every spearsman and every steersman shouting to them to pull better, and creating an Asiatic babel. Sometimes by a lucky turn one boat only is up, and the spearsman plunges head first with his spear. But more ordinarily the turtle, seeing that he is followed on both sides, ceases turning, and keeps a straight course, till his pace slackens, and the boats are closing up to him.

Then, by common consent, each spearsman lays aside his spear, and, still pointing out the direction with outstretched arm, watches his opportunity for a plunge. This he must take to a nicety, so as not to overshoot or fall behind his point, which is the outstretched neck of the swimming turtle. With one hand he has to seize this firmly just behind the head, before the turtle has time to withdraw it, and with the other hand to grip the shell by the edge and turn the turtle belly upwards, so bringing him to the surface. But if he has misjudged his spring he has lost his chance, and the sea is alive with others plunging in after him. These turtle frequently measure 3 feet by 2½ feet, and have a razor-like powerful beak and flippers that can give an ugly scratch. Englishmen have taken their place as prowman and successfully captured turtle by hand in this sporting fashion.

H. S. Thomas.

UNIVERSITY CONTESTS—The following tables give the results of contests between the two Universities, and there are one or two points upon which remark may be made.

Date—The priority in date must be granted to the Cricket Match which was arranged by the energy of the late Bishop Wordsworth, then at Christ Church, Oxford, in 1827, and was played at Lord's. In 1829 the teams met at Oxford; but for the next contest, in 1836, they reappeared at Lord's. Meanwhile, in 1829, the first boat race had been rowed. The Sports followed in 1864, and the five "blue" events were completed by the Rugby match, first played at the Oval in 1872, and by the Association match in 1874 upon the same ground.

Colours.—There appears to be no evidence as to the colours worn by the Oxford cricket team in 1827; but, from the facts pointed out later, it is certain that Cambridge did not wear light blue. At the first boat race, in 1829, "Oxford blue" was adopted as the colour for the crew from the Isis. In all probability this colour was taken from the Horse Guards' Blue, for the designation of that regiment was originally "The Oxford Blues," and the shade of colour is almost identical. At any rate, the resemblance is suggestive.

Cambridge, on the other hand, rowed their first race in pink, and there is a definite tradition as to the cause of their adopting the light blue. Just before the second race, in 1836, the crew realised that they were unprovided with colours, and at the last moment a Mr. R. M. Phillips was hurriedly requested to get them some ribbons, no particular shade being specified. Accompanied by an Eton man, he went to the nearest shop, and at his friend's suggestion purchased a supply of Eton blue ribbons, a chance choice to which future generations adhered.

When the Sports were started in 1864, athletic blues were granted without opposition to the first strings on either side, Oxford being the first to make the concession. A half blue was also granted to the second strings, which became a full blue if they won the event in which they competed.

The struggle for the football blue was more exciting, at Cambridge at least.

After the football teams had played matches for some considerable time, at the request of the Oxford Association captain, the Oxford Rugby captain wrote to the President of the O.U.B.C., requesting that a blue should be granted to both football teams, the eleven and the fifteen. The latter was laid before a meeting of blues, that is, of the cricket team, the athletic blues, and the crew of the boat, and the request was granted at once.

At Cambridge matters were not so easily settled. Towards the close of 1883 the question of granting blues for Rugby and Association was mooted. Application was made and was refused by the then blues, although they offered as a compromise that a certain limited number of blues should be shared between the teams. This was promptly rejected. Next season, on December 10th, 1884, the Cambridge Rugby Union XV. assumed the blue at Blackheath. Naturally a very heated controversy arose, which culminated in a debate at the Cambridge Union, of which full details may be found in the Rev. F. Marshall's book on Rugby football. On a division, the supporters of the football blue were victorious by 707 to 466.

Since this time, certain half blue distinctions have been invented, but they differ at the two Universities. No other full blue exists than the five above mentioned.

All questions connected with the awarding of blues and half blues, the general arrangement of contests, and their dates, come before the Blues Committee, composed of the presidents and captains.

C. R. B. Barrett.

RESULTS OF CRICKET MATCHES.

1827	Drawn.	1855	Oxford won in 1 inn. by 3 wickets.
1829	Oxford won by 115 runs.	1856	Cambridge won by 3wkts.
1835	,, ,, 121 ,,	1857	Oxford ,, 81 runs.
1838	,, ,, 98 ,,	1858	,, ,, in 1 inn. 38 runs.
1839	Cambridge won in 1 inn. by 125 runs.	1859	Cambridge won by 28 runs
1840	,, won by 63 runs.	1860	,, ,, 3 wkts.
1841	,, ,, 8 ,,	1861	,, ,, 133 runs.
1842	,, ,, 162 ,,	1862	,, ,, 8 wkts.
1843	,, ,, 54 ,,	1863	Oxford ,, 8 wkts.
1844	Drawn.	1864	,, ,, 4 ,,
1845	Cambridge won by 6 wkts.	1865	,, ,, 144 runs.
1846	Oxford ,, 3 ,,	1866	Oxford won by 13 runs.
1847	Cambridge ,, 138 runs.	1867	Cambridge ,, 5 wkts.
1848	Oxford ,, 23 ,,	1868	,, ,, 168 runs.
1849	Cambridge ,, 3 wkts.	1869	,, ,, 58 ,,
1850	Oxford ,, 127 runs.	1870	,, ,, 2 ,,
1851	Cambridge ,, in 1 inn. by 4 runs.	1871	Oxford ,, 8 wkts.
1852	Oxford won in 1 inn. by 77 runs.	1872	Cambridge ,, in 1 inn. by 166 runs.
1853	Oxford won in 1 inn. by 19 runs.	1873	Oxford won by 3 wkts.
1854	Oxford won in 1 inn. by 8 runs.	1874	,, ,, in 1 inn. by 92 runs.
		1875	Oxford won by 6 runs.

RESULTS OF CRICKET MATCHES—*Continued.*

1876	Cambridge won by	9 wkts.	1888	Drawn.	
1877	Oxford ,,	10 ,,	1889	Cambridge ,,	1 inn. by 105 runs.
1878	Cambridge ,,	238 runs.	1890	Cambridge won by	7 wkts.
1879	,, ,,	9 wkts.	1891	,, ,,	2 ,,
1880	,, ,,	135 runs	1892	Oxford ,,	5 ,,
1881	Oxford ,,	135 ,,	1893	Cambridge ,,	266 runs.
1882	Cambridge ,,	7 wkts.	1894	Oxford ,,	8 wkts.
1883	,, ,,	7 ,,	1895	Cambridge ,,	134 runs.
1884	Oxford ,,	7 ,,	1896	Oxford ,,	4 wkts.
1885	Cambridge ,,	7 ,,	1897	Cambridge ,,	179 runs.
1886	Oxford ,,	133 runs.	1898	Oxford ,,	9 wkts.
1887	,, ,,	7 wkts.			

RESULTS OF FOOTBALL MATCHES.

Rugby.

1872	Oxford won by a goal from a try.	1885–6	Cambridge, 2 tries to nil.
1873–4	Drawn, 1 try each.	1886–7	,, 3 ,,
1874–5	Drawn, 0—0.	1887–8	Cambridge, 1 goal and 2 tries to nil.
1875–6	Oxford, 1 try to nil.	1888–9	Cambridge, 1 goal and 2 tries to nil.
1876–7	Cambridge, 1 goal 2 tries to nil.	1889–90	Oxford, 1 goal and 1 try to nil.
1877–8	Oxford, 2 tries to nil.	1890–1	Drawn, 1 goal each.
1878–9	Drawn, 0—0.	1891–2	Cambridge, 2 tries to nil.
1879–80	Cambridge, 2 goals to 1 goal.	1892–3	Drawn, nothing scored.
1880–1	Drawn, 1 try each.	1893–4	Oxford, 1 try to nil.
1881–2	Oxford, 2 goals and 1 try to 1 goal.	1894–5	Drawn, 1 goal each.
1882–3	Oxford, 1 try to nil.	1895–6	Cambridge, 1 goal to nil.
1883–4	Oxford, 3 goals and 4 tries to 1 goal.	1896–7	Oxford, 2 goals (1 dr.) to 1 goal 1 try.
1884–5	Oxford, 3 goals and 1 try to 1 try.	1897–8	Oxford, 2 tries to nil.

Oxford 10 ; Cambridge 8 ; drawn 7 ; total 25.

Association.

1873–4	Oxford,	2 to 0	1886–7	Cambridge,	3 to 1
1874–5	Cambridge,	2 ,, 0	1887–8	Oxford,	3 ,, 2
1875–6	Oxford	4 ,, 1	1888–9	Drawn,	1 ,, 1
1876–7	,,	1 ,, 0	1889–90	Cambridge,	3 ,, 1
1877–8	Cambridge,	5 ,, 1	1890–1	Oxford.	2 ,, 1
1878–9	,,	1 ,, 0	1891–2	Cambridge,	5 ,, 1
1879–80	,,	3 ,, 1	1892–3	Oxford,	3 ,, 2
1880–1	,,	2 ,, 1	1893–4	Cambridge,	3 ,, 1
1881–2	Oxford,	3 ,, 0	1894–5	Oxford,	3 ,, 0
1882–3	Cambridge,	3 ,, 2	1895–6	,,	1 ,, 0
1883–4	,,	2 ,, 0	1896–7	,,	1 ,, 0
1884–5	,,	1 ,, 0	1897–8	Cambridge,	1 ,, 0
1885–6	,,	1 ,, 0			

Cambridge 14 ; Oxford 10 ; with one drawn game in 1888–9.

OXFORD AND CAMBRIDGE SPORTS.

100 Yards Flat Race.

		Won by	Official Time. Sec.
1864	S. B. Darbyshire (Wadham, Ox)	½ yd	10¾
1865	H. C. Jollye (Merton, Ox)	½ yd	10¾
1866	R. W. Vidal (St. John's, Ox) / T. M. Colmere (B.N.C., Ox)	Dead / Heat	10⅗
1867	E. A. Pitman (St. John's, Cam)	2 ft	10⅔
1868	J. P. Tennent (Wadham, Ox)	2½ yds	10
1869	J. G. Wilson (Worcester, Ox)	2 yds	10⅗
1870	J. G. Wilson (Worcester, Ox)	1½ yds	10
1871	J. G. Wilson (Worcester, Ox)	6 ins	10⅔
1872	W. A. Dawson (Trin, Cam)	2 yds	10⅔
1873	G. H. Urmson (Ch Ch, Ox)	2 yds	10
1874	E. J. Davies (Pem. Cam)	1 yd	10⅖
1875	C. C. Woodland (Corpus, Cam)	1 yd	10⅖
1876	M. Shearman (St. John's, Ox)	3 yds	10⅖
1877	E. C. Trepplin (B.N.C , Ox)	2 yds	10⅖
1878	E. C. Trepplin (B.N.C., Ox)	3 yds	10⅖
1879	E. C. Trepplin (B.N.C., Ox)	1 yd	10⅖
1880	E. L. Lucas (Jesus, Cam)	1½ yds	10⅖
1881	L. Carter (Corpus, Ox.)	1 yd	10⅔
1882	L. Carter (Corpus, Ox)	¾ yd	10⅔
1883	W. G. Mosse (Corpus, Cam)	1 ft	10⅔
1884	L. Carter (Corpus, Ox)	1 ft	10⅔
1885	H. E. Booty (Clare, Cam)	½ ft	10⅘
1886	H. C. L. Tindall (Christ's, Cam)	4 ft	10½
1887	E. S. Fardell (Trin, Cam) / H. M Fletcher (Trin, Cam)	Dead / Heat	10⅘
1888	H. M. Fletcher (Trin. Cam)	1 ft	10⅘
1889	R. W. Turner (Trin. Hall, Cam)	2 ft	10⅔
1890	E. O. B. Prest (Trin. Hall, Cam)	6 ins	10⅘
1891	A. Ramsbotham (Exeter, Ox) / C. J. B. Monypenny (Jesus, Cam)	Dead / Heat	10⅔
1892	A. Ramsbotham (Exeter, Ox)	1 ft	10⅔
1893	A. Ramsbotham (Exeter, Ox) / C. B. Fry (Wadham, Ox)	Dead / Heat	10⅘
1894	G. Jordan (Univ. Ox)	½ yd	10⅔
1895	G. Jordan (Univ. Ox)	9 ins	10⅗
1896	G. Jordan (Univ. Ox)	2 yds	10⅘
1897	C. R. Thomas (Jesus, Ox) / F. L. Carter (Caius, Cam)	Dead / Heat	10⅘
1898	C. R. Thomas (Jesus, Oxford)	1½ yds	10⅔

Quarter Mile Flat Race.

			Sec.
1864	S. B. Darbyshire (Wadham, Ox)	2 yds	56
1865	Hon. F. G. Pelham (Trin, Cam)	20 yds	55½
1866	Hon. F. G. Pelham (Trin, Cam)	3 yds	54½
1867	E. A. Pitman (St. John's, Cam)	2 yds	52
1868	J. H. Ridley (Jesus, Cam)	3 yds	51
1869	A. B. Upcher (Trin, Cam)	4 yds	53
1870	R. V. Somers-Smith (Mer, Ox)	1½ yds	51⅘
1871	R. Philpot (Trin, Cam)	2 yds	50½
1872	R. Philpot (Trin, Cam)	2 yds	51⅘
1873	G. H Urmson (Ch Ch, Ox)	10 yds	51
1874	G. A. Templer (Trin, Cam)	4 yds	51¼
1875	T. Snow (New, Ox)	1½ yds	51⅘
1876	A. R. Lewis (Corpus, Cam)	8 yds	52⅘
1877	W. H. Churchill (Jesus, Cam)	2½ yds	52⅘
1878	W. H. Churchill (Jesus, Cam)	3 yds	51¼
1879	M. R. Portal (Balliol, Ox)	6 yds	52½
1880	R. H. Macaulay (King's, Cam)	4 yds	51⅗
1881	R. H. Macaulay (King's, Cam)	2 yds	50½
1882	R. H. Macaulay (King's, Cam)	5 yds	50⅗
1883	E. P. Powell (Trin, Cam)	3 yds	52⅗
1884	M. H. Paine (Merton, Ox)	½ yd	51½
1885	A. S. Blair (B. N. C., Ox)	½ yd	51½
1886	H. C. L. Tindall (Christ's, Cam)	9 yds	51
1887	H. M. Fletcher (Trin, Cam)	1 yd	53⅗
1888	A. G. Lemaitre (St. John's, Ox)	2½ yds	51⅗
1889	K. W. Turner (Trin. Hall, Cam)	10 yds	51⅗
1890	W. B. Thomas (Ch Ch, Ox)	9 yds	50½
1891	P. R. Lloyd (Pem, Ox)	6 ins	50⅗
1892	C. J. B. Monypenny (Jesus, Cam)	8 yds	49½
1893	A. Ramsbotham (Exeter, Ox)	4 yds	50⅗
1894	G. Jordan (Univ. Ox)	4 yds	50⅘
1895	W Fitz-Herbert (Trin. Hall, Cam)	4 yds	50
1896	W. Fitz-Herbert (Trin. Hall, Cam)	4 ft	49⅗
1897	G. Jordan (Univ. Ox)	8 yds	49½
1898	E. L. Carter (Caius, Cam) / C. G. Davison (Sidney, Cam)	Dead / Heat	51

One Mile Flat Race.

			Min.	Sec.
1864	C. B. Lawes (Trin, Cam)	4 yds	4	59
1865	R. E. Webster (Trin, Cam)	40 yds	4	44½
1866	J. W. Laing (Ch. Ch., Ox)	20 yds	4	46
1867	S. G. Scott (Magdalen, Ox)	6 yds	4	40⅗
1868	W. C. Gibbs (Jesus, Cam)	20 yds	4	28½
1869	E. Royds (Trin. Hall, Cam)	3 yds	4	35
1870	R. H. Benson (Balliol, Ox)	1 yd	4	32⅗
1871	T. Christie (Lincoln, Ox)	6 yds	4	34
1872	T. Christie (Lincoln, Ox)	3 yds	4	38⅗
1873	C. E. Gunton (Trin, Cam)	10 yds	4	28⅗
1874	E. A. Sandford (Ch. Ch., Ox)	3 yds	4	39½
1875	E. A. Sandford (Ch. Ch., Ox)	½ yd	4	34⅘
1876	E. R. J. Nicholls (Ch. Ch., Ox)	6 yds	4	27½
1877	W. Cunliffe (Trin, Cam)	3 yds	4	32¼
1878	D. L. Clarke (Magdalen, Ox)	1½ yds	4	31⅗
1879	B. R. Wise (Queen's, Ox)	5 yds	4	34⅗
1880	B. R. Wise (Queen's, Ox)	25 yds	4	28½
1881	T. E. Wells (Magdalen, Ox)	25 yds	4	36½
1882	T. E. Wells (Magdalen, Ox)	50 yds	4	30⅗
1883	W. D. LaTouche (Pem, Cam)	18 yds	4	34½
1884	G. E. H. Pratt (St. John's, Ox)	3 yds	4	26⅗
1885	E. R. Holland (Pem, Ox)	12 yds	4	37⅗
1886	F. J. K. Cross (New, Ox)	8 yds	4	28⅗
1887	F. J. K. Cross (New, Ox)	40 yds	4	25⅗
1888	F. J. K. Cross (New, Ox)	25 yds	4	29⅗
1889	F. J. K. Cross (New, Ox)	20 yds	4	28⅗
1890	W. Pollock-Hill (Keble, Ox)	60 yds	4	21⅗
1891	B. C. Allen (Corpus, Ox)	3 yds	4	26⅗
1892	W. E. Lutyens (Sidney, Cam)	6 yds	4	24⅗
1893	W. E. Lutyens (Sidney, Cam)	25 yds	4	22
1894	W. E. Lutyens (Sidney, Cam)	10 yds	4	19¼
1895	W. E. Lutyens (Sidney, Cam)	60 yds	4	23⅗
1896	H F. Howard (Trinity Hall, Cam)	13½ yds	4	29¼
1897	H. F. Howard (Trinity Hall, Cam)	12 yds	4	27⅗
1898	A. L. Danson (Balliol, Ox)	6 in.	4	25⅘

Two Miles Flat Race.

			Min.	Sec.
1864	There was no race.			
1865	R. E. Webster (Trin, Cam)	40 yds	10	38½
1866	J. W. Laing (Ch. Ch., Ox) / C. H. Long (Trin, Cam)	Dead / Heat	10	20
1867	R. L. N. Mitchell (Ch. Ch., Ox)	1 ft	9	59

In 1868 a Three Miles Race was substituted.

Three Miles Flat Race.

		Won by	Official Time. Min.	Sec.
1868	J. H. Morgan (Trin. Ox)	200 yds	15	20¼
1869	J. H. Morgan (Trin. Ox)	200 yds	15	35
1870	J. H. Morgan (Trin. Ox)	100 yds	15	40
1871	A. F. Clarke (Trin. Ox)	100 yds	15	23
1872	R. H. Benson (Balliol, Ox) / E. M. Hawtrey, St. John's, Cam)	Dead / Heat	15	44⅖
1873	W. M. Smith-Dorrien (Mag, Ox)	100 yds	15	8⅗
1874	W. R. H. Stevenson (New, Ox)	220 yds	15	46
1875	W. R. H. Stevenson (New, Ox)	25 yds	15	30⅘
1876	A. Goodwin (Jesus, Ox)	40 yds	15	12
1877	W. R. H. Stevenson (New, Ox)	190 yds	15	38
1878	A. Goodwin (Jesus, Ox)	25 yds	15	50⅘
1879	A. F. Hills (Univ. Ox)	150 yds	15	14⅘
1880	W. W. Hough (Corpus, Cam)	85 yds	15	1¼
1881	F. R. Benson (New, Ox)	280 yds	15	5½
1882	W. W. Hough (Corpus, Cam)	180 yds	15	27½
1883	W. W. Hough (Corpus, Cam)	160 yds	15	29¼
1884	T. C. Toler (Ch. Ch., Ox)	10 yds	15	24⅘
1885	E. F. W. Eliot (Trin, Cam)	10 yds	15	27½
1886	J. H. A. Marshall (Univ. Ox)	150 yds	15	11¼
1887	F. M. Ingram (Magd. Ox)	7 yds	15	25¾
1888	W. Pollock-Hill (Keble, Ox)	50 yds	15	28¼
1889	W. Pollock-Hill (Keble, Ox)	70 yds	15	20⅘
1890	W. Pollock-Hill (Keble, Ox)	80 yds	15	20⅘
1891	C. Ekin (Clare, Cam)	8 yds	15	12½
1892	B. C. Allen (Corpus, Ox)	60 yds	15	13½
1893	F. S. Horan (Trin. Hall, Cam)	80 yds	14	44⅗
1894	F. S. Horan (Trin. Hall, Cam)	20 yds	15	7
1895	F. S. Horan (Trin. Hall, Cam)	150 yds	14	50⅖
1896	J. M. Fremantle (Hertford, Ox)	10 yds	15	12
1897	J. M. Fremantle (Hertford, Ox)	50 yds	15	7⅕
1898	J. M. Fremantle (Hertford, Ox)	100 yds	15	34

120 Yards Hurdle Race (10 Hdls.).

		Sec.
1864	A. W. T. Daniel (Trin. Cam) 6 yds	17½
1865	T. Milvain (Trin. Hall, Cam) 1 yd	19
1866	D. Morgan (Magd. Hall, Ox) 2 yds	18¼
1867	C. N. Jackson (Magd. Hall, Ox) 3 yds	17½
1868	C. Pitt-Taylor (Trin. Cam) 3 yds	16⅔
1869	F. O. Philpott (St. Edm. Hall, Ox) 3 yds	17½
1870	J. L. Stirling (Trin. Cam) 8 yds	16¾
1871	W. C. Davies (Trin. Cam) / E. S. Garnier (Univ. Ox) Dead / Heat	16¾
1872	E. S. Garnier (Univ. Ox) 1 ft	16½
1873	H. K. Upcher (St. John's, Ox) 1 yd	17½
1874	H. K. Upcher (St. John's, Ox) 5 yds	16½
1875	A. B. Loder (Jesus, Cam) 1 ft	16⅝
1876	A. B. Loder (Jesus, Cam) 8 yds	16
1877	S. F. Jackson (St. John's, Ox) 1½ yds	17
1878	S. Palmer (Corpus, Cam) 6 ins	16⅝
1879	L. K. Jarvis (Trin, Cam) 1½ yds	16⅝
1880	G. P. C. Lawrence (Corpus, Ox) 1½ yds	16⅝
1881	W. E. Bailey (Trin, Cam) 2½ yds	16⅝
1882	C. L. Des Graz (Trin, Cam) 3 yds	17½
1883	C. L. Des Graz (Trin, Cam) 1 yd	17½
1884	W. R. Pollock (Trin, Cam) 5 yds	16
1885	A. McNeil (Trin, Ox) 8 yds	17⅝
1886	A. C. M. Croome (Magd., Ox) 3 yds	16⅝
1887	J. Le Fleming (Clare, Cam) 1½ yds	17⅜
1888	J. Le Fleming (Clare, Cam) 2 yds	17½
1889	J. L. Greig (Clare, Cam) 1 ft	16⅝
1890	J. L. Greig (Clare, Cam) 5 yds	16½
1891	H. Le Fleming (Clare, Cam) 3 yds	16⅝
1892	H. Le Fleming (Clare, Cam) 1½ yds	16⅔
1893	H. T. S. Gedge (Keble, Ox) / E. L. Collis (Keble, Ox) Dead / Heat	16⅝
1894	W. J. Oakley (Ch. Ch., Ox) 1 yd	16⅔
1895	W. J. Oakley (Ch. Ch., Ox) 1 yd	16⅝
1896	E. T. Garnier (Oriel, Ox) 6 ins.	16½
1897	E. T. Garnier (Oriel, Ox) 2½ yds	16⅝
1898	E. T. Garnier (Oriel, Ox) 6 ins	16⅔

200 Yards Hurdle Race (10 Hdls.).

		Sec.
1864	E. Wynne-Finch (Trin. Cam) 6 ins	26¾

This race has not since been run.

Steeplechase (about 2 Miles).

		Min.
1864	R. C. Garnet (Trin, Cam)	10

This race has not since been run.

Long Jump.

		Distance	ft.	in.
1864	F. H. Gooch (Merton, Ox)		18	0
1865	F. H. Gooch (Merton, Ox)		18	9
1866	T. G. Little (St. Peter's, Cam)		20	4
1867	C. A. Absolom (Trin, Cam)		20	2
1868	A. C. Tosswell (Oriel, Ox)		21	0¼
1869	R. Waltham (St. Peter's, Cam)		20	8
1870	J. A. Ormsby (Lincoln, Ox)		20	3¾
1871	E. N. Hodges (Queen's, Ox)		20	2
1872	E. J. Davies (Pem, Cam)		21	5
1873	E. J. Davies (Pem, Cam)		21	8
1874	E. J. Davies (Pem, Cam)		22	10½
1875	H. K. Upcher (St. John's, Ox)		21	0
1876	M. J. Brooks (B. N. C., Ox)		21	8½
1877	C. M. Kemp (Oriel, Ox)		20	1¾
1878	C. M. Kemp (Oriel, Ox)		22	2¼
1879	E. Baddeley (Jesus, Cam)		20	10⅝
1880	H. S. Wood (Queen's, Ox)		20	11½
1881	E. Storey (Trin, Cam)		21	0½
1882	H. S. Wood (Queen's, Ox)		20	1¾
1883	M. B. Peacock (Trin, Ox)		20	3½
1884	O. Grabham (Jesus, Cam)		20	11½
1885	A. G. Grant-Asher (B. N. C., Ox)		19	10
1886	F. B. Roberts (Selwyn, Cam)		21	9½
1887	F. G. Tuck (Trin, Cam)		20	2
1888	W. C. Kendal (St. John's, Cam)		20	10⅜
1889	J. L. Greig (Clare, Cam)		21	0½
1890	J. L. Greig (Clare, Cam)		22	7¾
1891	T. Jennings (Caius, Cam) / R. J. Leakey (Corpus, Cam)	Dead / Heat	20	7½
1892	C. B. Fry (Wadham, Ox)		23	5
1893	C. B. Fry (Wadham, Ox)		23	0½
1894	C. B. Fry (Wadham, Ox)		22	4
1895	W. Mendelson (Jesus, Cam)		22	5½
1896	E. Batchelor (Caius, Cam)		22	7
1897	G. C. Vassall (Oriel, Ox)		22	7
1898	G. C. Vassall (Oriel, Ox)		22	5¼

High Jump.

		Heigbt	ft.	in.
1864	F. H. Gooch (Merton, Ox)		5	5
1865	F. H. Gooch (Mert n, Ox)		5	5
1866	J. H. Roupell (Trin. Hall, Cam)		5	6
1867	T. G. Little (St. Peter's, Cam)		5	9
1868	Hon. F. S. O'Grady (St. John's, Ox)		5	7
1869	R. L. N. Mitchell (Ch. Ch., Ox) / J. G. Hoare (Trin, Cam)		5	5
1870	E. Bergman (St. Edmund's Hall, Ox) / J. H. Gurney (Trin, Cam)		5	4½
1871	J. H. Gurney (Trin, Cam)		5	5½
1872	J. H. Gurney (Trin, Cam)		5	5
1873	J. H. Gurney (Trin, Cam)		5	6
1874	Mr. J. Brooks (B. N. C., Ox)		5	10
1875	M. G. Glazebrook (Balliol, Ox)		5	9
1876	M. J. Brooks (B. N. C., Ox)		6	2½
1877	G. W. Blathwayt (Corpus, Cam)		5	7
1878	G. W. Blathwayt (Corpus, Cam)		5	8
1879	R. H. Macaulay (King's, Cam)		5	8¾
1880	R. H. Macaulay (King's, Cam)		5	9
1881	H. R. Cooke (Trin, Cam)		5	6
1882	G. L. Colbourne (Corpus, Cam)		5	8½
1883	G. L. Colbourne (Corpus, Cam)		5	8¾
1884	G. L. Colbourne (Corpus, Cam)		5	9
1885	G. F. Hornby (Corpus. Ox) / W. P. Montgomery (Merton, Ox) / S. O. Purves (Queen's, Cam)		5	6½
1886	W. P. Montgomery (Merton, Ox)		5	8½
1887	W. P. Montgomery (Merton, Ox)		5	8½
1888	W. P. Montgomery (Merton, Ox)		5	10½
1889	H. J. Scott (Merton, Ox) / E. B. Badcock (Trin, Cam)		5	8
1890	T. Jennings (Caius, Cam)		5	8¾
1891	H. Le Fleming (Clare, Cam)		5	9½
1892	H. Le Fleming (Clare, Cam)		5	9½
1893	E. D. Swanwick (Univ. Ox)		5	11
1894	E. D. Swanwick (Univ. Ox)		5	10½
1895	G. A. Gardiner (New, Ox)		5	9
1896	E. O. Kirlew (Ch. Ch., Ox)		5	8½
1897	E. O. Kirlew (Ch. Ch., Ox) / E. H. Cholmeley (Jesus, Cam)		5	7⅝
1898	H. S. Adair (Oriel, Ox)		5	8

Throwing the Cricket Ball.

		Yds.	ft.	in.
1865	E. A. Gray (Trinity Hall, Cam)	103	2	8

In 1864 and since 1865 the Ball has not been thrown.

Throwing the Hammer (16 lb.).

		ft.	in.
1866	G. R. Thornton (Jesus, Cam)	87	7
1867	J. R. Eyre (Clare, Cam)	98	0
1868	T. Batson (Lincoln, Ox)	99	6
1869	H. Leeke (Trin, Cam)	103	11
1870	F. U. Waite (Balliol, Ox)	107	2
1871	A. W. Churchward (Pem, Cam)	105	5
1872	J Paterson (Trin, Cam)	105	2
1873	S. S. Brown (St. John's, Ox)	122	6
1874	G. H. Hales (Trin, Cam)	126	9
1875	G. H. Hales (Trin, Cam)	127	0
1876	G. H. Hales (Trin, Cam)	138	3
1877	G. H. Hales (Trin, Cam)	138	0
1878	E. Baddeley (Jesus, Cam)	106	2
1879	A. H. East (St. John's, Cam)	117	1½
1880	A. H. East (St. John's, Cam)	116	0
1881	W. Lawrence (St. John's, Ox)	120	2

		Distance	ft.	in.
1882	H. H. Birley (Jesus, Cam)		101	10
1883	F. P. Le Marchant (Queen's, Ox)		95	8
1884	F. P. Le Marchant (Queen's, Ox)		107	4
1885	J. R. Orford (King's, Cam)		99	7
1886	J. H. Ware (B. N. C., Ox)		96	11
1887	H. Neilson (Clare, Cam)		94	10
1888	H. Woolner (Trin, Cam)		93	10
1889	K. L. Macdonald (St. John's, Ox)		91	5
1890	N. M. Cohen (Jesus, Cam)		94	2
1891	T. Jennings (Caius, Cam)		102	10
1892	H. A. Cooper (Trin. Hall, Cam)		96	4
1893	G. S. Robertson (New, Ox)		105	1½
1894	G. S. Robertson (New, Ox)		101	4½
1895	G. S. Robertson (New, Ox)		116	7
1896	A. B. Johnstone (Pembroke, Cam)		107	7
1897	J. A. Halliday (Trin, Cam)		97	9
1898	L. O. T. Baines (Trin. Hall, Cam.)		102	6

In 1864 and 1865 Hammer throwing was not in the Programme.

PUTTING THE WEIGHT (16 LB.).

		Cam. style. ft.	in.	Ox. style. ft.	in.	Total dist. ft.	in.
1865	G. W. Elliott (Trin, Cam)	31	4½	33	10	65	0½
1866	G. W. Elliott (Trin, Cam)	32	10½	—		—	
1867	R. Waltham (St. Pet, Cam)	34	9	—		—	
1868	R. Waltham (St. Pet, Cam)	34	3	—		—	
1869	R. Waltham (St. Pet, Cam)	34	4	—		—	
1870	S. F. Lucas (Exeter, Ox)	36	2½	—		—	
1871	H. W. R. Domville (Pem, Ox)	35	3½	—		—	
1872	H. W. R. Domville (Pem, Ox)	37	5½	—		—	
1873	S. S. Brown (St. John's, Ox)	35	2	—		—	
1874	S. S. Brown (St. John's, Ox)	37	11	—		—	
1875	S. S. Brown (St. John's, Ox)	36	2			—	
1876	C. H. Hodges (Queen's, Ox)	36	0	—		—	
1877	H. O. D. Davidson (Trin, Cam)	35	0½	—		—	
1878	A. H. East (St. John's, Cam)	36	7½	—		—	
1879	A. H. East (St. John's, Cam)	36	2½	—		—	
1880	A. H. East (St. John's, Cam)	37	5	—		—	
1881	W. Lawrence (St. John's, Ox)	36	5	—		—	
1882	A. M. Evanson (Jesus, Ox)	35	11	—		—	
1883	J. H. Ware (B. N. C., Ox)	37	10½	—		—	
1884	J. H. Ware (B. N. C., Ox)	37	6	—		—	
1885	J. H. Ware (B. N. C., Ox)	36	11	—		—	
1886	J. H. Ware (B. N. C., Ox)	39	1	—		—	
1887	E. O'F. Kelly (Caius, Cam)	36	3	—		—	
1888	E. O'F. Kelly (Caius, Cam)	37	0	—		—	
1889	C. Rolfe (Clare, Cam)	35	6½	—		—	
1890	M. B. Elder (Jesus, Cam)	37	5	—		—	
1891	S. H. Barber (King's, Cam)	35	7	—		—	
1892	C. A. White (New, Ox)	36	2½	—		—	
1893	E. Hind (Keble, Ox)	34	11½	—		—	
1894	C. H. Rivers (St. John's, Cam)	37	8½	—		—	
1895	E. J. Watson (Trin, Cam)	37	9	—		—	
1896	J. H. Bulloch (Trin, Cam)	38	2	—		—	
1897	J. H. Bulloch (Trin, Cam)	37	6½	—		—	
1898	F. E. Snowball (Queen's, Ox)	37	4	—		—	

The Sports have been won on 15 occasions by Oxford and on 19 occasions by Cambridge.

There has been one tie, and if on that occasion the Sports had been decided by seconds, Cambridge would have won.

Since the commencement of the Sports, Oxford has scored 159 firsts and 158 seconds, and Cambridge has scored 155 firsts and 149 seconds, out of 314 events.

For the Boat Race results, see Vol. II., p. 296.

UNIVERSITIES, SPORT AT AMERICAN—At an American University all forms of sport are taken far more seriously than is the case at Oxford or Cambridge. In comparing my Harvard friends with those far more numerous companions who were my contemporaries at Oxford, I find it difficult to realise that both were undergraduates. The differences are emphasised with a keenness that is reflected in the men themselves, in every branch of sport which they affect, in the very point of view from which they regard their time at a University and their lives afterwards.

Climate, to begin with, is a very vital factor in the problem of describing either an English undergraduate to an American student, or a Cambridge "man" to him of Yale or Harvard. Abuse the English climate as you may, there is yet in it that saving quality of moderation which escapes the deadening extremes of heat or cold. A Thames that will bear a coach and four is as rare as a Henley that produces sunstroke in a single crew. Rowing is indeed not only a possibility, but in almost every year a recorded fact on English rivers from the first day of January till the last day of December. And since few Englishmen are content with merely practice, you shall find an energetic wet-bob within sight of a good race from one end of a year to the other.

Take the career of a freshman, for instance, who goes up to Christ Church with a reputation from the Eton eight, perhaps as captain of the winning crew in the last Ladies' Plate. He probably rows for his college in the University Fours in his first term; he certainly is sent up for the University Trial Eights, and before the next term begins he will have had a chance of several good races and at least two victories to add to his experience. If his excellence is already proved to be first class, he goes at the end of January straight into the University crew, and finishing the last part of his training upon tidal waters, he races at Putney against Cambridge early in April. If this has as yet proved impossible of attainment, he has at least rowed in his College Torpid, and very possibly put seven hard bumping races to his credit, without counting other minor college competitions that may come in his way. In the summer term the rowing calendar grows yet more thickly studded with "important fixtures." His college eight often begins training before the rest of the University are in residence. Soon after the middle of the term his crew has made its bid for the headship of the river, ousted its rivals, or maintained its place, and he sees his way clear to the possible entry for a cup at Henley. But there are University Sculls and Pairs to be won before the Isis is deserted, and the lesser triumphs of his college regatta to achieve, and a short period of rest (if his captain be a wise one) enjoined before the Henley training starts. After all that has gone before, about three weeks only is required (except in rare cases), either to accustom a college eight to the lively water of the lower reaches, or to weld into a crew the various oarsmen picked from the best of either University, who represent such a combination as Leander; for at Cambridge the rowing season has been, to all intents and purposes, identical.

Imagine, then, the American crew whom our three-weeks Leander eight find ready for them at the Temple Island. Whether they hail from Yale or Harvard or Cornell, they are eight as big and strong and handsome men as ever sat in a boat on either side of the Atlantic. You notice particularly the fine development of their arms and the sunburn of their skins; for their habit of rowing naked to the waist at home has

coloured them like so many bronze statues. But the greatest difference of all you will not see, for it is rather mental than physical, rather moral than material; it has nothing to do with *papier maché* boats and central seating, with swivel rowlocks or new-patterned blades; it is a matter of the "point of view," and a result of training, or—if you will—of nationality. Six months ago these eight devoted boys were practically certain that they would represent their University at Henley. Six months ago they toiled in a gymnasium at appointed tasks; they worked at an accurately calculated piece of machinery in a tank; they thought and slept, and dreamt and lived on rowing. If the contest in question had been one of Yale against Harvard, the eight would have devoted their entire nervous energy for a very considerable period not to rowing merely, but to the problem how most decisively to beat their rivals. The prospect of defeat has filled them with the bitter conviction that their whole after life would be a disgusting dreary desert. The vision of success has brought with it plans for extended journeying around a sympathetically joyful universe. Exile in a hard-worked West, where alone the vanquished may hide his humbled head from a world that echoes with derisive scorn, is their only alternative. The thing began very seriously indeed; it went on with dogged resolution; it has ended in a nervous tension that wears every member of the crew to fiddle-strings. And this is not merely the result of a necessarily peculiar preparation; it has been caused by intense mental preoccupation, only interrupted by examinations far more severe and far more frequent than any Blue at either English University is called upon to face. But it is caused more than all by a conviction that nothing—absolutely nothing—will atone for the bitterness of defeat. How different all this is from the "mental attitude" of the English crew beside them, must be clear from what has been already said. Whether from Oxford or from Cambridge, the English oarsman has had far more things than rowing to occupy his attention in the year that lies behind; even in rowing alone, so many varied interests and so many different races have taken up his time, that this international contest which winds up his summer season is itself but the final incident of an excellent good time.

Because I have so far confined myself to rowing, it must not be thought that this is the only sport in which the American undergraduate has a far harder time than we do. It was once actually said that the English took their pleasures seriously. That critic can never have had the advantage of visiting an American University. Sadness is no word for the feeling with which a Yale or Harvard captain approaches any contest against his hated rivals. He is filled with a serious and solemn realisation that out of an infinity of possibilities it lies upon him to choose that special combination which shall ensure success. He has no joy in practising save as a means to the perfection of that end. He takes no delight in the actual contest till the final record proves him incontestably—nay, overwhelmingly—the victor. This feeling finds its expression in the rigid formation of a certain style, that after long study has been judged to be most likely to succeed. That is why you hear strange terms like the "Abraham Lincoln" stroke, or the "George Washington" style in various Universities. The gentlemen whose names are thus immortalised are supposed to have invented a particular manipulation of the arms and body, which will apply the blade in a manner absolutely invincible, and—most important of all—absolutely unknown to any rival prophet. That is why American football teams practise in the darkest secrecy behind high palisades with posted scouts to ward off spies from any hostile camp. The rival team or eight might possibly discover the talisman of victory and put the secret of their opponents' lively combinations to their own base uses. I shall never forget the horror of an American University friend of mine when he first realised that Oxford were about to accompany the Cambridge coach in his own steam launch while he shouted instructions to the light blue crew. His state of mind then was only surpassed by the blank amazement with which he learnt one night at Putney that Cambridge were beguiling the after-dinner tedium of their training by inviting the Dark Blues to see—and loudly laugh at—a moving picture of the Cambridge crew at work near Mortlake thrown upon the screen by the merciless animatograph.

He was almost as much confused to hear the independent fashion in which the rival captains settled the details of the coming race. For no American undergraduate, however exalted his position among his fellow-sportsmen, can dare to settle the details of an athletic fixture of his own mere motion. The love of legal quibbling—which I have already noticed in another article upon their football—may perhaps go for something in accounting for this. But a very direct—and to my mind a very unfortunate—cause, is the way in which graduates are allowed the control of these affairs; not younger men only who have just taken their degrees, but men whose only excuse for being connected with University sport is the fact that they have grown old in delivering University lectures. I must not be so misunderstood as to be charged with ingratitude to the many—who shall be nameless, for their fame needs no advertisement and does not seek it—who have lived on at Oxford and Cambridge doing such good service to their various athletic institutions that we almost forgot they were "Dons" at all. But not one of these public-spirited gentlemen interferes with athletic details in the manner common in America. A con-

spicuous instance occurred at the last University boat race (1898). Not a man present had any voice in the matter save the two presidents. Many were of the opinion that a race in such weather was not only unwise but impossible. Yet the captains wished to row, and they did. The men who run, or play cricket and football, or row are accustomed to manage their own affairs in this manner, and it is a very good thing for them. Financial matters are often left —and with great advantage—to permanent and older officials of the kind I have mentioned. But it is no small part of the valuable training of English University life that the undergraduates have so much of the management of their own affairs in their own hands. Even a college captain tastes the joys of leadership and is stiffened by responsibility. The captain of any University team is a far more important member of society. The honour of his University in some particular direction is in his hands to make or mar. He is not judged merely on results, but he is asked to make the best use of his material, and he is conscious that every man behind him backs him up. The lessons in personal self-control, in the conduct of affairs, in the treatment of other men, that are thus acquired, are of the highest service afterwards, and even at the Universities their effect is to turn out men much more in contact with the realities of life, as represented by the surroundings of a larger world than is the case in America.

For at Harvard, to take an instance typical of the rest, the governing body of the university (called the "Faculty") has controlled its sports from the beginning: a system that has some excuse with schoolboys, or even at the outset of a very small University, but is antiquated and unnecessary now for Yale or Harvard or their rivals. Imagine the Senate or the Hebdomadal Council arranging the details of the 'Varsity sports and deciding to abolish the hundred yards! Yet the Harvard Faculty has always been accustomed to issue ordinances allowing or forbidding certain competitions, deciding the number, the date, and the place of various matches, controlling the movements of the members of the teams. Though undergraduates now go up a little older than they used to do, and though increase in numbers has been attended by a vast increase in all forms of athletics, yet the principle of this strange interference with University sports continues in the new "Athletic Committee" of nine, on which there are only three undergraduates, the remaining two-thirds being graduates and Dons. In the hands of this committee are placed all arrangements for the contests with Yale or other universities; with them rests the final and indispensable confirmation even of a captain whom a team have elected for themselves. One result is a quantity of preliminary correspondence which is far too like the prelude to a modern prize fight. I have no doubt that reluctance to begin relations with an epistolary war of words has often caused Oxford and Cambridge undergraduate captains to seek refuge in silence from the multitudinous queries of an American athletic committee more than half composed of Dons.

But the tyrannous way in which these young Republicans are governed is not the only thing which fills an inquiring English visitor with surprise. He regrets to discover that the spirit of competition is not nearly such a keenly living thing as he remembers it at home. It is replaced by a fatal lust for scoring victories and making "records." I will show what I mean by a quotation from one of their own prophets, one of the best sportsmen America has ever sent over here to write the result of his experience for his compatriots' instruction. Mr. Caspar Whitney remarks with surprise on the frequency with which our University football teams continue to play matches after the most important fixtures on their card is over. This, he writes, "differs materially from our own system, and is not so good, since it makes a series of anti-climaxes, where there is nothing to gain and everything to lose." Mr. Whitney has evidently yet to learn that English athletic contests are not arranged solely from the spectacular point of view. It is obvious that he cares more for victory in a certain match than for any enjoyment of the sport itself. But his admirable book seems to have done some good already. For soon after its publication there were signs that "college politics" were losing some of their severity. Early last spring (in 1897) a meeting between Harvard, Yale, and Cornell was arranged without any difficulty; and Columbia, Cornell, and Pennsylvania agreed to race as well. But this was only after a period of disputing which had almost resulted in the death of college athletics altogether. It seemed to have been entirely forgotten that victory or defeat were alike far less important than the fact of racing or playing one team against another, whatever the results.

I cannot but think that one reason for this diminution in the competitive spirit is to be found in the constitution of American Universities. For these abodes of learning are "one and indivisible." There are no separate colleges, apparently no centres round which that keen individual rivalry can cluster which is so well known at Oxford and Cambridge. Consequently there is no struggle twice a year for the headship of the river, no competitions for a college cup, no body of separately organised boat clubs from which ready-trained oars can be selected for the University crew. A far more fatal result is that an American undergraduate cannot get one-fiftieth of the racing or of the competition in any form of sport that his more fortunate English rival may enjoy. By the efforts

of Mr Rudolph Lehmann—to whose book I, like every one interested in these matters, am already an acknowledged debtor—an attempt has been made to widen the somewhat sterile rivalry of the various "classes," or years, into a longer series of competitions; and with excellent results.

But there is one thing that even Mr. Lehmann cannot do; he cannot change the climate. Though he can encourage sport during October and November, which were hitherto left useless, he cannot thaw the rivers that are icebound from December to March, nor can he mitigate the torrid heat from July to September. This is one reason, though not the chief one, why the American's opportunities compare so unfavourably with the list already given of an English undergraduate's chances, even in one sport alone. For in January a Yale or Harvard man is already sent to the training table for his University crew, already begins regular exercise, and learns the slow heart-breaking labour of rowing in a tank on a machine. Varying the monotony by no racing whatsoever, the coach keeps his men at this until the eight appears on the water early in March. Their great and only race comes off in June. No wonder they are worked up to a pitch of nervous excitement that is often as pitiful as it is unnecessary. That they last through it at all is an uncommon testimony to their physique and pluck. Until the mere division of the whole body of students according to their age of residence is given up, until they race at least once in sculls and pairs, and fours (all of which are apparently unknown), and more than once in eights, I cannot think that even their splendid physical development and their undoubted courage will ever get a proper opportunity for successful display on this side of the Atlantic.

Because I have said a good deal about one form of sport, it must not be imagined that Americans have not as many opportunities for different games as we have. But I have taken the management and the conditions of rowing as typical of all the rest; for all other forms of sport are managed and carried on in the same way. Their football I have already described elsewhere in these volumes, and the results of American specialisation need not be further alluded to. Cricket they soon found too slow for the quick and nervous temperament which their climate has produced. Baseball was invented in its stead and developed on the lines I have already suggested. Athletic sports, in their specialised sense, Americans attacked with their usual vigour, and the number of "records" they have already created show that the results they prefer have not been long in rewarding them for their perseverance. But Mr. Whitney may again be taken as a witness of his companions' over-energy. "Have we not been carrying our preparation too far in all branches of our college sports?" he asks; "We make too much of a business of our sport. Let us invest it with a little more of the recreative feature." If Americans took this advice we might perhaps see an American Henley: whereas, at present, a sight equivalent to Leander racing Thames, or New College winning the Grand Challenge, is out of the question in America; while the spectacle of a University team playing an outside club like Yorkshire or Richmond, is as impossible in America as it would be for them to see Yale or Harvard playing the State of Connecticut at baseball. But clearly something must be done if they are either to have more competition on their own side of the water, or to arrange international meetings upon ours. They must understand the real meaning of an "undergraduate," and of a "member of a University," when it comes to athletic meetings; and they must think of some more "recreative" methods of preliminary training when it comes to a race upon the water. In these two sports are the only two opportunities for a real international contest, because the element of "rules" enters into them the least, and it is only a question of moving a boat through the water, or getting first to the finish by superior speed over the cinder path. Baseball and cricket are out of court, football even more so. And I can imagine that the present time (June, 1898) is a favourable one for arranging a rowing fixture in the near future; because recent events must have confirmed Americans in their opinion that we are all wrong, and that they will only have to come over here to win.

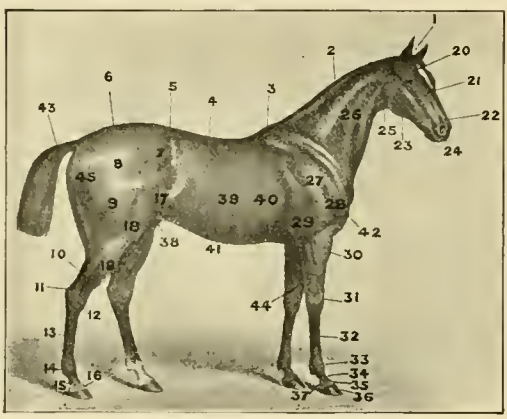
In the University race, which was decided while these lines were being written, the Cornell crew, coached entirely on the American plan, came in a long way ahead. The Yale eight, which used a mixture of the American and English systems, was second. Harvard, coached by Mr. Lehmann on solely English principles, was last. This, I say, may suggest to them an international meeting in the near future. But on this side we are more used to neglecting the actual result and considering the mere rowing; and I believe that Mr. Lehmann's work has been more valuable because its fruits are yet unseen. He may not have had time to teach Harvard how to win a race, but he has planted (in the soil where another Cambridge man, two centuries ago, set the first seed) the spirit of English competition and the details of English training, which cannot fail to do good in the end. Over here, it is our Universities who keep up the highest standard of amateur sport in all its branches. They do that by competing with every good amateur club in every possible form of sport, and by encouraging within their own borders a system of generous rivalry that is of the highest value to themselves and to the nation. Harvard, Yale, Cornell, and Pennslyvania have still got to learn what all this means. Their energy, in work and play, is far greater than our own;

their thirst for victory and records is far keener ; but in time they will discover that there are even better things than these.

THEODORE ANDREA COOK.

It is worth noting that the American Universities have adopted one game practically unknown in England, namely, Pelota (*q. v.*). The game, largely played in the Spanish States of South America, has been adopted, and somewhat modified, by the students, under the name of Basket Ball.

VETERINARY WORK—HORSE—None of the domesticated animals associated with man in the pursuit of sport is so liable to disease or so much exposed to injury as the horse. His speed and strength, and the manner in which he is employed, render him especially disposed to accidents, often of the most serious description ; while the very artificial life to which he is subjected in order that he may be in the fittest condition to perform the functions imposed on him, predispose him to diseases of various kinds, which demand careful and generally immediate attention. We shall here refer briefly to some



EXTERIOR OF THE HORSE.

1, Poll ; 2, Crest ; 3, Withers ; 4, Back ; 5, Loins ; 6, Croup ; 7, Angle of Hip or Haunch ; 8, Quarter ; 9, Thigh ; 10, Leg (wrongly named the Thigh) ; 11, Point of Hock ; 12, Hock ; 13, Hind Shank, Cannon or Metatarsal bone ; 14, Hind Fetlock ; 15, Hind Pastern ; 16, Hind Coronet ; 17, Flank ; 18, Stifle, properly the knee ; 19, Gaskin ; 20, Forehead ; 21, Face ; 22, Nose ; 23, Lower Jaw or Jowl ; 24, Upper Lip ; 25, Throat ; 26, Neck ; 27, Shoulder ; 28, Point of Shoulder ; 29, Elbow ; 30, Fore-arm ; 31, Knee (properly the Wrist or Carpus) ; 32, Fore Shank, Cannon or Metacarpal bone ; 33, Fore Fetlock ; 34, Fore Pastern ; 35, Fore Coronet ; 36, Fore Hoof ; 37, Heel ; 38, Sheath ; 39, Body ; 40, Chest ; 41, Belly or Abdomen ; 42, Breast or Counter ; 43, Dock or Tail ; 44, Chestnut ; 45, Point of Hip or Buttock.

of these diseases and accidents with which the horseman may have to deal before he can obtain professional assistance, and show him how to render first aid to the suffering animal, whether in or out of the stable.

Accidents — Wounds — The horse is particularly exposed to wounds, from the simple cut to the wide lacerated tear. According to their character and mode of production, they are usually described as "incised," "punctured," "lacerated," and "contused." The *incised*, or clean-cut wound, is generally the simplest and that most readily dealt with, though much of the success attending its treatment will depend upon its situation and the textures which are divided. In the treatment of all wounds, cleanliness is of the utmost importance in order to secure rapid and favourable union of the cut surface. Therefore the first thing to be done is to cleanse it from dirt and foreign matters, and if there is much bleeding this may be checked by the application of cold or hot water. If the wound is not large and the part can be bandaged, then the edges should be brought together as evenly as possible, and the bandage applied. It is well to place a piece of fine tow or lint (asepticised) over the wound before the bandage is put on. When the wound is extensive and the skin hangs in a flap, an attempt should be made to fix it by means of stitches of silk thread, or pins passed through the edges of the wound and across it, and thread twine or fine tow twisted round them, from heads to points, in figure of 8 fashion. In some cases, strips of cloth covered with glue may be applied across the wound to keep its sides together after the hair has been clipped or shaved off, and the wound itself covered with antiseptic lint.

In all cases, whenever possible, wounds should be treated with dry antiseptic dressings, and of these the best are probably chinosol and boric acid, each of which may be mixed, if need be, with a certain proportion of starch powder. The exclusion of the air from wounds is, when possible, always to be aimed at, and this can be effected most readily and the healing process best promoted by such dressings.

Rest of the parts is also essential to rapid healing of wounds, and this can be secured in various ways, but chiefly by means of bandaging, which also aids in maintaining apposition of the borders of the wound and the dressings applied to it ; but care must be taken that the bandage is evenly applied, and that it will not impede the circulation to an inconvenient extent. To wounds of the lower part of the limbs these remarks more particularly apply ; in this region, after obtaining apposition of the edges of the wound, dry dressing and careful bandaging are all important.

Punctured wounds, such as stabs from nails, sharp stakes, splinters of wood, pointed weapons, &c., are often the most dangerous to the animal, as they are also generally the most troublesome to deal with. Having ascertained that no portion of the substance which caused the wound remains therein, and having cleansed it as well as can be done, it should be dressed as in the case of a simple wound. Often, however, severe pain and great swelling occur soon after the punctured wound has been inflicted, and then it may be necessary to poultice or foment the part with warm water, and, after washing out the opening by means of a syringe, to get rid of putrid matter, to inject a solution of chinosol to destroy putrefactive germs. But unless constitutional symptoms become manifest, and there are indications that the wound is not doing well, it is the best course to keep to the dry dressings and interfere as little as possible with the injury.

Punctured wounds of the horse's feet produced either in shoeing, picking up stray nails on the roads, &c., are often followed by very serious consequences if not immediately attended to. The lameness soon becomes very great, and the animal evidently experiences intense pain. Sometimes much care is necessary in discovering the cause of this suffering. Nails picked up on the road are usually inserted alongside the frog, where they may be buried so deeply as to injure the flexor tendon of the foot and open the sheath through which it plays over the navicular bone. When, therefore, a horse falls suddenly lame in travelling on the road, the first thing to do is to lift the foot, and, if a stone is not found wedged between the shoe and the sole, to examine carefully the spaces on each side and in the middle of the frog. If a nail or other sharp body is found there, it should be removed before the horse is allowed to go further, and as soon as convenient the foot should be immersed for half an hour, or even an hour, in a bucket of warm water. Then it may be necessary to remove the horn from around the wound and dress this with Stockholm tar smeared on a pledget of tow, the dressing being retained by one or two pieces of thin wood or hoop-iron placed over it, their ends being pushed beneath the shoe. The horse should be kept as quietly as possible in a stall for a few days until it is

presumed the wound has perfectly healed, and there is no longer danger of complications. If, however, the lameness and distress, instead of gradually subsiding, increase, it will be advisable to resort to warm water fomentations several times a day, to feed the horse on a light, laxative diet, and, if there is great pain in movement and in getting the heels to the ground, a shoe considerably raised at the end of the branches should be put on, as this will considerably relieve the weight-strain on the injured parts. Should the serious symptoms continue, the services of an expert had better be obtained.

If nothing be discovered elsewhere to account for the lameness, then the shoeing may be suspected, and faulty driving of the nails most probably will be found acting as the cause. Fortunately there is no difficulty in putting this suspicion to the test. The horse will have been recently shod, or will have had fresh nails driven into the shoe of the lame foot, and this, if the nail or nails have been driven into or too close to the living parts, will be higher in temperature than the other feet. Lift the foot and squeeze firmly and steadily around it, between the wall and sole, by means of a pair of pincers ; when the injured part is compressed, the animal will demonstrate this by wincing considerably. The same manifestation will be made if the foot is placed on the ground and tapped around the neighbourhood of the nails with a hammer or the head of a hunting-crop, the opposite foot being held up meanwhile. The shoe must be taken off and the injury sought out by paring down towards the nail-holes, when, if matter has formed, this will escape on the puncture being opened ; if this stage has not yet arrived, the exalted sensitiveness shown in paring and the evident traces of puncture will testify to the cause of lameness, which should be much diminished by relieving the pressure on the part in this way. Immersing the foot in hot water for half an hour, or keeping it in a poultice of mixed bran and linseed for twelve hours, should tend to abolish the pain. Then the cavity made in searching for the injury may be filled up with Stockholm tar (melted by moderate heat) and a piece of tow, and the shoe replaced, omitting, however, to insert nails at or very near to the puncture. When the foot has been nail-bound and the nail or nails press too much on the sensitive parts, which is sometimes even more troublesome than puncture, the same treatment must be adopted. It should here be remarked that long continued fomenting or poulticing of the horse's foot is nearly, if not always, to be avoided, as after the urgent pain has been relieved its employment is not only unnecessary, but, as a rule, detrimental. Antiseptics, and cleanliness and rest are the mainstays of a cure.

Thorns often inflict troublesome punctured wounds, especially when they are lodged in the joints or in the sheaths of tendons. Hunters are more particularly exposed to these punctures, which sometimes cause considerable lameness when the thorns remain *in situ*. The first business is, of course, to discover the thorns and remove them. Their presence is revealed by the sudden symptoms of pain which the horse exhibits when the hand is passed over them, and they not infrequently produce swelling of the part. The finger nails or a pair of forceps can be employed to remove them—in their entirety, if possible—but sometimes they are so deeply buried that a careful examination has to be made of the skin, and the hair clipped or shaved off before anything can be attempted for their removal. Softening the skin by means of warm fomentations or poultices will facilitate the operation and also lessen the pain and inflammation.

Contused and lacerated wounds are often more troublesome than, and quite as serious in results as, incised and punctured wounds, inasmuch as not only are tissues cut, but they are also bruised and torn, and very often have foreign substances imbedded in them. Their gravity, as in the case of other wounds, depends very much upon their situation, extent, and the amount of bruising or laceration of tissues. A bruise is merely a form of contused wound in which the skin is intact, but the parts beneath it are more or less injured. This form frequently occurs from forcible contact with a blunt object, such as a stake, or pole, or a kick from another horse on the fleshy parts. There may be considerable pain and swelling, the latter being usually soft and containing fluid. To relieve the pain and diminish the swelling, the part should be bathed with hot water or with lotions that produce cold. It is not advisable to lance the swelling, so as to allow the contained fluid to escape, until it is seen whether the inflammation continues. If it does, then it may be surmised that matter has formed, and this must be drained away by making a very small incision through the skin at the most dependent part of the swelling. Contused and lacerated wounds occur most frequently on the limbs, through horses falling or stumbling, and the fore-legs are most exposed to such injuries.

"**Broken knees**" is the term commonly applied to injuries of this kind occurring to the front of the carpal, or, as they are wrongly designated, "knee" joints. The damage may be nothing more than a slight graze, merely abrading and bruising the skin, or it may pass through varying grades of injury to the most extensive and serious laceration, the knee joint itself being opened. When the skin is merely grazed, little more requires to be done than carefully and gently to remove any dirt and grit from it and bathe with warm water, afterwards dressing with a little chinosol ointment. If there be swelling and stiffness of the joint, the fomentation must be continued until these disappear. When the skin is cut and bleeding, the same treatment is to be adopted ; but if the wound is clean it may be dressed with boric or chinosol powder and covered with a piece of lint and a bandage. If the wound is rather extensive and transverse, the horse should not be permitted to lie down until the healing process is well advanced. In some cases, after the wound has been well cleansed, it may be dressed with tincture of myrrh, and then a piece of lint on which Canada balsam has been spread laid over it, and over this a bandage may be placed. This dressing will often remain on the knees until the wound is healed.

When the wound is ragged and contused, and the tendons passing over it are probably lacerated, so that there is great danger of one or more of the joint capsules being opened, then all the skill and care of the expert will be required to repair the injury and preserve the horse's usefulness ; therefore he should be called in early. In the meantime something may be done by the amateur. After the wound has been freed from grit and all foreign matter by gentle washing with warm water, it should be dried with lint ; then a wide piece of the same should be covered with a layer of the boric acid or chinosol and starch powder, and placed on the wound, this dressing being retained by a bandage. The leg should be made immovable by means of a starch bandage wrapped round it from above the knee down to the fetlock, and, as the horse must not be suffered to lie down until the wound is healed —which may occupy some weeks—he should be supported in the standing position by means of a sling. The wound will require to be dressed in the course of a few days, and to permit of this being done without taking off the starch bandage, a hole may be made in this by a pair of sharp-pointed scissors immediately over the seat of injury. When the knee has been dressed, the dressing can be kept in place by an ordinary bandage. The treatment of irritative fever and other unfavourable symptoms ought to be left to the veterinary attendant. It must be remembered that poulticing and fomenting such wounds is most injurious, and that the best results are derived from the dry antiseptic treatment. A tendency to fever must be combated by laxative diet in the shape of mashes, and by small quantities of nitrate of potass in the water given to drink. The temperature of the feet of the other limbs must be watched after a few days, and especially of the opposite foot, as congestion and inflammation sometimes attack them, owing to the strain imposed on them from the continued standing. This, however, is not so likely to occur when the horse is slung, as the legs are then relieved of much of the weight of the body.

Wounds of other joints, such as the hock and fetlock, are to be treated in a similar manner, as are also those of sheaths of tendons. Dry antiseptic dressings, moderately firm bandaging, immobility of the limb, and keeping the horse quiet until the injury has been quite repaired, are the chief points to be remembered.

A sometimes severe and troublesome form of contused wound is that known as "over-reach." This is usually produced in galloping, especially on heavy ground, and in jumping; it occurs most frequently in the hunting field and on the steeplechase course. The parts injured are the back of the leg or heels of the fore feet, and the damage is inflicted by the toe of the shoes of the hind feet. The extent of damage varies from mere laceration of skin to exposure of the posterior surface of the back tendon, or even tearing of the tendon itself or of the lateral cartilages of the foot at the heels, and sometimes involves the coronary frog-band at this part. When an accident of this kind happens in the field, all dirt should be removed by washing, and a temporary bandage—such as that afforded by a handkerchief—applied until the injury can be properly attended to. Mention of a temporary bandage calls to mind the great benefit that is often derived from a linen bandage, a piece of lint, and a few pins wherewith to close skin wounds; these can be easily carried by the horseman, as they are light and occupy little space, and may be of great service in an emergency, and even in the case of an accident to man. When the "over-reach" can be properly dressed, it should be again well cleansed, and it may be necessary to remove, by means of sharp scissors, any shreds of tissue hanging from the wound. This should then be dressed with chinosol or boracic acid powder, a piece of lint placed over it and a bandage evenly applied around the leg. When the heel is the seat of injury and there is evidence of much bruising, it is often advantageous to thin the hoof immediately below it, in order to relieve the tension from subsequent swelling of the bruised tissues. The wound should be dressed with the dry antiseptic powder every second or third day, and no washing, fomentation, or poulticing ought to be allowed. The horse should be rested and have light diet. With regard to the prevention of this accident, it is to be remarked that the injury is inflicted by the back lower edge of the toe of the hind shoe, and that the hind shoes of all horses that have to jump or gallop should be straight across at this part—"square-toed shoes," which should also be convex on the ground surface and have a clip at each side. The hoof may be allowed to project slightly beyond the shoe at the toe, but it ought to be well rounded.

Another kind of contused wound is that produced at the top of one foot by the opposite foot, or the foot of another horse, treading on it, and known as a "tread." The wound may be slight or severe, its character not being always ascertainable at first, so that it should not be neglected even when apparently trivial. If the wound is lacerated and there are loose shreds, these must be removed by sharp scissors. Then the part must be freed from dirt, washed clean, and dressed with antiseptic powder in the manner already described, keeping the part always dry. If the portion of hoof immediately in contact with the wound becames detached, it should be cut away by the shoer's knife.

A very serious form of lacerated wound is that which is sometimes met with in the hunting field, when a horse becomes "staked," *i.e.*, has the wall of the abdomen or chest or the muscles inside the thigh torn by a stake while jumping. It is usually the lower part of the belly which suffers from staking, and the tear is not infrequently so wide and deep that the abdominal cavity is opened, so that the intestines escape therefrom and may descend even to the ground. When the muscles only are wounded, all that can be done is to cleanse the wound and cover it up with handkerchiefs, bandages, or anything of the kind conveniently to hand, until it can be properly attended to. Wounds of the abdomen with protrusion of the intestines, though formidable looking, are not always hopeless if the bowel is not torn or severely bruised. As a temporary measure at the time of the accident, the intestine should be returned to the abdominal cavity if possible, the manipulation in effecting this being very carefully conducted; then a long bandage should be made by tying several handkerchiefs together; this is placed on the wound and tied over the back, being supported with the thong of a whip. If the intestines cannot be returned without the risk of injuring them, they had better be let alone and kept suspended in the bandage until an operation can be conveniently undertaken. The horse can generally be walked for some distance after being bandaged. The operation consists in throwing down the horse gently, taking great care of the intestines, placing the animal on his back, after having administered chloroform to him, returning the bowel, and passing sutures, or, better, a steel pin or pins through the lips of the wound and passing tow round the ends of them in figure of 8 fashion. The wound should be treated antiseptically during and after the operation. A wide bandage encircling the body should include the wound. The diet ought to be light and laxative.

Hæmorrhage—The most serious accompaniment of wounds of all kinds is hæmorrhage, and this cannot always be easily checked or controlled, especially when the blood proceeds from arteries. This is known by the bright red hue of the blood and by its flowing in pulsating jets, whereas blood from the veins is of a purplish colour and comes away in an even flow. Pressure is the most ready means of stopping bleeding, though if this be mere oozing of the blood in small quantity, cold or somewhat hot water will answer the purpose. If the bleeding occurs in the limb, a handkerchief dipped in cold water and applied to the part, being kept there by another handkerchief tied over it and around the leg, may succeed in checking the flow, if it does not altogether suppress it. When the bleeding proceeds from a deep narrow wound, it may be checked for a short time, until other measures can be taken, by passing the finger down into the opening and making pressure on the injured blood vessel; or a handkerchief may be thrust deeply and firmly into it, so as to stanch the flow. Should these measures prove unsuccessful, the garrot tourniquet can be adopted. This is readily made by folding a handkerchief in the longest direction, tying it quite loosely around the limb, between the wound and the body, and then tightening it to the required extent, *i.e.*, until the bleeding stops, by means of a hunting-crop or a stick passed through this loop and twisted round. If the horse has to travel any distance, which should not be far, with this tourniquet in position, the hunting-crop or stick may be tied to the leg by means of another handkerchief round one end. If a pad, made by a handkerchief folded into a lump or by a round smooth stone, is placed over the large artery of the limb and included in the tourniquet, the latter need not be so severely twisted. At any rate the tourniquet is a very temporary arrangement, and must not be kept on the limb any longer than is necessary to obtain expert assistance in order to tie the bleeding vessel.

It is astonishing how in these emergencies a little knowledge, self-possession and common sense will avert serious, if not fatal, consequences.

Contusions—Contusions are frequent in the horse, and are caused in a variety of ways. One kind has been alluded to. When the skin is not broken, applications of cold water or astringent lotions are the most convenient, and generally the most effective treatment. What is termed "sore back" is usually a contusion of the skin produced by severe and unequal pressure of the saddle in some particular part of the back. The saddle may have been badly constructed or fitted, the stuffing lumpy, the lining hard and dirty, the weight on the back long continued or unsteady, or the saddle removed too soon after a long journey, especially in hot weather. In some cases sore back is doubtless produced by the manner in which the saddle is put on—placing it back and then pulling it forward against the hair into its proper seat, instead of putting it on forwards and then moving it backwards in

the direction of the hair. Prevention, it need scarcely be said, is most important, for a sore back may imply inability to carry the rider, or even the saddle for some days. When there is danger of sore back from long continued pressure, it is an excellent plan, when the rider dismounts, to leave the saddle on the back for some time, to allow the skin to become cool and the blood circulation in it to regain its normal condition; if the weight has been great and the girths are somewhat loose, it is even advisable to tighten these to some degree after the rider has left the saddle. If, unfortunately, the skin becomes tender and puffy, applications of cold water, lead lotion, or common salt dissolved in water must be resorted to at once. If the skin is abraded, then astringent lotion is needed; and there is nothing more effective nor handier than dressing the part with ordinary writing ink, as the iron and gallic acid in it are eminently astringent. It is a good plan, when the weather is hot and the journeys long, to sponge over the back with a solution of alum, oak bark, or sulphate of iron, in order to render the skin hard and less sensitive and vascular. If the journey must be prolonged and the horse ridden, then the part of the saddle that impinges on the bruised place must be eased by removing the stuffing from it.

Fractures—Of all the domesticated animals the horse is the most exposed to fractures of the bones. This exceptional liability might be predicted when the nature of the services he is compelled to render is taken into account. And of all the bones of the body the most frequently broken are those of the limbs, especially those below the knee and hock.

Fractures are usually divided into five kinds:—(1) *simple*, (2) *compound*, (3) *comminuted*, (4) *compound comminuted*, (5) *impacted*.

The *simple* fracture is that in which the bone is broken into two pieces, but the skin remains whole; in the *compound* fracture the bone is broken, and there is a wound in the soft tissues and the skin covering the fracture through which the ends of the bones may protrude. In the *comminuted* fracture the bone is broken up into a number of pieces; and in the *compound comminuted* fracture, in addition to this break up of the bone, an external wound exists which leads to it or through which the splinters may project; while in the *impacted* fracture one end of the broken bone is wedged into the other end. In the horse, fractured bones are always serious, but especially when those of the limbs are concerned. This is not because broken bones are less ready to become united in the horse than in other animals, indeed, fractured bones are more rapidly repaired in favourable cases in this animal than they perhaps are in mankind; but it is because of the difficulty in keeping the parts sufficiently at rest to ensure continued apposition of the fractured portions and no interruption of the healing process. This is particularly the case in the limb bones, which have to sustain weight; a favourable position of the animal cannot be obtained, the only one usually secured being the standing one, with the weight of the body of the horse sustained more or less by a sling passed under it and suspended by ropes to beams or poles.

Fractures of the limb bones and the vertebræ are generally looked upon as incurable, and the animal is accordingly destroyed. Fractures of the vertebræ may unhesitatingly be pronounced as hopeless when they are diagnosed, and the horse should be mercifully slaughtered. The same conclusion unfortunately has to be arrived at in nearly all cases of compound, comminuted, and impacted fractures, especially of the leg bones; for even under the most favourable conditions, when the broken pieces of bone can be brought into their proper place and kept there until firmly united and the wound healed, the horse may remain a cripple afterwards, and be of little or no use except for breeding purposes, if a stallion or a mare. The difficulty of maintaining the broken bones in place, the complications which are likely to occur during the treatment, and the expense incurred, no less than the great uncertainty of even an imperfect cure, all militate against keeping the animal alive. But every case of fracture must not be condemned as hopeless, as is too often done in those of the leg bones, for simple, and even compound, fractures have been successfully treated, and the horses have subsequently performed good service. Much depends on the situation and nature of the fracture, as well as on the health and temper of the horse, and also on the skill of the expert and the patience and humanity of the owner.

Fractures generally occur out of doors, though they sometimes happen in the stable, and are produced by kicks from other horses, by falls in jumping, by pulling up short while galloping, by forcible impact of hard bodies against the bones, &c. A fracture may occur without any marked symptoms except, perhaps, the evidence of pain on manipulating the parts, and lameness if the limb bones are involved. Much will depend upon the situation and the character of the injury. When the bone is not concealed too deeply by thick masses of muscle, crepitation, or grating on each other of the broken pieces, may be felt, and even heard, on moving the limb; when there is displacement, the limb may be shortened, more or less pendulous, and capable of being moved in directions which it could not be made to do were there no fracture. In other cases the existence of fracture is at once apparent without manipulation being necessary, as when the angle of the haunch is broken and displaced—an accident not very uncommon, and usually brought about by this part being struck against the side of a door in entering or leaving a stable or loose-box. Of course, if the fracture is compound or comminuted, or both combined, the diagnosis is generally rendered easier. Sometimes, when the bone is only cracked, there may be lameness for a day or two and nothing serious suspected—the animal may even be exercised or worked, when all at once displacement occurs and then the leg is really broken. Such cases are far from unusual; the fracture generally occurs in the hind limb, the leg bone (tibia), between the stifle and hock, often erroneously designated the thigh bone, being nearly always the one that offers this peculiarity. The cause of fracture here is nearly always a kick from another horse, the injury being inflicted inside the leg a short distance above the hock, where the bone is only covered by the skin. There may be great lameness immediately after the kick, but this soon passes off, and then there is nothing more evident than the wound in the skin until, a few days afterwards, the horse is found in the morning with a broken leg and has to be destroyed. The explanation for this somewhat extraordinary occurrence lies in the fact that the bone—which is one of great solidity and strength—is cracked or starred into perhaps a number of pieces, but there is no displacement of these; this is prevented by the dense resisting membrane covering the bone (the periosteum), until the exudation that is thrown out preparatory to cementing the fractured surfaces separates these from each other and the containing membrane so far that the horse, in lying down or getting up, throws so much strain upon the leg that complete separation takes place, and the animal is found with the limb dangling in so peculiar a manner that the experienced eye can at once perceive what has happened.

In troop stables this accident most frequently occurs, though it also happens in the field; and so apprehensive was I of complete fracture ensuing that, for many years, when a horse received a kick on this part, I immediately had him put in a sling and kept as quiet as possible until I could assure myself either that no fracture had taken place or that there had been one, and that union was so far accomplished that there was no reason to fear displacement; though the horse was usually kept in the sling until he could be safely allowed to lie down. The evidence that there had been fracture was found in the great majority of cases, and consisted in the presence of a hard enlargement (callus) where the blow had been given.

As has been mentioned, and for the reasons adduced, many cases of fracture in the horse are not considered suitable for treatment; among these there are often cases which would, if occurring in man, be undertaken with every

prospect of a good recovery. Therefore it is that treatment for fracture in the horse is seldom attempted, and especially when the bones are those of the limbs, even when the fracture is of the simple kind. So that, in arriving at a decision as to whether the attempt should be made, several considerations must be kept in view, among which are the nature and situation of the fracture, the value of the animal, the conveniences for and the probable cost of treatment, whether he is likely to be quite free from lameness or other infirmity which will diminish his usefulness afterwards, and whether if he, if a stallion (or she, if a mare) may not be useful at the stud should the cure not be complete.

Fracture of the vertebræ, whether of the neck, body, or loins, is, it may be said, always fatal. Death may be instantaneous, as when the neck vertebræ are fractured near the head, or death may not ensue for some days when the back is broken. There is generally no difficulty in diagnosing "broken back," an accident which occurs more frequently in the field than in the stable. The horse is down and cannot rise, for he has no power over his hind limbs, though this inability might also be due to a bad sprain of the muscles or ligaments of the loins. But in broken back, in addition to immobility of the hind extremities, there is also loss of sensation in them; so that when they are pinched or pricked with a pin the horse does not show any sign of pain, which he would do if the back were merely sprained. As broken back is incurable, the animal should be killed to obviate needless suffering.

With regard to killing horses which have met with very serious accidents, the means are not always at hand for doing so, and it not infrequently happens that a considerable time must elapse before a knacker, a gun, or a pistol can be procured when the mishap has occurred in the field; and even when a firearm and ammunition have been obtained, it is not every one who knows how to shoot a horse dead instantaneously. The brain must be perforated if this is to be effected, and the best part of the head to aim at is the middle of the forehead, about three inches above the line of the eyes, where there is usually a curl in the hair. The firearm should be held close to the head, and the bullet or shot directed towards the top of the neck, so as to reach the base of the brain—death is then instantaneous. But shooting cannot always be carried out, and some other plan must be resorted to. If a blacksmith's forge is near, a sledge hammer and a pointed punch may be borrowed, and the latter instrumen idriven deeply into the brain, at the spot and in the direction indicated above, by a smart blow from the hammer. Death is then as prompt as by shooting, if the operation is properly performed. Or the carotid artery may be exposed by making an incision with a pocket knife in the side of the neck about midway between the head and chest, in the furrow immediately above the windpipe, and pushing the forefinger inwards until it meets the artery, which is distinguished by its strong pulsations; the vessel is then drawn to the surface by the finger being hooked round it, and a slit an inch or two long made in its wall. On allowing the vessel to go back the blood gushes out in a full stream, and death—almost painless—rapidly ensues. But this sanguinary business is not pleasant to witness, and I have on several occasions, when driven to my wit's end to find a ready way to kill a horse, when there was nothing with which to do it except a knife, thrown off my belt and tunic, rolled up my shirt sleeve, and introduced my hand, armed with an open pocketknife, well into the rectum, where, turning the point of the blade upwards and pushing it towards the loins, I made a strong cut across, and in this way divided the posterior aorta or one of its divergent branches. The horse was dead in a few seconds without a drop of blood escaping externally, and without anybody being cognisant as to how death was caused.

When fractures of the limbs occur on the road or in the field, and it is decided not to destroy the animals on the spot, but to give them a chance for their lives, great care must be taken, when moving them to some suitable habitation, that the injury is not made greater by the movement. To prevent a simple from becoming a compound fracture, the broken bone should be "set" as perfectly as may be possible under the circumstances—*i.e.*, the broken portions brought into their natural position, and kept there by any simple means until better can be devised. A bandage or handkerchief may be tied round it, and, if thought necessary, splints of wood cut from a paling, or stout branches of trees or twigs sufficiently long to extend some distance above and below the fracture, may be employed; hunting-crops sometimes answer very well in an emergency. Some soft material, such as reeds, grass, hay, or moss, should be laid around the limb on the bandage, so as to make the surface as level and even as possible; on this the splints are to be placed, inside and outside the limb, and their ends kept fixed by handkerchiefs tied around them.

When this has been done, an attempt must be made to get the horse to his stable or some other convenient shelter where he can remain until he is well. If a horse-ambulance cart can be procured, this difficulty is at once solved; but such a useful conveyance is rarely available in the country, and not always even in towns. Therefore the animal must travel on his own legs, only three of which can be used for this purpose. If the damaged limb is a fore one, with time and patience a considerable distance may be travelled, but frequent short halts are needed. When it is a hind limb that is disabled, progression is much more difficult, and a longer time and more frequent rests are required to travel the same distance. In these cases travelling is quicker and the crippled horse is much relieved if a portion of his weight can be borne on a narrow plank placed beneath his chest, each end of which is carried by one or two men; or each end of a sack may be tied securely to a stout piece of wood, and on this the chest may rest, while men at the sides of the horse partly carry him by means of the sticks.

Arrived at his destination, the horse must be slung, and in default of the proper gear a very useful sling may be made by nailing, or strongly sewing, each end of an ordinary sack to a short pole five or six feet long. This sling is placed beneath the body, and secured at the ends of the poles by ropes passed over beams in the roof. The shafts of a cart or wagon, firmly propped up, have sometimes been successfully employed to sling a horse. It must be remembered that the lame horse should not be lifted off his feet by the sling; this should just be in contact with his chest when he is fully standing up, so that when he seeks to rest he simply bends his knees and hocks and allows his weight to fall on the sling. The greatest care should be taken that everything is sufficiently strong to sustain the weight, as great damage is often done when the sling suddenly gives way while the horse rests on it.

The proper bandaging of the fracture can now be carried out, and this demands some skill. The temporary bandage and splints having been removed, a more careful examination of the limb may be made, but the broken bone should be handled as little as possible, if the parts are in their proper place. If there is no external wound, a thick layer of cotton-wool may be placed around the damaged part of the limb, and over that a linen bandage, evenly wrapped and moderately tight. Then a starch bandage may be placed upon this, and, if need be, splints of wood or iron, the object being completely to immobilise the limb. To allay the pain, lead lotion and laudanum may be poured between the skin and the upper part of the inner bandage, and if the inflammation runs high, cold water may be applied by a sponge or a hose frequently during the day.

This treatment is more particularly applicable to fractures of the leg bones, but it must be remarked that little can be done in the way of "setting" such bones as the arm bone, the humerus or bone between the shoulder blade and bone of the fore-arm; nor yet the thigh bone or femur (that between the hip joint and stifle), as these are too much surrounded by masses of muscle. Even the bone of the fore-arm, the radius, is difficult to set and fix, especially when the fracture is oblique; and the leg bone

of the hind limb, the tibia (extending from the stifle to the hock), is still more troublesome, the broken ends of the bone being very rarely brought together and kept so, if they are displaced. The same may be said of fracture of the bones of the pelvis, one of which, the ilium, is much exposed to this accident, especially at its anterior part, the point of the quarter or hip. This part, as has already been mentioned, is very liable to fracture when horses are passing through doorways, and when a considerable piece has been knocked off and displaced the animals are said to be "down in the hip." For such cases scarcely anything more can be done than to apply warm water fomentations to the part, sling the horse, and keep him as quiet as possible. Fracture of the hip joint generally occurs through a fall in the stall or on a hard road, and is not always easily diagnosed. It may be regarded as incurable.

The bones of the face are sometimes fractured by kicks from other horses, and displacement is usually the result. If this displacement gives the horse an unsightly appearance, or interferes with the breathing, the depressed bone or bones can be raised by an operative procedure that can best be carried out by the surgeon. In these cases there is often profuse hæmorrhage from one or both nostrils, to check which plugging cannot be resorted to, as in man, because the horse breathes only through his nostrils; so that little more can be done than apply cold water to the face and inject it up the nose.

The shank bones—large metacarpal or large metatarsal bones—if not much splintered, and provided the fractured ends can be brought together and kept so, may, in many cases, be successfully repaired, if properly set and bandaged. The pastern bones are often fractured, more particularly the smaller or lower one; the accident generally occurs in jumping at a fast pace or in pulling up sharp when galloping; it may also happen in slipping on ice or soft ground. The bone may be merely split vertically or obliquely, or it may be broken up into a number of pieces. Diagnosis is usually easy; there is great lameness and intense pain, especially when handling the damaged pastern, and, if the fracture is comminuted, the unusual mobility of the part, together with the crepitus, or grating of the fragments on each other, should leave no doubt as to what has happened. When the bone is merely split, the only evidence is the lameness, pain on handling the part, and probably some swelling. Recovery from split and fractured pasterns is not by any means rare, and if the horse is a valuable one, and the bone not much broken and displaced, an attempt at cure may be made with a reasonable hope of success. The treatment has already been suggested.

The foot bone—os pedis—is sometimes fractured, especially that of the fore-foot, and in a similar manner to the bones of the pasterns. Unfortunately, owing to its being completely buried within the hoof, the existence of this accident can only be inferred from the intense lameness and the great heat of the foot, and the absence of signs of fracture elsewhere in the limb. The treatment is simple enough, and consists chiefly in keeping the horse quiet in the sling, and resorting to continuous irrigation of the foot with cold water.

Dislocations.—The dislocation of bones which enter into the formation of joints is not a very common occurrence, though one may be surprised that, considering the great strain often imposed on many of the joints, especially those of the limbs and back, it is not more frequent. The most common form of dislocation is that of the stifle or patella, which usually happens in young or debilitated animals, and is due almost entirely to weakness or relaxation of the ligaments that attach the patella to the front of the thigh and leg bones. This dislocation is often only partial, and therefore not so serious, for it can generally be rectified without any manipulation. So persistent is it in some horses that at every few steps the animal takes when in motion the patella slips off to the outside of the joint, momentarily checking the extension of the leg, and slips on again as readily, this reduction being often accompanied by a dull clicking sound. Such partial dislocation may occur with both patellæ at the same time. Complete dislocation is usually witnessed in older horses, and is more serious, as the patella has not a tendency to return to its place without manual assistance.

The signs of dislocation of the patella are very marked and, to the experienced horseman, unmistakable, but those who see a case for the first time are inclined to look upon it as a very grave condition—nothing less than a broken leg in one case which I was called upon to see. The limb is rigidly fixed and thrust backward, the fetlock being bent forward until the front of the hoof nearly touches the ground, and no effort of the animal can bring it forward; so that in walking the leg is dragged after the body in the same rigid fashion, none of its joints being moved. The animal does not give evidence of suffering from pain, unless compelled to walk quickly, which is very difficult and fatiguing.

In the simpler form of patellar dislocation, if the bone does not return to its place spontaneously, drawing the leg forward and at the same time pushing the bone from the outside forward and inward, will make it resume its normal position with a smart jerking noise. To cure this relaxed condition of the stifle ligaments (which usually disappears with age), the animal should be kept tied up in a stall for a week or so, and the stifle blistered in front and on each side.

When the dislocation is more complete, reduction is not so easy. In order to draw the hind leg sufficiently forward, a rope must be passed round the pastern and brought towards the shoulder or placed around the neck; this rope on being drawn steadily, will carry the leg in advance, until the stifle joint is sufficiently straightened to allow of the patella being restored to its natural position by pushing it from behind forwards. This manœuvre rarely fails, at least it has always been successful with me; but if the attempt does not succeed, which is just possible with horses that have large muscular development, then, in order to induce muscular relaxation, the animal should be thrown down and chloroform administered. When reduction has been effected—and this ought not to be delayed if the joint is inflamed and painful—cooling lotions should be applied, after which it may be advisable to resort to blistering, and allow two or three weeks' rest.

Dislocations of the shoulder-joint, fetlock, and pastern joints, have been recorded, but these are too serious for the amateur to deal with unless he can reduce them easily without doing any damage. The smaller joints he may be able to put right by getting the dislocated bones in place and keeping the limb bandaged until the expert arrives. Some of these dislocations have made a good recovery. The vertebræ of the neck are sometimes partially dislocated through falls in the hunting field, but more particularly from being "cast" in the stable. The dislocation is outward, to the right or left side, and several of the bones may be involved. The neck is curved to one side, and this gives the horse a curious appearance. To straighten the neck again is nearly always a serious task, and takes a considerable time, if some days have elapsed before treatment is adopted. A splint apparatus or cradle has to be placed on the neck, and pressure applied on the convex side. This pressure must be exercised continuously, and gradually increased until the neck is straight; but the cradle must be worn some time afterwards until the ligaments have gained their normal condition.

The Detection of Lameness in Horses.—Among the many things which the intelligent horseman ought to know is, not only when a horse is in good health and condition or when it is sick or unfit for work, but also when it is lame and, if possible, where it is lame, as well as the cause of the lameness. This is indeed expecting a great deal from him, and in truth there are not many amateur horsemen who are privileged to possess this knowledge to such an extent as to meet every requirement; but the more he knows the more likely is he to keep his horses in health, to avoid being imposed upon or misleading others, and to be in a position to apply the

stitch in time when anything is amiss and expert assistance not immediately available. These remarks are more particularly applicable to cases of lameness, as the ability to distinguish unrhythmical from rhythmical movement of the limbs is often of great moment to those who employ horses, and, in only a less degree, is the faculty of being able to fix upon the ailing leg or legs, and to detect the seat and cause of imperfect movement.

It is more important for the rider to know when a horse is lame than to be absolutely certain as to the part affected or the cause, for an expert can generally be trusted to discover this; whereas, if an animal suddenly becomes cripple and continues to be worked without this being perceived, great, and sometimes even irreparable, mischief may be the result.

Lameness has been defined as the manifestation, in the act of progression, and by one or more of the limbs, of pain or weakness, inability or impediment in movement. Though pain is usually a cause of lameness, yet a horse may manifest irregular or halting movement of the limbs during motion without experiencing pain. There may be stiffness of a joint or malformation of a limb impeding movement, and yet no evidence present of any pain being suffered. For instance, the nervous affection of the limbs popularly known as "stringhalt" is a kind of lameness, and yet there is no sign that it is in any way productive of pain. It is most important to remember this, as very often people who are not acquainted with horses or their diseases, imagine that an animal must be suffering if they see it limp or move unevenly, and very often unfortunate drivers or owners of horses are unjustly punished for cruelty to them because of this mistake—some deformity of a limb preventing its being used as freely as the other legs, but causing no more pain than a club-foot or a stiff knee does in man.

Lameness may be only temporary, and be due to local causes, without disease being present. A wound, or bruise of the leg or foot, or even a stone lodged between the shoe and sole or about the frog, may induce limping; or lameness may be permanent from chronic disease, or the effect of such disease. Even weakness of muscle may cause lameness in one or more limbs, and the opposite of this condition, such as cramp of the muscles, will produce the same result, as will also partial or complete dislocation of a joint—that of the stifle, for example—in which there is complete inability to draw the hind leg forward.

In some cases lameness is so marked that the veriest tiro can scarcely fail to notice it, especially if only one limb is involved, and to determine in which leg it is. In other instances, however, it is so slight that it may escape casual observation, and even among experts it may chance to be of such a peculiar or trifling character that there will not only be a diversity of opinion as to the limb affected, but whether the horse is at all lame. Therefore it is that a horse will be passed as sound by some experts, and pronounced lame by others, though these again may differ not only as to the seat of lameness, but even as to the lame leg.

Skill in the detection of lameness would almost appear to be a special faculty in some people. Doubtless long experience and close observation among lame horses will tend to render this detection easier and more certain, but there are people whom no amount of practice will thoroughly teach, and whose eyesight and hearing do not enable them to detect if a horse is lame or on which leg it limps. Many even of those who have successfully passed through the veterinary schools have had their professional reputation seriously marred in the early days of their career through failing to detect lameness, or mistaking the limb, the location of the ailment, or the cause. Other men, again, are quick at detecting lameness, and not only in deciding on the lame leg, but in fixing upon the part where the cause of the lameness exists; some of these men can do this in certain cases before the horse has moved many yards.

Of course nothing but practice and careful observation can ensure the acquirement of this knowledge, but a few simple directions may render it easier of attainment.

Lameness is generally detected when the horse is in movement, this being either walking or trotting, or both, though it is generally necessary to make the animal trot in every case, unless the lameness is so marked, or progression causes so much pain, that the faster pace can be dispensed with.

But even when the horse is at rest the existence of lameness may in some cases be suspected from the attitude of the animal and the position of the limb or limbs. One or more of these, if pain is present in them, may be placed forward, backward or outward, and they may be extended or flexed. Indeed, to those who understand the anatomy of the limbs and the physiology of movement, the attitude of the horse and the position of the legs when at rest are in many cases of great diagnostic value. For it is to be observed that a limb in which there is pain is "rested"—that is, relieved from the animal's weight—as much as possible, and the manner in which this relief is effected is an indication not only as to the limb involved, but also, in numerous instances, of the seat of pain or infirmity.

For example, when a horse is experiencing pain in a fore or hind foot, the limb is usually extended forward. If it is in the back part of the fore foot, this "pointing," as it is termed, will be accompanied by raising of the heels from the ground, the symptom so characteristic in cases of corn and navicular diseases; but if the pain is in the front part of the foot, then the heels are placed on the ground more firmly than usual and the toe is relieved as much as possible, this attitude being very characteristic of laminitis. Lameness from injury or disease in the knee or its vicinity is generally marked by the horse standing with that joint bent forward, but when the elbow is the cause of lameness the knees will also be bent in the same direction, but the fore arm is carried forward and the foot backward. When the shoulder is the seat of pain the knee and foot are generally in the same position as in elbow lameness, but the entire limb droops in a very significant manner.

When the pain in a limb is severe, there is frequent, if not incessant movement of it; it is continually being raised from and gently placed on the ground, and if it be a fore limb the litter may be pawed back by it, while the animal's countenance and other signs will betray the agony experienced. Should the lameness be in a hind limb, there are similar indications of great value, and here "knuckling over" of the fetlock is more marked in many of the lamenesses of the hind than of the fore leg. In the majority of these cases the lame leg is advanced, and especially if the pain is below the hock; if the foot is rested on the toe, it generally indicates pain in the back part of the limb, tendons, ligaments or heels, while a bent hock is usually seen in disease or injury of that joint. Pain in the hip is manifested by an apparent shortening and resting of the entire limb; stifle trouble is indicated by a peculiar straightening of the leg, which can be drawn backward, but cannot so readily be carried forward. When the pain is in both hind feet, the attitude is very noteworthy; these are brought forward under the body, and they are lifted alternately in an evidently uncomfortable manner, the movement being often accompanied by groaning, hurried breathing, perspiration, and other signs of suffering, while the fore legs are carried back in order to sustain a greater share of weight-bearing. In some cases of this description it has been observed that the pain in the hind feet prevents urination being properly performed. The animal cannot extend itself as it must do in that act, though it may raise the tail and make efforts to carry the hind legs back, but the horse quickly resumes its former attitude with a groan, and agonisingly raises the feet in a spasmodic manner. This inability to extend has not infrequently led the attendants to imagine that the urinary organs were at fault.

The position the lame horse assumes when stationary is that in which the infirm or injured parts find most relief, and this indication is of the greatest service in arriving at a knowledge of the cause when the cripple

limb has been detected. Sometimes it is necessary slightly to move, or attempt to move, the horse in order to accentuate the evidence as to the degree and nature of the ailment. In laminitis, for instance, though the attitude is very striking and characteristic when the animal is not disturbed, it is more particularly significant when an attempt is made to make him move a step backward or forward. If the inflammation is at all severe, it is almost impossible to compel the horse to lift the feet from the ground; the body may sway to and fro, but the feet remain fixed as if rooted in the earth, the weight being thrown altogether on the heels, where the inflammation is not so severe.

It is the same with some other forms of lameness, the attitude in the stable often furnishing a valuable guide in ascertaining the leg that is at fault, and even the nature of the damage. It is therefore very necessary to see the horse when at rest in the stable, and the attitude should be observed for a few minutes, and the horse then moved backward and forward, as well as sideways in the stall. For it is to be remarked that horses affected with certain infirmities of the limbs will exhibit symptoms of lameness in the stable which they quickly lose when exercised out of doors; but when they return and stand still again for a short time, they limp even more than before. Of course the converse is also true of other kinds of lameness, which may appear to be absent when the horse is in the stable, but become very apparent during movement.

An examination of the limb by eye and hand after movement will in all probability confirm and complete the information acquired by observing the horse during progression. It must be stated, however, that a knowledge of the anatomy of the limbs is of great value in the diagnosis of lameness. It is always advisable to have slight cases of lameness, about which there is any doubt, tested at a trot upon hard ground; a horse which will then show inequality in movement may go apparently sound on a soft surface.

A lame horse in walking or trotting always endeavours to avoid increasing the pain by throwing as little weight as possible on the affected limb. Therefore, if a fore leg is amiss, when the foot comes to the ground the head is thrown upwards; if it be a hind leg, the quarter of that side is raised when the weight falls on it. It is wrong to say that a horse "drops" on the lame leg. Lamenesses are best detected when standing behind or before the animals in motion; in front of them if the fore limbs are to be observed, behind them if the hind ones are to be scrutinised. Then, having ascertained the lame leg, careful observation of the manner in which the leg is moved, the observer standing on that side, will give an idea as to the region where the cause of lameness is located, and a manual examination will generally complete the diagnosis.

We will now briefly take notice of the accidents and diseases which occasion lameness, in addition to those already mentioned incidentally when dealing with wounds and fractures.

Splints are sometimes a cause of lameness, though not so often as is supposed. They are usually looked for on the front limbs (they are very rarely seen on the hind), between the knee and the fetlock and on the inner side of the leg, so that in standing in front of a horse, if a splint is present and of a considerable size, it is at once evident. In exceptional cases, chiefly those in which there is malposition of the limb—the elbow inclining inwards and the toe of the hoof outwards—the splint is observed on the outside of the leg. Splint is really a bony tumour, nearly always formed between the shank bone and the small bone attached to it on the outside and inside—the so-called "splint bone"—which generally unites them immovably together, whereas in early life these bones are only held together by a kind of ligamentous substance. When the horse is worked on hard ground and shod with iron shoes, and especially if he carries weight on his back, the splint bone, from its position on the inner side of the leg and closer relationship to the knee bones, has to bear a larger share of the weight and concussion than the outer one. The ligamentous connection with the shank bone is strained, inflammation is set up in this, and in the end bony matter is thrown out between the two bones, and often to a considerable amount on the shank bone in addition, constituting the tumour. People possessed of the evolution craze have attempted to explain this pathological process as a natural tendency towards unification of the three bones—quite a normal transition. But it is forgotten that splint usually appears only on one side of the limb—that which is most under the body, and therefore has to sustain most weight; that it occurs, it might be said, always on the fore limbs—those which sustain most weight—and is indeed exceedingly rare on the hind limbs; and that every horse does not have splints, those which are unshod and employed on soft ground rarely having them.

When the inflammation is only slight it causes little lameness, but in proportion to its severity the movement of the limb is impaired and the lameness increased. At first there may be no perceptible enlargement to account for the great lameness, but generally, in a short time, a gradually increasing and rather hard swelling is perceived, and this is hot and painful on manipulation. These signs, and the fact that young horses are most liable to splints, as well as the knowledge that the lameness is least noticeable at a walking pace and most marked in trotting, especially on hard ground, and that it increases in intensity as movement is continued, are distinctive. The severity of the lameness nearly always depends upon the situation, not so much on the size of the tumour, and upon the extent of bone implicated. When once fully formed, if the tumour does not interfere with the movement of the knee or with ligaments or tendons, the lameness disappears and there is no further trouble. But in exceptional cases splints are a source of inconvenience, even if they do not cause pain and interfere with the horse's action.

The treatment for splint must largely depend upon whether it causes lameness, and also whether, from its size, it is likely to prove an eyesore. If it is small and does not make the horse lame, there is little need to meddle with it; and if it is recent, all that requires to be done is to take off the shoes and allow exercise on soft ground, keeping the animal standing while in the stable on soft bedding, such as moss litter. If the lameness is very marked and it is desired to check the inflammation, thereby preventing the tumour from growing, acetate of lead lotion applied to the part by means of two or three folds of lint tied round it and kept constantly moist, will prepare the inflamed part for the application of a blister. After a few days of the lead lotion, a small portion of biniodide of mercury ointment should be rubbed into the skin of the affected part; the blister may be repeated two or three times, at intervals of about a week. This is as much as the amateur can venture to do, for though in extreme cases it may be advisable to cut into the swelling and so divide the dense membrane covering it, thereby relieving the tension, yet the operation is almost too delicate for an unskilled person.

An inflammation of the shank or cannon bones of the fore legs, rarely the hind ones, similar to that of splints, and also occurring in young horses, especially those in hard training for racing, has not unfrequently to be combated energetically if chronic lameness and deformity are to be avoided. This condition, commonly known as "sore shins," is usually ascribed to the concussion and strain to which the immature tissues of the limbs are subjected. It is generally witnessed in two or three year old race horses, mostly the former, and, unlike splints, the inflammation occurs on the front of the bones, nearly always towards the middle or the lower end of the shank. The symptoms are at first slight lameness and hesitation in extending the limbs when moving on hard ground; then the action becomes that of a cripple, and walking even induces pain. If galloping is continued when this stage has been reached, serious consequences will ensue. A very perceptible swelling appears on the front of the

leg, as if the animal had received a blow there, and this is hot and very painful on pressure, while the attitude betrays uneasiness and suffering; this is still more indicated by constitutional disturbance, such as diminished appetite, fever, dejected countenance, &c. In extreme cases, when treatment has not been undertaken in time, these symptoms increase in intensity, the swelling will increase and, if not relieved by lancing, the bone involved may perish, the soft textures slough, and the patient eventually die. In many of those animals which recover, the bone remains enlarged where it was inflamed, and gives the limb a more or less deformed appearance.

In the early stage a speedy cure can generally be effected by appropriate treatment. The training should be suspended for a few days, and the animal allowed rest. The leg should be enveloped in lint covered by a calico bandage, and this must be kept constantly wet by lead lotion, with which has been mixed a little laudanum to lessen the pain. After two days, when the inflammation has been somewhat subdued, the part may be painted over with compound tincture of iodine, repeated every second or third day until the skin is slightly blistered; or, if the swelling is more considerable, the application of biniodide of mercury ointment instead will act more promptly and effectively as a blister. The diet should be soft food. If the case has been neglected and the swelling is great, deep scarification or incision will be necessary to relieve the pain and preserving the bone from serious alteration, but this had better be done by an expert. Such cases require a long rest and exercising gently on soft ground before training can be recommenced, and this should only be gradual.

Ringbone is an analogous condition to splint and sore shins, though it is, with regard to its consequences, a more serious cause of lameness than these. It is due to inflammation on the surface of the large or small pastern bones, and though it may appear on either hind or front pasterns, the former are probably most frequently the seat of it; exceedingly rarely the foot bone is affected, the membrane covering it—periosteum—being mainly involved. There is swelling, considerable lameness, and pain on pressure of the enlargement, which may be on any part of the bones, but is generally on the front or sides. The lameness is likely to remain permanently after the inflammation subsides, as the deposit of bone that almost inevitably results is immediately beneath the expansion of tendons and ligaments, and interferes with them. Sometimes the enlargement is so considerable as to catch the eye at once, while in other cases it requires a nice sense of touch to detect it. The horse has a tendency to travel more on the heels of the affected limb than is customary, and there is not much difference in the degree of lameness on soft or hard ground. In the treatment, the animal must be rested as much as possible, cold applications being continuously made to the inflamed part, after which there should be repeated blistering with biniodide of mercury ointment; in bad cases it may be necessary to have recourse to the actual cautery.

Spavin, the name commonly given to a diseased condition of the hock, is frequent in horses, and is generally marked by the presence of a bony tumour on the inner side of the front of that joint. It is due to much the same cause as splint and ringbone, the predisposition to it being a hock defective in shape. There is nearly always lameness, but the degree of this will depend not only upon the size of the tumour, but also upon the manner in which the implicated bones are affected; the lameness is nearly always permanent, and the horse usually travels more on the toe of the affected limb than when there is no spavin. When the disease is commencing, in order to ensure a rapid and satisfactory cure the joint should be relieved from weight and movement as much as may be possible, and this is best obtained by placing the animal in a sling and blistering the inside of the hock repeatedly, the stall being laid with moss litter. A long rest must be allowed, and, when the horse is put to work, this should at first be light. When spavin is very pronounced, so that the horse goes lame and treatment is of no avail, he can be much relieved in travelling by raising the heels of the shoe.

Lameness from **navicular disease** is less frequent, perhaps, than it was half a century ago, thanks to a better knowledge of the horse's foot and how it should be managed, especially in the matter of shoeing. The causes of this troublesome malady are somewhat numerous. It may appear suddenly or gradually—suddenly when it is the effect of an accident, such as sprain of the perforans tendon where it passes over the navicular bone; or gradually when due to mismanagement of the fore feet, in which alone it is seen. The symptoms are resting the affected foot when the horse is at rest, which is done by advancing the foot and raising the heel, and "pointing," as in this way the tendon is relieved from strain. The step is short and the toe comes sooner to the ground than the heel, hence the toe of the shoe is most worn; the temperature of the affected foot is increased, and in the stable the litter is often pawed away from before and raised behind the foot to give it a better resting place. Little can be done to cure the disease, though certain measures may palliate it and keep the horse serviceable. The foot should be kept cool, the toe of the hoof shortened as much as can be done with safety, and the frog allowed to come into contact with the ground, or, if this cannot be contrived, an artificial frog of india-rubber may be placed over it.

Lameness from **congestion of the laminæ** of the feet is not infrequently a result of over-exertion in travelling, especially on hard ground in warm weather; it may also come from long continued standing in the stable or on board ship, and in some cases it may be a sequel of disease. There is intense lameness, and the horse can scarcely move the fore feet, which usually suffer most. The tendency is to rest on the heels. The temperature of the feet is increased and there may be fever present, with impaired appetite. Gentle exercise and cold applications to the hoofs will frequently dispel the symptoms in a short time. It is judicious treatment, after a long or a fast journey in the saddle during hot weather, to walk the horse about for some time after the rider has dismounted, so as to allow the circulation in the laminæ to acquire its normal condition.

Laminitis is the stage beyond congestion of the laminæ, and is much more serious, for here we have inflammation of these delicate and highly sensitive structures. The pain is much more intense, and movement is more distressing; there is fever and loss of appetite; the pastern arteries throb, and the agony is so intense that the body is often covered with perspiration. If the horse is standing, he will not attempt to lie down, and if recumbent he makes no effort to get up, but lies and groans, with the fore limbs thrust out in front of him. If the horse is standing, he must be put in a sling or compelled to lie down, so that the feet may be relieved by taking the weight off them; then cold water swabs must be wrapped round them, or cold bran poultices applied. Morphia should be injected under the skin to diminish the pain, and the diet must be laxative and sparingly given until the inflammation subsides. Then gentle exercise in a loose-box or on soft ground may be permitted for a short time, and gradually increased until all danger of a relapse has disappeared.

It should be noted that in all cases of disease or accident in which the animal is compelled to lie for some days on the hard ground, or on hard litter such as wheat straw, there is danger of severe bruises to the prominent parts of the body, and these "bed-sores" have sometimes worse results than the disease or accident itself. To prevent or retard their appearance, the horse should rest on a thick bed of some soft material, such as dried moss, moss litter, or old but dry oat straw which has already served as bedding.

Corns are often a cause of lameness, especially when shoeing is not carefully attended to. What is termed a "corn" in a horse's foot is really a bruise of the sensitive

sole, this bruise being the result of undue pressure, usually made by the shoe. The ordinary situation of the bruise is the angle formed by the wall and bar of the inside heel of the fore foot ; corns may be said to be unknown in the hind feet. In some cases the lameness is considerable, and the bruise may run on to suppuration if neglected. The signs are those which are induced by pain in the back part of the foot, and tapping with a hammer upon the wall of the hoof in that situation will at once reveal the cause. Removal of the shoe is necessary, and paring away some of the horn at the bruised part—which will be bloodstained—is also required in order to discover the extent of the injury. If this is slight, nothing more may be necessary than lowering the wall at the heel so that it will not touch the shoe when this is nailed on, and, still further to ensure this, it is advisable to leave out the nail nearest the damaged heel. When the bruise is more severe, the pain and inflammation will be lessened by immersing the foot in a bucket of warm water for an hour, or in a poultice for twelve hours. After this the shoe is to be put on and the bruised part smeared with Stockholm tar, care being taken that the shoe does not touch the heel when the horse's weight is on it.

In some cases of chronic corn much benefit is derived from the horse wearing a shoe with the part chopped off that would rest on the bruised heel.

Thrush is an unhealthy condition of the horny frog, brought about by the shoer paring it, by standing on foul litter, or by the frog not coming into contact with the ground, and sometimes it is an accompaniment of navicular disease. The horn is softened and ragged, and usually there is a very offensive discharge from the cleft in the middle of the frog. The treatment is simple. Clean out the frog well, remove all shreds of horn, dress the cleft and other parts with calomel, covering this by pledgets of fine tow pushed firmly into the recesses, and keep the horse on dry clean litter. In a day or two remove the tow and insert other pledgets smeared with Stockholm tar. After a few of these dressings the morbid condition disappears.

Sandcrack is not very common among light horses, but it is occasionally met with, and when it is suddenly produced generally causes severe lameness. It is a vertical split in the wall of the hoof extending, when it causes lameness, to the sensitive tissue within, from which blood sometimes escapes. In the fore foot the split is generally on the inside, rarely at the toe or outside ; in the hind foot it is nearly always in front. It is usually produced during severe exertion, as when jumping, and commences at the top of the wall of the hoof. When the lameness is considerable, the foot should be kept in a bucket of warm water to soften the horn and reduce the pain. This may have to be frequently repeated. When the lameness has gone, and if the horn is sufficiently thick, a fine horse-shoe nail may be driven through the edge of the crack and the ends brought together by pliers so as to form a clamp to hold the sides of the fissure together ; or the hoof may be firmly bound round with many strands of fine tar twine. A little Stockholm tar may be rubbed into the coronet, above the crack, in order to stimulate the growth of sound strong horn. The shoe should not be allowed to rest on the part of the hoof corresponding to the crack. "**Seedy-toe**," another disease of the foot, is sometimes accompanied by lameness. It is a separation between the wall of the hoof and the horny laminæ on its inner surface, and this separation may be only to a very limited extent, or it may involve a large portion of the wall, and extend from the lower border to near the coronet. There is little or nothing to denote its existence until the shoe is taken off, when the cavity is readily seen. This contains some loose crumbling horn, to which the disease probably owes its name. The cause is usually severe pressure on the wall of the hoof, produced by the shoer driving the clip of the shoe too close against it, and, as the clip is in front of the fore shoe, so we find the separation there. The hind feet are largely exempt from this defect. To make a radical cure, it is the best course to take away all the separated wall as far as the sound hoof, carefully removing all the discoloured horn beneath and cutting out all cracks and fissures in it. The gap left in the hoof can be filled up with gutta percha or covered with pitch. The shoe must not have a clip at the toe, but one on each side if necessary ; the coronet should be stimulated to increased secretion by rubbing a little Stockholm tar into it at intervals of a few days.

The secretion of hoof horn is sometimes so very defective in quantity and quality that the shoer has great difficulty in attaching the shoes. This may arise from mismanagement of the feet, and especially to the mutilation the hoofs undergo when being shod, such as over paring the sole and frog and rasping the front of the wall, or rubbing oil and certain compositions on this part ; or it may be due to natural weakness. The face of the wall should not be rasped, and the sole and frog never ought to have more than the loose portions removed from them, while nothing but water should be applied to the wall by means of a sponge. To promote a healthy secretion of hoof wall, the coronet should have an application of Stockholm tar at intervals of a few days.

Sprains—Muscles, tendons, and ligaments are all liable to sprain, those of the limbs of the horse—especially the fore ones—being particularly exposed to damage done by sudden and severe extension. In fast galloping and in jumping such accidents are most common, and in many cases the results are extremely serious, so far as the future soundness and usefulness of the horse are concerned. Sprain of tendons and ligaments is more frequent than that of muscles ; the position of some of these, their function, and their texture, predispose to this accident, as do faulty conformation and weakness of structure, owing to lack of tone. The injury may be merely over-extension of the fibres, or these may be ruptured ; the number involved may be very many, or only a comparatively small number. Sprain of muscle is indicated by lameness or stiffness, with pain on pressure, and sometimes swelling. The muscles of the limbs, especially those of the shoulder and hip, suffer most frequently from this injury. Fomentations with warm water and rest will be found the best treatment. It may be necessary in some cases to put the horse in a sling in order to secure rest.

It must be remarked that in the case of sprains of all kinds, as indeed in the matter of lameness generally, rest is an indispensable requisite in treatment, and nothing can be more injurious than to compel horses to take exercise until lameness has disappeared ; as not only does this, in the majority of instances, cause a relapse, but it often converts a curable case into an incurable one, or an acute case into a chronic one. It is not at all unusual to hear of lame horses being turned out to exercise or to graze in order that they may become sound. Of course, when the limbs are injured it is most difficult, if not impossible, to secure that absolute rest which can so readily be obtained in man, but everything should be done to make it as perfect as circumstances will permit.

Sprains of the shoulder and hip-joints, as well as of the muscles and ligaments in their vicinity, are not so frequent as of the tendons and ligaments below these, and are indicated by inability to extend the limb, and pain on manipulation. Fomentations with warm water, rest, and the application of a blister over the part if the lameness does not subside in the course of a few weeks, are the measures to be adopted.

Sprain of the loins occurs in jumping, backing, pulling up suddenly in a fast pace, over-exertion in draught, getting cast in the stall, &c. If the horse can move, there is generally much difficulty in bringing the hind legs forward, with stiffness in the back—and especially in turning round—a straddling gait, in which the hind quarters sway more or less from side to side. If the horse lies down, he is often unable to rise without assistance, and not unfrequentlyhe cannot extend himself to micturate; there is nearly always pain on pressure over the loins. In severe cases, the horse is down and cannot get up, though the hind legs are warm and can be moved about, and sensation in them is perfect. This will differentiate sprain of the loins from broken back. Warm water fomentations

to this part for several hours a day, with rubbing in of stimulating liniment in the intervals, sloppy diet, and slinging are about all that can be done by the amateur.

Sprains of the knee and hock are to be treated by fomentations with warm water, succeeded after a few days by lead lotion or tincture of arnica, applied by means of swabs round the joint. A frequent cause of lameness, especially in light horses, is a sprain of an important ligament at the back of the hock, producing a convex swelling more or less marked, and known as "curb." Sudden severe exertion, such as jumping, bucking, the hind legs slipping forwards, &c., are the immediate exciting causes, but in very many instances the defective shape of the hock predisposes to the sprain. At first, in many cases, there may be considerable lameness with swelling of the part; in other cases the lameness is not very perceptible, though the curb may be distinctly observed. Even when the lameness does pass off, it is rare indeed for the swelling to subside. The treatment is limited to wrapping round the part fine tow or lint, and applying a bandage firmly over this, pouring in at the top, and frequently, tincture of arnica lotion, or one composed of sal ammoniac and nitre in the proportion of two ounces of each to a pint of water. The horse should be kept tied up in a stall. When the inflammation and lameness have subsided, the swelling should be frequently painted over with tincture of iodine or, better, a small portion of biniodide of mercury ointment may be rubbed in at intervals of a week. This may be continued when the horse is at work.

In speaking of curb, mention may here be made of what is called "capped hock," which is usually due to contusion, but may in some instances arise from sprain; in the latter the swelling is on each side of the joint of the hock, in the former it is immediately on this part, and projecting backward. Unless the injury or sprain is very severe, the lameness at first is but slightly, if at all, noticeable, though there may be swelling, heat, and pain. If this is the case, a cooling lotion should be applied—such as an ounce each of arnica and Goulard's extract in a pint of water, and by means of lint maintained by a bandage; if the lameness is marked, a high-heeled shoe will relieve it. In the course of a few days a stimulant may be used on the part, such as the tincture of iodine or the biniodide of mercury ointment. If the enlargement becomes chronic it is most difficult to reduce it. It has been recommended to plaster it over, while the horse is in the stable, with pipeclay or whiting mixed into a paste with vinegar, and this is to be rubbed off when the animal goes out to work.

Sprain of the back tendons occurs in either the fore or hind limbs, and is due to a sudden and severe effort. These tendons are below and behind the knee and hock, and are two in number, one in front of the other—the posterior is the flexor of the pastern, the other, in front of it, is the flexor of the foot. It is rare that both are sprained, the one in front being most frequently involved in the accident, when the swelling is most marked at the inside and outside. If the posterior one is sprained, the swelling is noticeable immediately behind, and forms a convexity. There is swelling, heat, and pain on handling the part, and lameness commensurate with the degree of injury. The limb at the seat of sprain should be thickly enveloped in tow, cotton wool, or lint, and bandaged firmly, then the arnica and Goulard's extract is poured in between the padding and the skin, which is to be kept continually moist with it. Or, if the weather is not cold, water may be applied by means of a hose from the water tap. A high-heeled shoe should be put on the foot if the horse is afraid to place his weight on the limb; indeed, in all cases this kind of shoe expedites recovery, but it should not be kept on longer than a fortnight. Instead of employing the lotion or cold water, it has been recommended to pad the sprained part firmly by first wrapping a moderately tight bandage round it, then on top of this at each side, a thick pledget of cotton wool evenly laid on, and another long bandage tightly wound over all. The bandages must be removed morning and evening and re-applied, the leg being gently rubbed each time they are taken off, and bent up and down. When the pain and lameness have disappeared, and thickening of the tendon remains, it will be advisable to blister it, perhaps repeatedly, with biniodide of mercury or cantharides ointment. Sprain of the check ligament below the knee, or of the suspensory ligament, is indicated by similar symptoms to sprain of the back tendon, the horse manifesting signs of pain on pressure of these parts. The treatment must be the same as first indicated, though it has usually to be longer continued.

Diseases—Only a few of the many diseases the horse is liable to can be noticed here, and these must be those which the amateur can deal with, or at any rate palliate, until the arrival of the veterinary surgeon.

Congestion of the Lungs—None of the domesticated animals is more liable to congestion of the lungs than the horse. This is doubtless due in some degree to his anatomical structure, but more to the nature of his work and the management to which he is subjected, and also in many cases to the nature of his surroundings. Congestion of the lungs may be an accompaniment or sequel of other diseases, or occur by itself, when it usually appears in the acute form, or "pulmonary apoplexy," as it is termed. This may be induced by sudden severe exertion when the horse is not in condition, or it may be brought on by long continued severe work when not in good training—as in the hunting field; it may also be caused by exposure to cold, and especially to cold winds and wet. The symptoms are very marked; the breathing is extremely hurried and laboured, the nostrils are widely dilated, the head is carried low, and the countenance is anxious and haggard; the body is often covered with cold perspiration, the legs are stretched out and are cold—the flanks heave tumultuously, there is tremor of the muscles, and, if the congestion has been induced by over-exertion, the heart can be heard beating violently. When the congestion is extreme, in many cases blood flows from the nostrils, and if this is foamy it is an indication that the blood is effused into the lungs. If not speedily relieved the horse will succumb to suffocation; so that treatment must be prompt. The horse should not be moved or disturbed, if possible, and, if he is wearing harness, this ought to be removed. An abundance of fresh air must be allowed; if the horse is in the field his face must be turned to the wind, and if in the stable his head ought to be brought to the door; the legs and body are to be well rubbed and clothed; before the limbs are bandaged they may be rubbed with stimulating liniment. Brandy or whiskey should be given in large doses (four to six ounces) and frequently at first—say every two hours for two or three doses, in a pint or two of water, warm if possible, or in oatmeal gruel. Tincture of arnica in doses of one or two ounces has been recommended. If there is thirst, tepid water or warm oatmeal gruel can be given. In very urgent cases the horse's life may be saved by abstracting a quantity of blood—from four to six quarts—from the jugular vein, but this operation requires some skill. When the animal is able to eat, the diet for some days should be restricted and of a kind that is readily digested; quietness is necessary, and the body and legs must be kept warm.

Inflammation of the Lungs—This is often a sequel of congestion of the lungs, though it may also follow catarrh, bronchitis, &c., or occur spontaneously. It differs in symptoms from congestion by the presence of fever—otherwise the symptoms, if perhaps less urgent at first, are somewhat similar. The horse is dull and prostrate, though he may wander about the loose box, but seldom lies down. The surface of the body and the legs are often cold, though the mouth is hot and dry, and the lining membrane of the eyes and nostrils is of a dark red colour; a short painful cough is emitted from time to time, and when the disease is advanced there is not unfrequently a rusty coloured discharge from the nostrils. In some cases the inflammation is complicated with pleurisy.

With regard to treatment, this is somewhat the same as for congestion, so far as keeping the body warm, fresh

air, and diet are concerned. Every four hours there should be given, in a quart of thin gruel or tepid water, tincture of aconite six minims, nitric ether one ounce, solution of acetate of ammonia four ounces. But, if there is much weakness, for this draught may be substituted six ounces of brandy or whiskey three or four times a day. The food is often refused, so it should be made as enticing as possible; it may consist of sloppy mashes of bran or boiled linseed, with oatmeal gruel, a small quantity of picked hay, green forage, and sliced carrots, &c. Cold or tepid water is to be given to drink, with an ounce of nitrate of potass dissolved in a bucket of it. Litter should be thinly spread on the floor of the stall or box, so that it may not get entangled among the feet, and great attention should be paid to the admission of fresh air without draughts. When recovery has begun and only debility remains, a more generous diet can safely be allowed, and with it a tonic—such as finely powdered sulphate of iron in one or two drachm doses daily, mixed up in a little mash, morning and evening.

Bronchitis—This is an inflammation of the membrane lining the air-passages entering the lungs, and is usually due to colds. It nearly always begins with shivering and dulness, and some degree of fever, as well as loud, hard, and very frequent cough, accompanied by quicker breathing than in health. A discharge from the nostrils is generally present. The cough increases in frequency and severity, and causes exhaustion and loss of appetite; consequently debility soon sets in, and death not infrequently ensues from the air cells of the lungs becoming filled up with effusion. When the fever gradually subsides and the cough becomes softer and less frequent, the discharge from the nostrils ceasing and the appetite returning, amendment is taking place. When bronchitis occurs in cold weather, which is usually the case, the horse should be kept in a well-ventilated loose box, the body well clothed, and the legs enveloped in woollen bandages after being firmly hand rubbed. The throat should be well rubbed with stimulating liniment—such as compound camphor liniment, which may also be applied to the sides of the chest; or a woollen blanket may be wrapped round the chest, and hot water poured on the outside of it for an hour or two at a time, after which the blanket is to be taken off, the skin well dried, and the liniment rubbed into it. The horse should also be made to inhale the vapour of hot water from a bucket on which some hay has been spread; into this water a quantity of oil of turpentine or carbolic acid may be poured. A draught composed of camphor one drachm, solution of acetate of ammonia two ounces, and nitric ether one ounce, all mixed up in a pint of tepid water, should be given two or three times a day. The diet to be as for inflammation of the lungs.

Colds—Catarrh is very common among horses kept in hot, badly-ventilated stables, or exposed to variable weather, especially cold and wet. An attack usually begins with sneezing and slight fever, perhaps shivering; the legs are also cold, and the horse is dull and listless. Then cough becomes frequent, there is discharge from the eyes and nostrils, and soreness of throat is shown by more or less difficulty in swallowing, and swelling of the glands about the jaws. The breathing is but little disturbed, and the horse gets up and lies down. With judicious treatment of a simple kind the symptoms subside in a week or ten days, and complete restoration to health is generally the result. Good nursing is nearly all that is required in the way of treatment. A comfortable, well aired stable, clothing for the body and legs, sloppy mashes, with carrots, a little good hay, and water into which small quantities of nitre have been introduced, are about all that is needed until convalescence sets in. If the cough is troublesome, the upper part of the throat may be rubbed with camphor liniment, and the head held over the vapour of hot water in a bucket, to which oil of turpentine has been added.

Exhaustion—When this is due to over-exertion of any kind—as in the hunting field—the symptoms are not unlike those of acute congestion of the lungs. While going, the horse becomes unsteady in his pace and soon begins to stagger; the breathing is hurried and distressed and often accompanied by sighing, the eyes show extreme anxiety, the ears and tail are drooping, the body is covered with cold perspiration, and the head is carried low and heavily. If the pace is continued, the horse will quickly fall and lie in a semi-comatose state until he slowly rallies, if he does not speedily die. No horseman would knowingly or willingly push his horse to this dangerous stage of exhaustion, and there must be few indeed who could not perceive when it was being approached and take action accordingly. The horse must be relieved from saddle, bridle or other harness, and allowed to stand at liberty with his face to the wind. If brandy or other spirit is at hand, six ounces in water should be carefully poured down his throat, if he can swallow it all at once; if not, then it must be given by one or two mouthfuls at a time. When he has somewhat rallied, a little cold water or some tepid gruel may be offered him, and then his legs and body can be well rubbed.

Fits and Fainting—Horses are sometimes attacked with epilepsy, usually while at work, and as the attack is sudden and generally without warning, it is not without its inconveniences and dangers if the animal is being ridden or driven. Harness horses appear to be most liable to these attacks, though they are sometimes witnessed in riding horses. In some cases the attack is begun by a few rapid shakes of the head, then the horse staggers, may give a slight scream, and, running forward, falls unconscious. The limbs and lips are moved convulsively, the jaws are champed, and the eyes rotate in their sockets. After lying for a short time, consciousness is regained, though the horse may be unable to rise immediately. He looks stupefied, bewildered, depressed, and is an hour or two before he resumes his normal condition. But little can be done in such cases in the way of treatment with any prospect of cure. When the premonitory symptoms—such as shaking of the head—are observed, the horse ought to be pulled up and held by the head to prevent his falling, and this timely succour may avert the more severe phases of the attack. Should he fall, efforts must be made to prevent him doing damage to himself by keeping his head down and throwing a rope or rein round his legs. Two or three ounces of alcohol in water will be beneficial when the attack has passed off.

Horses sometimes, though rarely, faint. They fall to the ground suddenly and are unconscious, but they lie perfectly still and do not struggle as in epilepsy. The girths and throat strap should be loosened, and, if the horse is wearing a collar, this ought to be shifted up the neck. Cold water may be applied to the head and passed into the mouth by means of a sponge or handkerchief; when the horse can drink, water should be offered, and a dose of alcohol—four to six ounces—administered in a quart of water or gruel.

Sunstroke or Heat Apoplexy—Horses soon experience exhaustion when undergoing exertion in a high, moist temperature, and especially in the direct rays of the sun. Even when away from the sun's rays and standing quiet, great exhaustion, and even death, may occur in a very hot climate.

The animal suddenly becomes distressed, breathes heavily and quickly, ceases to travel or to notice surroundings, and, if not urged on, lies down, when he may become more or less unconscious, struggle with his fore limbs and make attempts to rise, or he may remain quite tranquil. In a severe case, the temperature of the body is increased and the breathing more rapid, and the muscles are in a state of tremor, with perspiration covering the skin. In these cases death often ensues in a few hours. Treatment, to be of any avail, must be prompt. If the horse is out of doors and there is any shade procurable, he ought to be moved to it, and all equipment removed from him; cold water should be dashed over his head and body, and the air agitated above him by means of a waving blanket, board, or sheet; hand-rub the legs. If there is struggling, the leg should be tied, and when the horse is able to swallow, a dose of alcohol and water may be given. Careful dieting must be observed for a few days

after recovery, and the horse should not be exposed to a high temperature until he is well and strong.

Colic—Colic is not an infrequent disease where stable management, and especially feeding and watering, are not properly attended to. Bad or improper food, giving water immediately after grain, exposure to cold draughts of air, particularly on the legs, drinking a large quantity of water during cold weather, or at any time if the horse is exhausted, are the chief causes of colic. The symptoms are well marked. The horse is very restless and violent in his movements; he strikes at his belly with the hind feet, stamps and paws, often throws himself down and rolls and looks back at his flank. There are lulls in these manifestations, during which the horse appears to be nothing amiss and may commence to eat, until another attack comes on. If the pain is due to spasm of the bowels, the abdomen is not altered in dimensions, but if flatulence is the cause—and this is generally the case in crib-biters and wind-suckers—then it will be much distended. As spasmodic colic is the most painful form, the horse is more violent during the paroxysms, but these are longer continued in flatulent colic, and the horse lies down more carefully. Colic is usually readily and speedily amenable to treatment. The horse must be prevented from throwing himself down, and four to six ounces of whiskey or brandy administered in a quart of warm water, or, better still, if at hand, two or three ounces of laudanum; much benefit is also conferred by rubbing the surface of the abdomen firmly with wisps of hay or straw, or fomenting it with hot water. It is generally advisable to give a dose of purgative medicine—such as from four to six drachms of aloes dissolved in a pint of warm water; and an enema of warm water will aid in relieving the intestines. In flatulent colic, the addition of an ounce each of ammonia and oil of turpentine to the laudanum will be most useful.

Inflammation of the Bowels—This most painful and rapidly fatal disease may be ascribed to several causes, among them being colic, poisonous substances, exposure to cold, exhaustion, drinking much cold water when fatigued, &c. The earlier symptoms are those of colic, though to the expert there appear others which differentiate it from that disease; the horse lies down with greater care, the pain is continuous, and its severity is indicated by the animal's expression; the pulse and respiration are hurried, groaning is frequent, and the skin is wet with perspiration. All these symptoms become aggravated, and if not soon relieved the horse dies. To assuage the pain, large doses of opium powder mixed in tepid water—beginning with one drachm and followed at short intervals by half-drachm doses—should be administered; blankets steeped in hot water must be applied to the abdomen for an hour at a time, stimulating liniment being used in the intervals. Enemas of warm water may be administered twice or thrice, but in small quantity. For this disease the veterinary surgeon should be sent for as soon as possible.

Rheumatism—Some horses are very subject to attacks of rheumatism about the joints, sheaths of tendons, muscles, &c., and they may be acute or chronic. Exposure to cold winds and wet weather will induce them, and they sometimes accompany such diseases as influenza. In the acute cases there is often a considerable degree of fever, and the disease localises itself in one or more parts of the body, *e.g.*, in the stifle, hock, knee, sheaths of tendons; there is generally swelling and great lameness, with pain on handling the parts, and sometimes the disease will suddenly leave one situation to appear in another. With regard to treatment, the horse must be kept warm and comfortable, fed on sloppy food, and given oatmeal gruel in which bicarbonate of potass in ounce doses has been dissolved. If the fever runs high, salicylate of sodium in two-drachm doses should be given in a pint of water or gruel three times a day. The inflamed parts may be fomented with warm water and bathed with tincture of arnica or laudanum; when the inflammation is subsiding, they should be frequently rubbed with soap liniment, or one composed of Coutt's acetic acid, whiskey, and oil of turpentine, two ounces of each, with the white of one egg beaten up in them. The skin should be well brushed, and the liniment then firmly rubbed in.

Surfeit—This term is popularly applied to several affections of the skin, but more especially to one which appears as an eruption of small, hard lumps in different parts of the body, accompanied by itching and symptoms of indigestion. It is usually transient, and disappears in a few days. Care should be taken with regard to the diet, and a mild laxative may be given—such as an ounce of sulphur in a small mash, or a pint of linseed oil; an ounce of nitrate or carbonate of potass should be given in the drinking water once a day.

Eczema is a term also sometimes applied to surfeit and to some other diseases of the skin, but it is usually employed to describe a condition in which there is an eruption on one or more parts—back, sides, shoulders, neck and root of tail—of minute vesicles or blisters that burst, when scabs or scales form in their place, and the hair falls off. There is considerable itching, which causes the horse to rub or gnaw the affected part. It generally appears in summer, and in some horses recurs year after year. It is not contagious, and is very troublesome to get rid of, as it must be ascribed in the majority of cases to constitutional causes. In treating the affection, attention must be paid to the diet, which ought to be of a laxative kind. Arsenic has been given in three-grain doses in a little mash every morning and continued for some months with advantage, with a mild dose of physic once a week, and the following lotion has been applied to the skin: bicarbonate of soda one ounce, oxide of zinc two ounces, and lime-water eight ounces; to be thoroughly mixed. For chronic cases, boracic acid ointment, to every ounce of which a few drops of creosote have been added, may be well rubbed into the part night and morning.

Mud Fever—This odd designation has been given to an inflammation of the skin which is usually seen in winter among horses whose limbs or bodies are liable to be spattered with very cold mud or that of an acrid kind. It is most frequently seen in hunters whose stable management is not carefully attended to, and is easily prevented by abstaining from clipping the hair off the legs, and not washing them when the horse returns to his stable, unless they can be thoroughly dried and kept warm. As much as possible of the mud should be removed by a wisp, and when the skin is dry the remainder must be brushed out. If the legs must be washed to free them from dirt, this should be done with cold water in a place sheltered from the wind; then they ought to be dried, well hand-rubbed, and covered with flannel bandages. When the skin is inflamed and painful, it should be dressed with Goulard's extract of lead, one ounce to the pint of water or to four ounces of olive oil; oxide of zinc ointment answers the same purpose—as does also a liniment composed of Goulard's extract five ounces, eucalyptus oil and laudanum of each one ounce, and olive oil five ounces; or another liniment made up of acetate of lead one ounce, olive oil one pint, water one pint, to be well rubbed up together. Either of these may be applied once or twice a day, and continued for some time after the inflammation has gone, if the horse has to go out in cold wet weather. If fever is present, a mild laxative will prove beneficial, as will also half an ounce of bicarbonate of potass in a small mash morning and evening.

Cracked Heels—The skin behind the pasterns is very liable to become inflamed from the same causes as produce mud fever, the inflammation in both being erythema; but in the heels it often runs on to ulceration in the form of cracks or fissures; consequently there is great pain and lameness, the horse walking on his toes in a very cramped manner. Not only will mud and dirt cause cracked heels in cold weather, but fine, peaty sand will do the same, especially if there is wet. Even washing the heels and not drying them well will often excite inflammation of the skin. Clipping the hair off, no doubt, predisposes to it. To cure the ailment, the skin should be well cleansed, and if there are cracks it will be advantageous to apply a linseed meal or bran poultice to free them from dirt and

allay the pain. Afterwards use either of the applications prescribed for mud fever. If the skin is not cracked, the zinc ointment answers well, and if there is a discharge from it, powdered oxide of zinc rubbed gently into it will be beneficial. When cured, it is advisable to smear over the skin with an ointment composed of equal parts of lard and beeswax to protect it from the weather and dirt, for some time.

Warts—These are sometimes, from their situation, troublesome, and often cause inconvenience when they are in the way of the harness. They grow only from the skin, but their mode of growth varies, and this influences the measures to be adopted for their extirpation. Those with a narrow pedicle may be removed by tying a silk thread tightly round that part, or snipping them off by knife or scissors; others can be pulled off by the thumb and first finger nails, while those with a wide base have to be dealt with by the very careful application of arsenic, after making the surface slightly raw; sometimes the application of strong acetic acid or a solution of chromic acid will destroy them.

Itching Tail—Some horses are disposed to rub their tail on every opportunity, and to such an extent as to break the hair and even make the skin raw. In some cases this is due to eczema at the root of the tail; in other cases there may be some irritation underneath, or when nothing can be discovered there may exist a morbid sensation in the skin of the tail which impels the horse to rub it so continuously and energetically.

The cause should be ascertained, and a remedy then applied. If the itching is due to irritation of the skin, one of the dressings recommended for eczema may be tried; if it is owing to small worms about the anus or the rectum, these can be removed by injections of a solution of common salt or an infusion of quassia chips. When the rubbing is persistent, the root of the tail should be covered by a leather or cloth guard fastened to a crupper, and beneath the tail by tapes.

Ringworm—This is an unusual disease among well-kept horses, and is always due to contagion, the spores of the fungus which occasion it being derived directly from affected horses, or through the medium of clothing, brushes, harness, &c., which have been in contact with them. At first there are minute elevations on the skin which can be felt with the finger, and soon the hairs at these spots break, leaving a bare place that extends more or less rapidly, and generally in a circular manner. In this way the whole of the skin will be soon invaded by the parasite, and the horse then presents an unpleasant appearance. There is slight inflammation in some parts of the denuded patches, with a raw surface, but the horses do not seem to suffer much, if any, inconvenience. Precautions must be taken with a view to prevent the disease extending to other horses, and all brushes, combs, &c., should be well washed in a strong solution of chinosol; blankets should also be steeped in this solution. The horse must be dressed with an effective parasiticide—the best I have found to be chinosol ointment; it is not only a potent destroyer of the fungus, but, being non-poisonous to the horse, it can be freely applied over the entire body if need be; it should be well rubbed in, and left on the skin for two or three days before it is washed off.

Mange—This is caused by a minute insect of which there are three kinds, but the most common, and certainly the most troublesome, is the one that infests the whole surface of the body and burrows into the skin. It causes an intense itching from which there is no respite; consequently the infected horse has not a minute's rest, but rubs and gnaws himself day and night. The hair is shed where the insects burrow, and there are minute raw places that are sometimes covered with crusts. In the course of time, from the incessant irritation, the horse suffers in health and becomes emaciated, while the skin is gathered up in wrinkles and is raw and scaly. As the disease is very contagious and can be communicated even to men, efforts should be made to prevent its extension and to cure it as soon as possible. All implements and clothing must be thoroughly cleansed, as well as the stall or stable and fittings; the litter used by the infected horse or horses ought to be put in the manure pit. The horses should be dressed over the entire body with chinosol ointment after they have been well washed with soft soap and warm water and dried; if the coat is long, it should be clipped off. If the ointment cannot be procured, or is deemed too expensive, the following makes a good and a cheap dressing: powdered sulphur eight ounces, oil of tar one ounce, common oil one quart. These should be well mixed, allowed to simmer at a gentle heat, and frequently stirred. When being applied to the skin, the dressing should again be kept stirred. After two or three days another application should be made, and in two days more a complete cure may be relied on and the dressing washed off.

DOGS—As might be anticipated, the dog is very much less liable to disease, and is far more exempted from injury than the horse; and the sporting dog lives a healthier life than the over-domesticated creature that is pampered and limited in its movements to a short stroll beyond the drawing-room. So that when given good food and kept clean, the dog used for sport is comparatively free from serious disorders, though perhaps he incurs some risks that are inseparable from the work he is called upon to perform.

Wounds—These are not, as a rule, so serious in the dog as they generally are in the horse, because the intelligence of the former greatly assists in ensuring the position and quietude essential to the repair of injuries. The different kinds of wounds described as occurring in the horse are met with in the dog, and it is sometimes quite astonishing to find this animal recover rapidly, often without any assistance, from the gravest incised and lacerated wounds, which would be considered almost beyond repair in the larger animal. Perhaps the commonest wounds are those from the bites of other dogs,[1] and as these are punctured they are more troublesome to deal with than some of the other kinds; moreover, they may be inflicted by rabid dogs or by those with foul mouths and teeth, which may lead to dangerous disease. With ordinary wounds very little, if any, treatment is needed, beyond keeping them clean, and this the dog's tongue will generally accomplish if the part is within reach. If any dressing is required it should be of a non-poisonous kind, such as solution of chinosol. Simple wounds can be painted over with collodion, friar's balsam, or solution of gutta percha, or an ointment of oxide of zinc, iodoform, or boracic may be employed; but, when they are applied, the dog should wear a muzzle to prevent him licking them off, unless a bandage will answer the purpose. He must also be kept well muzzled when large wounds are in process of healing, as at a certain stage there is so much irritation that he would otherwise do great mischief to himself by tearing the part with his teeth. Large gaping wounds may be closed by stitches in the manner described for the horse, though it is to be

[1] Quarrelsome and savage dogs are dangerous not only to others, but to mankind, and it is well therefore to know how to act in releasing oneself from the fangs of such an animal, rescuing a helpless dog that is being worried by him, or in separating fighting dogs. I will here quote what I wrote on this subject some years ago in my work on *Rabies and Hydrophobia*:—"The only safe place to seize a dog is at the back of the neck, behind the head; there the skin is sufficiently loose to afford a good hold, while the hands and arms cannot be touched by the animal's teeth so long as the grasp is maintained. . . . . Blows will not prevent dogs biting and holding on, indeed they will generally make them more furious. . . . . The simplest, safest, and by far the most effectual plan of rescuing one's self, or defending other persons or dogs from some infuriated or mad animal's fangs, is *choking him*. If the animal wears a collar this is easily done, as one has only to seize it firmly at the back and pull it tightly against the throat in front; the knee, the foot, or the other hand will usefully aid in the operation by pressing strongly against the back of the neck. The dog should by no means be released immediately he lets go his hold, but ought to be still further choked until he is harmless for the time, when means may be had recourse to for securing him properly. When there is no collar on the neck, a strong handkerchief or piece of cord tied round it and pulled in the same manner, or twisted with a stick, is a ready appliance. . . . . It requires strong arms and a little coolness and tact."

observed that sutures rapidly ulcerate out in the dog. This may be obviated to some extent, however, by not bringing the sides of the wound too close together, so as to allow for the subsequent swelling, and the stitches themselves must not be very near the margin. In many cases the sides of the wound can be kept in apposition by glue or pitch plasters, or by bandages if the wound will permit. The wounds of dogs, if beyond reach of the tongue, and if the weather happens to be warm, are likely to become infested with maggots when not kept clean. These can be got rid of by washing the wound with solution of chinosol.

Fractures—Broken bones are very frequent in dogs, as they are much exposed to external violence; but fortunately, owing to their comparatively small size and their intelligence, they may be easily handled, and the fractures can therefore be satisfactorily examined, set and fixed in the best position for repair, the animals themselves aiding in this by remaining patient and tranquil. Besides, repair is usually rapid, and constitutional disturbance rarely takes place.

Fractures of the *skull* are always serious. If the bones are depressed, so as to make pressure on the brain, they must be raised, and removed if necessary. The *lower jaw* is sometimes broken, but unless there is much displacement, little more is needed than taking away any splinters or loose teeth. *Broken ribs* are extremely rare, as these bones have long cartilages and are very elastic; when this accident does occur, a wide bandage fastened tightly round the chest, and quiet, are all that is necessary. Fracture of the *bones of the shoulder blade* is dealt with by applying a pitch plaster to the skin over it, making it firmer by splints of pasteboard, while a starch bandage passed round the neck and fore-arm in a figure of 8 manner, and then round the body two or three times, keeps the shoulder immovable. The arm bone (humerus) and thigh bone (femur) are often broken, and until it is convenient to fix them properly, the leg should be firmly bound up with a handkerchief to prevent displacement. When all is ready, the broken bone is "set," by bringing the fractured ends together and keeping them in place by means of bandages and splints. If there is a wound extending to the fracture, it should not be covered by the retaining apparatus; and if there is swelling, before reducing the fracture it is well to get rid of it by warm water fomentations. When bandaging, allowance must also be made for subsequent swelling, as the circulation in the part may be seriously hindered if the bandage is too tight. The splints may be of wood, cardboard, stiff leather, sheepskin, or gutta percha: there is often advantage in having them of some material that will become pliable when steeped in warm water, as then they can be made to fit better; otherwise they are liable to cause bruises or ulceration. Various substances are employed to stiffen the bandages and support the splints, and keep them in place; these substances are usually solution of gum, pitch, starch, or plaster of Paris. The pitch is melted and applied at a moderate heat; it is smeared over the skin or the bandage, as is also the gum; the starch is dissolved in laundry fashion, the bandage soaked in it, and then rolled round the limb. The plaster of Paris bandage is generally preferred, and is prepared by spreading the gypsum in a dry condition over the extended bandage, rolling this up, and then steeping it in water. The limb having been enveloped in a dry cotton bandage, that with the plaster in it is put on evenly above it; when it becomes dry it forms a rigid case, so that no splints are required. When pitch is employed, it may be spread on basil leather, and pieces of this having been stuck on the skin inside and outside the limb, a long splint is placed outside, and held there by a bandage or broad tape. The entire limb may be kept immovable by a bandage encircling it and the body.

Fractures of the other bones of the limbs are to be treated in a similar manner. Detached splinters of bone, if projecting through a wound, are to be removed by means of forceps, and the wound is itself to be dressed with chinosol. After a limb is set, there is often so much irritation that the dog shows a disposition to tear off the bandages; a muzzle should therefore be worn for some days. The splints and bandages should not be removed in less than a month. A dose of cathartic medicine is beneficial.

Dislocations—Dislocations readily take place in the limbs of dogs, especially if young, and are in some cases complicated with fracture. There should be no difficulty in discovering them, the lameness and distortion being significant, while the absence of crepitation distinguishes them from fractures. After reduction, which is effected by extension and judicious manipulation, the limb must be bandaged as in the case of fractures, and kept immovable for as long a time.

Diseases and Accidents to the Feet—Foot lameness in the dog is due to a variety of causes, and in order to discover these, a careful examination of the toes and pad is necessary. In addition to the lameness, the animal favours the limb in every way and frequently licks it. There is also pain on manipulation. Thorns, pins, and other sharp foreign bodies are a frequent cause; these should be sought for, removed, and the foot immersed in hot water or poulticed. When the foot is bruised or crushed, the same treatment will generally suffice. The pad is liable to over-wear from long travelling on hard, broken ground, and sometimes the pain is so great that the animal has difficulty in moving; in some cases there may be actual inflammation and ulceration of the skin, with accompanying fever. This accident occurs more especially in sporting dogs which are not in condition when suddenly put to hard work; they may also be due to frost-bite. When the feet are merely tender, resting them for a few days and bathing with milk and water, or solution of alum or sulphate of zinc, and wrapping them up in a piece of cloth, will set them right. In the more severe cases, fomentations with hot water and poultices will subdue the pain; the poultices must be protected with a bandage or a laced boot made of cloth or soft leather, and the dog should wear a muzzle. In two or three days, astringent lotions—such as solution of alum or sulphate of zinc—may be applied. If an abscess forms, it must be opened and the resulting wound dressed with chinosol or iodoform. A long rest will be necessary to ensure recovery, and the dog may have to wear a boot for a considerable time afterwards. In such cases, a good but temporary protection to the skin is afforded by painting it with a solution of gutta percha. An eczematous condition of the skin between the toes is at times observed, redness, vesicles and moisture being the chief symptoms; in these cases a similar eruption is generally noticed elsewhere. Powdering the inflamed skin with chinosol, oxide of zinc, or iodoform once or twice a day and keeping the feet dry, is the local treatment to be adopted, and it may be necessary to supplement this by the administration, morning and night, of a few drops (4 to 10) of Fowler's solution of arsenic, given in milk or broth.

In *mange* the parasites sometimes burrow in the skin around the root of the toe nails, and cause mueh irritation, ulceration, and eventual loosening of the claws. This condition is usually troublesome to get rid of, and it may be needful to extract the claws before a radical cure can be effected. Chinosol ointment may be tried before this operation is adopted; it is certainly most useful after it. An ulcer is occasionally found beneath the claw, from which there is a slight discharge. This is caused by dirt, or the sand used on kennel floors, finding entrance between the skin and claw; there is soreness and swelling around the horn. In many cases the claw must be extracted; then the toe is poulticed for a day or two, and afterwards dressed with tincture of calendula or myrrh.

Over-grown Claws are more frequently seen in house than in sporting dogs, owing to their receiving insufficient exercise out of doors. The claw grows to such a length that it curls backward and inward until it enters the pad, and causes ulceration and intense pain. The claw must be shortened by wire nippers, pruning scissors, or a small triangular saw—though this last is not

to be recommended. The foot is then to be poulticed, and the wound afterwards dressed for a few days with chinosol lotion, to be succeeded by solution of gutta percha.

Not infrequently parasites of different kinds—among them harvest mites—lodge between the toes, and cause the dog such great annoyance that he bites the skin severely. An examination will reveal the presence of these insects, and dressings with chinosol ointment will kill them.

Ticks—Sporting dogs are occasionally troubled with ticks on the surface of their body, which give rise to restlessness and local irritation. A good dressing with chinosol lotion or ointment will cause them to disappear, though they may also be removed by the fingers, or with scissors or forceps. Washing the dog in warm water to which a small quantity of chinosol or ammonia has been added will allay the irritation.

Burns and Scalds—These accidents are not very frequent with dogs. A very good application is the famous carron oil, which is a mixture of lime water and linseed oil in equal parts. Cotton wool is to be dipped in this and applied to the injured parts. A solution of picric acid—made by dissolving the acid in water until no more can be taken up—painted over the burnt place, which is then to be powdered with starch or wheat flour, is sometimes recommended, as is also bathing the part with a solution of baking soda, and afterwards dusting it with chalk, flour, starch, or kaolin.

Diseases of the Skin—These are comparatively few, but two or three of them are rather common.

Eczema—This is a special form of inflammation of the skin, largely due to constitutional causes, and is extremely difficult to get rid of in the great majority of cases. The skin is inflamed, more or less destitute of hair, and has a crop of vesicles on its surface or a moist discharge on its surface. Only a small portion may be affected, or the greater part of the body may be involved. There is not much itching. When local, if the disease is only slight, oxide of zinc powder may be dusted on the part, or kaolin if it is very moist; should the surface be raw, chrysophanic ointment ought to be applied once or twice a day, the kaolin or zinc powder being put on afterwards. When the disease is very extensive there is a tendency to rub the skin, and the dog should therefore wear a muzzle, or a broad collar round his neck. External treatment must be supplemented by internal medication. Fowler's solution of arsenic is usually prescribed in doses of from three to twenty drops twice daily; the smaller quantity is given at the commencement, the dose being gradually increased up to the maximum, but for small dogs this should not exceed ten or twelve drops; it may be given in the food. As there is generally some debility, this medicament is often combined with tonics, and the following is a good formula:

Citrate of iron	2 drachms
Acetate of potash	3 drachms
Fowler's solution of arsenic ...	1½ drachms
Infusion of calumba	8 ounces.

One teaspoonful increasing up to one tablespoonful is to be given twice a day. This mixture should be continued for a considerable period—several months—though it is recommended that an interval of a week should be allowed between each quantity. It may also be necessary to give cod liver oil or malt extract. The food should be chiefly meat, and the dog ought to have abundant exercise.

Mange—There are two forms of this disease in the dog, in one of which the insect lives on or in the surface of the skin (*Sarcoptic scabies*), and is easily destroyed. The parasite multiplies rapidly and soon spreads over the body, causing great irritation and congestion of the skin, with continuous itching. Consequently the dog is always scratching and biting itself, making the skin sore; while the parasite, burrowing into the substance of this, causes the formation of vesicles or pustules, which break, discharge, and form small scabs. Various remedies have been prescribed, but chinosol ointment I have found as good as any. Some of the others are as follows: balsam of Peru, one part dissolved in alcohol four parts; or sublimed sulphur and whale oil, of each sixteen parts, well mixed with one part each of mercurial ointment and oil of tar; or one ounce each of oil of tar and sulphur well mixed in a pint of common oil; or lime and sulphur eight ounces, water three and a half pints, to be boiled until there is only one quart left; or oil of tar, powdered sulphur, powdered oxide of zinc, of each one drachm, glycerine two drachms, lanolin one and a half ounces. Whatever application is selected, it is advisable first to wash the dog thoroughly with soft soap and warm water; if the coat is long, it must be removed, and the dressing should be applied at least once again in two or three days, when the skin may be again washed. As the dog, in scratching itself, is likely to carry some of the parasites to the root of its claws, particular care should be observed in washing and dressing the toes, as well as every part of the skin elsewhere. The affected dog should be kept isolated from all others, and everything with which it has been in contact must be destroyed or thoroughly cleansed. It may be necessary to attend to the general health by giving tonic and laxative medicine, as well as good food and shelter.

The other form of the disease is known as "follicular mange," because the peculiar parasite that causes it is lodged deeply in the hair follicles of the skin; and therefore, though it is less contagious than sarcoptic mange, it is far more intractable to deal with. It usually commences in patches about the head, but soon extends to the body, and is most noticeable about the loins, sides, belly, and legs, to which it gives a very disagreeable appearance, as there is much suppuration, as well as a foul odour. At first the hair falls off in patches, upon which red spots appear; from these comes serum, then pus and blood, which form scabs, among which are cracks and other sores. The dog soon becomes unwell and appears to suffer considerably, though the itching is not so intense as in the other form, so that the animal, instead of scratching, rather shakes himself; but this may be from the pain, as he objects to have the affected parts handled, whereas, in sarcoptic mange, pleasure is manifested when the skin is rubbed. After a time, emaciation and debility are very marked, and the dog becomes such a loathsome object that he is usually destroyed before he succumbs to the effects of the malady. Treatment has often been unsuccessful, but this was probably because it has not been properly conducted, or was adopted when the disease was too far advanced. The hair should be removed as close to the skin as possible, and the treatment adopted may follow that recommended for ordinary mange. A solution of chinosol (1 to 100 or 150 of water) has proved effective. Another dressing is creosote and liquor potassae of half an ounce each, barley water eight ounces. Both of these dressings should be applied frequently, after the skin has been well cleaned by scrubbing with soda and hot water. Another dressing is olive oil fourteen parts, well shaken up with one part of creosote, and two parts of strong liquor potassae added; this is to be applied every third or fourth day to all the affected parts, the dog having been washed a few hours before each dressing. As a rule the treatment has to be continued for a considerable period, during which the dog's strength must be maintained by good food, to which small doses of sulphur should be occasionally added. For bedding, red-pine shavings should be employed, in preference to anything else, and they ought to be renewed at least twice a week, the soiled shavings being burned. Precautions should be taken against the disease extending to other dogs.

Lice, fleas, and other vermin of this kind, are got rid of by cleanliness of surroundings, washing the animals with soap and warm water, and dressing the skin with any of the simpler mange applications, especially chinosol solution.

Ringworm in two forms affects the dog, though rarely; both are due to a vegetable parasite. The

ordinary form presents itself in circular and always increasing patches of baldness, in which are seen broken hairs and greyish scales or crusts. There is not much irritation of the skin, though the patches are reddened, and the dog does not appear to be seriously inconvenienced. Washing with soap and water, and painting over the places with tincture of iodine, or dressing with chinosol ointment or lotion, will readily effect a cure. The other form, known as "honeycomb ringworm," has yellow crusts of a cup shape, which join each other to constitute comparatively large masses possessing a peculiar smell. These crusts usually show themselves first on or about the head. In treating the disease, all the hair and crusts must be got rid of, the skin thoroughly washed, and dressed with one of the mange applications, glacial acetic acid, or solution of corrosive sublimate.

Canker of the Ear—The skin lining the ear is not infrequently the seat of inflammation or ulceration, accompanied by a foul-smelling discharge; there is generally much pain and irritation, as the dog usually carries the head to one side, is constantly shaking it, and shows great dread and agony when the ear is handled. Sometimes there is bleeding from the ear, and when treatment is long deferred large granulations (proud flesh) spring up and obliterate the passage leading to the internal ear; deafness is the consequence. This is commonly known as internal canker, and is most frequently witnessed in long-eared dogs, and especially in those which are liable to be wet—such as water dogs; though it is sometimes seen in over-fed dogs which do not get sufficient exercise, and particularly if their ears are allowed to become very dirty, or if soapy water is allowed to remain in them. For the earlier stage, washing out the ears and thoroughly drying them, then dressing with chinosol lotion, or with one made by adding ten grains sulphate of zinc to an ounce of water, or two drachms liquid acetate of lead to eight ounces of water, are very serviceable. When there is much discharge and ulceration, chinosol or iodoform powder should be dusted into the ear after using the lotion. Calamine ointment makes a good dressing. It is most essential, in endeavouring to effect a cure, to prevent the dog flapping the ears, and this may be best secured by causing the animal to wear a cap fastened round the head. I have always preferred a fine net, such as ladies wear their hair in, as it keeps the ears confined without heating them.

External canker is merely an injury to the outside of the ear or a slight eruption that soon becomes ulceration; it is usually towards the tip of the ear, and is most frequent in long-eared dogs. Either of the above lotions, or a weak solution of corrosive sublimate, should be applied frequently and the head-net worn. Sometimes a soft painful swelling appears suddenly inside the ears of certain dogs, and the pain causes them to keep continually shaking the head, which makes the swelling still larger. It is produced by injury, and the tumour contains blood, a portion of which may be in the form of a clot. An opening or long slit should be made in the lowest or most dependent part, so that all the contents will drain away, and, to keep the wound open, the edges may be touched with caustic, or a piece of lint inserted for a short time. The interior should be dressed with chinosol lotion, and the dog made to wear the head-net until the part is healed.

General Diseases.

Distemper—The most serious, as it is the most common disease to which dogs are exposed, is that known as "distemper," which, attacking all varieties, is most fatal to well-bred, delicate dogs, and especially to puppies. It is a most infectious and contagious fever, being due to a microbe, and can be communicated not only by actual contact of healthy with diseased dogs, but by means of almost every conceivable medium—even through the air for a certain distance. It is maintained and spread solely by the microbe, and cannot be spontaneously developed; though bad or improper food and insanitary conditions may favour its reception and extension. Some persons believe that every dog should have it, and dogs are often exposed to the contagion purposely, in order that they may acquire it and so have done with it. This is a great mistake, as there is no necessity whatever for a dog to have such a dangerous and damaging disease; on the contrary, everything should be done to avert it. There is no doubt, however, that if a dog gets the disease and recovers, he generally enjoys immunity from another attack, as is the case in several other specific fevers; but this rule does not always hold good, for I have known of dogs being infected twice. The malady would appear to be special to the canine species, as I am not aware of its having been conveyed to any others. It is such a serious disease, and is so often fatal or followed by grave *sequelæ*, as well as accompanied in many cases with troublesome complications, that on an outbreak the advice of an expert should be obtained. The symptoms are generally those of catarrh; in from one to two weeks after exposure to infection, there is discharge from the nose and eyes, which are inflamed; shivering, sneezing, and cough; fever, listlessness, and depression, with the loss of appetite and much thirst—sometimes there is vomiting. The animal seeks warmth, and does not care to move. There is a tendency to constipation, though in young dogs there is often diarrhœa, the fæces being streaked with blood. The loss of condition is rapid, and extreme debility soon becomes manifest, especially if diarrhœa with ulceration of the bowels sets in. The nervous system only too frequently participates in the disorder, and this is shown by the occurrence of epileptic fits and convulsions or paralysis. In the course of the disease, in very many cases, the front of the eye (cornea) undergoes ulceration. There is often a pustular skin eruption. The complications are bronchitis, pneumonia, or liver disorder. The disease runs its course in two or three weeks, and little can be done to shorten this period; the chief thing to be observed is to nurse and maintain the strength of the patient most carefully. Cleanliness must be attended to, and at the same time the dog must be kept warm and comfortable; the diet should be meat broth or beef tea, egg, or finely chopped raw meat, and if it is not taken voluntarily, the animal must be fed with it. Small quantities of brandy must be given at short intervals; or three to five grain doses of quinine in a tablespoonful of port wine. The nose and eyes are to be kept clean by gently sponging them with warm water and milk; for the eyes, two or three drops of a lotion of sulphate of zinc may be dropped into them after cleaning them.

When recovery is taking place, from twenty to forty drops of tincture of gentian may be given three or four times a day.

But, as may be readily understood, prevention of distemper is all-important, and it is to be remembered that it is one of those scourges which can be completely extirpated by preventive measures. These are: keeping the diseased, or those which have been in contact with them, rigidly isolated until all danger of communicating the infection has passed away; disinfecting or destroying everything which has been in actual contact with or in proximity to the diseased, and not allowing people who have been with them to go near healthy dogs. The greatest cleanliness possible should be strictly observed. As dog shows are largely instrumental in extending the malady, every care should be taken to prevent infected dogs gaining admission to these, and sanitary measures likely to be efficacious in averting infection ought to be scrupulously adopted.

Rheumatism is not infrequent among dogs, especially sporting ones, and is due to exposure to cold and damp, particularly in their dwellings. It is most prevalent during the winter and spring. It may be acute or chronic—most frequently the latter, and though the joints may be involved, it is generally the muscles which are the seat of inflammation.

In the acute form there are all the signs of fever, with those of pain in the affected part. Should this be in the loins, constituting "lumbago," there is stiffness in the

hind extremities, and often the animal walks as if partially paralysed, though he is averse from movement; the back is arched, and so painful on manipulation that the creature whines or screams; while the abdomen feels hot and is tender on pressure. Constipation is a constant symptom. When the muscles of the shoulders are affected—"kennel lameness" or "chest founder"—the pain is as great on movement or in handling, while the lameness is of course limited to the fore limbs. When the joints are affected, they are swollen, painful, and hot. In chronic rheumatism there is no fever, but the joints are enlarged and make a clicking sound on movement; the animal is stiff, and often whines and howls, especially at night.

Dogs affected with rheumatism should be kept dry, warm, and comfortable. In acute rheumatism a dose of purgative medicine must be administered, and the bowels afterwards kept rather relaxed. Warm water fomentations of the affected part, and, after well drying it, rubbing in a liniment made up of equal parts of belladonna, camphor, and capsicum liniments, or the acetic acid liniment prescribed for rheumatism in the horse, night and morning, will allay the pain and stiffness. When the fever runs high, the following mixture has been recommended in doses of a teaspoonful to a tablespoonful, according to the size of the dog, every six hours: salicylate of soda four drachms, tincture of colchicum three drachms, acetate of potass two drachms, bicarbonate of soda one drachm, water six ounces. In chronic rheumatism the above liniments may be employed, and in the food may be given from three to eight drops of Fowler's solution of arsenic daily for one or two weeks at a time. Careful attention must be paid to the diet.

Catarrh—This differs from distemper in being non-infectious, unaccompanied by prostration and high fever, and usually in rapid recovery under suitable treatment. There is sneezing, a watery discharge from the eyes and nose, with dulness, and perhaps slight cough. The body should be kept comfortable and dry; the food nourishing, and small doses of any stimulant—such as brandy or whisky, a tea- to a table-spoonful—two or three times a day.

Sore Throat. Laryngitis—These disorders are sometimes noted in dogs, and are denoted by a hard or soft cough, which is very persistent; difficulty in swallowing, with extended head, and pain on manipulation of the throat. When acute, there is generally some fever. The animal should be kept warm in a moist atmosphere, the throat fomented with warm water, or rubbed with camphorated or other stimulating liniment, and covered with cotton wool and flannel. As swallowing is difficult, an electuary, composed of one drachm of chlorate of potass rubbed up in an ounce of honey, a little of which is to be placed frequently on the tongue, is useful in allaying the irritation.

Bronchitis—This may be the result of neglected catarrh, a complication of distemper, or it may occur independently of other diseases. It is sometimes caused by parasites. If acute, there is frequent cough, which may be dry or moist; fever, loss of appetite, attempts as if to vomit, rattling in the throat, quickened breathing, pulse increased in frequency, and debility. The dog should he kept warm in an equable temperature, with plenty of fresh air; the food must be good and easily digested, with small doses of stimulants frequently. Warm linseed-meal poultices should also be applied to the chest, and the vapour of hot water, to which a small quantity of eucalyptus oil has been added, inhaled. Doses of laxative medicine should be given at intervals.

Chronic Bronchitis is often seen in old dogs, and especially those which have been over-fed and under-exercised. It much resembles asthma in man, and is generally accompanied or preceded by indigestion. The chief symptom is a harassing cough, that comes on in paroxysms, and the breathlessness is so distressing that the animal looks as if about to succumb. However, after coughing for some time, a frothy mucus is expectorated and relief follows. Exertion develops these attacks. Little can be done in the way of cure, except in diet, which should be given in small quantities and frequently, and laxative medicine occasionally. Tonics, in the form of arsenious acid and quinine, are sometimes advantageous.

Inflammation of the Lungs—This is very often a sequel or accompaniment of bronchitis, and demands similar treatment; but as it is a very serious disease, and demands special skill in order to bring about restoration to health, a veterinary surgeon should be called in to undertake this task. The same may be said with regard to **pleurisy**, which nearly always complicates pneumonia.

Jaundice is sometimes a complication of other disorders, but in all cases the liver is disordered in its functions, or may itself be the seat of disease. The skin and eyes and mouth are tinged yellow, as is the urine; there are signs of sickness, and constipation is noted. After a time there is wasting and general unhealthiness; the right side of the body and the belly are enlarged, and the breathing becomes affected. If the liver itself is diseased, a warm linseed meal poultice may be applied over it. A half grain opium and calomel pill should be given, together with a dose of castor oil, to be followed by dilute nitro-hydrochloric acid in ten to fifteen drop doses every three or four hours. The diet should be light, and plenty of exercise is often beneficial.

Rabies—Until this formidable disease is finally eradicated, every one possessing dogs should know its early symptoms, so as to be on their guard against it. Usually the earliest signs are changes in manner and habit. The dog is ill-tempered and aggressive, particularly towards other dogs; he seeks retirement, or wanders away from home; his appetite is depraved, and he has a tendency to gnaw wood-work and swallow all kinds of foreign matter; he snaps at imaginary objects, and there is a peculiar alteration in his voice when he barks or howls; he has no dread of water, though he may be unable to swallow it; at a certain stage of the disease, in some cases, the muscles of the lower jaw become paralysed and the mouth remains open, while the eyes appear to squint; saliva often dribbles from the mouth; the gait is slouching. In countries in which the disease exists, and especially when it is prevalent, any change in the usual habits or manners of the dog as above described, should at once excite suspicion, and cause the animal to be at least carefully secured until his condition can be assuredly determined.

Worms—Dogs are perhaps more infested with worms than any other of the domestic animals, a circumstance due to their habits. The bowel worms are of two kinds—tape and round worms. The tape worms are flat, as their name implies, and they are in segments or joints, each of which can have an independent existence and propagate, as it contains male and female generative organs; these segments are cast off at a certain stage of development, and expelled from the body of the dog, to be taken up by some other creature and become a parasite in it. There are several kinds of tape worm, but their description would be of little value to the amateur. They are all more or less injurious to the animal infested with them, and though in all cases the signs of injury may not be equally apparent, yet it is desirable in every instance of such infestation to destroy these parasites as soon as they are detected. They, in the majority of cases, cause general unthriftiness, depraved appetite, bowel derangement, indigestion, convulsions, and in young dogs they retard growth. Perhaps the best remedy for all tapeworms is areca nut in doses of from half a drachm to two drachms, according to the size of the dog. Or half a drachm of this powder and the same quantity of liquid extract of male fern in combination, mixed in an ounce of milk, makes an effective dose. After this has been given, a dose of purgative medicine—castor oil is safe and convenient—should be administered. The fluid male fern can be given alone, and it is to be had in capsules, which are convenient for administration. Oil of turpentine, in doses of from one to three drachms

mixed with three or four times the quantity of oil or milk, is a handy and prompt remedy.

Round worms are not so injurious as tapeworms, but they often cause much annoyance; in puppies they frequently give rise to convulsions and death. Santonine, in doses of from two to ten grains, mixed up in a full dose of castor oil, generally causes their expulsion. The oil of turpentine, as above, is also useful in this direction. Tonic medicine—the best of which is, perhaps, powdered sulphate of iron in two to four grain doses given in milk twice a day for four or five days—should be given afterwards.

Poisoning—Dogs are frequently poisoned accidentally or maliciously, and if remedies are at hand, death may be averted.

Strychnine is frequently the poison from which they suffer, and if the dose has been large, death from general convulsions, in the form of intense cramp, is not long delayed. If sulphate of zinc is at hand, a dose of from ten to thirty grains may be given as an emetic in a wineglassful of water if the poison has been quite recently swallowed. When the spasms have set in, the dog should be kept partially under the influence of chloroform, which is administered by inhalation, a small quantity at a time being placed on cotton wool, which is held close to the dog's nose; the dog is placed on his chest and held in that position. The treatment must be continued until the spasms have subsided; then extract of belladonna—eight to ten grains in solution—can be administered by the mouth. Hydrocyanic acid, in minute doses—ten drops in water—may be given occasionally.

Apomorphin administered hypodermically, in one-eighth of a grain dose, has also been given to induce immediate vomiting, followed by the inhalation of half a drachm of nitrate of amyl at short intervals; this was succeeded by two draughts of chloral hydrate in solution, ten grains in each draught, an hour elapsing before each dose. Recovery has resulted from this treatment.

Carbolic acid is sometimes a cause of poisoning, either when absorbed through the skin or taken in by the mouth. It produces great depression, heart failure, and convulsions. Its presence is indicated by its odour. Stimulants and douching with cold water until the convulsions cease, have been recommended.

Arsenic, antimony, corrosive sublimate, and other mineral poisons, are sometimes taken by or given to dogs, and if the quantity is sufficiently large they induce severe vomiting, diarrhœa, and inflammation of the bowels, with blood-tinged fæces. Until the nature of the poison can be ascertained a suitable antidote cannot be given; but, in the meantime, some relief may be afforded by giving the poisoned animals plenty of milk or white of egg, or both combined. An emetic of sulphate of zinc may be given immediately after the poison is taken, if that opportunity be afforded. For arsenic the best antidote is freshly prepared peroxide of iron. For antimony, strong boiled tea infusion has been recommended, the dose being a small cupful.

G. FLEMING.

WAPITI (*Cervus canadensis*)—The wapiti is the lordliest of all the true deer; and among all the beasts of the chase there is none more stately or more beautiful, and none which yields a finer trophy to the hunter. It is essentially a gigantic Scotch stag, or, rather, the stag and the wapiti are the extreme forms of several races of the red deer type, which succeed one another in tolerably regular gradation as we pass from west to east through temperate portions of Europe, Asia, and North America.

Habitat—The white hunters throughout its range invariably call the wapiti "elk," because this was the name given to it by the settlers, who first encountered it near the Atlantic coast a couple of centuries ago. Formerly no game animal of North America, except the common or white-tailed deer, was so widely distributed as the wapiti; for though its habitat was, generally speaking, the same as that of the bison, it extended further west and further east. It abounded throughout the Alleghany ranges in the middle of the eighteenth century, and was very plentiful between them and the Mississippi as late as the Revolutionary War. Like other large game, however, it vanished with

WAPITI.

Av. height at shoulder, 60 *in.* *Av. horn meas.* 52 *in.* *Max. horn meas.* 73 *in.* (*right*), 64 *in.* (*left*).

melancholy rapidity before the oncoming of the rifle-bearing settler.

By the beginning of the present century it had become practically extinct in most regions east of the Mississippi, except in some spots just south of the Great Lakes and in a small stretch of the Pennsylvania mountains, where the last individuals lingered until after the close of the Civil War. During the first half of the present century, wapiti abounded on the great plains; and all the earlier explorers bore witness to the abundance of the great herds, though they were not found in such incredible myriads as were the bison. Being conspicuous animals, which could often be run down with a good horse, they were killed off much sooner than

deer or antelope. Like the bison, they were practically exterminated from the plains early in the eighties, excepting in an isolated tract here and there. They are now limited to the wooded mountains of the Rockies and the Cascades, where they are in places still very abundant. Indeed, there are parts of western Wyoming, Montana, Colorado, and Washington where they are almost as plentiful as ever.

Characteristics—The wapiti is highly polygamous, and during the rut the master bulls gather great harems about them, and do fierce battle with one another, while the weaker bulls are driven off by themselves. At this time the bulls are comparatively easy to approach, because they are very noisy, incessantly challenging one another by night and day. Settlers and hunters usually speak of their challenge as "whistling," but this is a very inadequate description. The challenge consists of several notes, first rising and then falling. Heard near by, especially amid unattractive surroundings, it is not particularly impressive, varying in tone from a squeal to a roar, and ending with grunts; but at a little distance it is one of the most musical sounds in nature, sounding like some beautiful wind instrument. Nothing makes the heart of a hunter leap and thrill like the challenge of a wapiti bull, as it comes pealing down under the great archways of the mountain pines through the still, frosty, fall weather; all the more if it be at night, under the full moon, and if there is light snow on the ground.

Methods of Pursuit—Doubtless the most exciting way to follow the wapiti was on horseback in the old days. Then the mounted hunter pursued him either with dogs or without, and in the latter case trusted to get alongside and kill him with a revolver-shot. The great size of the quarry was such that only the largest and most powerful dogs could in any way interfere with its flight.

Nowadays, however, wapiti must be generally killed by still-hunting, and the rifle has of need supplanted horse and hound. To me, still-hunting the wapiti has always been amongst the most attractive of sports. It cannot be said to be as difficult as the chase of the big horn, and it is free from the almost intolerable fatigue attendant upon clambering over mountain-tops after the white goat; but there is plenty of exercise about it if one hunts faithfully. Usually the scenery is very grand, for the wapiti are found scattered through the glade-broken forests which clothe the rolling mountain sides, and they have a habit of occasionally standing and even lying on bare, jutting look-out points on the edges of cliffs, from which one can see, as far as the eye can reach, nothing but vast stretches of lake-dotted, wooded wilderness. Often when I have killed a wapiti bull early in the morning, or at least with plenty of daylight ahead, so that there was no hurry about reaching camp, I have sat down by the dressed carcase, and literally for hours have gazed across deep valleys and at giant mountains, whose wild and savage beauty was unmarred by the least trace of man; then, with the tongue at my belt, I would start off to camp, timing myself so as to get there just as dusk came on and the blaze of the pitchy pine stumps shot upward through the darkness.

In the old days I not infrequently killed wapiti near my ranch on the Little Missouri. Even when I first went there, however, in the early eighties, wapiti had become scarce, while the black-tail deer still swarmed. I do not think I ever got a wapiti in one day's hunt from the ranch house. We always went with a wagon to some likely spot and began the hunt early the following morning. At the ranch house we depended for our fresh meat exclusively on our rifles; and on these occasions I was usually hunting for the table. I never got a wapiti head of any size on the Little Missouri.

My chief hunting after wapiti has been done in north-western Wyoming and western Montana, and there I got many splendid trophies. The largest head I ever killed had antlers fifty-six inches in length, and this is well above the ordinary size; nevertheless, in wholly exceptional cases they grow eight or ten inches and even a foot longer. Nothing can exceed the splendid massive symmetry of such a head.

On a trip in the mountains after elk it is usual to go with a pack train, for the country is too rough for wagons, and yet not so utterly impracticable as to forbid the use of horses, which is often the case in the haunts of sheep, goat, and caribou. With a pack train many comforts can be carried along, such as tents, and an ample supply of bedding, and of small luxuries for the table. In consequence it is far pleasanter, especially on a long trip, to have a pack train, for although any good hunter will always rough it as much as is necessary to get the game, still it is a pleasant thing to be comfortable when the chance offers. In fine weather a man can lie out in the open with impunity, and indeed I personally much prefer it to lying in a tent; but in the rain a man who has to lie out in the open is sure to have a rather dismal time. In the plains country, long-continued rains are rare, and, with a stout tarpaulin in which to wrap the bedding, a man can afford to disregard the chances of bad weather; but sometimes in the mountains it will rain every day for a considerable time, and then the discomfort of coming back to camp at night to pass a wretched hour standing up in a downpour, or couching under a leaking brush lean-to, with the certainty of damp blankets for the night, takes away a good deal of the fun of hunting. On the other hand, with a comfortable tent, a great deal of the fun of the hunting trip is after nightfall. To come back from a long all-day's walk, thoroughly

tired, yet not so done up as to be unable to appreciate rest and a hot supper, to sit around the blazing pine logs after the meal of elk venison, grouse, trout, and flap-jacks, and to turn into one's warm sleeping bag as the ice begins to skim the water in the buckets, make up, in the aggregate, as much real comfort as often comes to any man.

From the point where one meets the pack train it is now usually several days' journey into good elk country, for the skin- and meat-hunters butcher all game, the haunts of which are accessible from railroads. Once on the hunting grounds, it is easy to determine what are the chances for elk. If they are at all numerous, their trails will be seen everywhere, making well-beaten paths through the forests, while the edges of the streams and marshy hollows will be trodden up by the great round foot-prints, like those of two-year-old cattle. If it is during the rut, bulls are certain to be heard challenging one another. Later in the season, when there is apt to be snow on the ground, the trails are of course more distinct than ever.

In fairly wild country, there is less need in the case of wapiti than in the case of deer for being abroad early in the day. Although fond of taking siestas, they feed irregularly throughout the day; and during the rut the bulls are rarely still for any length of time, either by night or by day. In wild weather the herds are particularly active, although they are also then rather more difficult to get at, seeming to be more on the alert than when the weather is still and warm.

In hunting wapiti, some use can be made of glasses, but not nearly as much as in the case of sheep or goats, for there is too much forest. If it is rutting time, the bull can usually be placed by the sound of his challenge; otherwise his tracks must be diligently searched for, or else the hunter simply works his way cautiously through and across likely places until he comes upon some sign of his quarry. It is always necessary to go across or up wind, the nose of the wapiti being very sharp; but his eyesight is not particularly good—hardly as good as that of a deer, and not to be compared to that of a prong buck or mountain sheep. In very wild places wapiti bulls, especially during the rut, are so bold and self-confident that it is easy to stalk and kill them; but where they have been much hunted they become as wary as a deer, and it is then only their superior size, and the greater eagerness with which hunters follow them, that places them at a disadvantage in the struggle for life when compared with their smaller kinsfolk. Owing to its bulk, the wapiti is much more easily seen, and the hunter will of course follow it under circumstances in which he would abandon the chase of a deer, because the trophy is so much more valuable. Moreover, the wapiti lives in ground that favours the still hunter. The moose and the white-tail deer dwell in forests so dense that the difficulty of approaching them is very great; for it is almost impossible for any white man not to make some noise in slipping through the bushes and over the dead sticks and dried leaves. The sheep and goat are protected by the inaccessible nature of the lofty cliffs in which they delight. But the wapiti, like the black-tail deer, is not a beast of the high crags, nor, by preference, of the dense woods. The ground in which he delights is the broken rolling hill country, where groves and glades alternate, just as the black-tail loves the open hillsides, riven by gorges clad with ash and cedar. In consequence the wapiti and black-tail can be readily seen at quite a distance; whereas the moose and white-tail live in cover where it is hard to catch a glimpse of anything thirty yards off; and, moreover, when once seen, the wapiti and black-tail can generally be stalked without much difficulty, for there is always cover on rough hillsides and among patches of scattered timber. Under like conditions, however, I do not think that there is very much difference in point of wariness and keenness of sense among these four different beasts. Undoubtedly the moose and the white-tail are a little more clever, and the white-tail especially is the most cunning of all; but those wapiti and black-tail which do haunt the deep woods are nearly as hard to get at as their two slier relatives; at any rate, the difference is not great enough to warrant the hunter in taking liberties. Of course, in places which hunters have not yet penetrated—and there are a very few such in out-of-the-way mountain regions even nowadays—all four beasts are absurdly tame; but they never show the stupid self-confidence of the white goat.

Though the wapiti is so large and powerful, it is not a very tough beast, and succumbs to a bullet as readily as a deer or antelope. In shooting it I have usually carried a 45·75 or 45·90 Winchester; but the new small calibre smokeless powder cartridges, using a bullet with the nose of naked lead, will probably become more and more in use among the hunters who follow them.

The flesh of the wapiti is to my taste more delicious than that of almost any other wild game; though it must be eaten hot, as the fat tends to form tallow as soon as cool. The wapiti is easily domesticated, at least to the extent of being hardy and breeding well when kept in parks; but as soon as the bulls lose the dread of man which they have when wild, they become very dangerous in the rutting season.

There are several aberrant forms of wapiti, including one that dwells in the great Tule swamps of California. There is also an entirely distinct species with its centre of abundance in the Olympic mountains of Washington and in Vancouver Island. This species, which Dr. Hart Merriam has recently done the present

writer the honour of naming after him (*Cervus roosevelti*), is larger than the common form, with the head in winter black instead of dark brown; and the antlers have a straight beam, ending in a cluster of erect points instead of the long terminal prong with backward sweep, so characteristic of the ordinary form. The ordinary wapiti in the north reaches west to the Rocky Mountains. There then comes a great space where no wapiti are found at all until the coast ranges of the Pacific are reached, and the recently described species appears. From the days of Lewis and Clark these wapiti of the Pacific coast have been known, but they have always been confounded with the ordinary form, from which they are as distinct as is the Columbia black-tail deer from the ordinary black-tail or mule deer of the Rockies and the great plains.

THEODORE ROOSEVELT.

WART HOG—This animal (*Phacochœrus æthiopicus*), the *Vlakte vark* (pig of the plains) of the Cape Dutch, *Nkululu* of the Matabele, *Kolobe* of the Bechuanas, is the most familiar of the wild boars known to the African Continent. It has a wide distribution, and, in slightly varying forms, is found from North-east Africa to the Cape Colony. The northern wart hog (*Phacochœrus æliani*), which is classed by naturalists as a separate species, differs but slightly from the *Vlakte vark* of South Africa.

A full grown wart hog stands at the shoulder from 27 to 30 inches. In colour the animal is of a darkish-brown, inclining somewhat more to drab in the northern species. The top of the head and the upper parts of the neck, back, and shoulders are covered with long, stiff bristles, those on the top of the head radiating a good deal. The wild ferocious-looking head is disproportionately large and the muzzle very broad. The tusks are remarkably large and thick; they stand out wide from the jaw, curving upwards, and are often of surprising length. Fifteen, or sixteen inches is about the limit of the great upper tushes of the South African wart hog; but Mr. Rowland Ward, in his *Records of Great Game*, makes mention of a pair, procured by Captain Berners, R.N., from Annesley Bay, Abyssinia, which reach the extraordinary measurements of 27 and 26 inches respectively. The most remarkable feature of this wild hog, from which, of course, it takes its name, lies in the great fleshy warts or wens which protrude from the face. Of these, the upper and larger grow outside each eye, while the lower pair are found between the eye and mouth, not ar above the upper tushes.

The flesh of the wart hog, when the animal is fat and in fair condition, is very good eating, and forms a by no means despicable addition to the hunter's larder. As a general rule, it may be said that this wild pig is not so formidable an opponent as his relative of India; yet, when pursued by dogs, he often inflicts severe wounds; he has been occasionally known to attack horse and man, and more than one South African hunting pony has been badly ripped by his tremendous tusks. The fashion of spearing wild boar, pursued with such zest in India, has never come into general vogue in Africa, although in Somaliland one or two Indian sportsmen have tried their hog spears on these animals, and the legations protect wild pig for sticking around Tangier. The reason for this is, probably, that the wart hog is neither so common nor so easily found as the boar of India, and that he has a habit of running to ground when pursued. When a wart hog goes to earth, which he usually does in the hole of a Cape ant-eater (*aard-vark*), he twists suddenly

WART HOG.
Av. height at shoulder, 28 *in.*

round and backs in stern foremost. He can be bolted, after allowing a short interval, by two or three men jumping lustily together upon the ground above.

In former days it would seem that the wart hog was more commonly found feeding upon open plains than is now the case. He is now more often found in the vicinity of well bushed country. The hunter in the wilder parts of the interior, however, even at the present day, often gets a fair shot at this pig with the rifle. The wart hog can go very fast for a few hundred yards, but a pack of strong, rough dogs, or a mounted man, can pretty easily run into him. With good and plucky dogs, who understand their work, this animal affords very excellent sport, and can be killed by a man on foot armed with a long knife or an assegai. Systematic boar hunting is, however, seldom resorted to in South Africa, and the wart hog is only slain occasionally by hunters in the veldt in pursuit of other and nobler game. When alarmed or excited, the wart hog bolts with his

family as hard as he can lay legs to the ground, his tail held stiffly erect, with the tassel hanging curiously over. If he can find thick bush handy, he seeks shelter there, and if very hard pressed, will, as shown above, go to ground in the nearest earth or hole known to him. When set up at bay, he will attack dogs fiercely and inflict severe wounds, and the hunter on foot should approach with caution. More often than not a rifle bullet puts an end to his defence. If any of the dogs are badly ripped, a stitch or two and a washing of weak carbolic and water will usually set matters right, but occasionally an over-plucky or incautious hound is killed outright by the wart hog's formidable weapons of defence.

The tushes and head of a well-grown wart hog form a very remarkable trophy. It may be noted that the sow of this species carries fine tusks, only a little inferior in size to those of the boar. The appearance of the wart hog is hideous and ferocious-looking, but, save when molested or driven to bay, the animal is quite inoffensive. It is shy in its habits and has excellent powers of scent, and, if the hunter attempts a stalk, it is necessary to take every advantage of the wind.

H. A. Bryden.

WHALING—This is a sport that few amateurs have shared, and it therefore became necessary for me to take some of the information given here from professional fishermen. It is a maxim among true sportsmen never to take the life of an animal without making proper provision for saving those parts that are useful for food or other purposes, and all vessels employed for this fishing ought to be supplied with tanks or barrels to hold any oil that may be got, and, if it be Arctic whaling, some salt is required for bear, seal skins, &c.

There are several species of whales, some of which are much more dangerous to catch than others, and the grounds these different species frequent cover a large area of the ocean.

The pursuit of the Greenland whale (which supplies the best whalebone) would probably be found the most interesting from a sporting point of view, for, even if the voyage proved unsuccessful, there is just the chance of some sport at seals, walrus, bears, reindeer, narn-whale, sometimes white whales, and by extreme good luck one might get a musk ox.

Habitat—Sport in the Arctics almost entirely depends on the position of the ice, which varies considerably every year, and, like the big game in Africa, Arctic game and fish of all kinds have become very scarce, and retire further every year to more inaccessible places.

The Greenland whale, called "black fish" by the Scotch fishermen, and "bowhead" by the Americans, is found in the ice, and never goes far from the pack. The fishing grounds of this species are roughly, Behring Straits, Baffin's Bay, and North Greenland, but of late years I believe very few fish have been got in North Greenland.

Equipment—The vessels for this work are steamers strongly fortified and protected for ice navigation, carrying from six to eight whale boats, with a crew sufficiently strong to man the boats. They are also provided with plenty of sail power, for, when once among fish, the screw is stopped. The boats used by our Scotch fishermen are from 26 to 30 feet long, and about 5 feet 9 inch beam, with a depth of from 28 to 30 inches.

They have very little keel, and are built with a slight curve from the centre of the keel to the stem and stern posts, which rake outwards so as to allow the boat to turn easily and follow the motions of the whale. Their bows are protected from ice by a sheet of copper or zinc.

The gun, bollard heads, &c., are fitted as described in the "Sharks" article, Vol. ii. p. 235.

The usual complement of **line** for each boat is five lines, of 120 fathoms each, of from $2\frac{1}{2}$ to 3 inches soft laid Europe or tarred rope, made especially for the purpose. The lines are coiled down in a box, placed in the centre of the boat and in the stern sheets.

The boat is steered with a long oar, and the oars are so arranged by a grommet and a thole pin, that when let go they remain attached to the boat.

The **crew** is usually made up of harpooner, boat-steerer, line-manager, and three seamen.

The American whale boats are from 28 to 29 feet long, with a beam of from 6 feet 2 inches to 6 feet 5 inches, and are made with a centre board. Their lines are 300 fathoms of very soft laid Manila rope, and their bollard head is right aft. As a rule, the American fishermen do not use gun harpoons, but are very successful with rockets and bomb lances, which explode in the fish and often kill her on the spot. If any sportsman wishes to try this fishing, probably his best course would be either to purchase a steam whaler, or hire one for the season ready equipped with a suitable crew. As he is only fishing for sport, a crew sufficient to man four or five boats would be strong enough.

A fair-sized vessel for the purpose might possibly, with economy, be built for from £10,000 to £12,000.

There are some keen sportsmen who cannot afford such a large outlay, and, if they do not mind roughing it a little, it is quite possible to arrange for a berth on board one of the regular whalers, and, if they happen on a lucky year, they might have some good sport.

This fishing is a great lottery, for even when it was in full swing a ship would sometimes have two bad seasons in succession. A few small vessels still winter, I am told, at certain points in Baffin's Bay or the neighbourhood, and employ Esquimaux to make up their crews.

The whaling is done from the shore. The expense of hiring one of these vessels would probably be far less than the hire of a steam whaler for the season, but an Arctic winter would have to be faced. If any sportsman contemplates taking up whaling as a sport, probably his best course would be to try the bottle-nose whales for one season before embarking in the expense of a steam whaler. They take line rapidly, and I have seen them occupy four or five boats for several hours before they were killed. These fish are found from Iceland to Jan Mayen, and about Bear Island to the south of Spitzbergen. They do not go into the ice.

A small vessel, either a schooner or a brig, with an experienced crew, could probably be hired at Peterhead or Dundee. I am sure Messrs. Robert Kidd and Co., of Peterhead, would render every assistance for this purpose.

Should this fail, another course would be to hire one of the Norwegian schooners, crew, equipment, &c., which could probably be done through the British Consul at Christiania.

We now come to a group of whales which seem to frequent more temperate waters—viz. : Right whale, Pacific right whale, sperm whale, humpback whale, Californian grey whale, sulphur bottom whale, fin-back whale.

The vessels mostly in use in these waters are sailing barques and schooners, but there are also shore stations along the American coast and elsewhere, where at times a good many fish of some of these species have been taken.

The Californian grey whale, although by no means the largest, is said to be the most dangerous, and it appears usual to fire a gun rocket into the fish, so as to disable her seriously before the harpoon is driven in. The same tactics are carried out with the sulphur bottom and fin-back. If the sportsman wishes to try one of these species of whales, his best course would be to engage a suitable vessel and crew in America.

Most of these whales require different tactics for their capture, and it is extremely doubtful whether a crew in this country could be got together with sufficient experience for this class of whaling. Probably with the assistance of four or five American harpooners something might be done, but under these circumstances it is nearly certain that American whale boats would be required.

There is still another class of whaling practised round the north coasts of Norway. The whales are of four species, and are too wild and strong to be captured in the ordinary way, so small steamers from 80 to 90 feet long are employed. In the bow is placed a very powerful harpoon gun. The harpoon has a neat arrangement attached to it by which, when the strain comes on the closed barbs, they open, and explode a powerful shell, which frequently kills at once.

The line used for this fishing is about 500 fathoms of 5-inch rope, with a foregore of thirty fathoms of $4\frac{1}{2}$-inch rope.

There does not seem to be anything like the sport attached to this fishing that there is in the capture of the other whales, but if any one wishes to try it, the best course would be to communicate with the Consul at Tronso and endeavour to come to some arrangement with one of the companies, which own these steamers and have boiling stations on the coast to dispose of the blubber.

A good deal of practical information can be obtained from the following:—*Fisheries of the United States*, George Browne Goode. (Mr. Goode's book is the best authority I have come across, as he deals with every class of whaling, and has a map of the whaling grounds.) *An Account of the Arctic Regions*, 1820, W. Scoresby, Jun. *Journal of a Voyage to the Northern Whale Fishery*, W. Scoresby, Jun. *Whaling Cruise to Baffin's Bay*, Albert Hastings Markham. *Old Whaling Days*, 1895, Captain William Barron. *Whaling*, in sea-fishing volume of Badminton Library.

H. W. Gore-Booth.

WHIPPET RACING—Since in many parts of England this sport is practically unknown, it may be as well to explain that the whippet is a dog specially bred and trained for speed, to be run against others of its kind. Certainly no dog approaches it in fleetness for its size, as a course of 200 yards is covered by the whippet in about 13 seconds. The breed was originally a cross between the Italian greyhound and fox-terrier, but probably no first cross between the two would result in the type that is now termed a whippet, so the breed may reasonably be said to have separated itself from the parent stock on both sides. A true whippet should weigh from 12 to 20 pounds. Most of its points should be those of the greyhound, but the terrier blood should show through in a shorter head, slightly stouter build, and stronger coat.

The course for whippeting should be laid down in cinders and well rolled while wet, but it must never be allowed to get hard on the top, for that is sure to result in sore feet or other lameness. It should be 220 yards in length, and about 10 yards wide. This allows $1\frac{1}{2}$ yards for each dog, as the usual number to start in a heat is six. The course is then divided lengthways by boards or strips of canvas about 18 inches high, supported on pegs, and for some 30 yards from the start the course is marked across from side to side with parallel creases one yard apart, every fifth having the number of yards from "scratch" clearly marked at the side. At 200 yards from scratch is the winning post, and 15 yards beyond that is the "overmark." The judge's box should be sunk in a pit some three feet below the level of the course, to admit of a good view of the finish. The whole should be railed round at a convenient distance for onlookers, and there should be a tent with scales for weighing in at the start, and a tele-

graph board at either end. The competitors in each heat are given distinguishing colours, which are worn round the dog's neck, and the winning colours are posted on the board in the order of finishing, as the heats are run off. At well-attended meetings, the number of heats is large, and smart management will keep an almost incessant stream of dogs racing up the course. Whippets are handicapped according to weight and previous performances, and the name of the dog, colour, owner, and handicap is entered on the race-card in the following manner :—

HEAT FIVE.

			lbs.	st.
—	R.	Mr. Robinson's f. d. Peter	19¾	19
1	W.	Mr. Wardell's b. w. d. Old Father .	20½	20
7	B.	Mr. Hide's b. w. d. Doge	17	26
12	Y.	Mr. White's bl. w. d. Blue Funk . .	16	31
14	G.	Mr. Noble's b. w. b. Thoughtless Beauty	13¾	33
21	Bk.	Mr. Rice's b. b. Hannah	12	40

By this it will be seen that Mr. Robinson's fawn dog with the red ribbon starts at scratch, though his handicap is 19 yards, and the others start at distances reduced in proportion from their respective handicaps. Generally speaking, bitches are faster than dogs and are more severely handicapped in consequence. A fifteen-pound dog, for instance, gets 4 yards advantage over a bitch of the same weight.

The dogs are weighed in at the start of the racing and should remain inside the enclosure so long as they are left in the handicap. The clerk of the scales allows 4 ounces over the weight at which the dog is entered to run, and under some circumstances as much as 8 ounces, with 6 ounces extra in the final heat. After weighing in, the dog is taken to its handicap mark by the slipper. On the crack of the pistol the slippers simultaneously throw the dogs into their stride, and they race up the course to a white cloth which is waved before them by their respective "runners up." These runners have preceded the dogs up the course, and the signal to start must not be given before they have all passed the winning post, and the race cannot be declared fair if they have not all passed the over-mark at the moment at which the first dog breasts the tape.

Such, broadly speaking, are the rules of the course, and when a meeting is well-managed and anything is known of the various competing dogs, a good deal of amusment may be got out of the game little creatures. At the same time the element of sport cannot be said to be so prominent as the medium that is afforded for betting.

Training—There is considerable variety of opinion upon the subject of training. Some consider that a whippet requires a month or six weeks preparation before he can be expected to render a good account of himself in a handicap. It is understood, of course, that from early youth he has been encouraged to worry a cloth at all odd moments, and it is surprising how soon he will take to what is born in the blood, for it has been mysteriously ordained that the lure for a whippet should be a cloth held by the "runner." However, his physical training is another matter, and, taking into consideration the delicacy of the animal, it is often a difficult one. First, it should be ascertained that the dog is in good health, and then he should be put upon a diet of wholesome plain food :—biscuit or bread soaked in broth with an occasional boiled onion or parsnip is the staple diet. Sometimes a new laid egg mixed with the food is advisable if the dog has been rather over-exercised.

LITTLE JOE.

For exercise, walking smartly about five miles a day with an occasional gallop is sufficient, for the dog will do considerably more than this if taken over a country with some grass. As the day of the race approaches, he is put upon the best mutton diet, and beaten eggs if necessary. The trainer of "Little Joe," a dog that is tolerably well known in the neighbourhood of London, has kindly put a few notes on the subject at the disposal of the writer. He gives a course of three weeks only, and proceeds as follows :—

First week.—Dose with castor oil, and, if it should not seem necessary to follow this up with areca nut, feed twice a day on brown bread soaked in tea or mutton broth, and weigh the dog at the end of the week.

Second week.—Feed with brown bread soaked in beef-tea with a small piece of meat twice a day. Exercise for two miles morning and evening. Rub well, keep the feet clean, and weigh every morning.

Third week.—Feed with four ounces of grilled beef night and morning, with a teaspoonful of linseed tea on a piece of toast. For exercise, a walk of a mile and a half in the morning,

a short turn at mid-day, and a run on the grass in the evening. The last three mornings before the race an egg should be given with the food, and a small piece of boiled fish at night. On the day of the race, about three ounces of beef-tea and toast should be given in the morning, and a piece of lean roast beef or mutton after the first and second heat. "Little Joe's" trainer adds that kindness is essential in training a whippet, and that a bath once a week in summer is necessary.

Whippeting is still in its infancy, and has so far been almost exclusively practised by the mill-hands and miners in the manufacturing districts of Yorkshire and Lancashire. It is also said to be popular in Holland, but if dog-lovers among the English country gentry were to see the possibilities of the sport for a summer amusement, it would probably alter its character considerably. In a county like Surrey, for instance, where many people of moderate means live within easy distance of one another, a whippet meeting would form a very pleasant change from the monotony of the stereotyped garden party, for races can readily be run over turf, though of course a cinder track is preferable. Then the training of the dogs is an interesting occupation, and when out of training a whippet is a delightful companion, having most of a terrier's intelligence coupled with a greyhound's grace. His worst proclivities are a greed for carrion and all sorts of refuse, with a wonderful capacity for catching cold. The first of these makes a box muzzle almost a necessity while in training, and the second a Jæger coat with the owner's initials in the corner. Amongst the North Country miners, whatever may be the state of the family exchequer, the whippet is never denied his mutton. Perhaps this is not so much due to sporting instincts as to the chance of winning a large handicap—for it is no exaggeration to say that in many such cases the whippet is the chief bread-winner of the family.

An attempt was made a few years ago to popularise whippeting in the eyes of polite society, and a handicap was arranged in connection with the show of the Ladies' Kennel Association at Ranelagh. But from one cause or another the handicap resulted in failure. This was not the fault of the dogs, which were as smart a lot as could have well been brought together; but the management was bad, and the onlookers were in want of explanations which no one could be found to give them. Moreover, since whippets were then kept only by the rougher element and the owners were present, the better-dressed habitués of Ranelagh seemed a little shy of the sport. This was not unnatural, for it must be admitted that as at present practised it is crude and unpolished.

In the opinion of the writer a decently-trained whippet should race up the course to the whistle of its runner, and so avoid the ridiculous spectacle afforded by a troup of ungainly "runners" cantering up the course shouting and gesticulating to their respective dogs.

The slipping, too, would be a much more workmanlike performance if the dogs were despatched from boxes opened simultaneously by a wire under the control of the starter. This leads on to another point, namely, the size of the dogs. In order to make this system of starting at all possible, it would be necessary to limit the weight of competing dogs, so that boxes of a uniform size could be used, not too large, to be easily lifted about between the heats. This would all tend to result in prettier racing and better sport, for at present whippets range from nine to thirty pounds, and a heat may often present anything but a level lot of competitors. Moreover, with the present mode of starting, it is possible for a slipper to hold his dog if he wishes to avoid showing his true form. The rules are the making of a game, and so far whippeting has been a duller game than need be, for want of more stringent rules.

F. I. Thomas.

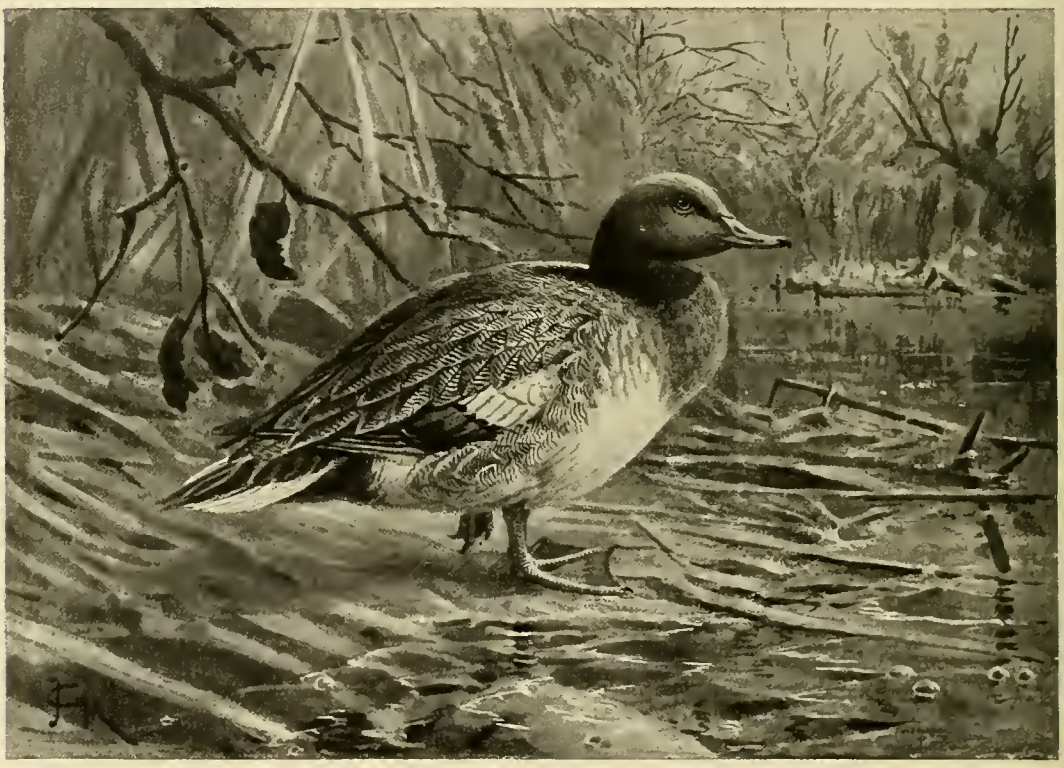
WIGEON—A species of wild duck (*Mareca penelope*), best known in the British Islands as a visitor during the winter months, when it is extremely common on most parts of the coast. Indeed, it may be doubted whether any other wildfowl, except perhaps the Brent goose, is ever seen in such flocks as those of wigeon, which resort hither in the cold weather.

Intermediate in size between the common wild duck and the teal, few birds present a handsomer appearance than the cock wigeon, thus described by Professor Newton:—"The greater part of the bill blue, forehead cream colour, head and neck chestnut, passing into pinkish grey below, and above into lavender grey, which last, produced by the transverse undulations of fine black and white lines, extends over the back and upper surface of the wings, except some of the coverts, which are conspicuously white, and shows itself again on the flanks. The wings are further ornamented by a glossy green speculum between two black bars; the tail is pointed and dark; the rest of the lower parts is white. The female has the inconspicuous coloration characteristic of her sex among most of the fresh-water ducks." Although a good many pairs may be found nesting in the north of Scotland and fewer in Ireland, the greater number retire to breed in Lapland and countries further to the eastward. Small flocks begin to arrive on the east coast about the middle of October, increasing in numbers till the middle of November, by which date there are as many probably as will be seen during the winter. They leave us about the end of February or beginning of March, although on the larger inland pools of fresh water, where they are but little disturbed, a few may linger on until April.

During the winter they afford almost unlimited sport to the wildfowler, both ashore and afloat, the greatest number being killed by the punt-shooters on such parts of the coast as afford shallow water over mud flats on which the favourite weed *Zostera marina* grows abundantly.

The haunts and habits of the wigeon have been well described by many writers, amongst whom may be named Colonel Peter Hawker, William Thompson of Belfast, Folkard, Abel Chapman and Sir R. Payne Gallwey, to whose works the reader may be referred.

A large flock of wigeon is termed by wildfowl



WIGEON.

shooters a "company"; a smaller number they term a "bunch." A company of wigeon, when first collecting, may be heard at an immense distance by the whistling of the drakes and purring noise of the ducks; but, when they are quietly settled and busy at feed, the only sound heard arises from the motion of their bills, which is similar to that of tame ducks.

It is a wonderful sight to observe a large company of wigeon congregating on a mud flat, the area of which is gradually becoming reduced by a flowing tide. "As the mud begins to disappear" (to quote the words of Colonel Hawker), "they will concentrate themselves on the last uncovered spot, where, as soon as the water begins to whiten the mud, thousands may be seen, literally wedged among one another, whence they are so unwilling to fly that they will seldom stir until the water actually sets them afloat." Then is the time for the wildfowler to work up to them in his punt, in which he will lie down and push or paddle towards them until near enough to get a shot. In this way an enormous number of wigeon are killed every winter on the coast.

An Irish wildfowler, Captain Kinsey Dover, shooting in Mulroy and Sheephaven Bays, in the north-west, killed in one winter 671 fowl, of which 518 were wigeon. The following year he secured 594, of which 386 were wigeon, and the next season the bag was 642, amongst them 408 wigeon. The number of duck and mallard killed by him in these three seasons amounted to 59, 55, and 46 respectively; teal 41, 55, and 70, the remainder being pochard, scaup, and divers.

Those who do not own a gunning punt, nor care for this particular phase of wildfowling, may sometimes enjoy excellent sport by shooting wigeon from the shore at flight time. The *modus operandi* is thus described by Sir R. Payne Gallwey in his excellent book, *The Fowler in Ireland*. "Place yourself and dog," he says, "behind a bank, looking in the direction in which the fowl will appear when making inland. You must choose a position over which you

know they cross in the morning flight. They will return the same way and face you if posted right. Should the wind be against them, they will travel low over the land, just topping the banks and hills. If the wind is favourable, they skim along with extended wings, high, and often out of reach. In calm weather they are up in the sky, and can oftener be heard than seen."

It is well never to fire at fowl coming towards you; they should be taken sideways overhead, or, better still, when they have just passed. By shooting thus the shot will not glance off nor encounter the dense mass of down and feather presented by an approaching bird.

In bright and early morn the flight is late and uncertain. The fowl will then straggle in at all hours up to 10 o'clock, when they usually decide to visit the flats or swim above them until their food is exposed. At dawn their movements are reversed. On fine, still mornings the main body quit their haunts before it is daylight; others following later. After a boisterous night they rest on the flats, or float over them longer than usual. They are loth to face the storm, and afford a good chance to the early flighter as they fly to sea, and doubly so if forced to fly against the wind.

For flight shooting a good retriever or Irish water spaniel is indispensable, for by his aid much valuable time will be saved in recovering wounded birds and picking up the slain.

Seeing that so good an authority on wild-fowling as Folkard spells "wigeon" with a "d" —widgeon—and many writers of the present day follow his example, it may be well to state here the grounds of objection to such a practice. Etymologists are agreed that "pigeon" comes through the French from the Latin word *pipio*. In the same way "wigeon" comes from *vipio*. The old French form is *vingeon* and *vigeon*; in Anjou *digeon*, male, and *digeonne*, female. Professor Skeat has shown that the spelling *wigeon* is to be found as early as 1570, and that the insertion of the "d" in the word has no more etymological significance than has the same letter in "judge," from the French *juge*. Hence there can be no doubt that if we spell "pigeon" without a "d" we must spell "wigeon" by the same analogy.

J. E. HARTING.

WILD BIRDS' PROTECTION—It is inevitable that wild creatures should suffer from the encroachment of a civilised and rapidly increasing population upon their haunts, and the avifauna of the British Isles has already lost some interesting species for ever. The great auk, the black tern, the avocet, the black-tailed godwit, the bittern, the great bustard and Savi's warbler must be reckoned extinct as breeding species; the first-named has ceased to exist anywhere; the rest are known to us only as vagrant individuals, almost invariably shot as soon as their presence is detected, to be added to some private collection or local museum. Other species, once very plentiful, have been reduced to the verge of extermination, partly by the drainage of their native swamps, partly by that rigour of game preservation which has caused all birds of prey to be entered in the black list, and, lastly, in the case of the ruff and reeve, by the diligence with which they have been persecuted at all seasons because of their edible qualities. In only one instance has the attempt to re-establish a lost species been rewarded with success, that, namely, of the capercaillie in Scottish woods.

In one respect, Great Britain has shown itself more hospitable to its native birds than has almost any other European land. It has never become the fashion with us to shoot or capture many species of small birds which are eagerly sought for on the continent for the table: and the destruction of birds of prey in this country in the process of game preservation has tended to maintain an abundant stock of song birds. So general has been the destruction of small birds in parts of Europe, notably in France, parts of Germany and Italy, that agriculture and horticulture have suffered seriously owing to the consequent increase of injurious insects and land molluscs. In 1895 the French Government invited all European Governments to send delegates to an International Congress, to consider the question of concerted action for the purpose of protecting birds useful to agriculture. M. Méline, the late Prime Minister of France, acted as President of the Conference, at which every European State, except Turkey, and some of the Danubian Principalities, was represented, Mr. Howard Saunders and the writer of this article having been appointed delegates by Her Majesty's Government. The proceedings were exceedingly earnest and harmonious, and resulted in a series of very strong recommendations. It was gratifying to the British delegates to know that the principles of these recommendations (except as regards prohibition of the importation of birds killed in other countries) have already practically been carried into force in this country by the Wild Birds' Protection Acts of 1880, 1894, and 1896.

These Acts certainly provide sufficient means for the preservation of rare or otherwise desirable birds, if their provisions can be carried into effect. This is left in large measure to the discretion of County Councils and other local bodies, which have shown a gratifying degree of activity in adopting the optional powers entrusted to them, and already, during the few years the Acts have been in force, a notable increase in some species has taken effect in some localities and an extension of the breeding range of others, such as pochards, tufted duck, and great crested grebes.

Authorities are divided in opinion as to the usefulness of prohibiting the taking of eggs of certain birds, owing to variability in the eggs of different individuals of the same species, and a close resemblance of the eggs of some species to those of others. But all agree that advantage may safely be taken of the power given in the Act of 1894 to prohibit all egg-taking whatsoever within limited and strictly defined areas, frequented by birds which it is desirable to protect. It is clear, however, that the Acts must remain a dead letter in those places where landowners and other residents do not bestir themselves to see that they are enforced.

The following abstract shows the extent to which the legislature has interfered to protect birds other than game. It is unfortunate that, although the Act extends to Ireland, the police in that country have received instructions not to enforce them.

I. Summary of the Acts.

Wild Birds' Protection (Principal) Act, 1880 (43 & 44, Vict. c. 35).

(1) Shooting or snaring all wild birds during a particular period (*close time*) is prohibited, and in the case of certain wild birds, named in the Schedule, special and fuller protection is granted.

(2) Offering for sale, after March 15th, any wild bird recently killed or taken, is prohibited.

(3) Provision is made for the extension or variation of the close time.

Wild Birds' Protection Act, 1881 (44 & 45, Vict. c. 51).

(1) Amends the law as to the offering for sale in respect of wild birds killed abroad.

(2) Adds the lark to the Schedule.

Wild Birds' Protection Act, 1894 (57 & 58, Vict. c. 24).

(1) Enables orders to be made, on the application of County Councils, to prohibit the taking or destroying of the *eggs* of certain wild birds, and of the eggs of any wild bird in particular breeding areas.

(2) Enables orders to be made to add further species of wild birds to the Schedule.

Wild Birds' Protection Act, 1896 (59 & 60, Vict. c. 56).

(1) Enables orders to be made to prohibit the taking or killing of any wild bird beyond the breeding period (or close time), and orders prohibiting the taking, &c., of all wild birds, in particular places, during the period to which the Act of 1880 does not extend.

(2) Enables application to be made by the Council of a County borough to prohibit the taking of eggs, and to add birds to the Schedule.

(3) Gives power to forfeit traps, nets, snares, decoy birds, &c., on conviction, in addition to any penalty, under any of these Acts.

These four Acts are to be read as one, and may be quoted as the Wild Birds' Protection Acts, 1880—1896.

II. Protection of Wild Birds.

Offences—*Any Wild Bird*—During the close time :—

(*a*) Any person (other than the owner or occupiers of any land or his authorised agent on such land) is guilty of an offence who shall knowingly and wilfully shoot, or attempt to shoot, *any* wild bird ;

(*b*) Or who shall use any boat for the purpose of shooting, or causing to be shot, *any* wild bird ;

(*c*) Or who shall use any lime, trap, snare, net, or other instrument, for the purpose of taking *any* wild bird ;

(*d*) Or who shall, after March 15th, offer or expose for sale, or have in his possession or control, any wild bird recently killed or taken.

Penalties—Upon conviction, the offender shall for a first offence be reprimanded and discharged upon payment of costs : for every subsequent offence, forfeit, and pay, in addition to costs, a sum not exceeding five shillings for each bird, and, in addition to this penalty, the trap, net, snare, or decoy bird used by such person may be forfeited.

Offences—*Scheduled Wild Birds*—During close time, or the further period which may be fixed under the Act of 1896, it is an *offence* for *any* person, including the owner or occupier of land and his agent, to commit any of the acts enumerated in respect of "any wild bird," and such person, upon conviction, is liable to the following punishment :—

Penalties—For every such bird in respect of which an offence has been committed, a fine not exceeding £1 may be imposed. In addition, the trap, net, snare, or decoy bird used by such person may be forfeited. Both as regards "any wild bird" and "scheduled birds," for refusal to give name and address, or giving false name and address to any person asking for such name and address, a penalty not exceeding ten shillings may be imposed.

These paragraphs apply to England, Wales, Scotland, and Ireland,[1] but in the case of Ireland, there is not the further power to confiscate the nets, snares, &c.

The penalties are to be recovered under the Summary Jurisdiction Acts, and all informations must be laid within six months.

Offering for Sale, &c..—A person shall not be liable to be convicted, however, if he satisfies the court, either—

(1) That, if in a place to which the Act extends, the killing or taking was lawful at the time when and by the person by whom it was taken or killed ;

(2) That the wild bird was killed in some place to which the Act does not extend (see Sec. 1, Act 1881).

A special Act was passed in 1888 with reference to the Sandgrouse (51 & 52, Vict. c. 55), under which any person who shall kill, wound, or take or expose, or offer for sale any Sandgrouse, killed or taken in the United Kingdom, shall be liable, on conviction, to a penalty of £1 for every bird.

III. "Scheduled Birds."

The original list of about one hundred birds appears in the Schedule to the Act of 1880, but power has been given under the Act of 1894 for orders to be made so that other birds may have the special protection "as if such species were included in the Schedule to the Act."

By the Act of 1881, the lark was added to the Schedule. In a supplement to this pamphlet a list is given of all the birds named in the Schedule, and those which have as yet, in any county, or part of a county, been added to the Schedule.

IV. Close Time.

By the Act of 1880 the close time for scheduled birds was fixed as between March 1st and August 1st in each year. Power, however, was granted to vary the close time locally, and this varies in different districts between the maximum of February 1st to October 1st, and the minimum (Essex) March 15th to August 1st.

Under the Act of 1896 the following further period has been granted for Middlesex, viz., October 1st to February 1st, for forty-seven birds, many of whom are migrants. This in effect gives protection to these birds all the year round.

V. Protection of Eggs.

Applications may be made by County Councils to the Secretary of State for an order to prohibit—

[1] The island of St. Kilda is exempted from the provisions of the Act of 1880.

(1) The taking or destroying of wild birds' eggs in any specified place or places;

(2) The taking or destroying the eggs of any specified kind of wild bird within a county, or county borough, or any specified place.

It is incumbent on the Council applying to specify—

(*a*) The limits of the place or places, or otherwise;

(*b*) The particular species of wild birds to which the prohibit is to apply; and

(*c*) The reason on account of which the application is made.

Offences and Penalties—Any person who shall take or destroy or incite any other person to take or destroy the eggs of any wild bird protected under an order shall, on conviction, forfeit and pay for every egg so taken or destroyed a sum not exceeding £1.

Under the Game Act (1831, 1 & 2, W. IV., c. 32), any person not having the right of killing the game upon the land nor having permission from the person having such right, who shall wilfully take out of the nest, or destroy in the nest upon such land, the eggs of any bird of game, or of any swan, wild duck, teal, or wigeon, *or* shall have in his possession any such eggs, shall be liable, on conviction, to a fine of five shillings and the costs of the conviction.

Under the Poaching Prevention Act (1862, 25 & 26, Vict. c. 114), the *eggs* of pheasants, partridges, black and moor game are treated as game.

VI. Breeding Areas.

Orders may be issued by the Secretary of State on the application of a County Council, defining specified areas within which the taking or destroying the eggs of *any* wild bird is prohibited. Various areas have been thus protected, such as Holy Island in Northumberland, part of the Island of Sheppey in Kent, and the Broads' district in Norfolk.

VII. Jurisdiction, and how to enforce the Acts and Orders.

The first point to remember, is that *any* person may take up the duty of preventing disobedience to the Acts and Orders, and help in obtaining convictions for any offences.

It is itself an additional offence to refuse to give the name and address, or to give a false name or address, to *any* person asking for this information.

Any person may also apply for a summons against an offender, and himself prosecute. If particulars are given to the Police, to a Secretary of the Society for the Protection of Birds, or to an officer of the Society for the Prevention of Cruelty to Animals, every assistance in their power will be given. In the cases of the taking of eggs of particular birds, it is expected that difficulties about identification will sometimes arise, and that expert evidence may be necessary.

A summons should be taken out for each offence against each person to be charged, and it is advisable to apply for two summonses where more than one bird or egg has been taken, &c.

All offences under these Acts are to be prosecuted in the manner provided by the Summary Jurisdiction Acts.

Where any offence is committed in or upon any waters forming the boundary between two counties, districts of Quarter Sessions or Petty Sessions, such offence may be prosecuted before any justices of the peace or sheriff in either of such counties.

All offences which shall be committed within the jurisdiction of the Admiralty,[1] shall be dealt with as if they had been committed upon any land in the United Kingdom, and tried in any county or place in the United Kingdom in which the offender shall be apprehended or be in custody, or be summoned, in all respects as if such offence had been actually committed in that county or place. Any information or conviction for any such offence may be averred to have been committed "on the high seas." In Scotland, any offence committed on the sea coast or beyond the ordinary jurisdiction of any sheriff, justice, or justice of the peace, shall be held to have been committed in any county abutting on such sea coast or adjoining such sea, and may be tried and punished accordingly.

[1] The Admiralty jurisdiction is "the high seas," and "the high seas" commence below low-water mark when the tide is out, or, in the case of rivers in the United Kingdom, outside an imaginary line drawn from the one point of land to the other, between which the river-tide flows.

IX. How to obtain an Order.

It is advisable first to interest some one or more of the Councillors in the question; to write to the Chairman, or petition the Council. The proposal will probably be referred to a committee to draw up a report as to the form of application and the reasons to be assigned. The opinion of an ornithologist should be sought, as it will be of great assistance.

The Home Secretary has sent circular letters on the subject to all the County Councils in England, and the orders which have been asked for have, as a rule, been granted. The application should deal with the following matters:—

(1) The extension of the close time.

(2) The addition of birds to the Schedule of the Act, 1880.

(3) The protection of the eggs of certain birds in the whole County or County Borough, or a specified area therein.

(4) The special reservation of any parts of a County or Borough as a breeding area, prohibiting therein the taking of the eggs of all birds or of certain named birds.

(5) A further period for the protection of particular kinds of birds which may in effect secure for them protection during the whole year.

The application for an Order may be made by any County Council in England, Wales, or Scotland, and, under the Act of 1896, the Council of a County Borough (except in Ireland) has now the power to apply for an Order.

X. How to make the Orders known.

The duty of making known the Orders is thrown upon the Council, who, in every year, are directed to give public notice of any Order during the three weeks preceding the commencement of the period of the year during which the Order operates—

(1) By advertising in the local papers.

(2) By fixing notices of the Order in conspicuous spots.

Copies of the Order should be sent to the county constabulary, police, coastguard stations, parish councils, and all elementary and secondary schools in the County. Private persons can help by inquiring if this has been done, and also by themselves obtaining copies of the Order from the Clerk to the Council; by distributing them and posting copies on their own land. In some cases, as in the County of Middlesex, the notice which has been issued contains engravings of some of the birds named in the Order. In Chester an excellent memorandum has been issued by the County Council giving full particulars.

It is very important that the existence of any extension of close time should be well advertised in the district affected, and the Protection Orders well placarded, so that "prevention" may have its full effect, and avoid, to a great extent, the necessity of prosecutions.

The Orders are published for England, Scotland, and Ireland, in *The London*, *The Edinburgh*, and *The Dublin Gazettes*, respectively, and all the Orders are to be obtained in separate form at the Queen's Printers.

This notice of what has been done to protect British wild birds would be incomplete without

some reference to the useful work done by the Society for the Protection of Birds, under the presidency of the Duchess of Portland. The committee of this Society have shown great discretion in avoiding ultra-humanitarianism, and great activity in the diffusion of knowledge and attraction of intelligent sympathy by means of lectures, pamphlets, leaflets, &c. The indefatigable secretary is Mrs. Lemon, Hill Crest, Redhill, Surrey, from whom the rules can be obtained.

HERBERT MAXWELL.

WOLF-COURSING—The wolf has always been recognised as the inveterate foe of man, and especially of domestic beasts; moreover, his fur is quite valuable. Wherever he is found, therefore, men wage merciless war upon him with guns, traps, and poison. He is very wary and cunning, however, and is well able to take care of his skin, so that every means must be taken to outwit him and every ally enlisted against him. Accordingly, from the earliest times, man in chasing the wolf has made use of the wolf's close kinsman and hated foe, the dog.

COYOTE.

Most domestic dogs loathe and fear the wolf more than any other beast; and a hungry wolf will snap up one of them as readily as he will snap up a sheep. Only a few breeds can be brought to face the wolf, and these must be specially trained. The huge shaggy dogs used in different pastoral countries to guard the sheep or cattle often have to encounter wolves. The big smooth-haired dogs, certain varieties of which were especially trained in the Middle Ages to assist in the death-grapple with dangerous beasts of the chase, can also be used against wolves. Hounds proper will only run a wolf if specially trained, and they are too weak to assail him singly or in small parties; but for centuries the great sportsmen of Continental Europe have hunted the wolf with specially trained packs, and a few of these are still kept up and trained for this purpose. But the true dog to use in the chase of the wolf is what was anciently called the "long dog," the gaze-hound, now called the greyhound. The Irish wolf-dog was simply a giant, rough-haired greyhound, and the quaint old sporting books of three centuries back show how frequently powerful greyhounds were used to overtake and tackle wolves, which the ordinary track-hounds had roused from their lairs.

The ordinary greyhound used for the chase of the hare is too light for rough work against dangerous prey, and in most countries the few remaining wolves have retired into wooded and rocky fastnesses where greyhounds are of no use; but where wolves are found on great open plains, like those of Russia and Siberia, and parts of western North America, greyhounds are specially adapted for their chase. At present there is a good deal of wolf-coursing done both in America and in Russia, though the conditions of the sport are widely different in the two places; for in Russia it is regarded as a sport pure and simple, to be followed only by a few of the great nobles; while in America, aside from an occasional army officer or ranchman, it is followed as a business by men who wish to exterminate the wolves, either for the bounty or to protect the cattle heads. Moreover, as in America the settlements continually increase, the wolves continually decrease, and the sport is so much more evanescent that it has never had the opportunity to assume any fixity of type.

In both places special types of dog have been bred for the purpose. In Russia these are the so-called borzois, or long-haired greyhounds, a type which has been in existence for centuries. In America a few men, during the last thirty or forty years, have bred big greyhounds, both smooth- and rough-coated, producing a type which shows signs of reversion to the old Irish wolfhound; dogs weighing something like 100 pounds, of remarkable power and of reckless and savage temper. The professional hunters, however, draft into their packs any animal which can run fast and fight hard, and their so-called greyhounds are often of mongrel breed.

In Russia the sport is a science. The princes and great landowners who take part in it have their hunting equipages perfected to the smallest detail. Not only do they follow wolves in the open, but they capture them and let them out before the dogs, as hares are let out at ordinary coursing matches. The huntsman follows his hounds on horseback. Two, three, or four dogs usually run together, and they are not expected to kill the wolf, but merely to hold him; and as soon as possible after he is thrown the huntsman leaps to the ground, forces the short handle of his riding-whip between the beast's jaws, and then binds them tightly together with the long thong. Great skill and coolness is needed, both on the part of dogs and men. The borzois can readily overtake and master partly-grown wolves, but a full-grown dog-wolf, in good trim, will usually gallop away from them, and will outfight any reasonable number. A good

many borzois have been imported into America, but when tried against our wolves they have not, as a rule, done as well as the best home-bred dogs.

In America, the only place where I have had a chance to take part in the sport, it is of course conducted in a much more rough-and-ready manner. For fifty years the officers of the United States army on the great plains have used greyhounds to chase jackrabbits, foxes, coyotes, and occasionally antelopes. Now and then those dogs which had been entered on coyotes were used against the big wolves; but it was only during the last few decades that the sport became at all common. There are now, however, a good many men who follow it in Montana, Wyoming, and here and there in Colorado and western North Dakota. There is a pack near my ranch on the Little Missouri which has a record of several hundred wolves to its credit. The owner is a professional wolfer, and his dogs represent every kind of pure blood and half-blood greyhound; but they are a wicked, hard-biting crew, and as they are usually hunted eight or ten together, they will, unlike the borzois, tear even the biggest wolf literally to pieces, without assistance from the hunter. Numerous casualties of course occur in the pack, for a wolf is a desperate fighter, and the sound and sight of the worry is fairly blood-curdling. The Sun River, in Western Montana, was at one time a famous place for its wolfhounds, and there was another celebrated pack near Fort Benton; but it is eight years since I was in either neighbourhood, and time marches fast in the Far West. My own experiences have usually been with scratch packs, to which I have occasionally contributed a dog or two myself. Ordinarily these packs contained nothing but greyhounds, either smooth- or rough-coated, but in one of them there were two huge fighting dogs of mixed ancestry, which could not keep up with the greyhounds, but did most of the killing when their lighter-footed friends had succeeded in stopping the quarry. The greyhounds with which we usually hunted had not been specially trained to the work, and were not bred for the purpose, having simply served an apprenticeship as coyote hunters. In consequence they were not capable of killing the wolf without assistance. They usually stopped him by snapping at his hams, and would then form a ring through which he could not break; or if he did break they would overhaul him shortly, and once more bring him to a standstill. The hunters either shot him or roped him.

I doubt if the sport, even when carried on in a more legitimate manner, could afford more fun than these helter-skelter skurries over the plains gave us. We generally started for the hunting-grounds very early, riding across the country in a widely spread line of dogs and men, and if we put up a wolf we simply went at him as hard as we knew how. Young wolves, or those that had not attained their full strength, were readily overtaken, and the pack would handle a small she-wolf quite readily. A big dog-wolf, or even a full-grown and powerful bitch-wolf, offered an altogether different problem. Frequently we came upon them after they had gorged themselves on a colt or calf. Under such conditions, if the dogs had a good start, they ran into the wolf and held him; but if a big wolf in good running trim was able to keep ahead of them for half a mile or so, his superior strength and endurance told, and he gradually drew away.

Of course the packs composed of nothing but specially trained and specially bred greyhounds of great size and power made a better showing. Under favourable circumstances three or four of these dogs readily overtook and killed the largest wolf, rushing in together and invariably seizing by the throat. The risk to the pack was so great, however, and dogs were so frequently killed or crippled in the worry, that the hunter always endeavoured to keep as close as possible, and on his arrival he put an immediate end to the contest by a knife-thrust. In running, the dogs usually had an advantage, because they were so apt to find the wolf near a carcase from which it had just made a hearty meal; and, moreover, the dogs, when possible, were taken on a wagon to the field of their exploits. Their dashing courage and ferocious fighting capacity were marvellous, and in this respect I was never able to see much difference between the smooth-haired and the wire-haired, or Scotch deer-hound, types, while the smooth-haired were generally faster.

THEODORE ROOSEVELT.

WOLF SHOOTING IN RUSSIA — In Russia the wolf is every one's enemy, and it is therefore the business of every man to kill him whenever and wherever met, so long as his killing can be brought about without much danger. There are many ways of doing this, for the wolf is not a dangerous animal when single, or in twos and threes, or even in a company of four or five. It is only when, half starved and frantic with hunger, he assembles in tens and scores to ravage the country, that he may be a source of real peril to human beings, and this—in spite of many excellent and exciting tales of wolf-packs and pursued human beings—is a matter of very rare occurrence, since wolves are not so numerous that a pack of a hundred or so can easily get together for the purpose of hunting human beings.

In the south of Russia wolves are hunted with dogs of a special breed. Men on horseback follow the hunt, and the quarry is not, as a rule, pulled down by the hounds, but shot by the guns of the mounted sportsmen. In the

north of Russia wolves are not hunted with dogs, their destruction being brought about, as a rule, in one of three ways; either by battue, by decoy, or by a peculiar method of discovering and killing them, which may be described as the pig-squeaking method.

To consider the first of these three ways of ridding the country of a pest, it may be said that a wolf may be started, unexpectedly, at any hare battue in autumn, for until the snow comes, to give unfailing evidence of his presence, he may of course appear anywhere. For this reason, when battue shooting, it is as well to have a slug cartridge handy for his benefit, should he, as he occasionally does, suddenly show himself among the hares and the black-game. While upon this subject it may be further suggested that a ball cartridge, in another pocket, is not amiss on such occasions, for

Russian Wolf.

during the autumn battues around St. Petersburg it has happened before now that a bear has suddenly darted out and away in response to the yells of the beaters.

But a real wolf battue is quite a different affair. This has been carefully prepared for, it may be for a month beforehand. Carcases of horses or cows have been laid down for the purpose of attracting any wolves that happened to be wandering in the neighbourhood; but wolves are no longer very numerous, and perhaps two or three weeks may have passed without the odour, which is strong enough to sicken a human being at a quarter-mile range, having reached the nostrils of a single wanderer. But suppose the wolves have scented the feast and have arrived in force, four or five of them. After they have supped off the malodorous carcase once or twice, they should, if need be, be coaxed to remain about the place, by new decoys placed close to the original spot. The keeper has his eye upon the party, and while they lie surfeited and sleepy with the carrion provided for them, he first sends a telegram (if he is in civilised regions), or a messenger, summoning his employers from St. Petersburg; then he noiselessly rings the wolves by walking round upon his snow shoes until he has completed a circle into which the wolf-tracks have entered, but out of which none have re-issued; he engages his friends and relatives at the village—to the number of fifty or more—as beaters; and surrounds the overfed slumberers with a cordon of silent and most alert and anxious peasants, each of whom has a personal animosity against the common enemy, perhaps only hereditary, but possibly justified by the actual loss of lamb or dog or sucking-pig. Afterwards, when the sportsmen have come down, and these peasants and their wives have suddenly, at a signal, raised pandemonium in the silent forest by a simultaneous uproar of yelling and cursing, those surfeited wolves will have to run the gauntlet and one or two of them are sure to breathe out their savage lives upon the snow. Soon every foot will have a kick at the victim and every tongue will curse him from generation to generation, as he lies bleeding and mangled, the most unpopular thing that lives—for a Russian peasant community.

Or, again, the sportsman who has paid for the carcases laid down to attract the wolves, may have elected to make no battue for his wolves, but to take up his position within the branches of some tree overlooking, at easy range, the spot where lies the garbage of which the wolves have already partaken once or more, and will partake again to-night.

The keeper who has brought him to the place, if he is wise, will leave him there and walk away again. Wolves (and bears also) are suspicious folk, and have been known to retire on discovering that the scent indicated the arrival of a human being but not his departure, arguing that he must therefore be present somewhere. The shooter must come early and stay among the branches until it is light enough to shoot, and this will be some little while; he is therefore recommended to dress very warmly and to bring with him such creature comforts as the circumstances would suggest. Another word to the wise: do not fall asleep among the boughs, and snore; for if you do this thing, not a wolf, worthy the name, will come near you. Moreover, fix yourself in so secure a position that even though you fell asleep you would not fall out of the tree; for, whether the wolves were there or no, this would be an uncomfortable thing to do. Bears may be shot from ambush, over a kill, as well as wolves; and it has happened occasionally that both bear and wolves have visited the food during the same night. In such a case the bear will, as a rule, give way to the wolves if these are more than two or three, retiring in terror and with moans and roars of rage, and very likely pursued by his foes into the branches of some adjacent tree, from which he will watch

his rival's enjoyment of the food with the most dismal utterings of his displeasure, in groanings and scoldings which are quite piteous to hear.

The third recognised method of obtaining a wolf-skin—or at least of endeavouring to achieve that distinction—is original and entertaining, and may perhaps be considered the most "sporting" way of the three. We will now suppose that the English sportsman has penetrated into some out-of-the-way Russian village, during winter, *en route*, perhaps, by sledge for some outlying destination such as Olonetz, the headquarters of the bears, and that he is obliged to pass the night there. There are wolves about, he is told; perhaps he has observed their tracks, but there is no time to lay down a carcase and wait about for days until it shall have attracted the animals so that he can sit in ambush with good hope of a shot; a battue is also impossible, because there is no Ochotnik, or village sportsman, in the place capable of organising such a thing, with any chance of success, against so acute a beast as a wolf. The animal must be approached with scientific skill and much caution, and surrounded at the right moment and in a proper manner, or he will slip out of the ring and stand grinning and looking on at the beat from a quarter of a mile away, on the *outside* of the ring, as the writer has seen him do before this. But though neither ambush nor battue is practicable, the sportsman need not despair. Let him inquire in the village for a young pig, one with good lungs, and a sack, and, having obtained both, let him put the pig in the bag. There are some who advocoate the cutting of a small hole for the pig's tail to emerge from the sack, with a view to pinching, in order that the little creature's squeaks may be, as it were, "turned on" when required: but it will be found that sufficient squealing will be done without special inducements. Having secured his pig and his sack, the sportsman must engage a sledge and horse, with a man to hold the reins. The moon must not be too bright, neither must the night be too dark, as the enterprising sportsman takes his seat, slug-loaded gun in hand, in the sledge, and drives softly and slowly into the loneliest road that will bring him into mid forest. A dense wood with cover on both sides and a good smooth sledge track, running like a white ribbon through it, will best suit his purpose. The sledge must have no bells, there must be as little urging of the horse as possible, no coughing or sneezing, and above all no conversation of any kind. The only sound permissible is the squealing of the pig, and the more of this, the better. Wolves—if within a mile or so—will hear it and come, and since the sledge is constantly moving, the area within which a wolf may happen to be prowling and to hear the call, is constantly widening. There are many chances against the sportsman: the wolves may never come within earshot; or, if they do, and respond to the invitation, an unlucky cough or a Russian expectoration (never withheld for long by the true Muscovite), may turn them aside before they have come within shooting distance of the sledge, even if seen; and again, they may approach quite close and follow the sledge or even accompany it, some twenty or thirty yards away among the thick cover to right or left, and yet never be seen at all. Nevertheless luck is not always on the wolf's side. It may be that the sportsman is a lucky person or the wolf the reverse, and in that event a delightful thing may occur. The shooter is sitting or reclining in his luxurious seat—there is nothing more luxurious to recline in than the bottom of a village sledge well padded with hay; he is half asleep, in spite of the pig's constant and frantic vocal efforts, which have never ceased for a moment, and which first enraged him almost beyond endurance, but at length gradually lulled him to slumber. His eyes occasionally sleepily glance at the trees to right and left; the forest has been a very dense one, but is gradually thinning out, and revealing here and there a little space of open which the moonlight illuminates in a weird manner. Suddenly he starts up, wide awake, and grasps his gun tighter—it has half subsided into the bottom of the sledge: he has seen something. The driver is fast asleep, holding the reins perfunctorily in his lap; the horse is walking in his sleep, Russian horses generally are. Another moment and the moonlight reveals first one gaunt, grey, cantering form and then a second, leaping from cover to cover, accompanying the sledge, thirty yards away. Up goes the trusty weapon: there is a bang and instantly a second, the horse wakes up and dashes forthwith into a confused, oblique gallop which lands the sledge and its occupants against a pine tree and thence into the deep snow; our sportsman is on his legs in a moment, and rushing into the wood to ascertain the effect of his shots. When, at last, the vituperating driver has caught and turned his startled steed and brought the sledge back to the scene of its disaster, he finds, maybe, our shooter—supposing him to be a fair shot—standing over the body of one wolf and preparing to administer the *coup de grace* to its snarling, wounded companion.

FRED WHISHAW.

WOODCOCK — The general characters which distinguish the different species of woodcock from the true snipes have been already pointed out in the article SNIPE, and need not be recapitulated. The European woodcock (*Scolopax rusticula*), and the American woodcock (*Philohela minor*), are the two best known representatives of their kind, for they are both widely distributed, and both are much sought after by sportsmen of every country which they frequent or visit. Indeed, it may be doubted

whether any game bird affords more thoroughly enjoyable sport than a woodcock, or leads the shooter into wilder or more picturesque haunts.

Licence for Shooting—It may be well to note, by the way, that although neither woodcock nor snipe come within the definition of "game," as laid down by the principal English Game Act (1 & 2 Will. 4, cap. 32), a game licence is nevertheless required for shooting them (23 & 24 Vict. cap. 90), and this applies also to quail and landrail. (*See* LICENCES.)

Result of Protection—Since the passing of the Wild Birds' Protection Act in 1880, many more woodcocks have remained to nest in the British Islands than used formerly to be the case. At one time the discovery of a woodcock's nest was so rare an occurrence that it was deemed worthy of record in journals devoted to sport and natural history; at the present day, there is perhaps hardly a county in the United Kingdom in which at least a few pairs do not remain to breed; and this not merely in the north, but in many of the southern counties. In Sussex, for example, Mr. Monk, of Lewes, ascertained a few years ago, from statistics carefully collected from the owners of game coverts and their keepers, that not less than 200 nests might be found in the eastern division alone. In view of this fact it will be readily perceived how difficult, if not impossible, it is to determine whether a so-called "early woodcock" is really a fresh arrival from across the North Sea, or has been here, perhaps bred here, during the previous summer.

Migration—It is of course well known that the great majority of woodcocks which are met with in the British Islands during the autumn and winter are visitors from the continent. In Northumberland these birds have been observed to arrive in the greatest numbers in hazy weather with little wind, and that blowing from the north-east. In Norfolk it has been remarked that the nocturnal migrations of the woodcock are influenced rather by the wind than the moon, and they have been found quite abundant on that coast after a dark night, with the wind from the north or the north-east. In Yorkshire and Lincolnshire some of the largest flights have been known to arrive about October 10th or 12th with a strong east wind, fog, and drizzling rain. At Spurn Point sixty have been shot in one morning after a fresh north-east wind during the previous night with drizzling rain, and at Skegness forty-three were shot in the same day under similar conditions of wind and weather. In Cornwall the first flights generally arrive about the second week in October, and with the wind at any point from south to east. In one year, however, a continuance of north-east winds to the end of October, with a waning moon, brought a large flight of woodcocks to the Land's End district. One gun there killed fifty-four in a week, and another thirty-nine in a day.

The Annual Reports published by a Committee of the British Association appointed to collect information in regard to the migration of birds from the keepers of the lighthouses and lightships, furnish some curious and interesting statistics concerning the arrival of woodcocks in autumn, and establish the following facts. Their migration takes place chiefly at night. Birds which strike the lanterns of the lighthouses are generally picked up between midnight and daybreak. When a large number come over together, as they often do, they fly with the wind; but, as an exception, single birds have been seen to arrive with the wind against them. During the autumn migration comparatively few are observed at stations on the west coast of Scotland, while during the spring migration few are seen on the east coast, and this applies to England as well as to Scotland.

Condition on Arrival, and Weight—It is generally supposed that woodcocks on their arrival here are lean and out of condition, but this is not always the case. Sir R. Payne Gallwey states that out of hundreds which he examined during the exceptionally long and severe winter of 1880–81, only a dozen were small and poor birds; and at the end of the frost he picked out three birds, each of which weighed exactly 16 ozs., a fourth weighing 18¼ ozs. These must have been exceptionally fine birds, for the average weight of a woodcock may be set down at 12 ozs. or thereabouts.

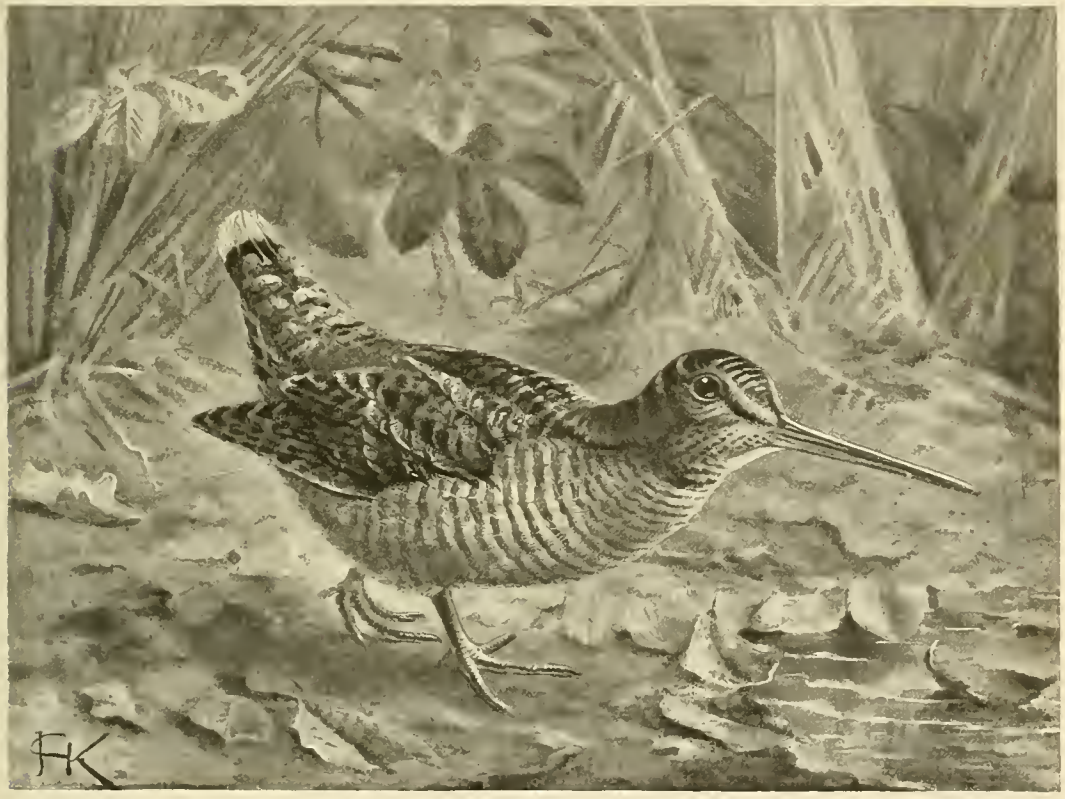
Sexes and Alleged Races—It has not been ascertained whether the sexes travel apart, as is known to be the case with certain small passerine birds; but some persons maintain there are two distinct races of woodcock, one large and light-coloured, the other small and dark, which keep apart and arrive independently. At Kilnsea, near the Spurn, it is said that a south-east wind always brings large grey or light-coloured woodcocks, and a north wind small and red-coloured birds, and this is reported from other parts of the coast. (See *Fifth Report on Migration*, 1887, p. 51, note.) According to Professor Newton, however (*Dict. Birds*, p. 1042, footnote), those who have taken much trouble about the matter are unanimous in declaring against the existence of two "species" or even "races." In other words, the difference observable in size and colour is due to individual variation and age, and not to specific distinctness.

It has often been asserted that the sexes of the woodcock may be distinguished by the appearance of the first primary, in which, it is said, the outer web is of a uniform colour in the female, and has white or buffy-white zig-zag markings on a darker ground in the male.

Woodcock

This, however, is a fallacy. We have seen the first primary of a woodcock which had the markings referred to for half its length only, the remaining half being quite uniform in colour. Thus no dependence can be placed on this character, which varies not with sex, but with age; nor can any constant character be pointed out as an invariable indication of sex.

White and Pied Varieties—Occasionally the variation of colour is carried to excess, and woodcocks are met with having more or less white about their plumage, giving them a pied appearance, while more rarely an albino or nearly pure white specimen is shot and preserved as a curiosity. See an article on "White Woodcocks," by the present writer, in *The Field* of November 20, 1897.



Woodcock.

Good Bags—In his excellent work on the *Birds of Norfolk*, the late Mr. Stevenson has given some interesting details of woodcock shooting in that county, mentioning some notable bags which have been made in certain favoured coverts; and allusion has been already made to the sport which these birds sometimes afford in Cornwall and the Scilly Isles. But of all places in the United Kingdom for this kind of shooting, none is comparable to certain localities in the west and south-west of Ireland. Kerry, Sligo, and Mayo are noted counties for woodcock. In Mayo ten to thirty couple is a fair day's sport for a party of six guns, but forty couple have been killed in a day in one of Lord Sligo's woods. At Lissadel, in co. Sligo, 150 couple were killed in three days by a party of eight guns; and at the same place on another occasion 338 cocks were bagged in six days by seven guns. In co. Kerry, the year Lord Elcho resided at Muckross, Killarney, the party, averaging five guns, shot in ten days 840 cocks, and during that winter (1863-64) 1,250 were killed on the estate. On Lord Ardilaun's estate at Ashford, co. Galway, the woodcock shooting is famous. There, on a January day, five guns have bagged 106 birds, and six guns 350 cocks in a week. On the two best days of this week there were killed respectively 117 and 115 birds. In January 1880 six guns shot 365 cocks in four days, killing on one day 165, and on another 82 birds.

According to Sir R. Payne Gallwey, from whose work, *The Fowler in Ireland*, these figures are quoted, from 300 to 400 cocks is a good yearly average on a favoured estate in Ireland, but in exceptionally good seasons even this number has been exceeded.

J. E. Harting.

WRESTLING—In Great Britain, wrestling, although much practised in days gone by in Cumberland and Westmorland, Lancashire, Devon and Cornwall, and in some parts of Ireland, cannot in any sense be considered a national pastime, or one that is cultivated so generally throughout the land as the sister science, boxing. There exists, however, so strong an affinity between wrestling and boxing that the one may be considered a useful and natural adjunct to the other. But, in order to make the pastime generally popular, it is the opinion of many that a style on the "catch hold" principle should be generally adopted as the recognised English method. At the present time we are lost in the maze of a variety of systems, to wit—Græco-Roman, Cumberland and Westmorland, Lancashire (catch as catch can), Cornish and Devon, Scottish, Irish, German, Swiss, Japanese, Indian, &c. Without doubt the Græco-Roman fashion of wrestling is productive of some excitement when witnessed by the uninitiated; but apart from that it may be asked, "What useful purpose does it serve?" As the struggle proper does not commence until both the competitors are on all fours on the ground, it is useless in a hand to hand encounter, where fair play is insisted upon. To have to throw an opponent down, and afterwards mangle him while in a helpless position, is somewhat inconsistent with the feeling which prevents a man striking an adversary when he is down. The following are the Græco-Roman rules.

(1) The wrestlers are only allowed to take hold from the head, and not lower than the waist.

(2) Tripping and taking hold of legs are strictly forbidden.

(3) The wrestling is with open hands, and the wrestlers are not allowed to strike, scratch, or to clasp hands.

Clasping hands means that the wrestlers shall not clasp one of their hands within the other, nor interlace their fingers, but they are permitted to grasp their own wrists to tighten their hold round their opponent's body or otherwise.

(4) The wrestlers must have their hair cut short, also their finger nails, and they must wrestle either barefooted or with socks.

(5) If one of the wrestlers fall on his knee, shoulder or side, they have to start again.

(6) If the wrestlers roll over each other, the one whose shoulders shall touch the carpet first is deemed the conquered.

(7) To be conquered it is necessary that both shoulders of the fallen shall touch the ground at the same time, so as to be fairly seen by the judges and the public.

The most surprising thing is that tripping should be prohibited. Tripping is the very essence of the art of wrestling; without the chips and other manœuvres peculiar to the science of English wrestling, there remains very little beyond weight and strength to battle with.

Some two or three years ago, when Paul Pons, the gigantic Frenchman, and the equally brawny Memisch of Turkey, met in a real contest, Græco-fashion, on the Canterbury stage, the men both got down on the carpet early in the struggle and sat on the floor for two hours and fifty-five minutes, neither daring to get on his feet, and a draw had to be declared, no fall being recorded. This so-called system, dignified by the high sounding Græco-Roman title, was foisted upon the British public in 1870, when the French giants, Le Boeuf and Dubois, contended with the Cumbrian champions, William Jameson and Richard Wright, at the Agricultural Hall. Both parties scored in their own style, but the Frenchmen eventually won the match through the doubtful issue of a toss up for choice of styles in the concluding bout, the Frenchmen, who won the toss, naturally choosing their own method. The two systems are so dissimilar that the merits of the men were never fairly tested. Yet, though Jameson and Wright failed to hold their own under Gallic rules, it was evident at the time that a little tuition and practice would have enabled the Cumbrians to compete successfully with their rivals. The English and French champions subsequently visited most of the principal wrestling towns in the North, but the game was generally looked on with disfavour except in a few of the leading wrestling resorts in Lancashire, where a style of wrestling nearly akin to the Græco-Roman fashion prevails. This, instead of being the art of standing up against an adversary, is simply the art of getting down in a certain position, so as to avoid being thrown a fair back fall. Tripping is the very backbone of the science of wrestling, and a system that does not teach a man to retain his perpendicular in the face of attack is of very little service, either as an athletic exercise, or as a means of self-defence. Ground wrestling on all fours, which includes throttling, is dog fighting pure and simple, and can only have been invented with the view of bringing an ancient and useful pastime into disrepute. When Greece took a leading position in the promotion of wrestling and other athletic exercise, ground wrestling is scarcely hinted at. In the celebrated contest, for instance, between Ajax and Ulysses, we are told that the champions endeavoured to "keep on their legs," and when Ulysses plied the outside stroke, supplemented by the back heel. and fell on the top of his opponent, the contest was over and the populace satisfied.

Cumberland and Westmorland Rules—On taking hold with the arms round the body, the right arm underneath and the left above, the wrestlers stand chest to chest, each

placing his chin on his opponent's shoulder and grasping him round the body, each placing his left arm above the right of his antagonist.

When both men have got hold, and are fairly on their guard, the play commences, and, with the exception of kicking, they are allowed to use every legitimate means of throwing each other.

If either party breaks his hold, that is, loses his grip, though not on the ground, and the other still retains his hold, the one so leaving loose shall be the loser.

If either man touches the ground, with one knee only or any other part of his body, though he may still retain his hold, he shall not be allowed to recover himself, but shall be deemed the loser.

If both fall to the ground, the man who is first down, or falls under the other, shall be the loser, but if they fall side by side, or otherwise, so that the umpires cannot decide which was first on the ground, it shall be what is technically called a "dog-fall," and shall be wrestled over again.

The Cumberland and Westmorland Hold—In securing a grip, the best way is to make of the hands a couple of hooks, by placing all the fingers of one hand into the other hand held in the same way, so that the back of the right hand shall press on an antagonist's back. Laying hold of one wrist with one hand, or clasping hands, are fruitless methods, as the former shortens the arms, and the latter gives an insecure grip which is easily broken. Having obtained a good hold, make play at once while the grip is retained, and always keep the right arm well up in order to prevent an adversary from getting too low a hold.

The back heel—The back heel is without doubt the father of all wrestling chips; in fact, every man, boy and child in the universe naturally resorts to the back heel in the emergency of a hand-to-hand struggle. When a wrestler gets a leg behind his opponent's heel on the outside, it is termed back-heeling. Always back heel with the left leg and as near the ground as possible. Those learning wrestling in the Cumberland and Westmorland style—indeed, in any other style where tripping is recognised—should commence their study of the art by getting proficient in the back heel, which is also a saving measure, for when a wrestler is in danger of being lifted from off his feet or swung round, the insertion of the back heel often brings about the downfall of an antagonist. Again, when a wrestler feels he is being back heeled, he should slacken his hold and lean forward; if he once allows himself to be pushed back, over he must go. Finally, the back heel should not be taken out when once inserted, especially against a long legged man, who is always a dangerous opponent.

The outside stroke (left leg)—This is George Steadman's, the champion of England's, favourite chip. The best way of using it is to twist your antagonist suddenly to the left, at the same time striking him with the left foot against the outside of his right ankle, as near the ground as possible. This, with the assistance of the arms, is generally effective.

The hank—The hank, when manipulated by an expert wrestler, becomes one of the hardest and most dangerous falls of all. It is a very insidious chip, and brought about by turning your left side to your opponent, then click him and lean, or rather fall, backwards; but be mindful that the click is secure, and the result will be that the leverage supplied by the inside click will bring about the downfall of your antagonist. The only way to elude the hank is to lean forward and endeavour to obtain an improved hold. The hank is one of the most uncomfortable falls imaginable, as the wrestlers usually reach the ground glued together like a couple of planks. If the man who falls uppermost is sometimes thoroughly shaken, how, may it be asked, does the underneath individual fare?

The inside click—Face your opponent squarely and jerk him towards you, when he will naturally step forward with one leg. He will try to steady himself by hanging back, which assists the expert inside clicker, who dashes in the chip, adding to it all the weight at his command. To click an opponent's right leg on the inside with your left, or his left with your right, or to use the cross click, that is, to click his right with your right or his left with your left, seems easy on paper, but the manœuvre requires an enormous amount of practice, and few men excel in the movement.

The crossbuttock—The crossbuttock with the left leg is the best. Turn your left side to your antagonist, and rapidly cross both his legs with your left leg, at the same time twist your man forward with all the force at your command.

The buttock—Few know the difference between the crossbuttock and the buttock. In the buttock, which is the finest of all wrestling chips, the legs are not used, and therefore great strength and quickness of action are necessary. It is accomplished by turning the left side quickly round, getting your back under your opponent's stomach and throwing him bodily over. It is an unsafe chip and, although very attractive-looking in exhibition wrestling, is seldom resorted to in genuine contests. Buttocking is little known beyond the confines of Cumberland and Westmorland, as no other style of wrestling is suitable for its display.

The hype—After securing a tight grip, step forward with the left leg, lift your opponent, and carry him to the left about a quarter of a circle, taking care the while that both his feet are free of the ground: at the same time strike

the inside of his left leg with your right knee, which, if properly done, will land him plump on his back. This is the right leg hype. The left leg hype is used in the same way, only the left leg is used as the aggressive weapon. It is accounted the utmost folly for a short man to attempt to hype a wrestler much taller than himself. A short man, say of 5 feet 6 inches, cannot lift a 6 feet grenadier high enough from the ground to hype him.

The swinging hype—The swinging hype differs in no great degree from the hype itself, except that it is necessary for the wrestler to swing his man after lifting him, and previous to applying the hype.

The outside click—When you find yourself being lifted, click your antagonist with your left leg, as in the back heel. Light weight men cannot attach too much importance to this chip, as it often happens that the click on the outside is the only defence they can make against superior weight and strength. Click smartly and low down, for in that consists the efficiency of the chip.

The breast stroke—This seems a simple move, but it is difficult to meet, and has baffled some of the best wrestlers in England. There is nothing particularly clever about the manœuvre. The assailant, however, requires great development of chest in order to accomplish it successfully. Grasp your opponent firmly round the body, twist him suddenly to one side and then to the other with a rapid jerk. As the legs are not brought into play, the fallen one often cannot realise by what he has been thrown.

The foregoing are the principal chips used by the best Cumberland and Westmorland wrestlers of the present day. Wrestling, however, can only be learned by continual practice commenced at an early age, as it is very seldom that a man attains any proficiency who commenced to study the exercise when out of his teens.

The Lancashire style (catch as catch can)—The Lancashire fashion is considered by its exponents to be much in front of all other recognised systems. It is certainly the roughest of the three English methods, as unlimited action is allowed, which includes struggling on the ground, catching hold of legs, and other tactics. Throttling and breaking arms are forbidden, but these are sometimes indulged in when the Lancastrian "birse" is up. A man on his hands and knees must not be choked by being pulled upwards by his opponent, but either party may break fingers or arms, so long as the referee is satisfied that such took place solely in the struggle for the mastery, and not through any desire to act unfairly. The Lancashire system is closely allied to the French or Græco-Roman style, the only material difference being that the French method forbids tripping, and catching hold of legs, whereas both are allowed under Lancashire rules. The principal chips associated with catch as catch can wrestling are the double Nelson, the half Nelson, the heave, the Lancashire lock, the flying mare and the three-quarter Nelson. The double Nelson is now barred at most wrestling gatherings, on account of the danger attending its accomplishment. It is brought about by getting behind an antagonist and placing both arms under his; the assailant then clasps his hands behind the neck of his opponent, and bends his head downwards in such a manner that his breast-bone will give way if he does not previously measure his length on the ground. Two shoulders down constitutes a fall.

The hold—Generally speaking, Lancashire wrestlers assume a half-stooping position at the commencement of an encounter, and either seize each other by the wrists or get into head holds, when, after much wriggling, they fall struggling to the ground. Here the real contest begins, the point aimed at being to bring the opponent on to his back with both shoulders at the same time, which constitutes a fair back fall.

The half Nelson and heave—In the **half Nelson**, grasp your opponent by the right wrist with your left hand, place your right hand under his arm while you seize him by the neck, and press his head forwards: then quit his right hand and clasp him round the waist underneath with your left arm and you will easily heave him over on all four points. The **heave** is a useful chip. Place your right arm round your opponent's right shoulder and reach over to his left loin, at the same time slip the left arm under him so as to get hold of his left elbow; a complete somersault is often the result. One way to stop the heave is to cross click your man and then ply the crossbuttock.

The Lancashire lock—The lock is simply that each wrestler grasps the other by the thigh when both struggle to get on all fours, the half Nelson usually then coming into play. If you catch your opponent by the thigh, and get underneath his body before he is down, you can lift him bodily up shoulder high and dash him down with considerable violence if so minded. This is called the Lancashire ham and leg.

The three-quarter Nelson—Probably the three-quarter Nelson is the most useful of Lancashire chips. In the first place, grasp your antagonist round the neck with both hands, without allowing him to get a similar hold, and then you have him in a good position for the buttock or crossbuttock, which no other form of catch hold wrestling supplies. The flying mare will be dealt with under the Cornwall and Devon style.

The Cornwall and Devon style—In the emergency of an unexpected attack, the West Country method, as it is often called, would

probably serve a man better than either the Cumberland and Westmorland or Lancashire systems, provided fair play were observed on both sides. The champions hailing from the west wrestle in strong linen loose jackets reaching to the hips and tied by linen strings in front. Catch hold above the waist is the rule or by any portion of the jacket. There are two great drawbacks connected with this style of wrestling. First, the wrestler must be attired in his jacket ere he can display any of his best points, and, second, their definition of a fall, viz., three points down, two shoulders and one hip or two hips and one shoulder, is always productive of endless wrangling amongst the partisans of the contending parties, a circumstance that has probably tended to wipe the practice of this exercise almost out of existence. A man must be thrown flat on his back before any portion of his body touches the earth ere a decision can be given againt him. Kicking, which was a speciality of the Devonians, is now abolished and the two styles amalgamated. The jacket is the great factor in these contests, and some astonishing throws are often brought off when a proper grip has been secured by a powerful and expert wrestler. It is usual to grasp the jacket by the bottom corners, or, by slipping one arm under the garment and seizing the opponent's collar, a telling hold can be obtained. The wrestlers are forbidden to take hold of the two corners of an opponent's jacket for the purpose of strangling him, and they must not grasp by the drawers, handkerchief or belt. The flying mare, the inside lock forward and inside lock backward, which are the best throws in this style of wrestling, may be briefly described. First, however, comes :—

The hold—The best position to assume before taking hold is to stand with the feet a trifle apart and the knees slightly bent, so as to be ready for either attack or defence. Ground wrestling is forbidden, and a man must be thrown very decisively before a verdict can be recorded against him. A cunning wrestler, when he finds himself going down, very adroitly makes for the ground, face downwards, in order that he shall not be landed on his back. Consequently a match in this style often lasts several days.

The flying mare—Seize your opponent's left wrist with your right hand, then quick as thought turn your back upon him, at the same time grasp his left elbow with your left hand and swing him over your back, as in the buttock, with a sudden jerk. The best method of preventing this is, directly your adversary gets in front of you, to click him from behind, at the same time clasping him round the body with your right arm. By this means you may get in the front position, when the half-buttock should come into operation and your antagonist will, as a rule, be thrown on his face.

Scotch Wrestling—A new system has recently been adopted at some of the tournaments held across the Border, which is simply Cumberland and Westmorland and catch hold wrestling combined. The wrestlers commence operations in the North Country style, with the arms round the body, and the hands grasped in the ancient back hold fashion. The tussle which ensues frequently lands one or other of the competitors flat on his back, which ends the contest before the struggling on the ground has a look in. If, however, a fair back fall with two shoulders down does not result, the bout is continued on the ground. Scotsmen, as a rule, do not excel in wrestling, probably from want of practice and the necessary tuition. The only time a Scot ever took the first prize at Carlisle was in 1812, when James Scott of Canonbie, Dumfriesshire, threw all comers.

In Ireland the national style of wrestling is the collar and elbow method. Take hold of an opponent's collar with one hand and his elbow with the other. First point down, as in Cumberland and Westmorland, constitutes a fall. German wrestling is a mixture of Lancashire and Græco-Roman and therefore calls for no comment.

Turkish wrestling is principally carried out in catch as catch can style. No kicking is allowed, and the throw must lay the vanquished man upon his back, so that both shoulder blades touch the ground at the same time.

The Swiss wrestle in stout drawers and shirt, and the champions are girded with a stout belt, for the purpose of affording a good hold, but they are allowed to catch either by the belt, shirt or drawers, or by all at one and the same time. There is no ground wrestling; first man down loses in Switzerland.

WALTER ARMSTRONG.

WRESTLING — INDIAN — The Indian differs *in toto* from the English wrestling. There is more art and less of brute force in it. The experts say that a man has to learn some four hundred tricks or *Penches*, before he can be considered a *Pulwan*, or expert wrestler; and I fear even a clever English wrestler, unacquainted with the Indian mode, would run a great risk of coming off second best in an encounter at first. It is just possible that before he could close with his antagonist, he might find himself on his back. The sport is most popular. Great crowds collect round the arena, in which noted performers of the art—as well known to fame in India as were Sayers, Mace, Heenan and other pugilists in Great Britain and Ireland—are about to try a fall. Whilst the wrestlers are silent, the audience often gets wild with excitement. This is bad enough amongst the solemn Indians, but with the excitable Burmese, the excitement reaches

blood heat, and the men and women bet their last rupee on their favourite.

A wrestling match in India strikes a European spectator as being decidedly slow. There is, apparently, too much patient waiting, manœuvring and watching for an adversary's blunder. A Cornish or a Cumberland wrestler would accuse his fellow-athlete of Hindostan of too much and too prolonged inaction. But the initiated appreciate the skill that is being exhibited even when the two opponents are, to all appearance, motionless as the sculptured statues they closely resemble, and he knows that the chances are in favour of many trials of that skill rather than of strength, and many changes of fortune before the contest is ended by one of the combatants being laid on his back so that both shoulders at once touch the ground. There is no calling of time; from the moment the two opponents enter the arena, and until that fair and square back throw, the struggle must proceed without pause.

Often there is considerable delay in getting to that grip which in English wrestling is speedily determined, if—as is the case in some countries—it be not arranged by agreement at the start.

The Indian wrestler has to be wary in his approaches to embrace his opponent, for he knows of *penches*, deftly dealt, jerks of his thumb and elbow by which he may be thrown before he holds his adversary at all, and therefore he indulges in much fencing at a respectful distance, and breaks the silence by slapping his biceps and his thighs with hollowed palms as he stalks round the other, looking for an opening, or hoping to find his opponent off his guard for a second. Nude, save for a scanty cloth round his loins, he is, when not too obese, a graceful object as he creeps lithely and cautiously round the ring.

At last the two get hold of each other, and the struggle commences. Now it looks as if one is about to be thrown, and the spectators expect to see him deposited on the broad of his back. Finding he cannot keep his foothold facing his adversary, he turns a somersault, using the body of his antagonist as a fulcrum; his legs go over the other's shoulders and he alights on the ground firm on his legs behind the other's back, and possibly with an advantage that imperils in his turn the stability of his opponent.

If one finds himself hard pressed and on the point of being thrown upon his back, he anticipates this by throwing himself down with his back uppermost and face downwards, clings to the ground while his opponent sits athwart his loins, and applies all his knowledge and strength with a view to reversing the position of his foe. So they remain awhile, the one in vain exhausting himself, the other husbanding his strength and recovering his wind for a favourable moment. The crowd look on breathlessly, wondering which will win. There is a sudden change, the uppermost man has been incautious, and he who was below and all but vanquished apparently, has thrown aside his opponent, has risen from the ground and, with a dexterous *penche*, has the other stretched beneath him, perhaps with shoulders that touch the ground, and so ends the conflict.

These wrestlers are always in training, and practise with the Indian clubs when not engaged in swallowing *Dahie* (clotted milk) or struggling in the arena itself.

F. T. Pollok.

YACHTING—Yachting in general, and yacht racing in particular, are not, and never can be, popular in the sense and to the degree that horse racing, cricket, football, and many other sports and pastimes are popular. Circumstances do not permit of it. A yacht race is, except perhaps on the Clyde, inaccessible to the multitude. The elements of excitement derived from betting are absent, as are also all the ordinary adjuncts of a holiday outing. Moreover, the rules and science of the game are so technical as to be appreciable only to those more or less initiated. It is a sport in which the people cannot largely participate, and consequently it cannot claim to be national in the sense of being universally popular. But in another sense it is *par excellence* the national sport of the United Kingdom. It is indigenous. It is the outcome of intense love of the sea—the modern expression of those roving characteristics which drove the longships of our Scandinavian ancestors from Norwegian Fiords and Icelandic bays along the Western sea-board of Europe, and far up the waters of the Mediterranean Sea. It is the peaceful complement of warlike naval power, the exhibition and satisfaction in a pastime of those qualities which, under sterner circumstances, made us mistress of the seas. And it satisfies the craving for independence so strongly implanted in our race, for in these modern times where can liberty of action be sought so well as upon the boundless ocean, where no notices of trespass can be found, and where every man is free?

And yachting is national in other senses. It started, or at any rate it grew to large dimensions, under the stimulus of laudable and patriotic ambition to increase the efficiency of our naval forces at a time when we were very keenly alive to the fact that national existence depends upon supremacy at sea. That mission is fulfilled: but yachting is still of national importance from a strictly practical and commercial point of view.

According to Lloyd's register, the yachts owned and built in the United Kingdom amounted in 1898 to 898 steam yachts, with a tonnage of 95,015, and to 3,206 sailing yachts,

having a tonnage of 60,739, making a total of 4,104 vessels with a tonnage amounting to 155,754. But many yachts are built in this country and owned abroad; and according to the same authority the total number of yachts built in the United Kingdom and now upon the register, amount to 4,603, with a tonnage of 214,533. The total number of yachts in the world is 6,747, with a tonnage of 265,568. The United Kingdom thus owns, roughly speaking, $\frac{3}{5}$, and has constructed $\frac{4}{5}$ of the tonnage of the world. Putting the average cost of steamers, racers, and cruisers at £50 per ton, the capital sunk in our own pleasure fleet, exclusive of vessels built for foreign owners, amounts to no less a sum than £7,787,700, and assuming that two-thirds of the total number are put into commission for the summer months, and that up-keep amounts to £10 per ton, the annual expenditure upon the fleet will be, in round numbers, something over £1,000,000.

To calculate the number of hands engaged either as seamen or in the yards would be a difficult task. The number of seamen employed on a yacht is, of course, not proportionate to tonnage, a small racing yacht requiring many more hands than ordinary cruisers of a much larger size; but estimating the number at the ratio of one hand to every ten tons, it is not too much to say that some ten or eleven thousand of the smartest seamen that this or any other country can produce, depend largely for their living upon our pleasure fleet. Many of the hands working in shipbuilding yards are not exclusively occupied in building or repairing yachts, and it is impossible, therefore, to arrive at an accurate calculation of the total number of men whose livelihood depends on the pastime of yachting. But if yacht designing and building, spar making, sail making, block making, rope making, upholstering, the manufacture of metal frames and plates and sheathing, and the making and fitting of the multifarious objects required in a yacht, be taken into consideration, there can be no doubt that many thousands of families on shore owe their employment to our national love for the sea, and that yachting contributes not a little to the maintenance of a race of seamen upon whose skill and courage the country has relied in the past, and will have to rely again.

To trace yachting from the beginning is a difficult task, but it appears to have originated in a well defined desire to supplement the naval power of the country. Our pleasure fleet being subject to conditions similar to those which have so profoundly affected both our ships of war and our mercantile marine, great changes have taken place in it since the early years of the present century. Steam has almost completely superseded sail as the motive power of large yachts, and, among sailing vessels, the tendency is to multiply in numbers and to diminish in size. As the direction in which a pastime such as yachting develops is dictated by the temper and bent of national feeling, the change from long years of war to long years of peace profoundly modified the character, aims, and objects of yachting. Racing has become of absorbing interest now, whereas formerly yachtsmen devoted themselves almost exclusively to cruising in company and performing evolutions under an admiral or commodore, after the fashion of a fleet of ships of war. Though these formal cruises and manœuvres, and the lavish expenditure of gunpowder in vogue half a century ago, appear somewhat ridiculous to us now, their object was sound and laudable and their meaning is clear enough.

Though occasional matches are mentioned as early as 1661, there can be no doubt that yachting developed into an important pastime under the stimulus of patriotism. Largely for that purpose clubs were formed, pre-eminent among which on account of numbers, wealth, and enterprise was the Royal Yacht Club, now known as the Royal Yacht Squadron. Fleet evolutions, signalling, chasing imaginary foes, and all the incidents of naval war,—to excel in these was the ambition of yachtsmen; moreover, the fact that we were constantly at war, and that privateering was universal, must have tended to encourage armament and cruising in company.

Early in the century our yachts were essentially sea-going cruisers, and the ambition of their owners was to emulate the performances of the smaller frigates, brigs, and despatch vessels of the Navy. The extent to which yachts copied men-of-war may be gathered from a description in *Bell's Life* of August 12th, 1827, of the Duke of Buckingham's yacht. She is described as carrying 12 brass guns, 18- and 12-pounders, and a full complement of seamen and marines, with a chaplain and doctor. This vessel was a brig, and probably of the same class as the 10-gun brigs of the Navy, of which there were such a number in the service. Discipline was kept up on these private vessels with a degree of strictness equal to that maintained in the Navy, and was enforced by similar means. The *Hampshire Telegraph* of August 5th, 1826, gives the following account of the discipline maintained by Lord Yarborough:—"The 'Falcon' yacht, Lord Yarborough," it states, "is manned by 54 choice hands who are governed in every respect as on board a man-of-war. The honest tars were so well convinced of the impossibility of being properly managed without a due sense of the 'cat o' nine tails' that they voluntarily consented to its lawful application on board, and ere the 'Falcon' left Plymouth Sound last week, all hands cordially signed a paper setting forth the usefulness of a sound flogging in cases of extremity and their perfect willingness to

undergo the experiment whenever deemed necessary for the preservation of good order." It was no uncommon thing for yachts of this class to obtain leave to join the squadrons of his Majesty's fleet. For instance, we learn from the *Morning Herald* of August 3rd, 1809, that Sir William Curtis, an alderman of London, wrote a pressing request to Mr. Percival for permission to sail with the fleet. Mr. Percival answered that as a friend he did not like to refuse Sir William Curtis, but as Chancellor of the Exchequer he could not write upon the subject to the Admiralty unless the worthy alderman would consent to put his vessel under their orders, which condition Sir William Curtis readily accepted.

Discipline was perhaps harder to maintain among owners than among crews, but goodwill and a hearty desire to co-operate towards making the manœuvres a success seem to have been fairly effective.

That muddles were occasionally made is shown by an account in the *Sporting Magazine* of October, 1831. It is there narrated that the squadron, consisting of 33 sail, weighed for Cherbourg in two lines, Lord Yarborough in the "Falcon" leading the weather, and Lord Belfast with his flag flying on board the "Harlequin" the leeward line. In consequence of the fleet being at Spithead and the wind nearly right through the Needles, they went out by St. Helens. Soon after getting round St. Helens the wind freshened considerably, and a great many of the smaller ships were obliged to shift jibs and reef. About 3 o'clock, the wind still freshening, some yachts with ladies on board made a signal for permission to anchor, and the commodore replied "Anchor when you please and where most convenient." Of course this signal was in reply to those yachts which had asked permission to anchor, but unluckily it was understood by a great many to be a general order, and the consequence was that almost all bore up and ran in under the land, leaving their noble commodore and a few others to face the anticipated gale. The consequence was the dispersion of the squadron, to the great mortification of their commodore, who doubtless would willingly have brought many of the captains to a court martial, had it been in his power to do so.

Lord Yarborough took a leading part in promoting manœuvres, and we learn from the *Hampshire Advertiser and Royal Yacht Club Gazette*, which paper is a mine of information on nautical matters of the day, that his lordship, availing himself of the offer of Mr. Markham to lend his yacht, as a tender to the "Falcon," struck his broad pennant on board his own yacht and hoisted it in Mr. Markham's schooner. He then proceeded with the fleet to sea, where he exercised them in a variety of evolutions.

Though racing among yachts was not neglected, speed was looked at from a naval point of view. Owners sought to demonstrate the advantages of certain improved models and types by building yachts identical with king's ships in all respects of tonnage, armament, crews and stores. They raced them against picked specimens of men-of-war; and naval constructors were glad to avail themselves of the information thus derived.

Men like Lord Yarborough and the Duke of Portland took their yachts to sea with the Royal Fleet, as these two gentlemen did with the "Falcon" and "Pantaloon" in 1831.

The purpose with which these yachts accompanied the fleets was clearly not simply for pleasure, but to demonstrate to the authorities the advances which private enterprise had made in the science of ship-building.

In an interesting article on the utility of yacht clubs in a number of the *Sporting Magazine* of the year 1832, it is explained that naval constructors were so bound by hard and fast rules, and the Merchant Service by tonnage regulation, that the only means the dockyard designers had of getting new ideas was when they happened to catch a fast privateer. "But at length," it adds, "a Society has sprung up, abounding in resources, enjoying more than princely wealth, independent of power, unshackled by the mercenary views of interest, and marshalling in its lists half the rank and talent in the country. Its aim was to associate pleasure with profit, and to establish on a patriotic basis a national and splendid festival worthy of the brightest age of England, but there was another and more direct object to which it tended—the improvement of the art of construction. The Naval administration foresaw this consequence and were not backward in promoting the welfare of the Society, which it is unnecessary to say was the Royal Yacht Club. How bright has been the result! Every year has brought additional improvements, and every day has pointed out some new field of experiments, and even while I write the Navy has acknowledged its inability to compete with one of the newest models." On July 13th and 17th, as we learn from the same source, an interesting match took place, by order of the Admiralty, in the presence of Sir Thomas Foley, the commander-in-chief at Portsmouth, between the "Emerald," the fastest cutter in the Navy, and the "Paddy from Cork," the property of Mr. James C. Beamish, a member of the Water Club of Cork Harbour. The "Paddy from Cork" beat the "Emerald" on every point of sailing, in running, reaching and beating to windward, in smooth water and in a sea way. She was so far superior to the naval cutter that it was deemed useless to prolong the contest to a third day.

That the Admiralty recognised the value of the service rendered by private owners is shown by the fact that in 1832 Mr. Fincham, Superintendent of the School of Naval Architecture in

the dockyard of Portsmouth, measured up the following yachts:—Lord Yarborough's "Falcon," Mr. Thorold's "Coquette," Lord Anglesey's "Pearl," and Lord Grantham's "Nautilus"; and reports that "from having the elements of a variety of vessels, and their ascertained sailing qualities, conclusions may be drawn which will greatly conduce to the improvement and adjustment of vessels. The excellency of many of the vessels belonging to the Royal Yacht Club, and the improvements which are frequently made in the construction of new vessels added to the list, render the operations of this distinguished club highly interesting and important."

"The advantages to be derived from yacht sailing to the general improvement of naval architecture, are principally in the forms, as particularly adapted to fast sailing, which under the favourable circumstances the yachts are placed in by not having those weights which men-of-war necessarily have on board, they are so well calculated to promote."

"When vessels of this description are found to possess superior qualities by ascertaining the principles, it may be determined whether they may be, or may not be, adapted to ships of war, either directly or by some modification."

The most remarkable instance of a direct private experiment in naval architecture, for public purposes, is to be found in the case of the "Water Witch," built by Lord Belfast in 1833. Lord Belfast, taking the given length of the most despised class of vessels in his Majesty's Navy, the 10-gun brigs, commonly known as "bathing machines," declared that he could construct a brig that would outsail any vessel in the Royal Navy, and be superior to any vessel of her class for purposes of war. To work his lordship went and produced the celebrated "Water Witch," built for him by Joseph White, of East Cowes. Every possible attention was paid to constructing and perfecting her exactly as a man-of-war brig. She was built with the same heavy scantling; and with all her proper complement of guns and crew, stores, provisions, water and other weights on board, she started under Captain George Pechell and joined the experimental squadron at sea.

The task she had before her was formidable, as the fleet contained four new ships built on the most approved principles.

The trials were brought off near Cork, and we learn that the "Water Witch" beat the whole squadron in a way hardly to be credited.

In a trial of $6\frac{1}{2}$ hours in a fine breeze she weathered on "Castor" $\frac{1}{2}$ mile, on "Prince of Wales" $2\frac{1}{2}$ miles, and on "Donegal" and "Nimrod" $3\frac{3}{4}$. We learn also that she beat "Vernon," "Snake," "Pantaloon," and "Serpent" on other occasions.

Sir P. Malcolm, who commanded the squadron, reported of her that she was perfect of her class, carrying her guns higher out of the water than the "Trinculo," 18-gun brig, with complete storage for crew, stores, water and provisions. *Bell's Life* attributes her success to her finer entry.

Thus it will be seen that the object and ambition of yacht owners was to set an example to the Royal Navy in construction, and to vie with it in the skill and seamanship necessary to manœuvre fleets of sailing ships in company. But as the memory of war became less and less distinct, the character of yachting gradually changed, and manœuvring and formal cruising died out by degrees. The last occasion on which the R.Y.S. executed any nautical manœuvre was in 1887 when, on the occasion of her Majesty's Jubilee, they sailed past Osborne in two columns, steam and sail, finishing up with a signal from the commodore—"Steam full speed ahead."

As steam gradually superseded sail in the Navy, it became more and more difficult for private owners to render much assistance to the Board of Admiralty, and it is practically impossible for them to do so now.

No private gentlemen are possessed of wealth sufficient to enable them to experiment in line-of-battle ships, or ships of the cruiser type, while the discomforts of life on board torpedo boats and "destroyers" are such as to deter any sane man from building one for his own use.

Occasionally a vessel, built for private owners, has been utilised for some special warlike purpose, such as, for instance, the "Candace," now "Fire Queen," built by Messrs. Ramage and Fergusson for the late Mr. John Lysaght, which is now serving in her Majesty's Navy as a despatch boat, and the "Giralda," designed and built by the Fairfield Shipbuilding and Engineering Company for Mr. McCalmont, which has recently passed into the service of Spain. From the designs of Mr. G. L. Watson have come the "Mayflower," built by the Clyde Bank Engineering Company for the late Mr. Goelet, and the "Hermione," built by Messrs. Fleming and Fergusson, both of which vessels have been added to the navy of the United States. But, in spite of these few examples to the contrary, it is to the last degree improbable that yachtsmen will in the future be able to render that practical assistance to the Navy that they certainly did in the past. Fortunately, however, their services are no longer necessary. The advantage of great speed in the numerous mail steamships of our mercantile marine stimulates private firms and companies to carry out experiments in naval architecture and marine engineering analogous to those which in the early days of the century were mainly conducted by yacht owners. Naval constructors can, and it is to be hoped do, study the results of private enterprise exhibited in the wonderful ships turned out from building yards on the Tyne, the Clyde, the Thames and Belfast Lough.

The origin and development of yacht clubs is so intimately connected with the origin and development of yachting that no review of that pastime would be complete without some notice of the clubs.

As the pastime of pleasure sailing became popular, and as men joined in cruising in company, in performing combined evolutions, and occasionally in racing, some organisation among them became necessary. Yachting created clubs, and clubs encouraged yachting.

Owing to the dearth of records, it seems impossible to do more than guess at the earlier events which led to the formation of clubs. A few of those now in existence can claim lineal descent from ancient institutions, but the greater portion of the numerous clubs which now occupy almost every available yachting centre round our coasts, are of comparatively modern date.

Where yachts were gathered together it was inevitable that matches between them should take place, and as these occasional private matches developed into regular open regattas, some sort of organised authority for the regulation of the sport became essential

A short cruise or the performance of combined nautical manœuvres, followed by a dinner, after which resolutions for the regulation of manœuvres or regattas were passed, formed the germ of a society which gradually developed into a club.

The most ancient club of which we have any authentic record is the Water Club of Cork Harbour. The origin of this club is lost in obscurity, but in the year 1720 it was established on a permanent basis, and its regulations were set down in writing, forming quaint and curious regulations which throw an amusing light on the manners and customs of our forefathers.

These rules are, like so much of the statute law of England, only declaratory of a common law, which existed long previously. This is clearly established by the rules themselves, particularly by Rule 3, which runs as follows:— "Resolved that no admiral presume to bring more than two dozen of wine to his treat, for it has always been deemed a breach of the ancient rules and constitutions of the club, except when my Lords the Judges are invited." From this it is quite clear that even in the year 1720 there were "ancient rules and constitutions."

The club appears to have consisted of an admiral, elected annually, twenty-four captains, and a chaplain, added to which there was an official known as the Knight of the Island, the island in question being Haulbowline Island. The objects of the club seem to have been to

FLEET OF WATER CLUB IN CORK HARBOUR—MANŒUVRING.

(*From a painting in the possession of the Cork Yacht Club.*)

carry out a formal cruise at every spring tide, from April to September; and to dine together after the cruise, it being a rule of the club that each captain should entertain in succession. The fleet was ordered to rendezvous on club days between Spithead and Spike Island, at a quarter ebb. Any boat not in sight when the admiral was abreast of Spike Island forfeited a "British half-crown" for gunpowder for the fleet. Gunpowder seems to have been in great requisition, and elaborate rules existed as to signalling by guns and saluting the admiral.

Whether the club possessed a club-house of its own at this early date, or whether its meetings were held in some convenient tavern, it is difficult to determine. References are made to the "Castle" at Haulbowline, and it would be very interesting to know what building was referred to, and whether it constituted a club-house. Such would seem to be the case, for it is laid down in the rules that it was the duty of the Knight of the Island, under severe penalties, to see that no unauthorised person entered the club-room, that the secretary had the rules of the club affixed to some proper place in the club-room at Haulbowline Island, and that on club days the flag—consisting of a Union with a green centre charged with the Irish harp in gold—should be hoisted on the Castle at Haulbowline.

The fortnightly cruise must have afforded a gay, and to our ideas a quaint, sight in the beautiful harbour of the Cove of Cork, when the fleet, decorated with huge ensigns and streamers, and manned by petticoated and pigtailed seamen, worked up to their rendezvous at Spithead, and let go their anchors. The admiral, who had been pacing his deck with as much importance as if he commanded a squadron of ships of the line, gives the word to hoist his foresail half-up, and at the appointed signal the others heave short and get their anchors apeak, all except perhaps one belated ship, which is struggling round the far side of Haulbowline Island. In a moment the admiral's foresail is hauled right up, while the hills reverberate with the sound of his gun, and the fleet weighs anchor. They glide in stately, and probably somewhat slow procession round Spike Island, led by the admiral, who doubtless notes the absentee, and subsequently extracts from him that "British" half-crown provided for in the rules.

Passing through the entrance of the harbour, the admiral proceeds to manœuvre his fleet, to the great gratification of the host of spectators, and after summoning first one captain and then another to receive his directions by a profuse expenditure of gunpowder, he hoists Dutch colours and fires two guns. This is the signal for a general chase after an imaginary enemy, a chase which continues till he hauls down his flag and fires another gun. The fleet re-assembles and once more falls into line in its appointed order. Back again through the Narrows and up to their anchorage they proceed in line, and the captains, having anchored in position and made up everything for the night, foregather at the club room to enjoy the hospitality of the host of the day.

This manœuvring and chasing of an imaginary foe sounds somewhat trivial in our modern ears; but when it is considered that the nation at this period was usually at war, and that yachts of those days bore a very close resemblance to the smaller class of king's ships and might do useful work, the origin and significance of the custom becomes clear. A fleet of steam yachts, analogous to our destroyers, might do worse under similar circumstances than learn to manœuvre together.

Quaint club rules existed apparently for the purpose of checking extravagance in their convivial meetings. It was ordered that no admiral should bring more than two dishes of meat for the entertainment of the club, or more than two dozen of wine to his treat. From 1720 to 1735 no restriction seems to have been put on the amount of wine consumed, and over the events which led to a change in this practice sympathetic history draws a veil. But in 1735 appears a rule that no member shall drink more than one bottle of wine, unless it be a "peremptory." What a "peremptory" was is not explained, but perhaps Rule 14, which says: "*Resolved* that such members of the club or others as shall talk of sailing after dinner be fined a bumper," may throw some light on the subject.

Peremptories were probably not infrequent or unpopular. Every member of the club being peremptorily obliged to drink the bumper inflicted as a fine for talking shop, it is hard to believe that when a number of enthusiastic yachtsmen sat down to dine after cruising all day, that they were not peremptorily obliged to drink a very large number of bumpers, to the inevitable and perhaps not unpremeditated infringements of the one bottle rule.

The club took cognisance also of the dress of its members, and in the rules dated 1720 it is ordered that no long-tail wigs, large sleeves or ruffles be worn by any member at the club.

In 1817 the club settled upon a uniform, and admitted ladies to the privileges of the club. The records of July 9th contain the following resolutions:—

"*Resolved* that the members of the club shall dress in the following uniform: plain blue cloth coat lined with buff, yellow buttons engraved Cork Harbour Water Club, buff waistcoat and breeches."

"*Resolved* that the wives and daughters of the members be also considered members of the club, and entitled to wear the uniform except the breeches."

The Water Club continued upon these lines

until the year 1765, at which time it appears to have almost died out, and from 1765 until 1806 the records concerning it are scanty. The reasons are not far to seek. Great Britain was passing through a troublous period, taxation was heavy, and the pressure of hard times and consequent necessity for retrenchment was felt by people of all classes, and especially in Ireland. Moreover, during the prolonged naval war, the press gang was continuously at work, and as the crews of yachts were not exempt from service, a yacht owner was liable to find himself stripped of his best men at any moment.

Under these circumstances it is not strange that yachting should have languished for a time.

After the victory at Trafalgar had relieved the strain on our naval forces, and at the same time had increased the national enthusiasm for all things nautical, we find a great impulse given to the formation of yacht clubs, and in 1806 the Cork Water Club was revived, mainly owing to the energetic action of the Marquis of Thomond, Lord Kinsale and Mr. Smith Barry.

About 1821 the club appears again to have fallen into decay, but continued to exist under the name of the Little Monkstown Club. This lasted for a few years, till in 1828 the remaining members of the Cork Water Club and the Little Monkstown Club amalgamated under the title of the "Cork Yacht Club," and took over the property of the old Cork Water Club, among which are the very curious club records alluded to, and a set of very valuable paintings, which now adorn the walls of the club, and which are exceedingly instructive as showing the type of yacht prevalent at that time.

In 1831 the club received a Royal Warrant entitling it to call itself Royal, and it now numbers 284 ordinary members, 315 honorary members, and 52 yachts sail under its flag.

Next to the Cork Water Club the Royal Thames Club can boast of the longest history. It dates from 1775, when the pleasure yachts on the Thames joined together and called themselves the "Duke of Cumberland's Fleet." The commencement does not appear to have been of a very glorious nature, as their races, which were sailed from London Bridge to Putney and back, were held in connection with the fêtes at Vauxhall and for prizes given by the proprietors of the gardens.

With the exception of a few years, the Cumberland Fleet held races regularly from 1775 until the coronation of George IV. in 1821, when the fleet was renamed "His Majesty's Coronation Sailing Society." Apparently the change was not altogether a success, as the result of a protest in connection with a race held in July of the same year was that eight of the captains called a meeting and formed "The Thames Yacht Club." They started with forty members, which included most of the old members of the Cumberland Fleet, and they attained such importance as quite to overshadow his Majesty's Coronation Sailing Society, which dwindled away and was finally dissolved in 1831.

In 1827 the Duke of Clarence joined the Thames Yacht Club, and on his accession to the throne in 1830 granted it the title of Royal. The first below-bridge match was sailed in 1823, and the last above-bridge match in 1840. The Royal Thames is one of the most successful clubs in existence, and numbers 827 members, with 355 yachts.

Next in point of age to the Royal Thames is a small Irish club called the "Loch Erne" Yacht Club, which still exists, with its headquarters at Belturbet.

The Solent, with an area of about 80 square miles, including Southampton Water, forms the most perfect stretch of water for yachting purposes in these islands, and yachtsmen were not slow in availing themselves of its natural advantages.

At the beginning of the century it was the custom for large numbers of the fashionable world to assemble at Cowes for a period of some weeks, many of them arriving in their own yachts. The fact of so many yachts being gathered together led inevitably to racing, and accordingly we find that in 1804 fifteen yachts competed on the 18th August for certain prizes given by Mr. George Henry Rose. The *Hampshire Courier* for the year 1810 gives lists of "fashionables" arriving at Cowes from July 16th until the end of October, and frequent mention is made of yacht races taking place off Cowes.

The first indication of a dinner, that invariable precursor of a club, is on September 18th, 1813, when it is recorded that after a match for pilot boats, at which a number of yachts were present, a select party of gentlemen dined together at the Marine Hotel at West Cowes.

On September 2nd, 1814, yacht races, which are referred to as the annual regatta, took place and were followed by a dinner at Aldred's Hotel, East Cowes, and in 1815 the *Hampshire Telegraph* alludes to "many members of the Yacht Club," thus showing that the gentlemen who had been in the habit of arranging the regatta and dining together afterwards, had practically banded themselves into some sort of club.

The Yacht Club was formally constituted at a meeting held on June 1st, 1815, at the Thatched House in St. James's Street, London. The chair was taken by Lord Grantham, and it was resolved that the club be called "The Yacht Club." The actual phraseology of the minutes is worth noticing, as showing that in this case, as in the case of the Water Club of Cork, an organisation in the nature of a club had previously existed, for we find it in the minutes that "At a meeting of the members of the Yacht

A Gale of Wind

Club it was resolved," and again "That the following are regarded members of the Club," and here followed forty-two names, these being no doubt the names of the gentlemen who had been in the habit of attending the annual dinners at Cowes.

It was at the same meeting settled that the qualification for membership of the club should be the ownership of a vessel not under ten tons, that ten members should ballot for the election of any new member, and that two black balls should exclude; that the entrance fee should be two guineas, to pay for two copies of the signal book, and that the flag of the club should be white, with a union in the corner.

On August 24th, the first annual meeting of the Yacht Club was held at Cowes to elect members and transact other business. It was at the same meeting decided that yachts should fly a plain white burgee, and that officers of the navy should be eligible as honorary members. The first of such honorary members elected was Sir Thomas Hardy.

The club seems to have prospered, for on September 15th, 1817, the Prince Regent expressed his wish to join, and in 1818 the Dukes of Clarence and Gloucester also became members. It was about this time that the club became much exercised as to the pattern of their uniform buttons, a controversy which raged at intervals for many years.

In 1820 the King was graciously pleased to give the club permission to use the term "Royal." The club was henceforward called the "Royal Yacht Club," and in June, 1821, its colours were changed to a red ensign and a plain red burgee.

It was agreed in 1822 that the members should meet on the first and third Monday in each month at Cowes, for a cruise under the commodore. Long and elaborate sailing regulations are set forth, some of which profess to be made for the comfort of ladies, who, it is interesting to note, were by this time participating in the sport.

In 1824 the club appears to have been rising in importance. It obtained considerable assistance from Government in negotiating with foreign countries for the remission of various port and tonnage dues, and the first step towards a club-house was taken in securing a coffee room in the Marine Hotel.

On August 22nd of the same year, seventeen yachts of the Royal Yacht Club, under Commodore Lord Yarborough, sailed for Cherbourg on the annual cruise. They encountered a thick fog which necessitated their anchoring off Lymington for the night, but though the fog lasted during the following day, they got under weigh, and when at last the fog lifted, found themselves within two miles of Cherbourg. The commodore hoisted the signal to anchor as convenient, and sent ashore a list of the yachts to the French Admiral, with the information that it was the squadron of the Royal Yacht Club on pleasure bent, and asking leave to salute. Leave was granted, whereupon the ships saluted with seventeen guns, to which the admiral replied. After three days of high festivity in the French port, the squadron sailed for Guernsey, and thence home.

The leading position of the Royal Yacht Club at this time is indicated by the fact that in 1825 the Plymouth Regatta Committee appealed to the Yacht Club to decide a protest of Mr. Wills's "Arrow" against Mr. Godfrey Webster's "Scorpion."

In this year, on September 13th, the general meeting of the club was held at the new club-house, West Cowes.

In 1826 qualification for membership was raised to the possession of yachts of 30 tons.

In 1829 the Admiralty granted to the Yacht Club the right to wear the St. George's ensign, and as a consequence a white burgee with a red cross and a yellow crown in the centre, as worn at present, was adopted.

In 1833 the King expressed his desire that the club should henceforth be known as "The Royal Yacht Squadron" of which his Majesty was graciously pleased to consider himself the head, at the same time presenting a cup, value 100 guineas, to be sailed for annually. On her accession to the throne, her present Majesty was pleased to become a patroness of the Squadron, and to present a cup for competition at the annual regatta.

Other Queen's cups are, by her Majesty's good pleasure, handed over, for competition annually, to the various principal yacht clubs in turn.

The Squadron was, at this date, using a house on the Marine Parade at Cowes, now known as the Gloucester Hotel, as their club-house, and continued to do so until 1857, when their lease expired. Cowes Castle becoming vacant about the same time, by the death of the Marquis of Anglesey, who had occupied it as Governor of the Isle of Wight, the Commissioners of Woods and Forests granted a lease of it to the Squadron.

In 1865 the Prince of Wales was elected a member, and in 1882, on the death of Lord Wilton, was appointed commodore, an office which he has held from that time to the present day.

The subject of classification of yachts for racing purposes has been before the Squadron on many occasions. The first attempt was made in 1829, when yachts were divided into five classes as follows:—Yachts above 140 tons constituted the first class, and started scratch Those between 140 and 100 formed the second class, and received a start of half a mile. The third class consisted of vessels between 100 and 75, receiving a mile and a quarter; the fourth

class of those between 75 and 55, receiving two miles and a quarter, the fifth class of those between 55 and 40, and receiving four miles; while vessels under 40 received seven miles, all calculations being made for a forty mile course.

In 1867 the Royal Yacht Squadron resolved "that it is desirable that a general Sailing Committee be appointed to consist of members of the different Yacht Clubs, with power to draw up general rules of yacht racing, and to act as a Court of Reference," and from this resolution the present Yacht Racing Association may be said to spring.

In 1824 the Royal Northern Yacht Club was established, with two branches under separate management, one in Scotland, on the Clyde, and one in Ireland, on Belfast Loch; but this plan was not found to answer well, and each division was constituted a separate club. The Irish club dissolved in 1838.

Belfast Lough, however, was not destined to remain without a yacht club, and the Royal Ulster Yacht Club, which was started in 1866, is now a very flourishing institution. The Marquis of Dufferin and Ava is the commodore, and commands a fleet of 110 ships, with an aggregate tonnage of 6,020 tons.

The Royal Western of England Yacht Club was (under the name of the "Port of Plymouth Royal Clarence Regatta Club") started at Plymouth in 1827, but in 1833 its title was altered to that of "The Royal Western Yacht Club." H.R.H. the Duke of Sussex, was patron, and H.R.H. the Duchess of Kent patroness, while eight Devonshire worthies were appointed presidents, of whom one, Sir Thomas Dyke Acland, of Killerton Park, died in this year (1898). In 1835 there were 43 yachts on the register. The number of yachts now belonging to the club is something over 100, and its membership is very large.

The Royal London was founded in 1838, under the title of "The Arundel Yacht Club," but changed its name in 1845, in which year it was granted by the Corporation of the City of London the right to use the City arms on its flag.

It is peculiar in possessing two club-houses, one in London, the other in Cowes. It numbers 700 members, with 265 yachts.

The races held by this club were originally sailed above London Bridge, but, after a time, a course from Erith round the Nore and back was substituted.

The Royal London was the first club to institute flying starts instead of starts from an anchor, a principle which has since been universally adopted.

The Royal Clyde is the largest club in the kingdom, and, I think, in the world. The number of members is 1,036, owning 322 yachts, of 15,468 tons. It was founded in 1856, and received the prefix "Royal" in 1871.

The Royal Harwich is one of the most important clubs on the eastern coast. In 1870 the commodore, Mr. Ashbury, raced his schooner "Cambria," against the American Schooner "Dauntless" across the Atlantic, beating the "Dauntless" by two hours. The club numbers about 350 members, with over 200 yachts.

Corinthian Yacht clubs are numerous about our coasts. Their principal function is the encouragement of amateur seamanship, and they have taken a very active part in promoting sport.

In the early days of Corinthian clubs, of which the Orwell Corinthian Yacht Club, established in 1830, was the first, it was the rule that the whole crew should consist of amateurs. This rule has been greatly relaxed, mainly owing to the increasing size of ships, which has made the employment of a certain number of paid hands advisable, if not essential. The number of hands to be so employed is, however, still regulated by the rules of each particular club, and no paid hand under any circumstances is allowed to touch the helm. Corinthian clubs are much to be commended. Every owner of a small or moderate-sized yacht should aspire to steer and sail her himself, for in that lies the great delight of yacht racing. Where it is a rule of the club that amateurs are to steer, crews cannot grumble, which they may be inclined to do if the owner steers against professionals, for in yacht racing, as in all other arts, amateurs that come quite up to professionals are few in number; yet owners should always steer in all races, and if a man with a natural aptitude begins young, and works his way up from the small classes to, say, 40-raters, few, if any, professionals will be able to give him points.

The Royal Corinthian Club hails from Erith, on the Thames, where it has a very comfortable club-house, and a yard for laying up small vessels. There are 324 yachts on the club's list.

One of the oldest and most successful of Corinthian clubs is the Mudhook, which has its headquarters at Hunter's Quay on the Clyde. Its membership is limited to 40, "and ane forbye," and 27 yachts constitute its fleet.

The Portsmouth Corinthian was started in 1880, and at its fourth meeting made the rule "that no person shall be considered an amateur who has been at any time engaged in the navigation or sailing of a yacht for pay." But this definition has subsequently been altered to the following:—"An amateur is a gentleman who has never received pay for sailing in a fore and aft vessel, officers of the Royal Navy and Mercantile Marine excepted," and this definition is now universally accepted.

In 1880 the race, held by the Portsmouth Corinthian for service boats of her Majesty's ships stationed at Portsmouth, was remarkable from the fact that the "Wren" was steered to

victory by Miss Foley, the daughter of the admiral commanding. Her good example has been largely followed, and many ladies owning yachts in the small classes now steer their own boats.

The Clyde Corinthian Club, at Hunter's Quay, was started in 1846. Like the Portsmouth Corinthian, it admits ladies to its membership, and the club rolls now show over thirty ladies, many of whom own their own vessels.

The Royal Plymouth Corinthian was founded in 1877, and numbers 260 members, with over 100 yachts.

Kingstown Harbour is the headquarters of the Royal Irish, Royal St. George, and Royal Alfred: the last is a Corinthian club. It was founded in 1857, and has been very active during the whole of its career. It started originally as a model yacht club, and has gradually developed. In 1864 the club took the name of the Prince Alfred Yacht Club, and in 1866, when the Duke of Edinburgh became its patron, and presented a cup to be sailed for, the club changed its name to The Royal Alfred. It was in this year also that the annual matches from Kingstown to Holyhead were established.

The club has no club-house, and one of its rules is, that all money received shall be devoted to the Prize Fund and Racing Expenses, the result being that for a minimum subscription a maximum amount of sport is provided.

The Minima Yacht Club was originally formed in 1889, and its chief station is at Hamble, on Southampton Water. Branches of the club have been established at Dartmouth, Southend, Surbiton, Sandersfoot, and Weymouth. As its name implies, it devotes itself to promoting racing among the smallest classes of yachts, and it is rapidly acquiring great popularity. The total number of members now attached to the club is 560, a very large portion of whom race their own ships.

The Castle, with its diminutive club-house on Calshot Spitt, has the advantage of possessing the best site in the United Kingdom. It holds races about once a week during the season for the small classes, but gives prizes for vessels up to and including twenty rating at its annual regatta.

Distinct in character from all the clubs hitherto mentioned are the Ocean Yacht Squadron and the Cruising Club. The former is international, but members fly a distinctive burgee, consisting of a red cross on a white ground charged with a blue wavy stripe and a golden crown and anchor.

It consists of thirteen members owning yachts, but the tonnage is, as might be expected, relatively very large.

The Cruising Club is, as its name implies, devoted principally to the encouragement of cruising in foreign parts and in home waters. It aims at the dissemination of local knowledge, and to its list of membership a valuable index is appended, specifying the waters, whether lake or river, sea or ocean, known to individual members. Mr. Arthur Underhill, Q.C., is commodore, and the club numbers 180 members, owning 105 yachts and 60 boats.

It is, of course, impossible to allude to all the yacht and boat sailing clubs established about our coasts, or even to mention the names of the most flourishing among them. A few have been selected, not on account of their importance, but as being typical and exemplifying the various stages of development and various uses to which yacht clubs are put. On the shores of the Solent alone sixteen yacht and boat sailing clubs are located, and races are held on nearly every week-day from early in May till the close of September. The yacht clubs and sailing clubs of the United Kingdom number altogether 120, to 43 of which the prefix "Royal" has been accorded.

Owing to causes already mentioned, yachting has long ceased to be of practical value as auxiliary to the Navy, and has become more and more a pastime or sport; but even in modern times it is rather difficult to confine it within the limits of sport, pure and simple, for many voyages have been, and probably will be, undertaken in the cause of science, adventure, exploration, and travel. Eliminating these functions of yachting, and looking at the matter as a pastime or sport, it divides itself naturally into two great branches, racing and cruising. I will take them in the order not necessarily of merit, but of convenience, and will treat of racing first.

The first yacht race of which any mention can be found was sailed on the Thames on October 1st, 1661, between Charles II. and his brother the Duke of York. The match was for 100 guineas, and the course was from Greenwich to Gravesend and back. The king won.

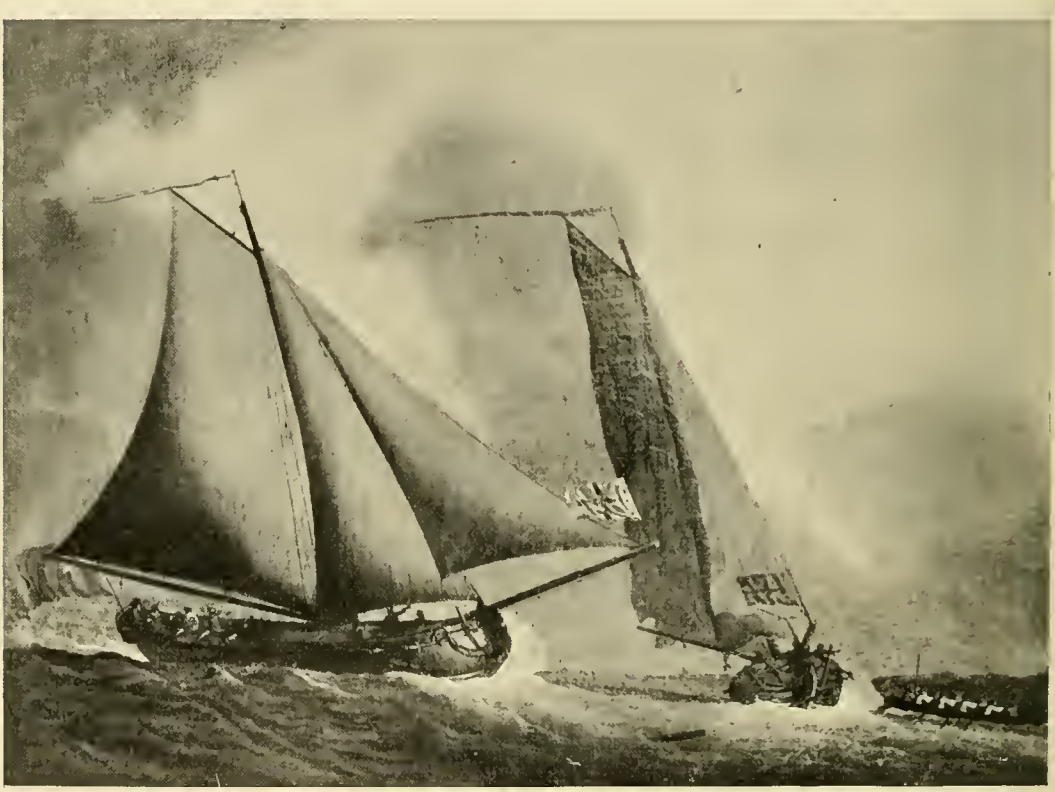
The next recorded instance consists of a race which took place in the Bristol Channel under the auspices of the Bristol Sailing Society—a society concerning the origin, history, and fate of which I can find no information. The race is thus described in the *Sporting Magazine* of July 21st, 1796:—

"This morning the following boats took their station in King Road, to contend for the premiums given by the Bristol Sailing Society, viz., 'Severn,' 'Despatch,' 'Antelope,' 'Dolphin,' 'Experiment,' 'Hope,' 'Frolic,' 'Fancy,' 'Industry,' and 'Chausen,' a Dutch boat.

"About eight o'clock they started, but the wind blew so strong from the westward all day, and the swell was so great, that only four boats out of the ten could keep the sea; the rest were obliged to run into different places for security. The other four sailed round the Holmes. The 'Antelope' was the first boat that returned; about two minutes after her the 'Dolphin' came in, the 'Hope' third, and

the 'Experiment' fourth, when the first received their respective prize cups, and the latter a telescope. No accident happened the whole day of any consequence, notwithstanding the high wind and rough sea they had to encounter in a race of fifty miles, allowing for traverse sailing."

Of course, vessels have raced from time immemorial, and will always do so. To get there first is, commercially, of great advantage, and wherever vessels sail together, emulation in the matter of speed is certain to arise. But of racing pure and simple, premeditated racing, without any ulterior purposes of gain, the above mentioned matches in the Bristol Channel and the Thames are the first instances on record.



YACHTS OF THE CORK WATER CLUB.
From a painting by Peter Monamy (1749).

For a long period racing consisted of matches between vessels used for ordinary cruising purposes, and it was not until comparatively modern times that racing developed into a distinct branch of yachting, and that vessels were designed primarily and principally for the purpose of racing. Racing is conducted subject to certain rules of the road and rules of measurement, which will be alluded to later on. Up to 1875 these rules and regulations existed in a somewhat chaotic condition, and were not reduced to uniformity and to accuracy of definition until the creation of the Yacht Racing Association in that year. The object of rating, or measurement rules, is to define for racing purposes the size and capacity of yachts, and to bring them as far as possible into distinct and homogeneous classes.

Obviously the interest of racing is enormously enhanced if all the competitors start on even terms, and consequently if the vessel first across the line wins; but it has been found impossible to insist upon absolute uniformity in rating, especially among big vessels. The cost of building and racing vessels like "Britannia" or "Satanita" is very large. Vessels of that description will always be few in number, and the men who can afford to build them will not be —and cannot be expected to be—tied down to particular classes; they suit their own convenience and their own ideas as to size; and in such cases yachts are brought together—or, to be accurate, an attempt is made to bring them together—by a time allowance, something in the nature of weight for age in horse racing—so many seconds a mile per ton being allowed to them. But in the case of smaller yachts, the object of clubs and of the Yacht Racing Association has been, and always ought to be, to confine vessels as far as possible to distinct classes, in which all the competitors are of one and the same

rating. Rating rules endeavour to provide for the development of the most speedy type of vessel, subject to certain conditions affecting safety, seaworthiness, and comfort. The object of the rule is to restrict the designer : the object of the designer is to get the better of the rule.

Various rating rules have been in force in the United Kingdom, and types have evolved according to the different formulæ from time to time adopted. There are four principles upon one or more of which any and every rating rule must be founded. First, tax motive power,—that is sail, and leave the designer a perfectly free hand in respect of displacement, that is to say weight, and of form. Secondly, tax displacement, and put no restrictions upon form or motive power. Thirdly, tax dimensions, and leave displacement and motive power alone. Fourthly, tax both dimensions and motive power. The last principle has been adopted with various modifications, since the introduction of the Length and Sail Area Rule.

The first two propositions possess the merit of simplicity. To tax sail area alone as the measure of size for racing purposes, and to ordain that vessels carrying a certain number of square feet of canvas should be classed as of so many tons, would be an easy and simple method of classification, and it would seem at first sight as though in the course of time the most perfect type of hull must by such a rule be evolved. Designers being restricted in a certain class to a given number of square feet of sail area, would gradually discover the form of body which would be most easily moved by the power derived by the wind acting upon that area of canvas ; and very likely such a result would be arrived at through the operation of the law of the survival of the fittest. But evolution would be attended by considerable loss of life, quite incompatible with ordinary ideas of legitimate sport. Displacement and natural stability, that is, stability deduced from breadth, would be reduced and reduced, until vessels became dangerously over-canvassed and over-sparred.

The tendency of such a rule would be to reduce displacement, strength and stability to a minimum. Of course other considerations would act as a check. Racing yachts from 20 tons upwards have to voyage round our stormy coasts from the Thames to the Clyde, from the Clyde to Ireland, back to the Solent, and down the west coast to Falmouth, in the routine of a regatta season ; they must be capable of making passages in any ordinary weather, and sometimes in very extraordinary weather, and they must have sufficient stability to stand up to their canvas under average conditions of wind. But the check would be insufficient : men become very reckless in racing. It is an historical fact that the Largs Club on the Clyde made it a rule that the hands sailing in their class of open lug sail boats should wear cork jackets, as capsizes were not infrequent. But they had to discontinue the rule, as it was found that the men filled their jackets with shot instead of cork, in order that by sitting up to windward, and acting as shifting ballast, they might give their boats an advantage when sailing on a wind.

It would not do, therefore, to rely upon the self-preservative instincts to prevent vessels from being built unduly weak, or becoming dangerously over-canvassed and over-sparred. The converse rule of taxing displacement, or taxing displacement and dimensions, and leaving motive power that is, sail area—free, would obviously produce precisely similar effects, and for similar reasons it is objectionable. Hence it follows that framers of rating rules have been driven to adopt the last alternative, and to tax both dimensions and sail. Naval scientists have never been able to propound a definite and satisfactory rule as to the true basis for measurement of tonnage, or rating of yachts in competitive sailing. The various formulæ from time to time employed are purely empirical. They are not, and probably cannot be, based on any simple principle, but are of the nature of a compromise, consisting of the taxation of motive power, and of one or more of the principal dimensions ; and they have been altered and modified from time to time to meet the various objectionable characteristics in the type of vessel produced under them.

How far they have been successful is a matter for argument, but one thing is quite certain, they are all exceedingly imperfect, and it still remains for some genius to hit upon an ideal rating rule.

Without going deeply into the mysteries of yacht designing it is evident that the gradual pressure brought to bear by designers upon the weak points of the rules of measurement in their efforts to reach perfection in speed has been the primary cause of the principal changes in the construction and form of racing craft during the past twenty years. As the weak points in the several methods of measuring "tonnage" or "rating" are detected or supposed to be detected by the critics, an inevitable cry for some change in the rating rule follows, and the alteration, when made, has invariably brought about a considerable change in the form of the racing yacht.

But it must not be supposed that the change has always been for the better, or that the desire for change was evinced by yacht owners and practical men.

During the present century the measurement rules have undergone fundamental alteration, and new rules have come into force, in the years 1854, 1881, 1887, and 1896. Prior to the year 1854 several methods were adopted for finding the tonnage The original system of

measurement was to multiply length, breadth and depth of hold and divide the result by 96—the figure 96 being chosen because it produced a result approximate to the tons burthen the vessel could carry. 94 was subsequently substituted for 96. This method, which was used for ascertaining (for purposes of assessment) the registered tonnage of all British vessels, was subsequently altered to the present system of assessment upon the actual cubic contents of the vessel. Lloyd's, while recognising registered tonnage for calculating the weight of outfit necessary for yachts built under their survey, was introduced. The length was measured from the fore part of the stem to the after part of the stern post in a straight line along the deck.

In taking measurements for scantling the committee of Lloyd's Register make a proviso as to yachts of peculiar construction, so that they may vary the points from which the measurements are taken to meet the necessity of the case in such vessels. This gives the committee a free hand to keep to the true meaning of the law and demand scantlings proportionate to the size of the vessel classed, whatever her shape or style, and for this reason the "tonnage

"Corsair," "Meteor," "Ailsa," "Isolde," "Satanita."

determined the scantling by a numeral ascertained by adding together breadth, depth, and girth, and multiplying the sum by length. As regards yachts, the first change consisted of the introduction of what is known as builder's measurement, in the place of the before mentioned rule. Builder's measurement, or as it is sometimes called old measurement, is usually signified by the symbols (BM) or (OM) and is found as follows: (length – $\frac{3}{5}$ breadth) × breadth × $\frac{1}{2}$ breadth divided by 94 = tonnage. This method is still used by builders in finding the tonnage of yachts.

In the year 1854 "Thames" measurement with the following formula (length – breadth) × breadth × $\frac{1}{2}$ breadth divided by 94 = tonnage

cheater" before the vigilant eye of Lloyd's Register is reduced to a nonentity.

The measurement of yachts for racing, however, is the branch of the subject which has more interest for the majority of yachtsmen of the present day, and this leads us to look to the era of Builder's and Thames measurements and to find why these methods eventually came to be deserted.

The true value of sail area as a natural factor in the measurement of yachts for racing was not realised by the experts until a later date, but apart from this point, in which all rules that did not tax the "driving power" were equally weak, the Thames measurement was considered unsatisfactory, inasmuch as it encouraged the

development of yachts of too small beam in proportion to their length.

For many years during which the rule had been in force this tendency was slow in its development because designers had not learned to adopt the use of outside ballast, and consequently had to rely upon beam for stability. Prior to the year 1870, no yacht had been built with more than ten per cent of her ballast on the keel. In 1871 "Peg Woffington," of eight tons, carried all her ballast in the shape of an iron keel. During the next few years experiments were made in the smaller yachts with outside lead ballast, which proved so successful that lead keels bolted on outside were fitted to larger craft, and the advantage of decreasing breadth and making good the loss of stability, without increasing displacement, by lowering the centre of gravity was proved.

The method of measuring the length between stem and stern post was also found to be unsatisfactory, as it produced long immersed counters; and one of the first moves of the Yacht Racing Association, which had been founded in 1875, and had adopted the "Thames" rule as its code of measurement, was to alter the mode of finding length in favour of the present method of measurement, namely on the load water line. This alteration was made in 1879, and two years later, in 1881, the formula for finding the tonnage was altered to

$$\frac{(\text{Length} \times \text{Breadth})^2 \times \text{Breadth}}{1730}$$

This rule, known as the 1730 rule, which was in force until the year 1886, saw the sport at its height amongst the classes of 40 tons and upwards, of 20 tons, 10 tons, 5 tons, and 3 tons; but curiously enough, its effect was exactly the reverse of the intention of its authors. It was meant to increase the proportion of beam to length; it succeeded in decreasing it. In each successive year yachts in all classes became longer, narrower and deeper, and in the classes below ten tons the "plank-on-edge" craze was at its worst.

Yachts of composite construction became general under this rule, the increasing weight of lead keel that year by year the craft were called upon to carry popularising the use of steel frames and the heavy internal T iron keels or foundation plates.

However, the doom of the narrow type was effectually sealed for large and small yachts alike in 1886, when the Yacht Racing Association went in to the matter of the measurement rule, and in an exhaustive report, arrived at after consultation with many eminent yacht designers, decided that the tonnage rule, which had been in force since 1881, was unsatisfactory, and recommended another.

The change was a new departure, and consisted in linking hull and sails together by the following formula

$$\frac{\text{Length} \times \text{Sail area in square feet}}{6000}$$

The idea was by no means a new one, having been under consideration in this country in 1880, and adopted by the Americans in 1882. In fact, it may be said that British yachtsmen proved to have been six years behind the times in adopting their own formula. Be that as it may, the Yacht Racing Association set to work and revised the "Classes" as follows:—

The new 60 rating and above in place of 40-tonners and above.
" 40-raters for 20-tonners.
" 20-raters for 10-tonners.
" 10-raters for 5-tonners.
" 5-raters for 3-tonners.

And after some discussion a sixth class was admitted for 2½ raters.

In 1887 this style of measurement came into force, and continued law until 1895.

It is evident from the records of yacht racing, that from the date of the framing of the length and sail area rule the pastime in all its branches attained a popularity far beyond the expectations of its most ardent supporters, and as far as can be gathered from records and correspondence, yacht owners, after six years' experience of this code of measurement, were for the most part satisfied with the type of craft which the rule had developed.

Nevertheless, builders and designers, supported by the inevitable crowd of "theorists," whose pockets were literally bulging with rating rules of every conceivable kind and character, the accumulation of a six years' peace, were ready to declare war against the length and sail area code of measurement.

Their chief argument against the rule was that it tended, especially in the classes of 40 rating and under, to the production of vessels with small under water body, and poor internal accommodation unfit for any purpose but racing. No immediate action was taken until August 1894, when the subject was brought before the Council of the Yacht Racing Association at Ryde.

After nine months' consideration, a conference of the Yacht Racing Association Council and certain experts and designers brought forth the present rule, and recommended that the formula be altered to

$$\frac{\text{Length} \times .75\ \text{Girth} \times .5\ \sqrt{\text{Sail area}}}{2.} - \text{Linear rating.}$$

and that the new rating lengths be arranged as follows, to correspond with the former class ratings:—

Linear Rating.	Old Rating.
18 feet.	½ rating.
24 "	1 "
30 "	2½ "
36 "	5 "
42 "	10 "
52 "	20 "
65 "	40 "

The rule was finally passed by the members

of the Yacht Racing Association in July 1895, and came into force in the season of 1896, with a subsequent provision that no change should be made for another three years.

It will be seen at a glance that the principal point in which linear rating formula differs from the preceding rule is in the introduction of a girth measurement. This measurement is taken round the skin of the vessel from water line to water line, technically round the vertical cross section, at a distance 0·6 from the point where the stem cuts the water. If the draught forward of this point, not including the girth of a bulb, if any, exceeds the draught at this station, twice any such excess is to be added to the girth.

Centre-boards or plates, whether fitted with bulbs, or ballasted, or otherwise, are measured as fixed keels.

It was feared by some that the practical difficulties in the way of measuring girth would tend to make the sport unpopular, but such does not appear to be the case, for practically no decrease either in the number of yachts built or of matches sailed has taken place. The advisability of adopting a different code of measurement for large and small classes was considered but was wisely abandoned, in the hope that at some future time an international rule might be adopted for yacht measurement, under which yachts of any country might compete in any waters without serious disadvantage.

The Council of the Yacht Racing Association have expressed themselves as thoroughly satisfied with the working of the present rule.

It is difficult to see why, unless it be on the ground that the rule has made very little change in the form of racing yachts.

Certainly the type promises to remain much the same as that adopted in the later stages of the length and sail area rule, which may be regarded as the most successful method yet formulated for ascertaining the rating of racing yachts.

All matters relating to rules for determining rating, to measurement and the granting of certificates, to the rules of the road to be observed during races, and to many other details connected with racing, are under the control of a body styled the Yacht Racing Association.

This association was formed in the year 1875 by Count—now Prince—Batthyany, the Marquis of Exeter, Sir George Leach, and Mr. Dixon Kemp, and originally consisted of the owners of racing yachts of and above 10 tons measurement, and "such other gentlemen as the committee might elect." The functions of the Association have been the framing and forming the various rules of measurement of tonnage and rating, the arrangement of the sailing rules of yacht racing and the settlement of such protests and questions of dispute as may be referred to them by sailing committees by desire of the parties interested or otherwise. The rules of the Association, however, provide that the decisions of sailing committees shall be final unless they think fit to bring the matters under discussion before the Council for their decision. At the present time the Yacht Racing Association, under the Presidency of the Prince of Wales, and Vice-Presidency of the Earl of Dunraven and Sir George Leach, consists of a Council of 24, and about 150 members, almost entirely composed of yacht owners and members of the leading Yacht Clubs, and 28 Club delegates.

The Association decrees that a Certificate of Measurement of Rating shall be held by every yacht starting in a match, which certificate states in detail the various measurements of hull and sail area necessary to determine the rating of the vessel. These measurements are taken by the Association's own official measurers at all the principal yachting centres. Mixed races between vessels of different rigs are discouraged by the Yacht Racing Association, which aims at dividing yachts as far as is possible into separate and distinct classes according to the rating.

Provision is made in the rules that racing craft shall use no shifting ballast of any kind; that every yacht if exceeding 60 feet rating and not exceeding 80 feet shall carry, when racing, a boat not less than 10 feet in length by 3 feet 6 inches beam, and, if exceeding 80 feet rating, a boat of not less than 12 feet in length by 3 feet 6 inches beam, with oars lashed and ready for immediate use; and that all yachts exceeding 42 feet rating shall be fitted below deck with the ordinary fittings of a yacht, including two transverse bulk heads of wood. The greater part of the work of the Yacht Racing Association Council consists in hearing and adjudicating upon protests referred to them by sailing committees, which is nearly always done in the not improbable case that the decision of the committee is considered unsatisfactory by one of the parties interested.

The position that the Yacht Racing Association holds in yacht racing is to some extent similar to that which the Jockey Club occupies in respect to the turf, but most unfortunately its powers are not so complete. Its relation, for instance, to the increasing number of local classes, and "one design" classes both in the Solent, Clyde, Irish waters, and round the coast generally, is at present somewhat ambiguous, and it exercises but little effective control over the eccentricities of ignorant or foolhardy sea jockeys.

It may be interesting to consider the creation of a racing yacht, under, for instance, the present rule.

A person of sporting instincts and seafaring proclivities determines to build a racing yacht of a certain class or rating, and consults a designer.

The first question to be decided is what is to be the strong point of the proposed ship, is she to be a fine weather boat, a hard weather boat, or an all-round boat? If designed to sail exceedingly fast in light breezes, she certainly will not excel in strong breezes; if sailing fast in hard winds is to be her principal merit, she cannot be expected to obtain phenomenal speed in light airs; if intended to be equally good in all weathers, super-excellence will be sacrificed to general utility. Unfortunately neither intuition nor meteorological science are very reliable guides in forecasting weather, and a man building a light weather boat may find himself very much out of it during a windy summer, while a stormy petrel may bitterly bewail the prevalence of light winds during an unusually fine season. But, as a matter of fact, the difficulty of choice is generally solved by a desire to beat some particular yacht. Some crack among the forties or twenties may have kept pride of place for two or three seasons, and the ambition of the prospective owner will be to beat that particular vessel, and ambition will therefore dictate instructions to the designer.

Yacht designing is a most maddening, complicated, and beautiful art. A successful racing vessel consists of a bundle of compromises, most perfectly balanced, and adjusted into a symmetrical and harmonious whole; and without going deeply into the subject, some account of the conflicting principles which the perplexed designer has to reconcile is necessary in order to understand the nature of his art.

"VALKYRIE."

Those principles in hydrostatics which show that a body floating in water displaces a volume of water exactly equal in weight to the weight of the body, and adapts itself as regards depth and line of flotation according to its peculiarities of

form and the situation of its centre of gravity, have become so generally understood as to render any detailed reference to them unnecessary. They form, however, the foundation upon which a designer has to work. With probably a wealth of experience, and numerous actual examples in the shape of previous successful productions to fall back upon, it is not necessary that a designer should begin to scheme out the elements of any new creation purely on the lines of abstract science. Nevertheless, in yacht designing, more than in any other branch of marine architecture, careful regard to scientific principles, tempered by practical experience, is essential. That science alone cannot be relied upon is proved by the tentative methods adopted, and the slow degrees whereby approximate perfection is arrived at, under any new rating rule. A wise designer, therefore, will—especially if restricted by a rating formula of which he has not had much experience—proceed on scientific principles, but also on the system of "trial and error." Whatever plan or combination of plans be adopted, the essential properties and characteristics of the proposed vessel have to be schemed out mentally, and tentatively figured down, before the graphic process of giving actual form to the vessel is proceeded with.

A short, but for the purpose sufficiently accurate, statement of some of the principles affecting a floating body will help to the better understanding of the nature of the problems which the yacht designer has to solve.

A vessel, floating upright and at rest in still water, will fulfil two conditions: first, as already stated, she will displace a weight of water equal to her own weight: and secondly, her centre of gravity will lie in one and the same vertical line with the centre of gravity of the volume of water displaced, or, as it is called, with the centre of buoyancy. The whole weight of the vessel may be supposed to be concentrated at her centre of gravity, and to act vertically downwards, and the resultant pressure of the surrounding water may in the same way be said to act vertically upwards through the centre of buoyancy.

When a ship is inclined from the upright position through any cause extraneous to herself, for instance, through the pressure of wind on the sails, the downward and upward forces of weight and buoyancy respectively act through their respective centres in two separate but parallel vertical lines, and form what is technically known as a "couple." The horizontal distance between the vertical lines varies with the inclination, and is called the "arm" of the couple. This arm measures the leverage with which the weight and the buoyancy of the vessel tend either to force her back into an upright position or to incline her to a still greater angle.. The former effect is the result of what is known as a "righting" couple; the latter, as an "upsetting" couple.

From a consideration of these facts it will be seen that the centre of gravity in every properly-designed vessel must be in such a position as to be below the point of intersection of a line passing through the centre of buoyancy, as shifted out when the ship is inclined, and the vertical plane of the ship, which point of intersection is called the meta-centre. The combined effect of both forces in this case is to rotate the vessel upwards towards the upright position; in other words, they form a righting couple.

In the opposite case, where the centre of gravity—either initially through top-heaviness, or as the result of a shifting of weight on board—falls to the other side of the vertical line, acting upwards through the centre of buoyancy when the vessel is inclined, the effect is to rotate the vessel in the direction of her inclination, and eventually to capsize her; that is to say, the forces form an upsetting couple.

When neither of these results positively follows, but the inclination from the upright is simply maintained, as in the case of a yacht under wind propulsion, the force of gravity, plus that due to wind pressure, is balanced by the force of buoyancy, and the stability of the vessel may be considered satisfactory.

The curve of stability of a vessel consists of a curve traced along the extremities of the lengths of the righting and upsetting arms at stated angles of inclination, set off from a base line, the former being set off above and the latter below the line. Or sometimes, and perhaps more conveniently, the curve set off, instead of being a curve of "arms," represents a curve of "moments," that is to say of the lengths of the arms multiplied into the displacement.

The centre of buoyancy is determined with almost absolute accuracy from the displacement caluclation, into which, in an article of this nature, it is unnecessary to go.

The centre of gravity can be found by calculation, after the size, scantling, and position of the various materials forming the vessels have been ascertained and fixed, by first finding the position of the centre of gravity of each of the component parts, and from this deducting the common centre of gravity of the whole vessel, including spars, rig, and equipment. As, however, this process cannot be entered upon, except very roughly, until the form, scantling, and position of all the various parts have been fixed, and as the calculation is in any case laborious and liable to error, it is usual to arrive at the position of the centre of gravity, approximately, from data derived from calculations of similar vessels previously built, or from results obtained, purely experimentally, by inclining existing vessels to various angles.

Another term essentially concerned with sta-

bility, is the "meta-centre," mentioned above. The meta-centre is the point where the new line of upward support, when the vessel is inclined at a small angle, intersects the original line when she was upright. The point can be determined from the displacement calculations.

"Meta-centric" height, that is, the distance or interval between the meta-centre and the centre of gravity, is an important measure of the stability of vessels, and in all cases where the type is not much out of the common, meta-centric stability is the only measure which it is necessary to take into account. The value that meta-centric height should possess varies with the type of vessel, but only to a small extent, unless the types vary very largely. In six yachts whose stability was carefully investigated by Mr. Dixon-Kemp, the meta-centric height ranged from 3 feet in "Kriemhilda," and 3 feet 6 inches in "Miranda" to 4 feet in the "Rose of Devon." In the case, however, of very broad shallow-bodied yachts, the corresponding heights may be as much as 8 or 10 feet.

For preliminary purposes, a fair approximation may be made of the volume of displacement appertaining to a suitable form of hull of given dimensions by assessing it as a percentage of the capacity given by the products of the three principal dimensions. This percentage is known as the "block co-efficient." Or an approximation may be arrived at by assessing the relation between the volume of displacement and that of a prism, having for its base the immersed mid-ship cross section of the vessel, and for its length her proposed length on the load-water-line. This percentage is called the "prismatic co-efficient."

By either of these means a fairly accurate estimate can be obtained of the displacement which will be the product of any proposed dimensions, and conversely from this result a more definite determination can be made as to what the precise dimensions should be.

The conventional centre of effort, that is, the centre of the effect of the propulsive power of the wind upon the sails, must also be considered. This is arrived at by simple triangulation applied first to each of the sails, and from those various centres of effort the centre of effort for the whole of the sails can be deduced. The true effective centre of effort and also the effective amount of lateral resistance, differ no doubt considerably from results theoretically derived; but by means of these preliminary calculations a designer gets a rough but fairly accurate idea as to the dimensions, displacement, stability, and sail area possible under the rating formula to which he is confined.

A designer in selecting an example need not confine himself to a vessel of the same size as that which he is shaping out in his brain. A basis of comparison has been established between the actual ship and her model, and equally therefore between big and little ships of the same shape. This measure, which is known as "Froude's Law of Comparisons," may be roughly stated to consist in this, that the equivalent speed of a ship and of its small scale duplicate or model, are proportional as the square roots of their lengths: for instance, if a vessel 100 feet long is represented by a model 4 feet long, the speed of the ship would be five times the speed of the model, and at these equivalent speeds all the phenomena which the ship would exhibit in the water would be fairly represented by the phenomena observed in the case of the model. Though this law requires special qualifications, for various obvious reasons, in respect of sailing vessels, yet it is no doubt fairly accurate, and Mr. G. L. Watson has put it on record that relying on this law, and judging from his experience in small boats, he carried out the design of his first large racing vessel, the "Vanduara," with confidence and with success.

Acting within the constitutional limits of these general laws, the object of a designer is to obtain

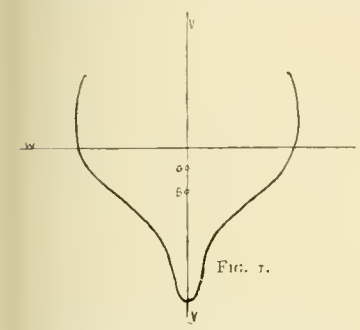


Fig. 1 represents a vessel upright, with her centre of gravity in a normal position. G is the centre of gravity, B the centre of buoyancy. WL the water-line. VV the vertical line passing through the centre of gravity.

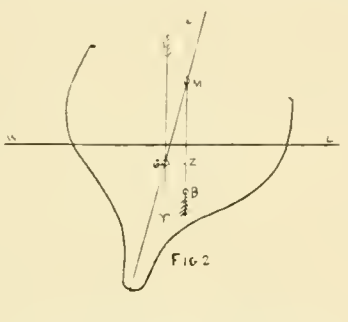


Fig. 2 represents a vessel inclined, the centre of gravity being properly placed at G. B is the centre of buoyancy shifted out by the inclination of the vessel. M is the meta-centre. GZ is the couple, and it is a righting couple, as the force of buoyancy acting perpendicularly upwards through Z rotates the vessel towards an upright position.

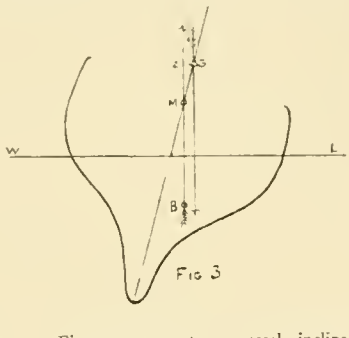


Fig. 3 represents a vessel inclined, whose centre of gravity is improperly placed in reference to the centre of buoyancy. In this case the arm, ZG, forms an upsetting couple, as the force of buoyancy, acting perpendicularly upwards through Z, tends to capsize the vessel.

the greatest possible speed out of a vessel of a given size; in other words, his problem is to find the maximum motive power, that is to say, the greatest sail-carrying capacity, relatively to resistance. This sounds fairly simple. But "size" is, in a ship, an indefinite and undeterminable quality, and "size," so far as the designer of a racing yacht is concerned, is "rating"—a certain ratio arrived at empirically in reference to certain dimensions, and frequently modified and changed; resistance is of various kinds, and is due principally to wave-making and to skin-friction; sail-carrying power is not a constant quality, but varies directly in reference to wind force; other qualities also besides speed pure and simple must be considered, such as lateral resistance, which mainly determines the weatherly qualities of a yacht; and, moreover, all the above-mentioned factors in determining design are affected by the condition of the element through which the body has to be driven, and vary in magnitude and effects according to whether the sea be rough or smooth. The solution of the apparently simple problem becomes, under these circumstances a most complicated matter.

Speed may be considered first apart from size.

It is well known that, in sailing boats, size is an element of speed, and that, given two boats identical in lines but of different sizes, the larger will be the faster of the two; and this characteristic of "size," regarded as an element in speediness, is not easy to eliminate in any definite way. Thus, in considering two yachts of different design, it may be very difficult to say which is the larger boat of the two, or how much larger she is, or to determine to what extent the extra speed of the faster boat of the pair is due to superiority in design, or to superiority in size. Nevertheless, if too close a definition of statement is not insisted upon, it is possible to study the features of design which make for speed, without introducing the question of size, and it is desirable to do so, because size cannot be considered apart from rules of measurement, and from what may be termed the *artificial* influences which these rules have upon design.

If, for the present, the quality of "close-windedness" which, though of great importance, may be best considered separately, be ignored, the secret of speed in a sailing boat may be said to lie in obtaining the maximum of sail-carrying power relatively to resistance. It may be objected that, in sailing in very light winds, at any rate, the question is one not of sail-carrying power, but of actual sail spread, which is a very different thing. But *ceteris paribus*, in virtue of certain practical reasons which are not far to seek, the actual potential sail spread which it pays to give a boat bears a fairly fixed proportion to sail-carrying power; and, therefore, the propulsive force, whether the wind be light or strong, may be regarded as approximately measured by sail-carrying power, in other words, by "stability." Hence, in judging of the wisdom of any contemplated modification of design such as, for instance, increase of beam, draught, or displacement, the question to be asked, on general principles, is whether the consequent increase in stability is worth the increase in resistance. On the other hand, if the contemplated change were of a nature to decrease resistance, the question would be whether the decrease in resistance outvalued the loss of stability.

The features of design principally conducive to resistance are large wetted surface; unfairness of lines; big displacement. But before entering upon these topics, a few words on resistance are advisable.

To go at length into the laws affecting solids in fluids would far transcend the limits of an article of this kind, and those who require information on that interesting subject must study the exhaustive experiments and conclusions of Mr. Froude, Professor Macquorn Rankine, Mr. Scott Russell, and others. But, as the results of the resistance of water upon vessels is of paramount importance in yacht designing and sailing, a few words on the subject are necessary.

Resistance is caused by skin friction and wave making. The effects of friction are so well known to all in a thousand ways in the ordinary affairs of life, that the resistance due to wetted surface, or, as it is called, skin friction, needs no explanation. But wave making is a factor with which seafaring people alone have any experience, and some explanation of the phenomenon is therefore desirable.

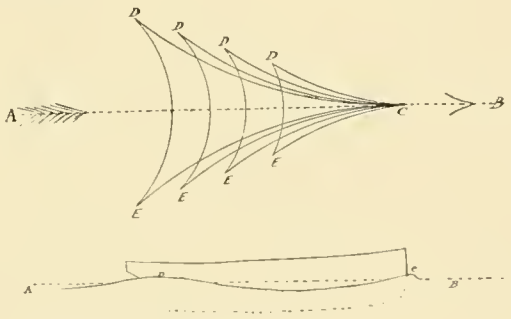
A body, a ship, for instance, travelling through a fluid such as the sea, imparts to the particles of fluid the motion requisite to enable them to get out of the way in front, and to fall into their places again behind. This change from a condition of quiescence to one of motion involves the creation of a system of local excesses and defects of pressure in the fluid, which system moves with the moving body. The surface of the sea being covered by atmosphere exercising uniform pressure, this moving system of excesses and defects of pressure must be satisfied by elevations and depressions resembling waves; and such waves, if really natural, or, as it is called "free" waves, would travel at a speed determined by the length of the waves from crest to crest. But the quasi waves here referred to are not natural waves, but are artificial, being created by the body moving through the water. If the speed of that body is much less than the speed proper to a natural wave of the same length as the artificial wave, the latter will acquire no natural wave life; it will consist merely of an undulation which moves with the body, but which does not spread into the surrounding water, nor throw out any train of

waves. Very little power is required to maintain such an undulation; in other words, the undulation produces very little effect in diminishing speed. But if the speed of the body coincides with the speed proper to a natural wave of the length of the artificial wave, the latter will acquire natural wave life and all the properties of a living wave to the fullest extent. It becomes accentuated; it propagates a train of waves extending sideways and backwards, according to the natural properties of waves, and covers more and more water with waves. The resistance which causes the formation of a wave system of this character requires a great expenditure of force to overcome it, or, in other words, the action of such a wave is to greatly diminish speed.

A natural free wave system, originated in the disturbance caused by a ship moving through the water, takes the shape of a series of crests and hollows ranged in a certain plan relatively to the line of progression. This series consists of low but massive transverse or athwart-ship waves, and of echelon, or diverging waves, forming steep ridges. The different component parts of this system are not always all equally well developed, because their development depends upon the degree in which the various parts of the system harmonise with the conformation of the undulations satisfying the pressure. Those parts only which harmonise with the undulations obtain life and become active.

In practice it will be found that at the bow of a vessel sailing at quite a moderate rate of speed, a portion of undulation exists, sufficiently small and steep to fit in with a similar portion of the diverging wave, with the result of giving birth to a lot of little live echelon waves, trailing away from the stem and bow. The resistance to which these waves are due does not consume much power. A similar state of things occurs at the stern, where even at moderate speeds a series of little live transverse waves are formed, which require greater power to overcome. But on the whole, these bow and stern wave formations at low and moderate speeds, have not much effect in reducing speed. The real trouble commences when the speed of the vessel through the water is sufficient to lengthen out the distance between the crests of the transverse waves to about the same length as that of the vessel. Then the pressure undulation and the artificial wave system fit exactly, from end to end of the boat, and a strong live natural wave system is produced.

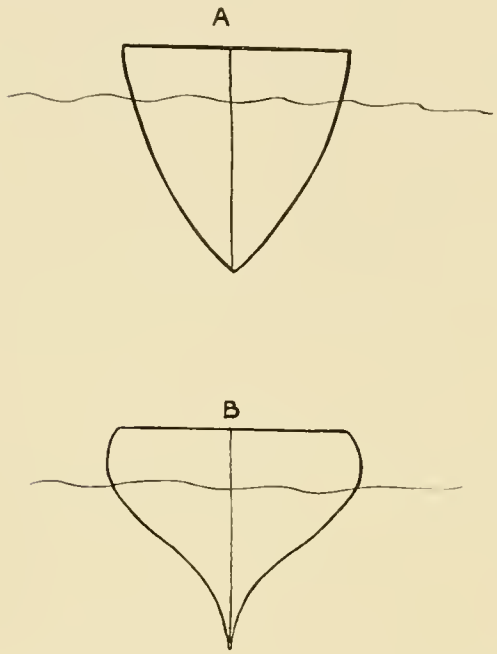
A great and fully formed transverse wave is thrown off from or hangs on to the counter, followed by a series of equally well-developed waves. Wave making is then at its maximum. The resistance causing this form and degree of wave making is enormous; in other words, speed is most seriously interfered with. So great is the resistance that as a matter of fact it may be said to put an end to any further development of speed, for in practice it is found that as soon as a vessel throws out this well-defined complete wave, at about right angles from her counter, she has attained her maximum speed, and no amount of pressure will make her go any faster. The only way to increase her speed would be to reduce the wave making characteristics of her hull. That problem involves very deep and complicated questions, and the most that can be laid down shortly and broadly is, first, that a boat relying on depth for displacement will, length for length, suffer more from wave making than a boat relying on breadth for displacement. For one thing, in a broad shallow vessel the trough of the undulation amidships materially lessens the immersed section of the vessel amidships, and consequently mitigates the pressure disturbance in which the wave originates. Secondly, such a form of entry as will throw the displaced particles of water upwards and outwards, and more especially such a form of run as will permit the displaced particles of water to close in upwards and easily, will delay the formation and mitigate the severity of the fatal counter wave.



A B is the mean level of the water.
C is the wave thrown up by the bow.
D is the first transverse wave.
If the distance *C D* is the natural distance due to two waves travelling at the same pace as the boat, then these waves become natural waves and give birth to an enormous succession of transverse waves which consume a tremendous amount of energy to overcome or rather create. When this state of things occurs, a vessel may be said to have attained her limit of speed, as any addition to her driving power will be expended in increasing the size of her transverse waves.

Skin friction—that is, the friction of the water upon the immersed surface of the boat, is the most important cause of resistance up to a certain rate of speed proportionate to the size, or rather, principally, to the length dimension of the vessel. After that proportionate rate of speed has been attained, skin friction ceases to operate as the chief form of resistance, and "wave-making" takes its place. Hence, other things being equal, a large bodied boat will be faster in light winds than a vessel designed on a hollow midship section. Midship section A has obviously less wetted surface than midship section B, and a vessel built on A will be faster

in light winds and slower in strong winds than a vessel built on B. To lessen skin friction a smooth immersed surface is most desirable. Black varnish applied to perfectly smooth wood makes a good surface ; but it has this great disadvantage, that it fouls quickly, and a vessel so coated must be docked or laid ashore and scrubbed every few days. "Valkyrie III"-was coated with black varnish. Her opponent "Defender" was built up to the aluminium topsides of a manganese bronze polished to the



smoothness of a mirror. Cold drawn copper sheathing is the material generally used among us on wooden skinned yachts of any size.

Unfair lines, abrupt curves and thick ends—especially of the after body, are also important features as producing resistance, principally at low rates of speed.

Conformably to the principles already considered, largeness of displacement, especially when associated with small length, is important mainly at high speeds, as for instance when sailing off the wind in a good breeze. It is conducive to resistance in proportion to the degree to which displacement is taken in the form of depth of underwater body, because displacement at a low level specially conduces to the formation of the end to end wave which boats create when hard driven. In fact, boats with very large and deep underwater bodies may be almost said to have a hard and fast limit of speed dependent on their length, beyond which no conceivable power can possibly drive them. This resistance-creating function of displacement is much less marked in its effects if the same displacement is associated with greater beam, and is therefore spread more widely over the surface of the water. So much for design in relation to resistance.

The features of design principally conducive to stability, are—

Breadth of beam ; which—with a certain laxity of expression—may be said to measure the width of the base on which the vessel stands. Its efficacy is, of course, largely increased if a heavy crew can be utilized as live, shifting ballast.

Lowness of weight ; which measures the leverage with which the weight acts to keep the vessel upright.

Quantity of weight at low level ; which measures the amount of weight acting at that leverage.

If these several expedients for obtaining stability be considered in connection with the elements of resistance which they involve, the following points may be noted—

Increase of beam must generally increase wetted surface, and consequently resistance from skin friction, especially at low speed ; but the loss through increased resistance is not proportionate to the gain due to increased stability. The limit to the advantage which can be thus gained by increase of beam arises apparently out of the following circumstances. Beyond a certain point, unless the increased beam is accompanied by a considerable increased displacement, and thereby of resistance at high speeds, the stability it gives extends to a very limited angle of heel, and, apart from the risk of an actual capsize, the boat will sail very badly in squally and unsettled weather unless undercanvassed for the average strength of the wind. In rough water increased beam means greater resistance owing to the greater effect of the waves upon a broader boat, and from this cause a boat of large beam and small displacement will probably sail very badly in rough water, especially if the wind be light. These conditions are aggravated by the larger spars necessary to utilise the extra stability given by increased beam. Stability derived entirely from beam, in other words unballasted boats, reached the height of perfection or absurdity—as the case may be considered—in the productions of Mr. Linton Hope, who, with his ½-raters, swept the Thames and Solent. They were wonderfully speedy little crafts in any weather, but they were capsizable, and did capsize ; and their existence was perhaps wisely terminated by a decree of the Yacht Racing Association, that no certificate should be granted to boats weighing less than 17 cwt.

Lowering of weight, so far as feasible without altering the external shape of the hull, is, of course, pure gain. Hence, anything that can be done, by good design and workmanship, or by structural contrivances, to reduce top weight, whether of spars or hull, consistently

with adequate strength, must tell in favour of speed.

With this object in view, vessels like "Audrey" are built with a double skin of thin planking, the inner planks being laid diagonally, and the outer planks longitudinally, which is, strength for strength, lighter than a single skin of thicker planking; the top sides of the "Defender" were made of aluminium; the booms of big cutters are of built steel tubes instead of solid wood, and the centre cores of topmasts have been bored out. So also structural contrivances may work wonders in the way of increase of speed if, by altering the disposition of the weights, they enable the shape of hull to be so altered as to give increased stability for the same resistance, or lessened resistance for the same stability. All the principal changes which the closing half century has witnessed in the designs of racing yachts are, in the main, traceable to developments of this kind. The first step lay in substituting iron for stone, and then lead for iron ballast; the second, in putting the lead on the keel; the third, in forming the outside lead into an isolated fin, projecting deeply below the hull proper; the fourth, and last, in carrying the lead in a cigar-shaped bulb, at the lower end of a deep metal blade or plate. In some of these steps, and notably the last, owing partly to the difficulty of giving sufficient strength to the plate, the change has been rather in the direction of obtaining the same stability by using less lead at a longer leverage, and so lessening displacement and resistance than in that of obtaining greater stability; but the effect has been equally to obtain greater speed by increasing stability relatively to resistance.

An absolute increase in the quantity of weight carried at a low level, in other words, of ballast, may, to some extent, be effected without increasing displacement by greater compactness of hull, or by any other characteristic tending to diminish structural weight. But otherwise it can be procured only by increasing the total weight of the vessel, and, for smooth water work, larger displacement generally results in a loss of speed, except in light airs and turning to windward. Nevertheless, up to a certain point, in rough water, especially combined with light winds, weight appears actually advantageous even apart from the extra stability it gives. The heavier vessel carries her way better through the seas.

The several foregoing considerations point to the conclusion that the type of cross-section most favourable to success in racing will depend very largely on the nature of the courses sailed over, and of the average conditions of wind and sea prevailing. The prevalence of reaching courses and sailing down wind, of smooth water, and steady moderate breezes, will tend to encourage light weights and dependence largely on natural stability, that is, stability derived from beam; while rough water and much turning to windward will encourage heavier weights and more artificial stability, that is, stability derived from ballast. For normal average conditions, and barring the effect of measurement rules, the plate and bulb type, in some form, is the most efficient, and seems almost certain to hold its own.

So far attention has been concentrated on considerations influencing the choice of type of cross section, rather than of general proportions or of "lines," properly so called, meaning by "lines" the longitudinal sections of the hull, whether in horizontal, vertical, or diagonal planes.

The lines, in this sense, are governed mainly by desire to fulfil two principal requirements. In the first place a certain degree of sharpness and gentleness of taper of the afterbody is essential in order to allow the displaced water to close in behind, and to avoid the serious resistance that arises from eddy or "drag" behind the vessel. So necessary is a fine afterbody that in boats of very large displacement in relation to length, or, to speak more strictly, of very large ratio of displacement to cube of length, such as the normal cutter yacht of half a century ago, an afterbody fulfilling this requirement absorbed more than half the length of the boat, thus making a bluff entrance a necessity. This seems to be the *rationale* of the "cod's head and mackerel's tail" precept of those days.

Presuming this first requirement to be fulfilled, and presuming also that all sharp corners or abrupt unfairness of surface are avoided, the remaining requirement concerns the shaping, not primarily of the outline of any of the actual lines, whether "water-lines" or other, but of what is known as the "curve of cross section areas," or "curve of displacement."

In order to make the best use of available length in minimising resistance due to wave-making, it is essential that this curve should pretty closely resemble a curve of versed sines or "wave-line"; but the very finely tapered terminations of the curve must be somewhat blunted in order to make the most of the length. This being the real nature of the requirement to be fulfilled, it follows that the precise character to be given to the "water-lines," or horizontal sections, must largely depend on the character of the vertical longitudinal sections, or "sheer profiles," and "buttock lines." Thus, in a vessel with a deep forefoot and straight keel, the surface water-line almost inevitably approximates to the "wave curve," showing considerable hollow, and the fuller and more U-shaped are the bow cross sections, the more pronounced will the hollow be. On the other hand, in boats with no forefoot at all, like modern yachts, a concave water-line, or, indeed, anything except a convex one, would necessarily give too little area of cross section in the for-

ward part of the forebody. The clue, therefore, to the apparently inconsistent changes which have at various periods taken place in the character of the water-line, must be looked for mainly in the developments which have taken place in the profile. These, again, evidently hinge, to a great extent, upon developments in the shape of cross section. Thus the cutting away of the forefoot and all "deadwood" is consistent with and has fostered the fin, or plate and bulb, types of construction, though in recently built boats the feature has doubtless been accentuated by the influence of measurement rules.

The question of proportionate length is the only one in the first rank of importance which has not been touched upon, and this cannot be fully considered apart from the effect of "size" and the influence of measurement rules. But it is worth while noticing, that besides the tax on length, which has hitherto entered into every measurement rule, there are certain natural considerations of importance, which tend to impose an early limit on development in the direction of increased length. Length, besides increasing the area of wetted surface, is a most potent factor in weight of hull. If an imaginary design of given type be taken, and length be increased without increasing displacement, the result must be diminished ballast which, with diminished cross-section dimensions, will give very greatly diminished sail-carrying power; and, with the consequent rapid decrease in the proportion of sail area to wetted surface, the limit of advantage of length, for racing purposes, will be very quickly reached, so long as there is a reasonable proportion of light weather sailing and windward work to be reckoned with. Increase of length may, in fact, be properly regarded rather as an instrument to enable a fuller form of cross-section and relatively heavier displacement to be used without too serious a sacrifice of speed off the wind. In other words, speaking broadly, a certain displacement requires a certain length to enable the available driving force to be utilised with the greatest advantage in propelling a boat off the wind in fresh breezes; if greater length than this is given, the slight further gain obtainable under those conditions of wind and sailing will be too dearly purchased at the cost of greater loss in light winds, and in turning to windward. The allowance of length which a given displacement thus requires will be increased, indeed, by developments in structure and design which tend to increase driving power relatively to resistance, in the manner already considered, and thereby raise the standard of attainable speed. But, apart from development of this kind, there is not likely to be any marked increase in length, except as the necessary concomitant of an increase in displacement.

Beating to windward is the crucial test of excellence in a fore and aft vessel, and the quality of close-windedness as affected by shape must be considered. It does not, indeed, follow that the closest-winded boat will be always the fastest, even to windward; but a certain high degree of close-windedness is certainly essential to first-rate performance to windward.

Close-windedness is of course favoured by high lateral resistance, but, strictly speaking, it depends not so much on lateral resistance simply, as on the ratio of lateral to fore and aft resistance; and it may, therefore, be favoured by decrease of the latter as much as by increase of the former. This is an important point to bear in mind, especially since decrease of fore and aft resistance, if secured without forfeiting sail-carrying power, means increased speed through the water also.

The lateral resistance of a vessel's hull acts as a lee-board and prevents her from being driven sideways or to leeward by the force of the wind.

In boats of the extreme "plank on edge" type, the entire area of the immersed profile must count at something approaching its full value, by way of leeboard. In those of the extreme modern fin, or plate-and-bulb type, on the contrary, almost the entire leeboard duty may be presumed to devolve on the plate or fin and rudder. In craft of an intermediate type, theory can do little to assess the leeboard effectiveness of different positions of the immersed profile.

The requirement of effective lateral resistance, for promoting close-windedness, though one of great importance, does not seem greatly to modify the problem of best design for speed, as already considered, because the depth of keel requisite for good sail-carrying power will generally in itself provide a fairly adequate leeboard. But it is clear that the general tendency of importing leeboard considerations into the problem must be to attach somewhat greater value to depth of keel than considerations of sail-carrying power relatively to resistance would alone warrant.

In theory the lateral resistance of immersed profile ought not to be affected by the shape of sections, and is not, I believe, considered to be affected by the majority of designers; but in practice, according to my experience, the lee-board action due to a given number of square feet of plate and bulb is superior to the leeboard effect of the same number of square feet of immersed surface of an old-fashioned keel boat. But when all is said and done the quality of close-windedness is still mysterious and difficult to trace. The productions of some designers are always more weatherly than those of other designers, and the reason why is impossible to detect. The shape of forward cross-section has much to do with it, as has also the securing of perfect balance of sail plan, and the proper relations of the centres of gravity, lateral resist-

ance and effort. The effect of wind on sails in beating to windward will be dealt with later on, and we may now turn to the consideration of speed as affected by size, and the influence of measurement rules upon design.

Imagine two yachts, the one a precise model of the other in every respect, but on a smaller scale; and suppose that they are both sailing in smooth water, with all sail set, on the same point of sailing, with sails similarly trimmed, and heeling at the same angle. A very simple calculation will then prove that in order for this condition of things to obtain, the wind speed in the case of the smaller yacht must be less than the wind speed in the case of the larger yacht, in the ratio of the square root of their respective linear dimensions. As an example, if the smaller one is one-half the size by linear measurement of the other, the ratio of the wind speeds must be $\frac{1}{\sqrt{2}}$ or 0·707; and under these circumstances, the speed of the smaller yacht through the water will be less than that of the larger, in the same ratio.

Subject to certain minor qualifications, this theoretical proposition furnishes a sound and nearly exhaustive exposition of the principle of the influence of size upon the speed of sailing yachts. It is important to notice this, because it is sometimes urged that the true factor of speed is not size generally, but length simply, because the length measures what is sometimes called the "finality speed," that is the speed at which resistance commences to mount up so fast as to impose a nearly hard and fast limit to attainable speed. But as has been already pointed out, increase of length does not always afford a royal road to increase of speed, because beyond a certain point it involves, *ceteris paribus*, such a sacrifice of sail-carrying power that the critical point of "finality speed" will not be reached at all. In fact it comes to this: that when the best has been done that can be done by selecting the best type and proportions, the most efficient way of getting more speed is by a simple increase of scale, in other words by increase in all dimensions proportionally.

That mere bigness, apart from difference in shape or proportions, is a factor of speed, has of course long been practically understood, and as soon as yacht-racing came to be systematically pursued it was found necessary to adopt some system of classification or allowance for size. There would have been no difficulty about this if the circumstances were such as to constrain all yachts to be built on substantially identical models, since in that case any single easily measured leading dimension would have sufficiently served as a measure of size for penalising purposes. But as plenty of opportunity for variation of shape and proportions existed, such a mode of measurement must necessarily tend to dwarf the particular dimension which is measured, relatively to the others. And in the same way, however elaborate a measurement rule may be made, however many dimensions may be taxed, and however carefully the several taxations may be adjusted, the rule must inevitably influence design, by furnishing the designer with an additional aim, namely that of getting the biggest boat for a given measurement. And thus, side by side with what may be called genuine speed qualities, and in some degree to their detriment, others which can be best described as measurement-cheating qualities will always be found.

On this principle it would be easy to trace the conspicuous developments of design in racing yachts, during modern times, to the changes which have been made from time to time in the measurement rules. Nevertheless it would be a great mistake to attribute them wholly to the direct and immediate effect of these rules. As has been already noticed, the most conspicuous developments in hull design seem directly attributable to the introduction of novel structural contrivances in the matter of ballasting and to the realization by designers of the importance of the resistance due to surface friction; but, on the other hand, it is only reasonable to attribute the structural contrivances to the pressure put upon the designer by the various rating rules. These rules may therefore be regarded as at any rate the indirect and ultimate causes of the several developments of type and form.

The three tonnage rules which were successively in force from the earliest days of systematic racing till 1886, did not, except in the case of a change in method of length measurement, differ very seriously in adjustment of taxation between the two measurements, length and beam, which alone they took into account. Under all of them alike, beam was heavily taxed and the endeavour of the designer was to secure the requisite sail-carrying power with the minimum beam. The developments in mode of ballasting were all in favour of this object, and when the whole of the ballast came to be placed on the keel, yachts attained the phenomenal proportions of six beams to length.

The introduction, in 1887, of the tax on sail area, was nearly equivalent, so far as hull design was concerned, to a tax on sail-carrying power, irrespective of the cross-section dimensions whereby that sail-carrying power was obtained; and the substitution of this for the tax upon beam alone quickly led to transverse expansion and vertical shrinkage of the body of the boat; and this produced the fin type in order to secure economy in wetted surface. At the same time, the desire to lessen length, which was the only hull dimension subject to direct taxation, made economy of displacement a prime necessity; and directly led to the development of the bulb keel as an instrument for obtaining

the requisite sail-carrying power from a smaller weight of ballast.

Reference has already been made to the alterations in water-lines which have resulted from developments in ballasting, and to modifications in the character of cross-sections and the concomitant changes in profile. It only remains to notice that the convexity of bow waterline which is a necessary concomitant of cutting away the forefoot and of extreme rake of stem—if indeed an up-to-date racing yacht can be said to have any stem—has probably been accentuated by the desire to make the greatest use of overhang in order to increase the effective length when sailing, as much as possible beyond the length as measured for taxation with the vessel upright and at rest. The shallow character of section favoured by the bulb keel type lends itself especially to this object, and so well has it been accomplished, especially in the smaller classes, that a boat measuring say 25 feet on the load water-line when upright will, when heeling over to a moderate breeze, lengthen out to say 30 feet. The additional immersion at the ends, due to the creation of waves, adds also to this result.

Of the effect of the change of rule made in 1895, it is as yet premature to speak. It may be noticed, however, that, as draught, as indirectly measured by girth, is now taxed as well as beam, in principle the change consists mainly of a partial restoration of taxation of extreme cross-section dimensions which contribute to sail-carrying power, in place of the mere taxation of the sail-carrying power obtained. The particular mode of measuring the girth, viz., all round the hollow of the section, is of course an additional hit at the bulb keel type, and at hollowness and leanness of section generally. At the same time, the relaxation of the tax on actual total area of sail-spread has already arrested, and to some extent reversed, the undesirable tendency towards the concentration of the whole sail spread into the mainsail.

The results so far are salutary, and the new rule would seem to answer fairly well in vessels of some size. In the small classes it certainly has not deterred building; but it has transformed the five-raters from nice wholesome *boats*, moderately canvased with two or three working sails, into horrid little toy *ships* with topsails and jibtopsails and all the paraphernalia of a "yacht."

Having thus sketched out the principal theories under which a designer works, it will be well briefly to consider the means whereby he proceeds to give tangible effect to the owner's ideas of what he wants, and concrete form to his own conceptions of the best means whereby those ideas can be embodied.

Two broadly distinctive methods of procedure may be followed: first, a small scale model may be shaped out according to rough general outlines, approximately answering to the form of the mid-ship section, principal dimensions, displacement, and rating required; which lines may be modified by the designer as the work of shaping proceeds. From this model, when thoroughly perfected and approved of, the "offsets"—which are necessary to lay off the lines of the vessel full size—may be taken, and drawn in chalk, properly faired, on the floor of the mould loft. This method, though it is still adopted to some extent, may be regarded rather in the light of a relic of former times, when hewing and fashioning to the eye was all-important, and was, on the whole, the most effective agency in the work of designing. But in these modern days, when our insight into the laws governing the movement of solids through water, the effect of wind on sails and the results of the various forces acting upon a vessel under sail is much keener than it was heretofore, geometrical rule and scientific accuracy of calculation count for more than eye, and the preparation of a design has become the product of the drawing office rather than of the model-maker's bench.

Nevertheless, the practice of first pleasing the eye by means of a model, which can be licked into shape with the gouge and the spoke-shave in hand rather than the pencil and the measuring scale, has still some votaries, and it must be admitted that in old times designers, relying upon the eye and practical experience, turned out remarkably fast and successful vessels. The superiority of scientific drafting to eye lies principally in this, that whereas the old-time designers made frequent mistakes, such accidents are very rare now, and a first-class designer can be relied upon to turn out a first-class article.

The second and more approved method is to scheme out and draft the form of the vessel on paper, to the scale of say quarter or half inch per foot, and to construct a half model from this draft, carefully faired.

But the best system of all consists, as is usually the case, in a compromise. Lines of the proposed vessel should be carefully drafted and faired on paper, then a half model should be made in wood, or, as I personally think better, in modelling clay, or wax from those lines. This half model should be worked over and perfected by eye, and finally the lines should be taken from the model, transferred to paper, and again accurately faired.

The lines can be taken off the model by shaping moulds of cardboard or thin wood to fit accurately to the model at stated and equidistant intervals; and by other methods known to designers. From the sections thus taken, the water and other lines can be arrived at, and the whole plan faired—that is, drawn to natural curves by means of thin wooden battens.

Lastly, a wooden model should be made, not so much on account of its conveying to the owner, designer or builder, a more realistic im-

pression of the actual vessel than the plan of lines, but because it is almost indispensable as an aid to the draughtsman in arranging the framework and the plating and planking of the hull structure, and in measuring off the quantities of material to be ordered.

The draft plan exhibits by a series of curves and straight lines, the contour of the vessel's hull on three distinct planes: the "sheer plan," or longitudinal elevation, showing the lines of length from stem to stern, that is to say, the sheer-line, water-lines, line of keel, and the lines of height from keel to gunwale, namely frame stations and stem and stern; the "half breadth" plan, which shows the lines of length and breadth, namely the gunwale or deck margin line and the water-lines from stem to stern; the "body plan," which shows all lines of breadth, such as water-lines, and line of deck, and all lines of height, such as frame stations.

"Valkyrie."

Water-lines, it will be observed, have an important place in all three planes on the draft plan. Upon them and upon the frame stations chiefly devolves the function of exhibiting the hull form. On the half-breadth plan, the water-lines appear much in the same way as, for example, the lines of angle bars forming the deck margin in a large ship present themselves to an observer looking down on the skeleton of the vessel from an elevation. On the body plan, the frame stations appear just as the actual framework of the vessel would, when erected, present itself to any one looking at it end on.

Other lines appearing on the draft plan, not so essential for exhibiting the hull form as the others, but of the greatest importance as means towards securing accuracy and fairness of the water-lines and frame stations, are buttock and bow-lines, and diagonals. The former represent the intersection with the contour of the hull surface of imaginary vertical planes parallel with the centre plane of the vessel fore and aft. On the half-breadth plan and body plan they appear as straight lines, and on the longitudinal elevation as curved lines. They convey a fair impression both of the after end and counter of the vessel, and of the contour of the forward end and bow. The diagonals represent the intersection with the hull surface of imaginary planes, which are arranged to be as nearly perpendicular to that surface as possible where curvature is greatest: hence they are most valuable checks upon the fairness of the hull, and are perhaps the most important of all lines in designing sailing ships.

From the drawing office delineation of the hull form, thus generally described, and after every means has been taken to secure fairness, off-set measurements are made, and from the sheet containing them the lines are laid off full size on the floor of the loft. In this full size delineation small inaccuracies, unavoidable in minute measurements from the small scale drawing, are eliminated, and, in the process of fairing by means of long wooden battens, a careful designer will find additional scope for the exercise of his skill and taste.

It is on the floor of the loft that some of our best designers impart a finish and character to their conceptions which are barely possible on the small scale draft plan.

From the sections so drawn, life-size on the floor of the loft, wooden moulds are, according to the custom of some designers, accurately cut, and these moulds are subsequently placed in their proper position upon the keelson of the vessel, and along this temporary skeleton long wooden battens are fastened from stem to stern. The designer can then judge by eye of the fairness of his lines. If they bulge out too much in one place, however infinitesimally, the frame mould must be proportionately reduced: if the slightest undue hollow is anywhere perceived, the batten must be wedged out, and the mould altered accordingly.

So far the outline given applies generally to yachts of any type or size, except the very smallest. Further operations are complicated and differentiated according to whether the vessel is to be built of iron, steel, or other metal, or of wood, or is to be composite, that is, composed of steel frames and a

wooden skin. The question as to what style of construction shall be adopted will necessarily be determined at a very early stage of the undertaking. Up to a certain size, say, roughly speaking, 40 tons, wood is the lightest and cheapest form of construction. Beyond that size, composite or steel is cheaper and lighter.

Large sailing yachts, vessels of, say, 150 tons or upwards, intended for cruising, are not infrequently constructed of steel, iron, or of some alloy of which those metals form the major constituent; and steam yachts are almost invariably built of those materials. But though steel, some of the bronze alloys, and alloys containing aluminium, have been used for the construction of racing vessels even of the largest size, they are generally built on the composite principle.

Each system has its advantages and disadvantages. Construction in wood is the best for small vessels; but for a large vessel it is not to be recommended, as it takes longer and is more costly, and, moreover, the vessel will weigh heavier than if built on any other system. Steel, metal, or composite is lighter and cheaper for good sized vessels, and both systems possess the additional advantage, that under them considerable space is gained in the interior for cabin accommodation, owing to the small size of iron or steel frames as compared with frames made of wood. In a composite yacht of, say, 300 tons, a gain of possibly one foot in breadth would be due to this feature, while in vessels plated with steel alone, the difference between the steel plate of $\frac{1}{4}$-inch thickness and a wooden plank of 3 inches, is also available for increasing internal breadth.

The principal disadvantages of steel and metal consist in the rapid variations of temperature due to a metal shell, and to the liability of the latter to become foul and to corrode.

Composite yachts not only possess the advantage of roomier and more comfortable interiors, but the wooden planking can be sheathed with copper, which is the best material that can be used under water as far as fouling and corroding are concerned. In large vessels, which may have to be docked to be cleaned, this is a matter of the greatest importance; in small boats, which can be easily beached, it does not so much matter, and, in point of fact, small racing vessels are never coppered.

To follow out the growth of a vessel from inception to completion in greater detail than this would transcend the limits of a formidable book. Suffice it to add that the vessel is coppered with sheets of cold drawn metal most carefully adjusted, the deck furniture is fixed, cabin fittings, tanks, and all internal fitments are put in, and she is launched into the element in which, let us hope, she is destined to have an honourable career. The mast is stepped and stayed, the other spars are put in their places, all the running gear is rove, sails are bent, and she is ready for a trial trip.

The launch is a moment of some anxiety, not owing to the probability of accident, for that is an occurrence of exceeding rarity, but because as soon as she is in the water and her weights are on board, the accuracy of her designer's calculations is put to the test. Her designed load-water-line length is marked on the stem and on the stern post, and if no error in calculating the weights has been made, she will float exactly as designed. It may be that she will be a little too much down by the head or by the stern; in that event weight must be shifted fore and aft of the centre of gravity. Possibly she will not come down to her marks, and lead ballast may have to be added. Or she may float below her marks, and it becomes necessary to reduce the amount of lead ballast. These are simple operations, but they may involve serious consequences. If the ship floats too high or too low in the water, the designer has obviously miscalculated his weights. His curve of stability must be erroneous, and, to put it shortly, he has made a somewhat serious mistake. But so accurately is everything calculated out, with such marvellous precision is the exact weight of every particle of wood and metal, hemp and cotton estimated, and its effect upon the centres of gravity and stability determined beforehand, that mistakes are excessively rare, and the vessel is generally found to float within some fractions of an inch of her designed marks.

Before proceeding further with a racing vessel's career, sail making must be considered. This is a beautiful art, and well-cut, perfectly fitting sails are as necessary—if not more necessary—to success in racing, as perfection in design, in construction, and in balance of hull.

The materials used in sail-making are flax, cotton, and ramie fibre. Flax is never used for racing sails, though on account of its greater pliability and the comparative ease with which sails made of it can be handled, it forms the best cloth for cruising purposes. But for racing, cotton cloth is far superior, and the best possible canvas is made of long-fibred American sea island cotton; but the expense involved in its use is enormous. The quantity is very limited, and as the fibre is nearly twice as long as that of ordinary cotton, and of a beautiful silky character, it is used largely for lace-making, for which purpose the yarn fetches 21*s.* per pound. The market price of Sea Island cotton is three times as much as that of the best Egyptian. Sail-cloth made of the former costs double as much as that made of the latter, and the cost of a mainsail is about half as much again. As the best Egyptian cotton is scarcely inferior, it is generally employed.

The advantage of cotton over flax consists in this: cotton cloth has a closer texture than flax

cloth, and consequently presents a smoother surface to the wind; the wind does not escape through it so easily as through flax cloth, but it does escape more easily off it, and its effort is therefore expended with less friction. The best sail cloth is a beautiful material, and is made chiefly of Egyptian cotton.

Though cotton has been grown in Egypt from time immemorial, it was as an ornamental plant; and it is only during the present century that it has become an important article of export. The value of a long stapled variety from Dongola and Senaar, growing in the garden of Maké Bey in Cairo, was observed by a Frenchman, and being brought under the notice of the Pasha, its cultivation was undertaken with such success that "Maké" cotton became an important production.

Cotton seed was also introduced from Isle de Bourbon and under instructions from Mehemet Ali its cultivation was carried on so energetically, that in 1824—5 the yield amounted to 9,464 tons. The civil war in America, and consequent cotton famine in England, greatly stimulated the cultivation of the plant in Egypt, and in 1892 the production amounted to about 220,000 tons. The cotton is of a superior quality, and best Egyptian fetches nearly double the price of American cotton, with the exception of that known as "Sea Island Cotton." This Sea Island cotton is grown on some small islands off the coast of Florida. It is very long in the fibre, and of unequalled quality, but the supply is small, and the price practically prohibitive.

The cotton yarn is all spun in Manchester, and the cloth woven by the well-known firm of R. Hayward and Co., whose ancestors started the trade 100 years ago. Their business is now managed by Mr. Edward Taylor, whose forefathers made sail cloth at Coker 200 years ago from flax grown in the west of England; hence the name "Coker" sail cloth, which is a trade mark to this day. They continued in the trade from generation to generation until 1878, when the present Mr. Taylor became associated with the firm of Hayward and Co., and under his able superintendence, sail-cloth making has become a fine art.

Ramie fibre is no new discovery. It was known to the Egyptians, and has been found in mummy cases. It is obtained from a tropical or semi-tropical plant, which grows wild in great profusion, and is very easily cultivated.

Although the fibre has many good qualities, it has not up to the present, or at any rate not till quite recently, been able to compare favourably with cotton for various reasons, the chief of which is, that whereas cotton can be put straight from the field on to the spinning machine, ramie fibre has to be separated, or de-gummed, from the bark of the stalk on which it is found. This operation is costly, and until very recently it could not be accomplished without damaging the fibre. The latter difficulty has been overcome by the "Gomess" process, but the former objection of cost still remains in operation.

Another objection to ramie cloth is that, although the fibre is long, and very strong as compared with cotton, and is of a fine silky texture, the small loose fibres work up during the process of weaving, with the consequence that the surface of ramie cloth is more thickly covered with small hairy fibres than is the case with cotton cloth, and it consequently creates more wind friction than the latter material. Ramie fibre is, however, likely to come into use. A composite cloth is now made, composed of cotton warp and ramie weft threads, and inasmuch as the cotton warps cover up the ramie weft, the difficulty of wind friction has been overcome, and a cloth stronger than cotton, equally smooth, and consequently very suitable for the mainsails of big cutters, is the result.

The "Defender," the yacht that defended the American Cup under the challenge of "Valkyrie III.," had a ramie mainsail and topsail, but the mainsail was not used during the race, and has not, I think, ever been seen in public. Report said that the "Defender" Syndicate bought up all the ramie fibre on the British market, took it to Belfast, had it spun into yarn there, and carried it over to the United States, where it was woven into cloth.

"Bona," the Duc d'Abruzzi's cutter, had a ramie mainsail which stood to its work very well, but has this year been fitted with an Egyptian cotton sail; and "Flavia," a 36-feet rater, has all her sails made from ramie cloth. But though these experiments have been made, and have, I believe, given satisfaction, ramie does not appear likely to supersede cotton.

Although a great advance in sail-making has taken place during the last half century, the substitution of steam for sails has naturally stifled the scientific development of the art. Demand is small in the yachting world, and only one firm has given the very difficult subject of cutting sails the attention it deserves. Scientific men have not been encouraged to invest much time upon it, and what is known on the whole subject of the propulsion of boats by means of sails has been slowly and gradually learned by practical experience and by rule of thumb. Tradition says that the Dutch originally instructed the English in the art of fore and aft sail-making when Holland was in her zenith some two centuries ago; with the result that, the English proving apt scholars, the mainsails of the London smacks and coasters, Revenue cutters, and last, but not least, of the large privateers, some of them of 400 tons burden, which scoured the seas during the latter part of the last and the early part of the present century, were fairly cut, and were probably almost as perfect as the loose hand-spun and hand-woven

cloth of those days permitted. Early in the present century, machine-spun yarn superseded hand-spun threads, to the great benefit of sail-making, for, although hand-spun yarn is preferable for ropes till this day, such is not the case in respect of yarn for sail cloth.

About thirty years later, weaving machinery was introduced and gradually took the place of the old hand looms, and the make of sail cloth was thereby very much improved. In this, as in other trades, the employment of expensive machinery brought about the gradual extinction of small men, and nowadays the yacht sail cloth business is practically confined to four firms in the south of England. Up to recent times, loose-footed sails were used; they were cut with a considerable hollow in them and flax was exclusively employed in their manufacture. It was not until the form and body of yachts had been greatly improved that the value of flat sails and the superiority of cotton over flax was demonstrated. Flax was good enough for the full-bottomed, iron ballasted yachts of early days, as was shown when flat sails were tried and proved to be of no advantage whatever. Then came the year 1851, and the revolution in yacht designing caused by the success of the "America." Great importance was attached to her flat cotton sails, and it was thought that her close windedness was due to that cause alone. Such, however, was not really the case; her fine performance was due principally to her beautiful model, fine lines and small displacement, factors which ensure that a vessel possessing them will hold a better wind than a full-bottomed beamy boat of large displacement. The "America's" sails undoubtedly suited her model, but they did not suit the British yachts of that day equally well, as was very soon discovered by experiment. Flat sails did little to increase their speed, and until improved models were introduced the advantages of flat sails were not made apparent. Cotton sail cloth was introduced about this time, but although tried for a year or two it was found useless in making full-bottomed boats go any faster, and it was abandoned.

"Britannia."

The object of the sail-maker is to obtain a material possessing great strength, little elasticity, uniformity of stretch, close texture, and a smooth surface, from which the wind frees itself with the least possible friction. Sail cloth makers and sail makers busied themselves for years in pursuing these requirements, and progressed faster than did designers and builders of yachts, for it was not until the advent of the "Alarm," "Gloriana," "Flying Cloud," "Galatea," and "Shark," that laced-footed and flat mainsails came into use. The year 1863 saw a lot of famous schooners, among them the "Aline," "Albertine," "Egeria," "Pantomime," and "Witchcraft," all vastly improved in model, and therefore capable of standing their sheets being pulled in; and once a yacht will allow of that, flat sails can be used with great advantage. Flat sails accordingly became the rule and not the exception; but flax cloth was still used, for the yachting world was not yet educated up to cotton. In 1868 appeared the beautiful 400-ton schooner "Sappho," from America, canvased with cotton. She was a lovely model, but had neither power nor ballast to stand up to her cloth, and she made a sorry show in a race round the Isle of Wight against such boats as the "Cambria," "Aline," "Oimara," and "Condor." Completely remodelled and rebuilt in 1870 by Bob Fish, one of the smartest men in America at designing and sailing boats, she sailed three matches against the "Cambria." As "Sappho" measured 400 tons, and "Cambria" only 200 tons, and as no time allowance was given, the former had naturally by far the best of it. She won easily, and her success set the fashion in cotton cloth.

The following year Mr. Ashbury built the "Livonia." She was canvased with cotton, and the sails did well. But the boat was not a great success, and in consequence cotton cloth again dropped out of use for some years,

and was not tried again till the year 1887, when the "Thistle" had all her sails made of that material. East India cotton was, however, used instead of Egyptian, and the cloth did not come up to expectation. The next boats to use cotton were "Yarana," "Valkyrie," "Deerhound," and "Iverna," and all the succeeding racing yachts, including "Britannia," "Satanita," "Calluna," "Valkyrie II." and "III." were canvased with cotton cloth.

The mainsails of "Valkyrie II." and "III." were both made of Sea Island cotton, but the latter was also given a white Egyptian cotton sail, which was used for the Cup races, as it was considered a better sail than the one made of Sea Island cotton.

It is no compliment, but a universally recognised truism, to say that the best sails in the world are made by Messrs. Lapthorn and Ratseys.

George R. Ratsey, born in 1769, served his apprenticeship at East Cowes, and in 1790 set up on his own account in that town. In those days hundreds of merchant ships called at Cowes for orders, and Mr. Ratsey's business was principally concerned with them.

But he also made sails for His Majesty's Navy, as in those stirring times, when fleets were constantly fitting out at Portsmouth, a good deal of sail-making was given out to private firms. He made the sails for the "Waterwitch" brig, owned by Lord Belfast, to which allusion has already been made.

"Valkyrie II."

Mr. Ratsey subsequently retired in favour of his son, and the Cowes business was carried on very successfully by him until the year 1880, when he retired, and his sons entered into partnership with Mr. Edwin Lapthorn.

James Lapthorn served his apprenticeship at Kingsbridge, near Salcombe, and then went to London, where he managed a large sail-making business. In 1825 he migrated to Gosport, and started sailmaking on his own account, and in the course of time was joined by his two sons, James and Edwin, who carried on the business most successfully for many years. James Lapthorn died in 1868, and his son James in 1869, and the business was conducted subsequently by his surviving son, Edwin, until he entered into partnership, as already mentioned, with Messrs. Ratsey in 1880.

The firm of Lapthorn and Ratseys carry on business at Cowes, Gosport, Gourock, and Southampton, and there can be no doubt that the combination of talent and experience derived by this amalgamation has been very beneficial to the art of sail-making.

Under these circumstances, immense strides have been made in the art of sail-cutting of late years, and the difficulty in setting sails properly and keeping them in their places has been proportionately decreased. Five and twenty years ago racing yachts were started from an anchor, with all their sails down, and it was a very difficult business, especially if there was any weight of wind, to set properly the canvas of a 100-ton cutter in those days. In fact, with much wind the mainsail could never be got to set all day. Hemp stays and gear were also stretching all the time, and even if the sails were properly set at starting, a pull here and there was constantly required to keep them in their place. Nowadays, with perfectly cut sails, and with wire gear and rigging, which practically has no stretch, a sailing master's difficulties in respect to setting his canvas are much diminished. The sail-maker always sends printed instructions with the sails, and the skipper has not very much more to do than to carry them out. Some care, of course, must be taken with a new mainsail, although it is not nearly so easily damaged as is generally supposed. Popular opinion is that a sail may be spoilt irretrievably if it gets wet, or if it is reefed before it has become thoroughly stretched. It is certainly better to avoid reefing it if possible before it is stretched into shape, but far from wetting spoiling a sail, I believe it does it good, provided of course that it gets thoroughly dry afterwards.

The difference between a well-cut and a badly-cut sail, though plain enough in practice, is due to such small and almost imperceptible causes, that it is not easy to account for the fact that one firm have succeeded in acquiring a practically complete monopoly of sail-making for racing yachts, especially as the superiority of their productions is not due to any patent process, or

secret of trade. Excellence led up to monopoly, and monopoly has conduced to excellence.

Severe competition would inevitably have produced depreciation of quality in the material used, and the primary consideration in sail-making is that the sail-cloth shall be A1 ; it is no more possible to make a good fitting sail from inferior stuff, than it is to make a good fitting pair of trousers out of shoddy. There are many small points in sail-making, individually of apparently but small importance, that go to make a good sail, and it is the combination of all these small items that ensures the success of the whole. If all sails were square sails, the difficulties in the way of sail-making would be comparatively small, and an ordinary skilled mechanic would be able to turn out as good work as any one else. But in respect of fore and aft sails, the case is very different. The cloths of such sails are all more or less cut on the gore, and one of the chief arts in cutting the gore is to allow for its stretching, so as to counteract the stretch of the sail, and thereby prevent the sail getting out of shape.

Another very important point to be considered in sail-making is the relative stretch of the cloth and the rope. This must be exactly calculated, allowed for, and adjusted, for if the rope is too tight, the sail will be baggy, and on the other hand if it is too slack, the cloth will be stretched out of shape or burst.

The constant and undivided attention of intelligent and talented men for some three generations directed to these and similar practical matters connected with sail-making, together with the fact that, owing to absence of competition, nothing but the very best material has been employed by them, no doubt explains the fact that, as is universally admitted, the work of no sail-maker in any country can compare with that turned out by Messrs. Ratseys and Lapthorn.

The following plan illustrates the most approved and up-to-date method of cutting the cloths of sails. Jibs, foresails, and topsails certainly stand much better cut according to this method, owing to the fact that, the after-leeches and foots being cut square with the cloth, the stretch is reduced to a minimum. Mr. Herreshoff has gone in rather largely for horizontal cloths, but apart from the fact that they are very unsightly, no advantage appears to be gained, and the old-fashioned method of cutting a mainsail holds its own to this day.

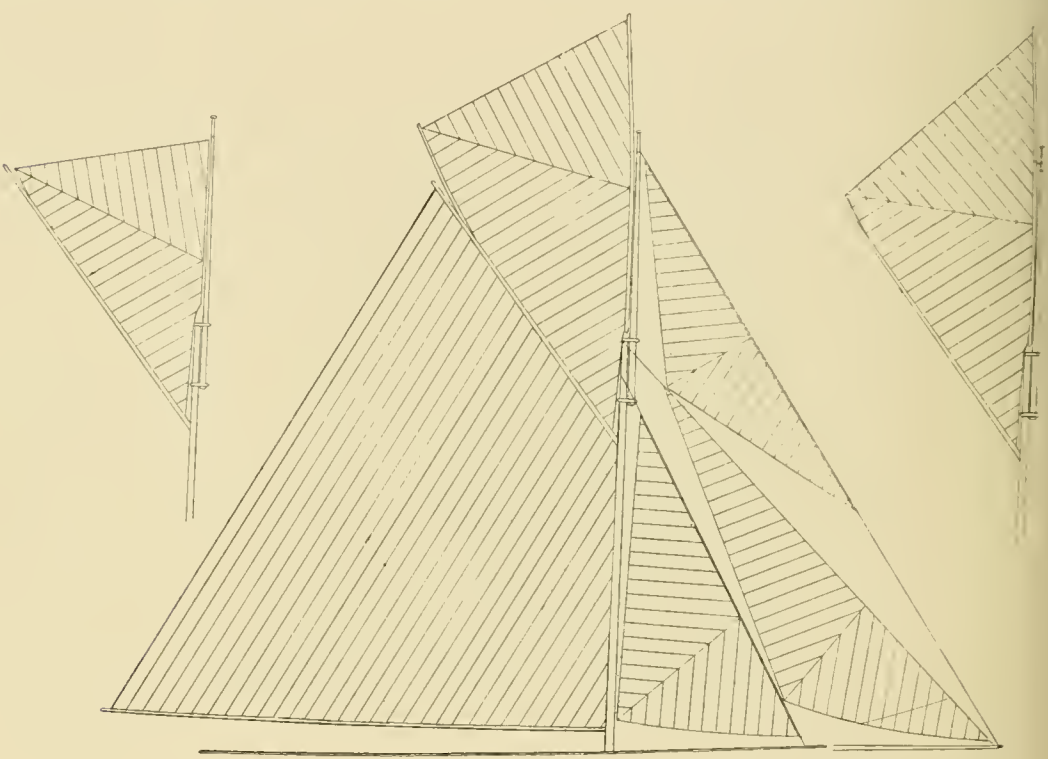


DIAGRAM SHOWING THE WAY CLOTHS ARE PUT INTO SAILS.

The propulsion of boats to windward and the trimming of sails is a most interesting subject.

History does not record the name of the astonished boat or ship sailor who first discovered that by trimming the yard of his square

sail, and hauling in a little of his sheet, he could manage, by going about, gradually to work his way dead against the wind; but there can be no doubt that the first steps towards beating to windward were made by accident, and that from sailing before the wind it was found out little by little that it was possible to work gradually against it. Though all that we know about windward sailing has been originally derived from practical experience, the theory and science is well worthy of consideration.

But before discussing why a vessel can be propelled almost against the wind, by the wind acting on her sails, the difference between true and apparent wind must be understood. The true wind is of course the direction of the wind as it strikes a stationary object; apparent wind is the direction of the wind as it strikes the sails, as it is indicated by the vane at the masthead of a ship in motion, and it is constantly changing according to the velocity of the motion of the ship.

As a craft close-hauled moves forward maintaining a certain angle between the plane of the sail and the direction of the *true* wind, she obviously draws the wind ahead, and lessens the angle between the plane of the sail and the direction of the *apparent* wind, in a degree dependent on her speed. Hence it is that under equal conditions of wind and of weatherly qualities, a boat progressing at the rate of five miles an hour will hold a better wind; that is to say, will sail closer to the true wind than one moving at the rate of ten miles an hour. The difference in the angles between the true and the apparent wind will be much less in the former than in the latter case.

It is this difference between the true and the apparent wind, and not, as is generally supposed, the action of tide under the lee bow, that makes a boat hold so good a wind when sailing against a foul tide. Imagine a cutter close-hauled going at the rate of five miles an hour through the water, stem on against a five mile an hour current; she will be stationary as far as the wind is concerned. She will feel the true wind, because the ship being stationary the true and apparent winds will coincide, and she will point, say, within three points of the wind.

Suppose the tide to turn, and to run with the same velocity in the opposite direction. The craft will then be travelling at the rate of ten miles an hour in reference to the wind, and the apparent wind which she feels will be drawn about two points ahead; in other words, the ship will break off two points, and will point within five instead of three points of the true direction of the wind.

In treating of the action of wind on sails in propelling a boat to windward, the apparent wind only has to be considered. The effect of air in motion upon a sail set at any angle to its direction, is to create an excess of pressure upon the side of the sail exposed to the wind and a diminution of pressure on the other side, and the result is a force acting at right angles to the plane of the sail. If, therefore, in the case of a ship, a sail were in the same plane as the keel, the force of the wind would be exerted in a direction forming an angle of 90 degrees with the keel, and, independently of shape, would drive the vessel in the same direction, that is to say, sideways. But sails are always trimmed at some angle, exceeding, say, 10 degrees to the line of keel; and, therefore, the force of the wind is exerted upon the body to be moved at an angle of less than 90 degrees, and that body will have a tendency to move forward. As an example, a truck on rails, equally free to move forwards or backwards, will, with the sail properly trimmed, move forward within about four points or 45 degrees of the wind. A sail being fixed on a body equally free to move in any direction, the body will move in the same line as the direction of the wind-force; in other words, at right angles to the plane of the sail. If the body is not equally free to move in all directions, the direction of motion will be correspondingly modified towards the line of least resistance. In the case of a ship, the line of least resistance is a prolongation of the line of the keel forward. If the resistance fore and aft be equal, and the wind is right aft, it will blow a vessel straight forward; if the wind is right ahead, it will blow her straight backward. If the wind strike the vessel at any angle sufficiently large to fill the sails, the course of the vessel will be in a corresponding angle determined by the relative proportions of fore and aft to lateral resistance.

So much for the effect of wind on a ship, on the assumption that the force of wind upon the hull, spars, and rigging, the friction of wind on the canvas, and the effect of curvature of the sail, are eliminated. But taking these factors into consideration, the result for a vessel sailing close hauled is that the various forces of the wind may be reduced to one resultant force acting in a direction nearly perpendicular to the plane of the sail; the angle between the direction of this single effective force and the apparent wind will be somewhat greater than a right angle.

But a vessel is not moving freely in the water; she is affected by fore and aft and lateral resistance, and the effect of the latter is much greater than the effect of the former. These resistances are also reducible to one resultant force, the direction of which forms an angle of something more than 90 degrees with the path of the vessel through the water. These two forces, the one forming an angle of over 90 degrees with the direction of the apparent wind, and the other forming an angle of over 90 degrees with the direction of the path of the ship through the

water, are the only two external forces acting upon the craft; consequently, assuming that the vessel is travelling steadily, they must be equal and opposite, their directions being in the same straight line. Hence it follows that the angle between the direction of the apparent wind and the path of the ship through the water, or her course made good, is equal to the sum of the excesses over 90 degrees of the angles formed by the two forces above mentioned.

Why, then, do vessels go to windward as well as they do? is a fair question to ask. Suppose, as an ideal condition, that a vessel has no fore and aft resistance, and has complete lateral resistance; assume, further, that there are no spars, rigging, or hull above water to hold wind, that the sail is a perfectly flat plane, and that the frictional value of the wind on the surface of the canvas is nil. In such a case the excesses of the angles under consideration over 90 degrees will be infinitesimal, and the ship would go nearly head to wind. It follows, therefore, that the close-windedness of a vessel depends mainly upon the relative proportion of lateral to fore and aft resistance, upon the effect of windage upon hull, spars, and rigging, upon the friction of wind upon the surface of the sail, and upon the curvature of the sail.

A smooth surface is very important, hence the superiority of Egyptian cotton over flax as a material for racing canvas. A flat sail is also important, but as elsewhere explained, a certain form of hull is a condition precedent to getting full value from a flat sail. Both these conditions help a vessel to windward, and other factors come under consideration which produce the same happy result.

Wind, which may be considered as a fluid, striking a sail must escape somehow, and naturally does escape in the easiest possible direction. In the case of a square-rigged vessel with the wind right aft, the wind may be said to escape in all directions; the only distinct effect produced, beyond propulsion, is the creation of a cushion of air, which is by some thought to interfere with the effect of the wind upon the canvas. It is to mitigate this supposed diminution of force that holes are cut in square sails, to allow the spent wind to escape through the canvas.

In the case of fore and aft rigged vessels, if the wind strikes the sail perpendicularly to its surface, it may also be assumed to escape equally in all directions. But under nearly all circumstances sails are trimmed at such an angle to the keel, that the wind strikes them obliquely. The case of a cutter or other fore and aft vessel with the wind abaft the beam, need not be considered: the effect is practically entirely propulsive, and in the line of the ship's keel: she makes no leeway.

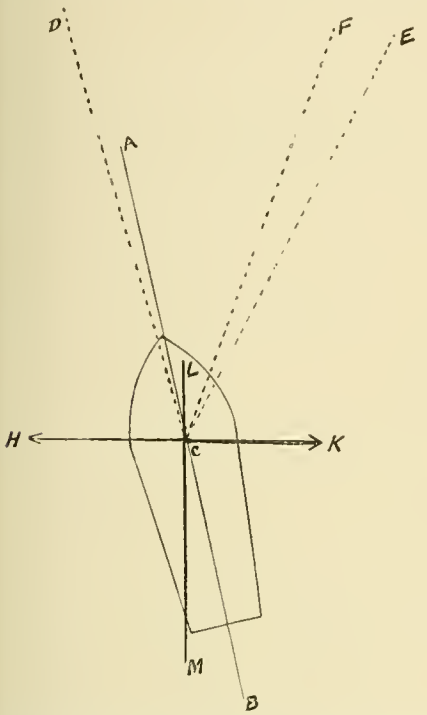
We are dealing with vessels close-hauled, and in that case the wind, striking the sails obliquely from before the beam, flies off the sail abaft the beam, with the exception of a certain quantity which escapes round the luff, or leading edge of the sail. If the sail can be imagined in a vacuum, the wind would escape in this manner without interference; but as a fact, the wind flowing from a sail meets a mass of atmosphere moving past the sail in a different direction, and is thereby deflected from its natural course. To enter into a discussion on the exact effect of this deflection would be beyond the scope of this article; it is sufficient to point out that this opposing force drives a vessel to windward.

Another assistance to a vessel turning to windward consists in this: one effect of wind upon a sail is to create a diminution of pressure at the back of the sail. The extent and scientific results of this diminution cannot be given, but the practical effect is to draw the vessel up to windward. Sailormen have by experience discovered that the luff of a mainsail should not be extravagantly taut: a slight slackness, they say, makes a "little draught in the sail." It does something of the kind, for it utilises some of the wind which would otherwise flow round the leading edge or luff of the sail. It is no doubt partly due to this cause that a London barge is able to turn to windward under a huge staysail, bulging out in an immense curve. The barge holds a good wind, and the sail keeps full. The bargee does not know why, and he would not sail his craft any better if he did.

Turning to windward is so important a matter in yachting, and especially in yacht-racing, that a diagram illustrating the above-mentioned theories may be useful.

These theories are, it must be admitted, somewhat obscure; and, as the effect of wind on sails, and of water on ships, have not been reduced to an exact science, they are no doubt open to criticism. Be that as it may, their application leads up to a very practical and interesting subject, namely, the angle at which a racing vessel will lie to the *true* wind and also to the *apparent* wind, and the latter needs more careful consideration than the former in calculating the angles for the leads of the head sheets. A smart racing yacht will work within 8 points (90°) of the true wind, that is to say, within 4 points (45°) on each tack: but in reality she sails within $1\frac{1}{2}$ or 2 points of the apparent wind, for owing to the speed of the vessel the wind is brought 2 or $2\frac{1}{2}$ points more ahead on each tack, and consequently the vessel's head breaks off 2 or $2\frac{1}{2}$ points. Were it not for this fact, boats would go to windward nearly as fast as to leeward, and, excepting in calms, steam would have little or no advantage over sail. It is the speed of the vessel which causes the difference between the true and apparent winds, and the faster a vessel is going, the flatter

will her sheets need to be drawn in, and the worse wind she will appear to hold. In the case of ice boats, which travel with fearful velocity, the apparent wind is always nearly ahead, no matter in what direction the true wind is blowing, and the sails must be trimmed nearly in the



This diagram represents a ship closehauled on the starboard tack. *A B* is the direction of the keel; *L M* the plane of the sails, represented for the sake of illustration by a straight line; *E C* the direction of the true wind: *F C* the apparent direction of the wind on board, it being brought more ahead by the forward movement of the ship. Although the lateral resistance, particularly in a deep-keeled vessel, is enormous relatively to the fore and aft resistance, still, it is not sufficiently great to prevent a certain amount of lee-way. Let *C D* represent the line of progression made good, the lee-way is the angle *A C D*. Now let *C H* represent the resultant effective force of the wind, made up of its action on sails, masts, rigging, hull, &c.; and let *C K* be the resultant of the resistance of the water to the lateral and fore and aft movement of the vessel. The angle *F C H* must be greater than a right angle, and the flatter the sails can be set the less the angle need be, or, in other words, the closer the ship will sail to the wind. Also, the angle *K C D* must be greater than a right angle; but, if the fore and aft resistance could be done away with it would become a right angle.

Now, if the ship is moving steadily along, as *C K* and *C H* are the only two forces acting upon her, they must necessarily he equal and opposite. The sum of the two angles *F C H* and *D C K* exceeds two right angles by the angle *D C F*, which is the angle between the direction of the apparent wind and the real path of the ship. Supposing the fore and aft resistance to become nil, the angle *K C D* becomes a right angle; and (neglecting the frictional force of the wind and its effect upon the masts, rigging, &c.) theoretically, with perfectly flat sails by making the angle *F C H*, a fractional amount greater than a right angle, the ship might sail nearly in the wind's eye, because the lee-way would be hardly appreciable and the angle *A C E* would be made infinitely small.

Practically, in modern racing yachts, the angle *E C D* is found to be about 40°.

fore and aft line of the boat. An Atlantic liner with anything like a moderate wind on the quarter, will also bring the apparent wind nearly ahead, and, if she sets a sail, the sheet will need to be hauled flat in. For the same reason the big cutters, when turning to windward, require to carry their main booms almost amidships in anything like smooth water. Under these circumstances it may seem strange that they get to windward as fast as they do. It is their great speed through the water, and the fact that they make little or no leeway which enables them to do so. It is not because they hold a higher wind than other vessels. A big cutter does not point so high as a 1-rater, she requires a larger arc to work in, and if a boat is ever built capable of sailing 15 knots on a wind, she will not work within less than 10 points: but her speed through the water and the total absence of leeway will get her to the weather mark far ahead of a slower antagonist sailing closer to the true wind. A London barge turning up the river on a flood tide with a hay-stack half way up the mast, will hold a good wind, but she will move very slowly through the water. The bargee would probably say that his ship went better to windward loaded in that way than she would if light, and would add that the hay-stack did it, especially the leeside of the hay-stack. Very likely he is right and has arrived at perfectly accurate conclusions purely empirically.

It is the apparent wind which has to be considered in calculating the proper angles for the leads of the head sheets. It is most important that a vessel's sails should be trimmed at proper angles, and at equal angles. The leads for the fore and jib sheets of a large cutter are generally drawn at an angle of from $7\frac{1}{2}$ to 8 degrees to the line of the keel, and those of small vessels at from 9 to $9\frac{1}{2}$ degrees, the difference in angle being due to the relative difference in speed. The main sheets of big cutters are, as before mentioned, brought in almost amidships, but as the angle of the gaff is considerably broader than that of the boom, the mean angle of the mainsail is about the same as that of the headsails. In the case of small boats, in order to obtain equality of angles, main sheets are not brought in nearly so flat.

A great deal has been said lately about the advantage of having holes in sails, in order to let the wind out. The idea seems a strange one, but it is by no means new. The Japanese, for instance, have always laced their sails together with about a 4-inch opening between the cloths so as to allow of the escape of the spent wind Experience proves that the wind becomes banked up in front of a mainsail with the sheet out, a spinaker, or any square sail: and that there is nothing like the weight of wind in the sails that there appears to be. All yachtsmen know that it is the first filling out of a spinaker that tries the gear, and that afterwards it settles down quietly. Doubtless the decrease of wind pressure, owing to increase in speed of the vessel, is a partial cause of this; but it is also due to the fact that the sails are then backed by large air cushions of

spent wind, and it is the pressure of the following breeze on that air cushion which drives the vessel along. Any landsman may demonstrate the same fact by standing on a lee shore under a high cliff, and even at some distance from it, during a heavy gale of wind, and then mounting to the summit of the cliff. He will find almost a calm at the bottom, and a gale fit to blow him off his legs at the top. It is the air cushion which produced the effect, and were it not for this the launch of boats from off a steep lee shore would be impossible. It is the force of the sea, not the force of the wind, which drives a lifeboat back and washes her broadside to the beach; the strength of the gale is not felt until she gets some distance from the shore. Holes in the canvas of square-rigged vessels may therefore be beneficial by allowing the dead wind to escape, and enabling the living wind to exert more direct force on the sails; but holes would be useless and worse than useless in fore and aft vessels on almost every point of sailing. Spinakers are practically the only sails to which the principle could be properly applied, but as we are slow to adopt new, or to revert to old ideas, and as neither the scientific mind nor the practical mariner has arrived at a definite conclusion on the subject, holey spinakers are not likely to come into fashion.

And now having briefly glanced behind the veil of mystery surrounding designing, construction, and sail-making, let us return to the consideration of the yacht—launched, sparred, canvased, ready for sea. Though a good designer may safely be trusted to make his calculations so accurately as to ensure that the vessel's flotation line, stability, centres of effort, gravity, and lateral resistance, are all as he intended them to be, no human ingenuity, science, or experience, will ensure her sailing up to her proper form at once.

A racing yacht is a marvellous product of the human brain, but, like all such products, imperfect: and its imperfections can be reduced to the lowest possible minimum only by the anxious care, study, and experience, of those who have to sail her. I have never known the scientific designer to be of much use in screwing a vessel up to her best form. Ships are very human, and rather feminine; they act like intelligent, but slightly unreasoning creatures. They do all kinds of odd things, and do not seem to know themselves why they do them, and it is very difficult to find out. They have their own individual peculiarities of disposition; one vessel will like her mast stayed as rigid as an iron bar, while another won't sail at all with the runner too taut. In some cases the boom can be carried almost amidships on a wind; in others the sheets must be eased a wee bit. In getting a new vessel perfectly fit some little alterations in ballast will almost certainly be required; a bit of weight may have to be shifted fore or aft to make her comfortable on her helm, and it may be found desirable to stay the masthead a bit aft or forward as the case may be to make the balance perfect.

All this requires a great deal of attention. An experienced skipper can tell by the feel of the vessel and the way she acts whether she is going comfortably to herself, and some of these skippers are endowed with a marvellous faculty for discovering her whims and peculiarities, and for humouring them. But though a good deal can be done to get a ship in her proper trim during trial trips, no real estimate of merit can be formed until the new ship meets her rivals with racing colours up in a good breeze and under fair conditions of sailing.

The first match is a great occasion. The momentous question whether you are the proud owner of a flyer, or the somewhat despondent possessor of a vessel only indifferently good, will be tested. The hopes and fears of anxious months will be justified or established. But even though achievement falls short of expectation, the yachtsman need not despair. The first match is not infrequently followed by a long and somewhat gloomy consultation between owner, skipper and designer, resulting in alterations and modifications of a character highly beneficial. On the other hand, if a winning flag is the result, a wise owner will be wary, shy of experiment, and will not forget the wisdom of the adage "let well alone." The first few races will suffice to get your vessel into the best possible trim. The proper position for every ounce of movable weight and the exact way she likes her masts to be stayed, and her sails trimmed will have been ascertained. But to keep her invariably to her best form surpasses the wit of man. So delicately balanced are all the factors and forces involved, that differences too slight to be perceptible produce most appalling results. Ships act like sentient creatures, they are subject to moods and fancies, and are liable to fits of temper, good and bad. Sometimes the vessel will not sail; the helmsman knows at once that something is wrong, he feels it, the vessel seems half asleep, drowsy, irresponsive, and the fact is soon made disgustingly evident by comparison with your competitors in the race. What is the matter? Nobody knows and nobody can find out. Everything—weights, stays, sheets—are exactly as usual, and all hands become reduced to a frame of mind that finds a natural though perhaps immoral relief in language of a strictly un-parliamentary character. And then, after straining patience to breaking point, the fickle jade wakes up, sails like a witch, and does her best to atone for past misdeeds. And the reason of all these vagaries is beyond human ingenuity to discover. Of course some minute change in the angles of the sails, in the position of the crew, in the tautness of the weather

runner, has made all the difference in the world, a difference, that is to say, imperceptible in cruising or pleasure sailing, but very noticeable when it comes to racing against vessels with an average difference of speed of perhaps only a few seconds in a twenty-mile course. These perturbations of perfection, however annoying they may be at times, undoubtedly constitute one of the many charms of racing. You have got a very beautiful machine, but you can never feel that you are utilising it to the utmost of its capacity. You may sail the same boat, season after season, and yet every day there is much to be observed if you have eyes to see, and much to be learned if you have brains to note, and something to be done if you have ingenuity to act. Possibilities of improvements are ever present, and hence the interest in your vessel never flags, nor does the pastime of racing ever pall.

"VALKYRIE" COMING THROUGH "NAVAHOE'S" LEE.

The rules to be observed in yacht-racing are, with one or two exceptions, identical with the ordinary Board of Trade rules of the road at sea. The principal regulations may be summed up as follows :—

Yachts having the wind free must keep clear of yachts close-hauled ; yachts on the port tack must give way to yachts on the starboard tack ; an overtaking yacht must keep clear of the overtaken yacht. A yacht may luff as much as she pleases to prevent another yacht passing her to windward, but she may not bear down off her course to prevent a yacht passing her to leeward. If in rounding any mark in a race, or any obstruction, an inside yacht has an overlap, the outside yacht or yachts must give her sufficient room. A yacht is considered to be overtaking until she has passed clear of the other ; and overlapping means that when the leading vessel's helm is altered to round a mark the following vessel has not a free choice and cannot pass outside the leader without touching her. Then

there are various regulations as to anchoring, sounding, &c., &c., all with the object of carrying out the principle that vessels may be propelled by sails only.

In former days yachts were started from an anchor, but about thirty-five years ago the Royal London Yacht Club substituted flying starts. This system has been universally adopted, and vessels are now always started under way.

Good judgment and knowledge of weather are most valuable qualities in a racing skipper, for shortening or making sail is practically out of the question during an ordinary race. It is possible to set a topsail or take in a topsail, or to substitute one topsail for another, and of course it is a simple matter if all competitors act in the same way, but usually the gain accruing from shifting sail is not commensurate with the detriment owing to the loss of time incurred through doing so. Staysails, jib topsails, spinakers, can of course be set, taken in, or shifted at will with no more harm than is caused by the men running about:—a matter, however, which should not be overlooked, for shaking a vessel interferes, especially in light weather, very seriously with her speed; but reefing is generally out of the question during a race; and as a rule it may be said that whatever canvas you start under must be carried or dragged along somehow to the finish. It is very necessary, therefore, that the canvas set should be adapted, not only to the strength of the wind at the time the race is started, but also in view of what the weather, wind and sea is likely to be during the match.

The start is effected across an imaginary line. The usual custom is to moor a small boat bearing a big flag at a distance of some hundreds of yards from the shore, or from the Committee boat. The starting line consists of the projection of a line formed by the alignment of two objects on shore, such as two posts, or a post and a church steeple, or factory chimney; and the competing vessels must cross it between the shore and flag boat, or between the Committee boat and flag boat as the case may be. At five minutes before the time appointed for the start, a gun is fired and the Blue Peter hoisted, and the yachts are then in the starter's hands and subject to all the rules of the Yacht Racing Association. At the exact moment of the start a second gun is fired, the Blue Peter is hauled down and the race begins. During the interval of five minutes elapsing between the two guns, the object of all helmsmen is to manœuvre so as to get into the best possible position,—which position is determined by the direction of the wind and tide, and to cross the line, if possible, exactly at gun fire. If a yacht crosses too soon by the fraction of a second, she must go back and recross the line, her number on the card will be displayed from shore or from the Committee vessel, and some suitable sound signal given to attract her attention. To re-cross the line is a manœuvre which in nine cases out of ten reduces the chance of winning to the lowest possible ebb. It is well to get under way and jill the ship about some time before the first gun fire, so that all things may be in their proper places and all panic and confusion avoided at the last moment. The ship should be placed in a good position for seeing the gun; some one is told off to watch for the puff of smoke with his finger on a stop watch; he will catch the flash of the gun on the instant, start the stop watch and call out the time to the helmsman as it elapses:—"One minute gone," "two minutes gone," "half time," "two minutes to go," "a minute and a half to go," "one minute to go," "forty seconds, thirty seconds," and so on. This is not quite so easy as it sounds, for the man taking the time must be ready to answer instantaneously, and above all things correctly, the helmsman's agonised inquiry, "How much to go?" and all the time the men are tumbling about over each other, booms are flying about his head, sails are shaking and slatting, collisions appear, to say the least of it, probable, and a good deal of shouting and confusion prevails. "No panic," should be the skipper's motto. All his business, good easy man, is to know instantaneously what he ought to do, and decide instantaneously what he is going to do in reference to his own and every other vessel in the race; to work his boat into a weather berth somehow or other; and so to estimate his speed and so to manœuvre his vessel as to bring her bowsprit end within a few yards or feet of the line when the second gun fires. Try to imagine, say, eight 20-raters manœuvring in a confined space not infrequently obstructed by shipping, each vessel struggling to get into a weather berth and to be on the line to the moment, the whole eight striving to occupy a position just big enough for one, twisting and turning about, shaving each other by hairsbreadths; and some idea of the difficulty of a start may be formed. A racing skipper should have eyes all over his head, his brain must work like lightning, and his action must be equally swift. He must meet every emergency as it occurs, automatically obeying the racing rules without thought, and he must be a marvellous judge of pace. When it is remembered that, in class racing and when vessels are pretty evenly matched, a good start means winning and a bad start means losing the race, it is not surprising that first-rate racing skippers are few in number, or that their hair turns grey early in life.

Some men make very elaborate plans for starting. It is a good thing, no doubt, for the helmsman to set definitely in his mind what he wants to do and intends to do if he can, but as probably everybody else desires to do precisely the same thing, plans require frequent modification. A good rule is, I think, to come

down to the line with plenty of way on. The advantages derived from the commanding position of a weather berth are enormous and obvious, but if to get into and keep that position you have to waggle your ship about, or shoot her up into the wind to deaden her speed, and eventually cross the line with but little way on, a rival coming down fast may shoot by you to leeward, and even pretty close to leeward, and take your pride of place before your ship gets on her legs. Of course no two starts are alike. Some may be in a flat calm, when you drift over the line stern first, others in light airs with vessels jostling each other and no harm done; others in plenty of wind, when a mistake may mean collision, big breakages, and perhaps dangers to life and limb. One day a start will be down wind, on another the wind may be blowing right up, or it may be a reaching wind. Infinite variety is the law and constitutes one of the many charms of racing upon the sea.

Courses vary in every locality according to the necessities of the case. They are marked out by light-ships or buoys, or, if such natural marks are not available, by flag boats moored. Usually the race is twice round the course, and the distance to be sailed is generally 8 miles for $\frac{1}{2}$ raters, 12 for 1 raters, 15 for $2\frac{1}{2}$-, and 17 or 18 for 5 raters, 25 or 30 for twenties, 40 miles for 40 raters, and 50 miles for larger yachts. Occasionally races are three times round a short course, as for instance at Torquay, and Channel races are from point to point, as in the races from the Nore to Dover, or Southend to Harwich.

The interest attaching to a race is so obvious to the initiated, so incomprehensible to those ignorant of the sport, that any attempt at description is but labour lost. It seems but a dull affair to those who do not understand the game. Half a dozen yachts start to sail over a certain distance, one of them is faster than the others and must therefore win, such is a very general conception of a yacht race; but it is far from true, for skill in handling a racing yacht on the sea is a more important factor in determining victory than skill in riding a race-horse on the turf; and the element of chance plays a most important part, especially in light summer weather. The movements of the clouds, the surface of the water, all the signs of the weather are carefully scanned, and every little catspaw taken advantage of, but in spite of the utmost watchfulness flukes are of common occurrence, the last is often first and the first last, and until the gun is fired no race is safe. Moreover, an inferior vessel by getting a good start, or otherwise obtaining a commanding position may, and very frequently does, beat a superior boat under perfectly fair and equal conditions of weather. On a reach or turning to windward, it is obviously difficult for a vessel behind or to leeward to get by an opponent, even though she is the faster of the two. She cannot pass to windward, for to do so she must get into the leading vessel's wash, and that will stop her, and the leading boat may luff as she pleases in order not to be passed, and does luff, and will luff till both vessels are head to wind. These luffing matches between two noted rivals not infrequently result in putting them both behind slower boats. To pass to leeward, an overtaking vessel must keep a long way to leeward, otherwise, even if sailing two feet to the other's one, she will stop as soon as she gets under the lee of her opponent's sails, and it must be borne in mind that the canvas of a yacht of any size affects the wind for a long distance. While the leading slower boat is sailing along the chord of an arc straight for the mark, the faster overtaking vessel has to describe the arc, and may not get to the mark in time to cut her adversary out. In turning to windward a boat once in a weather berth must be very badly handled or very inferior to allow herself to be passed. Your opponent may work up to you, but he cannot get through your lee, and once you are planted on his weather bow it is very difficult for him to get to windward of you. In cross tacking you will stay upon his weather bow as he passes, and though he tacks at once you will give him a terrible shake up. Of course every dodge will be tried. In approaching you, and not being quite able to pass ahead of you, she will keep a good full and pass just under your stern, and still keeping a good full may scramble out clear, and certainly will do so if you are a moment too late in staying. A series of short tacks in rapid succession may be tried, and if your opponent boat is quicker in stays, or carries her way better than yours, she will reduce you to a standstill and so wriggle out clear. She may try a false tack, pretend to stay, but put her helm up and fill again on the original tack, and if you are not watching her closely and do not follow her quickly enough, she will scrape clear of the lee of your sails, feel the true wind, and it is all up with you. A hundred dodges may be resorted to, but for all that it is extremely difficult for one boat to get by another boat to windward unless she is very much the faster and more weatherly vessel of the two. Running dead before the wind is the most disastrous situation for a leading yacht; she can do nothing to impede the vessel behind her, but the latter can do something to stop her. By sailing dead in the wake of the leader, the sails of the pursuing vessel intercept some of the wind, and the vessel herself will be drawn ahead by the moving water in the wake.

Running with spinakers set is the most trying point of sailing. Two vessels may sail for miles and miles abreast of each other—the spinaker boom of the one almost touching the main boom of the other, and sometimes one will draw ahead a few yards owing to some little

extra flaw of wind, and will then fall back again, and the other will temporarily draw ahead, and the helmsman can do nothing except try to hold his ship straight with no object to guide him, crouched in a constrained attitude, craning his neck to try and see under the spinaker, often with a blazing sun on the back of his neck, and, if running by the lee, in abject terror of a sudden jibe. With the breeze falling toward evening, as is often the case in fine weather, the leading boat on a run home is at a great disadvantage. She may sail into a calm and see the rest of the fleet coming up with a nice little breeze, and passing her; and, paradoxical as it may sound, the same untoward event may overtake her when, towards the close of a calm day, a breeze springs up. The hindmost yachts will feel it first, and by the time it reaches the despairing leader, the whole fleet may have sailed by. The tide also, in places where it runs strong, as in the Solent, wins and loses many races. You may be leading by half a mile in a very light breeze, and, on rounding a mark, be brought almost to a standstill by meeting a foul tide, and before you have proceeded half a dozen yards the others are on top of you, and practically the race begins all over again. On the other hand, you may have a very slight lead of a vessel overhauling you, but by scraping round a mark a few fathoms ahead, you may get into a fair tide, and be a mile away before your adversary rounds.

Great is the uncertainty of racing, an uncertainty that adds infinite variety and charm to the sport; and though in the long run superiority will tell, and the best boat will show the longest string of flags at the season's close, if you have a decent boat you need never despair, and may make a gallant show also when you sail home to lay up.

It is scarcely necessary to say that a smart crew is essential to success. The men must be young and active, intelligent, courageous, and possessed of endurance and of the peculiar quality that enables a man to skip about on a tumbling slippery surface, sloping like the roof of a house, without falling off. Quickness is necessary, for your chance of cutting out an opponent at a mark, or holding or passing him at any time during a race, depends upon the rapidity with which every operation is carried out. To get a spinaker set or to shift stay-sails a few seconds quicker than anybody else may give you the race. Courage is necessary, especially to work aloft when a vessel is hard driven in a nasty sea; and endurance, for to race perhaps twelve days in a fortnight, and be wet to the skin most of the time, takes a good deal out of a man.

Some races are doubtless uninteresting. But little fun is to be found in drifting round a course on very calm days. On such occasions vessels get strung out, flukes are the rule, and some lucky air of wind will probably lift some fortunate boat into a position which makes her victory certain; but such days are infrequent in our climate. The vast majority of races are sailed with plenty of wind, and sometimes a good bit to spare; and the interest and excitement of a race under such circumstances are intense. The attention can never flag; every moment is full of possibilities, and brain and nerve are kept on a constant strain. To give an adequate conception of the excitement of a closely contested race is impossible, but the closeness may be gathered from the fact that in class racing over courses of 20 miles victory or defeat frequently hangs upon a question of a few feet.

When vessels of different rating race in common, time allowance is used to bring them together.

For the convenience of yachtsmen the Yacht Racing Association has arranged the time allowance between yachts of various sizes in a time table or scale, on reference to which the allowance that one yacht has to concede to another may be easily reckoned.

At the same time it must be observed that no time allowance will bring a very big vessel back to the level of a very little one. In light winds, lofty canvas feels an air that would not touch the lower sails of a small vessel, and in strong winds power will prevail. Where the difference of rating is great, the big ship is, bar accident, bound to win; on the other hand, where the difference of rating is but small, the advantage —if any—rests with the smaller vessel of the two. To be given a few seconds of time is a good thing. It may frequently mean having just enough in hand to enable you to win without passing your antagonist, and in many cases you may be able to get close to her, and to keep there, though to pass her would, for reasons already explained, be impossible.

Where vessels of various rating sail together, they all start at the same moment, and the time allowance is given at the end of the race. It is an anxious moment for the owner of the first one in, watching, stop-watch in hand, to see if he has succeeded in giving the time, and for the owner of the second vessel to see if she has succeeded in saving her time. How slowly the time goes in the first case, how rapidly in the other!

On the whole, the present tendency of time allowance to check size is a wise and salutary one. Huge racing cutters are magnificent vessels, and it is a splendid sight to see them race, but they are too big. They are unhandy and unsafe, and the expense involved in their upkeep is well nigh prohibitive. Moreover, great size is destructive of the niceties of the game; skill and talent find more profitable employment in yachts of moderate dimensions.

Of late years handicap races have come much

into fashion. It is a reversion towards racing in its origin, when cruisers were occasionally matched against each other. It is difficult to handicap yachts even with the moderate success that attends handicapping in horse racing—which is not saying very much—for the simple reason that many most important conditions are unknown to the handicapper in the former, and are, or ought to be, known to him in the latter case. Yacht A. may be ten minutes better than yacht B. in light winds, and ten minutes worse in strong winds; and who shall foretell the weather? The element of uncertainty, therefore, attains to large proportions in handicaps, and for that and various other reasons the interest attaching to them can never equal that involved in legitimate racing. In that case, every ounce you can get out of your vessel by the expenditure of money and the sweat of your brain tells in your favour; while in handicaps the inducement to furnish your ship with new canvas and gear, and to string her up to the last point of perfection, is but small. Still, handicaps afford a great deal of amusement to men who cannot afford, or do not care to own, vessels intended for racing, and practically for nothing else. It opens up a field of utility for old racing vessels, and vessels which have not come up to expectations; and for these reasons it should not be by any means discouraged.

Before leaving yacht racing, some description of the various types evolved and of notable examples of those types is necessary to complete the subject.

As may be gathered from the foregoing pages, the modern racing yacht, and the sport of yacht racing, may be said to have originated within the Victorian Era, for, prior to 1837, square canvas was largely used, and, in the fore and aft rig, designers did not get far beyond the form of the old revenue cutter in their efforts to attain the beau ideal of a speedy craft; moreover, class racing was unknown. The fast boats used for smuggling purposes in those days were usually cutter rigged, and in the latter half of the last century the Government began to build vessels of a similar type known as revenue cutters to suppress the "free-traders."

Mr. C. White, of Broadstairs, constructed some of the fastest of these vessels. He does not seem to have been particular for whom he built, for a smuggler and a revenue cutter were often laid down side by side in his yard, and the legend goes that if the former promised to turn out the flier of the pair she was at once bought by the Government at a premium. This Mr. C. White had a son who settled at Cowes early in the present century, and who was the father of Mr. Joseph White, afterwards famed as the builder of the cutter "Louisa," and the brigs "Daring" and "Waterwitch" in the years 1830 and 1832.

The racing constantly taking place between smugglers and revenue cutters, and the desire on either side to attain to the highest possible rate of speed, caused great interest to be taken in the lines of the vessels, and certainly did much to stimulate yacht racing. The revenue cutters of 1780 to 1800 were large craft, many being over 200 tons; but later on, from 1815 to 1825, smaller vessels of 80 to 120 or 150 tons, of the type that is familiar to us in many of Clarkson Stanfield's pictures, and more especially in his illustrations of Captain Marryat's works, became the fashion.

Charnock's *History of Marine Architecture* says that in 1802 there were fifty-eight cutters in the service. Amongst the largest of these were:—

	Length.	Breadth	Depth.	Tons.	How acquired.
Kite	77·5	27·1	10·5	218	Bought in 1778.
Flying Fish	75	25·9	10·5	190	,, ,,
Busy	75	25·9	10·5	190	Bought at Folkestone.
Pigmy.....	80·3	26·1	13·2	201	,, ,, ,,
Alert	78·9	25·2	11·5	205	Built in 1779.
Mutine ...	79·9	26·1	10·1	215	Taken from the French.
Pilote	78·5	26·1	10·2	218	,, ,, ,,
Ranger ...	80·30	26·1	—	201	Bought.
Seaflower..	72·5	26	10·7	203	,,
Lapwing ...	47·8	21·1	8·1	82	Bought of C. White, of Broadstairs, 1764.

The superiority of the fore and aft rig in weatherly qualities, handiness and speed, being demonstrated by these service cutters as well as by the smugglers and privateers, it became fashionable also in the pleasure fleet; and though topsail schooners and brigs occasionally competed in matches, the cutter, or fore and aft schooner, became the favourite rig for racing.

Trials of speed between the yachts of that period could not, however, have been very satisfactory. Vessels of different tonnage were raced one against the other, and as no time allowance of any kind was granted the biggest craft generally came in first, especially in anything of a breeze.

The Royal Yacht Squadron, which had been established in the year 1815, did much to improve the pastime in British waters, though at first its efforts were attended with only moderate success. For some years the club languished, and according to the *Nautical Magazine* for the year 1836, it was reported to be about to close its doors. Both the Commodore and Vice-Commodore had sold their yachts, the Duke of Norfolk had offered his yacht "Arundel" for sale, and the secretary had given notice to Mr. Goodwin, the proprietor of the Club House, that the club intended to vacate the premises as soon as the lease was out. However, a decade later the sport had become far more popular and the Royal Yacht Squadron had revived. In the year 1844, its list contained no less than 100 yachts, whilst some dozen Royal Yacht Clubs had been

established round the coast, comprising a fleet of about 400 yachts in all. All the biggest vessels were owned by members of the Squadron, the largest in that year being :—

Yacht.	Rig.	Tons.	Owner.
Brilliant	Bark	393	Mr. G. H. Ackers.
Mischief...	Schooner..	221	Sir H. Hawley, Bart.
Kestrel	Yawl	202	The Earl of Yarborough.
Jeannette	Schooner..	186	The Earl of Egmont.
Alarm	Cutter.....	193	Mr. Joseph Weld.

Previous to this date, the last-named gentleman, who was a most enthusiastic yachtsman and yacht designer, had built the famous old cutter "Arrow." She may be taken as a sample of the most approved form of the type known as the "cod head and mackerel tail," a barrel-bottomed craft with short bluff bows and long fine run. The "Arrow" was 61 feet 9 inches long, by 18 feet 5 inches beam, and 8 feet 8 inches depth of hold. Yachts in those days were ballasted with pig iron, iron ore, or even stones, outside ballast being unknown. A crusade was initiated against this type of craft by Mr. T. Assheton Smith, Mr. William Simons, and Mr. Scott Russell, but their endeavours to introduce a fine entrance and hollow bow in the place of the old bluff nose did not find much favour until the visit of the American schooner "America" to our shores.

Mr. Assheton Smith was actually the first to introduce the hollow bow in his yacht the "Menai" of 163 tons, built in the early years of the century, but as she did nothing remarkable in the way of sailing she failed to dispossess the old type.

Mr. John Scott Russell's wave line theory found another exponent in the "Mosquito" cutter, built in 1848 on the Thames by Mr. Mare of Blackwall. She was 59 feet long by 15 feet 4 inches beam, the greatest beam being 4 feet 6 inches abaft the centre of the load water-line length.

The "Mosquito" was built of iron, and yachtsmen probably paid more attention to this than to her designer's departure in form, and did not credit the speed she possessed to her long hollow bow.

Scotland must take credit for the most striking departure of the period ; in 1850, Mr. William Simons, a Renfrew shipbuilder, turned out "Tiara," whose dimensions were :—

Length on L.W.L.	38 ft. 6 ins.
,, over all.....	45 ft.
Beam extreme	10 ft.
Draught extreme	7 ft. 3 ins.
Draught forward	4 ft.

"Tiara" was therefore a much narrower vessel than her contemporaries, and, in addition to having a fine long bow and clean fair after body, she was a long way before her time in the matter of a shallow draft of water forward. The Royal Clyde Yacht Club possesses a very interesting model of her.

But little impression, however, was made upon the old form of hull until the arrival of the "America" in 1851. It is a matter of history how the new clipper took English yachtsmen by surprise, and an hour's trial with her did more to open the eyes of yachtsmen than several years' preaching from Mr. Scott Russell and from the designers of "Menai," "Mosquito," and "Tiara."

It may be interesting to recall how the cup, which was presented by the Royal Yacht Squadron for a race round the Isle of Wight with no time allowance, was won in 1851.

The following were the starters, and it will be seen that they were not a particularly level lot in the matter of tonnage and rig :—

Yacht.	Tons O.M.	Rig.	Owner.
Beatrice	161	Schooner...	Sir W. P. Carew,
Volante	48	Cutter.....	Mr. J. L. Craigie.
Arrow	84	,, ...	Mr. T. Chamberlayne.
Wyvern	205	Schooner...	Duke of Marlborough.
Ione.....	75	Cutter.....	Mr. Almond Hill.
Constance	218	Schooner..	Marquis of Conyngham.
Gipsy Queen..	160	,, ..	Sir H. P. Hoghton.
Alarm	193	Cutter	Mr. Joseph Weld.
Mona	82	,, ...	Lord Alfred Paget.
Brilliant	393	Bark.....	Mr. G. H. Ackers.
America	208	Schooner.	Mr. J. C. Stevens.
Bacchante	80	Cutter	Mr. B. H. Jones.
Freak	60	,, ...	Mr. Wm. Curling.
Eclipse .....,	50	,, ...	Mr. H. S. Fearon.
Aurora	47	,, ...	Mr. Marchant Thomas.

The race was started to the eastward, and the yachts went out by Bembridge Ledge, with the wind from west-south-west. Working past Bonchurch to Ventnor, "Volante," "Freak," and "Arrow" were all ahead of "America," but "Arrow" got ashore, the "Alarm" went to tow her off, and later on "Freak" fouled "Volante" and knocked the bowsprit out of her, so that the leading British yachts were altogether in a bad way. There was a light wind, and they had to beat to the westward down to the Needles. "America," who was not doing much good in short tacking with the small cutters, made a long cast off, and with a slice of luck fetched the Needles some six or seven miles ahead of "Aurora" and "Freak."

On going through the Needles, "America" had a fair wind, but meeting the ebb tide in a light breeze she made but little headway boring against it, whilst the ebb was fetching "Aurora" down the back of the island to the Needles hand over fist. By the time the tide eased, the stern division had just got round the Needles point and consequently were the first to feel the young flood when it set in. Although this brought them up pretty close, "America" kept ahead, and finished at 8.30 P.M., eighteen minutes ahead of the 47-ton cutter, "Aurora."

Although "America's" victory afforded no decisive test of merit, on account of the weather prevailing and the disablement of her principal opponents, there is no doubt that the schooner, designed and built by George Steers, the son of a Devonshire shipwright who had settled in New York, was a great improvement on any vessel previously constructed in this country.

Her design combined the peculiarities of "Tiara" and "Mosquito," and in addition she had the advantage of a suit of canvas the like of which even the old salts, who were ready enough to condemn her lines, admitted had never been seen in Cowes roads.

These elements were the secret of her success; indeed, as that veteran yachtsman, the late Marquis of Anglesey, said when he saw her for the first time, "If she is right, we are all wrong."

In 1852 and 1853 scores of yachts were hauled up in the yards to have the old bow cut away and the new American type of bow built on to them. The schooner for the first time became the most popular rig in our waters, and Mr. Joseph Weld had his cutter "Alarm" brought up to date by being lengthened by the bow and converted into a schooner. The "Alarm" is often quoted as being a craft of much renown, but if her performances from the year 1830, when she first came out as a cutter, to 1869, when she finished her racing career, be analysed, they will not strike the yachtsman of to-day as being in any way remarkable. In the 39 years she was fitted out she only raced 38 times and won 21 prizes, which nowadays is but an ordinary performance for a racing yacht in a single season. Mr. Weld, her original owner, whom we have already mentioned as the builder of the old "Arrow" in 1823, was one of the most distinguished yachtsmen of the time; he also built three cutters, "Julia" in 1820, of 60 tons, "Lulworth," of 130 tons, in 1827; and "Lulworth II," of 80 tons, in 1856. Mr. Weld really built the second "Lulworth" because his big "Alarm" overpowered all antagonists, and could find nothing to race against; he was most successful, for the little "Lulworth" won a wonderful reputation for soaking out to windward of the big schooners and cutters of those days.

In 1858 Mr. Weld had "Alarm" out again, and in the month of August of that year, when her Majesty and the Prince Consort visited Cherbourg, took part in a remarkable match across the Channel, which was sailed under the auspices of the Royal Yacht Squadron. This race is specially interesting to the modern school of yachtsmen, who know little and care less about the doings of these old time craft, because the Royal Yacht Squadron decided to rate the vessels by sail area, and arranged for a time allowance scale of $\frac{3}{4}$ of a second per square foot.

Eleven yachts started, six schooners, four cutters and a yawl.

"Zara," schooner, was the largest in tonnage, measuring 312 tons and having 8,677 square feet sail area; but "Alarm" set the most sail, having 8,891 square feet of canvas to her 248 tons (she had been increased when she was lengthened and turned into a schooner from 193 to 248 tons).

The distance, 65 miles, was done by "Alarm" at an average speed of about 12 knots per hour, so it may be imagined that the old vessel was driven hard. It is recorded that there was a fresh wind a little forward of the beam, and the large craft carried whole mainsails and housed topmasts, while the small vessels were all reefed down. The prize went to "Ursuline" yawl of 112 tons, and 4,115 feet sail area, who, with her snug canvas, was 41 minutes astern of "Alarm," but was in receipt of $48\frac{1}{2}$ minutes' time allowance.

The result was the cause of much discussion, and for the future "sail area" races were regarded with dissatisfaction, although as a fact the race was undoubtedly one of the most satisfactory matches on record.

In 1859 and 1860 a controversy raged over the tonnage rules and time allowances almost as heated as that which has disturbed the rest of yachtsmen in the last decade; however, the clubs, unmindful of the sail area rating in the Cherbourg race, reverted to the old method of handicapping on merits as a way out of the difficulty.

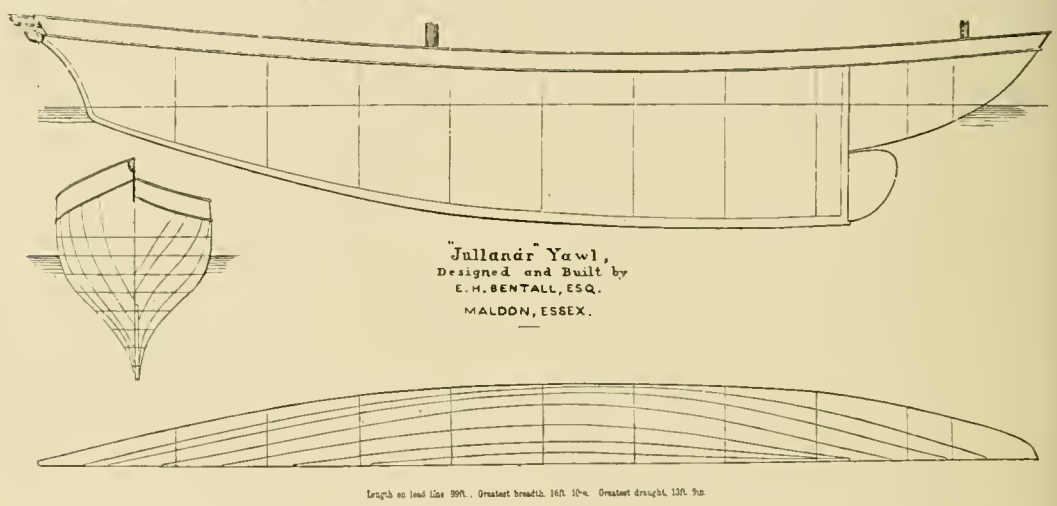
From this time forth yacht racing began to flourish. In 1863, 113 races were sailed; and in 1870 the number had risen to 168. It was during this period that schooner racing came to its height. The most successful schooners were "Aline," built in 1860 by Camper and Nicholson, of Gosport; "Pantomime," by Ratsey, of Cowes, a straight stemmed craft which for some years was a noted vessel, and in 1873 won 19 prizes in 25 starts; "Egeria," by Wanhill, in 1865; and subsequently Mr. Ashbury's famous "Cambria," which defeated the American craft "Dauntless." "Cetonia" was built by Ratsey in 1873, "Sea Bell" in 1874, and "Miranda," owned by Sir G. Lampson, by Harvey of Wivenhoe in 1877. This was about the last great year of schooner racing, and "Miranda" had the name of being the fastest and most weatherly schooner ever built. She rather frightened away the rest of the class, which dwindled down to very small dimensions in the early eighties. "Miranda," however, often joined in the hunt with the cutters and yawls, and proved herself as good as the best of them. In eight consecutive seasons she started in 144 matches and won 95 prizes, valued at £5,010. Her career in America, where she afterwards went, was equally successful, for she completely outsailed the

centre-board schooners in anything like a rough water trial.

Racing amongst the big 100-ton cutters, including the fliers "Kriemhilda," "Oimara" and "Cythera," was popular in the seventies, whilst some grand matches were sailed in the big yawl class led by "Florinda," "Surf," "Gertrude," "Condor," and others. In 1875, "Vol-au-vent," designed by Ratsey, came out and carried off the palm in the big cutter class. She had the name of being a very fast vessel in light weather, and gave the schooners a rare dressing round the courses inside the Isle of Wight. In 1876, "Neva," a comparatively small cutter of 60 tons, built two years previously, had a wonderful season, and saved her time on many occasions off "Vol-au-vent," "Cuckoo," "Arrow," and the other cracks of that year.

The new yawl had an extremely rockered keel and long immersed counter. Her fore foot was completely cut away and she was the first yawl built with a clipper stem. A notable feature in "Jullanar's" design was her raking midship section, that is to say, the greatest beam of each succeeding water-line was further forward, or, as the old salts say, the vessel was slightly "club-footed"; thus the entrance and run of the yacht were harmonically blended. "Jullanar" proved herself to be a marvellous vessel in thrashing to windward in a hard wind and heavy sea, but in light breezes the balance was in favour of "Florinda."

The season of 1878 was chiefly notable for the advent of "Formosa" in the big cutter class. She was an extremely beautiful vessel



From *Yacht Architecture* (1885), by kind permission of Messrs. Dixon Kemp and Horace Cox.

"Neva" and "Vol-au-vent" had the winnings of the big cutter class pretty much to themselves, and "Florinda," a yawl which came out in 1873, for the fourth year in succession headed the yawl class, winning altogether 21 firsts and 23 seconds in 64 starts. "Florinda" was almost without a rival until 1877, when Mr. Macleay bought the famous "Jullanar," designed and built by Mr. Bentall, of Maldon, on the Blackwater. "Jullanar" was an entirely new departure in yacht building, and a comparison between her and her famous opponent "Florinda" may be interesting.

	"Florinda."	"Jullanar."
Length of load water-line ...	85·9	99
Breadth	19·4	16·10
Draught 5 ft. from stem	7·3	2·9
Draught extreme	11·9	13·8
Mean draught	10	9·4
Displacement in tons	150	158
Area of midship section ...	106 sq. ft.	106 sq. ft.
Ballast	54 tons	79 tons
Area of lower sail	5,257	4,988

above water, though below she was hardly as perfect in form. Be that as it may, however, she was too much for "Vol-au-vent" and the other new cutters, and, curiously enough, her principal adversary during the next two seasons, in which she was in the zenith of her fame, was the venerable old cutter "Arrow," built some sixty years before, but entirely reconstructed by her owner, Mr. Tankerville Chamberlayne, with the exception of her midship-section. Year by year during this period, longer, narrower, and more powerful vessels were gradually coming into fashion. Designers began to learn the value of outside ballast in the shape of heavy lead keels. Experience had taught them the eccentricities of the Tonnage Rule, and it was found that they could turn out a craft of 90 tons more powerful than vessels of the older type which measured over 100, and "Formosa," which had been bought by the Prince of Wales, was completely overpowered and outclassed by "Vanduara," designed by Mr. G. L. Watson, and built of steel, in the year 1880, and

"Samœna," designed by Mr. Richardson, her most formidable rival.

It is worthy of note, too, that correspondingly successful innovations in type were made in the forty class about this time. "Annasona" and "Sleuth-Hound,"—built off the same scrieve from lines by Mr. Fife—and "May," a Watson boat, came out in 1881. "Annasona" was the crack of the three, winning fourteen matches to her sister ship's six, and "May" also was superior to the latter.

"Samœna" and "Vanduara" again had things pretty much their own way in 1882, when "Erycina," another 90-ton cutter by Fife, was built, but did not come up to expectations. "Silver Star," designed by Richardson, joined the forty class, but was not in it with "Annasona."

1883 saw one of Mr. G. L. Watson's masterpieces, "Marjorie," of 68 tons, joining in the fray, and also a new yawl "Wendur," 124 tons, by the same designer; "Tara" a 40-ton cutter designed by Mr. Beavor Webb, a vessel of abnormally heavy displacement, raced through the season against the old cracks in the 40 class, but her qualities were not properly brought out until her second season.

In 1884 Mr. Richardson designed "Irex" for Mr. J. Jameson, and "Genesta" was built from lines by Mr. Beavor Webb for Sir Richard Sutton, Bart. "Genesta" in her second season went to America to compete for the Cup, and "Irex" had a very successful racing career in home waters. She was a remarkable vessel, surviving the strain of class racing for four successive seasons without having her wings clipped, and racing for six seasons before being put down into the Handicap class, a fate which overtook most of the first class cutters in a much shorter time.

"Irex," "Genesta" and "Marjorie" were the finest vessels built of the old narrow type, and the latter was the most weatherly narrow cutter ever produced; but really very little improvement in yacht architecture could be claimed for them over the yachts of ten years previously, beyond the introduction of outside lead ballast, the extension of the buttock lines, which gave them a more sightly appearance, and the rounding off of the fore foot, after the example set by "Jullanar," which lessened skin friction and made them quicker in stays. The success of the yachts, as racers, was accounted for by the fact that they were longer and, as has been said, narrower and more powerful vessels, with greater sail spread than their predecessors. The climax was reached in 1885, when "Irex" was the top of the big cutter class, by "Galatea." She was the longest and most heavy displacement vessel in proportion to her Y.R.A. tonnage that had ever been built, and it was anticipated that she would create an epoch in the annals of yacht building, in fact, be a second "Jullanar." However, surprise and disappointment were general when the new steel cutter turned out an unqualified failure. The "Galatea" had rather a light draught for her proportion of length to beam, her draught being only ·9 of her greatest beam and her proportion of length to beam was 5·8. Most of her rivals went up to 1·16 for proportion of draught to beam, and this may in some measure account for the dismal failure which resulted. She was a cumbrous vessel and greatly oversparred. We have only to look at the result of the 1885 season's racing to get a clear idea of the "Galatea's" qualities.

"Irex"	19 first prizes.
"Marjorie"	13 ,, ,,
"Marguerite"	4 ,, ,,
"Galatea"	2 second prizes.

In 1885 and 1886 the long narrow flat-sided type had reached its height in all classes, and the exaggerated plank-on-edge overcrowded with sail was becoming unpopular. Hardly any class racers were built during these seasons, and matters had come to such a pass that the proverbial "something" had to be done. The "something" consisted of the institution of what were then known as the A., B. and C. classes, with the object of bringing together a large number of unclassed racers. In the B. and C. classes a limit was put on the sail area allowed to the vessels, and, although this new idea worked well and resulted in many sporting matches, and even to a considerable increase in the number of matches sailed during the last year, it sadly deteriorated first-class yacht racing. A natural tendency manifested itself to clip the wings of A. class yachts so as to get them into the B. class, and to cut down B. yachts so as to make them eligible for the C. class. Under these circumstances it was generally felt that the time had arrived for a new rule of measurement to be devised, and the Length and Sail Area Rule, propounded by Mr. Dixon Kemp, was introduced in the year 1887 by the Yacht Racing Association. The first big vessel built under the new rule was the "Thistle" from the lines of Mr. G. L. Watson. Though built under the rule she was also intended to compete for the "America" cup, to which match the rule did not apply, and as her designer was so to speak serving two masters he was probably somewhat hampered in turning out the best possible exponent of his views. However, Mr. Watson took advantage of the new rule to give his cup challenger a considerable increase of beam as compared with the proportions obtaining under the previous rule. The "Thistle" was 85 feet L.W.L. against "Irex's" 83·54 feet and had 20·30 feet beam against "Irex's" 14·99. "Thistle's" performances against "Irex" in 1887 were in every respect creditable to her designers, for the pair met thirteen times and the new cutter won eleven matches to "Irex's" two. The following year "Thistle" was an absentee and old "Irex" had her sail area reduced, which, although it

spoiled her chances in light winds, was rather an advantage to her in a blow of jib header strength; and, as this was the kind of weather in which the old narrow type of ship stood the best chance of winning a prize, she was probably rather improved.

The new first-class cutters consisted of "Petronilla" and "Yarana," and the one addition to the forty class was "Mohawk." "Yarana" was designed by Mr. G. L. Watson and must be taken as his first venture purely under the Length and Sail area rating rule. She was a composite built vessel of 60 rating, and was built by Messrs. D. and W. Henderson of Glasgow, as was also the "Thistle": she had a clipper stem, and a neat elongated counter. Her dimensions were: 66 feet L.W.L., beam 14·8 feet, and draught of water about 13 feet. Her chief successes were in light and moderate breezes and in her first season with "Irex" and "Petronilla" as her opponents she won 24 first prizes out of 38 starts. "Irex" did very well against her in strong winds, and eventually won 11 firsts out of 31 starts, and yachtsmen will have a vivid recollection of the way the sole survivor of the old 1730 tonnage rule went when driven hard, and especially of the match round the Isle of Wight, when she did the course in 4 hours 50 minutes and 41 seconds, a record which remains unbeaten to the present day.

"Valkyrie I."

Of "Petronilla's" racing career but little good can be said. She was not a success, winning only five first prizes out of twenty-eight starts, and in three out of these five wins she had not to meet "Yarana" as an opponent. She won at the Royal Cinque Ports Regatta at Dover, and at the Royal Southern Regatta at Southampton; but at that time the "Yarana" was round on the Clyde, sailing against "Irex," and "Petronilla's" opponents were reduced to the 40-raters "Neptune," "May," and "Mohawk."

She beat "Yarana" for the first and practically the only time at Falmouth on July 23rd. She made a very good start, and in a fresh wind succeeded in keeping ahead of "Yarana" and taking the prize, but had to content herself with a view of "Yarana's" taffrail for the rest of the season.

Her most creditable performance took place at Plymouth, in an amateur helmsmen's race, sailed in a whole gale of wind. "Petronilla," "Yarana," "May," "Neptune," and "Mohawk," started all under close-reefed mainsails, and with topmasts housed, in weather under which no sailing committee ought to have started a race. The sea was too heavy to put out mark boats—even the large trawlers which are there generally used for that purpose, and the vessels were ordered to go round the buoys off Rame Head and the Mewstone. They had to stay round one and jibe round the other, and considering that these buoys are placed to keep vessels off the rocks, and that the sea was breaking nearly out to them, it was nothing short of scandalous to send vessels round such a course.

All the yachts, with the exception of "Yarana" and "Petronilla," gave up, after making a few terrific dives, soon after they got outside the breakwater. "Yarana" worked out to the weather mark, the Rame Head buoy, and then gave up, and "Petronilla" alone completed the first round and came in with two out of three shrouds burst on her starboard side. The committee proposed to sail the race over again, and on "Petronilla's" refusing to agree, ordered her to complete the race and go round the course twice again: however, they thought better of this, and relieving her from the necessity of going round again, gave her the prize.

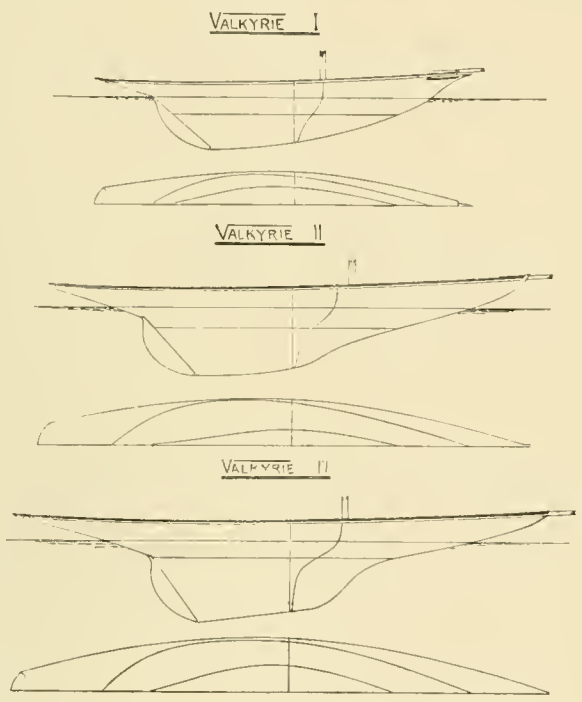
The best that can be claimed for "Mohawk" in the forty class is that she was about on a par with the old 40-tonner "May" and the cruiser "Neptune," which had been converted into the 40-raters.

In 1889 Lord Dunraven brought out "Valkyrie I," a cutter of 77 rating designed by

Mr. G. L. Watson; and the late Captain Nottage had a new forty "Deerhound" built from lines by the same designer. The last named completely extinguished "Mohawk," but "Valkyrie" and "Yarana" were pretty evenly matched.

The balance was in favour of Lord Dunraven's cutter whenever there was a fresh wind, but in light airs "Yarana" was generally the winner. "Irex," although in her sixth season, and despite the change of rule, was not quite outclassed, for on her day, a strong wind and a reaching course, she not unfrequently got the winning gun. "Yarana" won 15 firsts in 39 starts, "Valkyrie," 14 firsts in 34 starts, and "Irex," 8 firsts in 33 starts.

Mr. Jameson sold the "Irex" the following season, and she dropped out of first class racing; in her place he built "Iverna" from lines by Mr. A. Richardson, who had also designed "Irex," and in the same season (1890) "Thistle" was fitted out again. "Thistle" had not raced in British waters since her first season, 1887, when she gave "Irex" such a dressing and consequently had not met either "Valkyrie," or "Yarana."



"Iverna" rated 118 and "Thistle" 121, so that they were much larger and more powerful vessels than "Valkyrie I" and "Yarana." The last-named won ten first prizes during the season, chiefly by her wonderful qualities in light winds, but "Valkyrie" was between two fires, for "Yarana" could beat her in very light weather, and in strong winds she was overpowered by the big ships, and she only won three first prizes during the season.

The results of the matches between "Iverna" and "Thistle" were somewhat curious. The Richardson boat was at first fitted with a centre board, but she did not seem to relish this feature, for out of the first eighteen occasions on which she met "Thistle" the latter beat her no less than sixteen times. The plate was then removed, when she immediately began to turn the tables on "Thistle," and won fifteen out of the next sixteen races they sailed together.

In the forty class in the same year three new boats came out, "Creole," designed by Watson, "Castanet" by J. M. Soper, and "White Slave" by Fife; the last was rigged as a lugger and, it is unnecessary to say, proved a complete failure. "Castanet" and "Deerhound" were about on a par in fresh winds, whilst the former was best in light weather; "Creole" turned out the crack and, like most of the Watson boats, her best point was sailing on a wind.

In the seasons of 1891 and 1892 no new first-class cutters were built. In 1891 "Thistle" was an absentee, "Yarana" changed hands and was re-christened "Maid Marion," and was not given a racing fit out. "Iverna" won fifteen first prizes and "Valkyrie I" eleven, each starting twenty-seven times, and the latter followed up her successes by going out to the Mediterranean in the spring of 1892, and winning eight firsts out of nine starts, sailing against "Deerhound," "Castanet" and "Blue Rock." "Valkyrie" was bought by the Archduke Carl Stephan of Austria, and "Thistle" by the German Emperor, who renamed it "Meteor." In 1892 the latter was tuned up to concert pitch for another set to with "Iverna," but the balance remained slightly in favour of the latter, although the pair were very well matched. "Iverna" won thirteen matches and "Meteor" ten, whilst once on the Clyde in a fresh wind they sailed a dead heat.

Although nothing was done in the years 1891 and 1892 in the big class, a great advance had been made in the second class (the forty raters), "Reverie," "Thalia," "Varuna," "Corsair" and "Queen Mab" had been built and they showed a gradual improvement on the first type of cutter built under the Length and Sail area rule. With increased beam and the continual cutting away of the fore foot and raking of the stern post, the natural sequence was an increase of overhang fore and aft; and the necessity of utilising the overhang by redue-

ing the angle made at the stem and stern between the water-line and the overhang led up to long counters, and the modern "pram" bow. The vessels built in 1892 and 1893 all showed this development, and, especially in 1893, the fore foot was cut away to such an extent that a hollow profile to the longitudinal vertical section was introduced. The second class is perhaps the best in which to observe the changes in dimensions and type, as new craft have been built to it in each consecutive year since the year 1888, and a table of the dimensions of some of the principal vessels is appended :—

Date	1888	1889	1890	1891	1892	1892	1893	1895
Designer	Clayton	Watson	Watson	Fife	Watson	Watson	Fife	Fife
Yacht.....	Mohawk	Deerhound	Creole	Thalia	Varuna	Queen Mab	Lais	Isolde
L. W. L....	61·23	58·85	59·5	59·14	59	59	60	60·02
Beam	14·5	13·5	13·2	13·9	14·7	16·7	17	17·05
Depth	9·5	11·6	12	12·6	13·4	10·9	—	—
Displacement...	58·8	58	58	57	55	54·8	—	—

The splendid performances of "Queen Mab" in 1892, when she won twenty-four first prizes and thirty-six prizes out of forty-six starts from a powerful class of forties, gave designers a great insight into the possibilities of light displacement, and the advantages of the pram bow in skimming over the seas in bad weather instead of charging through them.

"Queen Mab" was at first fitted with a centre board, but it does not seem to have contributed to her success. Though it cannot be said to have had the effect of stopping her as "Iverna's" did, it made no perceptible difference to her weatherly qualities, and eventually it was taken out. In "Queen Mab" Mr. Watson may be said to have scored heavily, for she was the forerunner in form of his famous pair of first-class cutters, built the following year by Messrs. D. and W. Henderson, of Glasgow, for H.R.H. the Prince of Wales and Lord Dunraven respectively.

The season of 1893 was especially remarkable for its splendid series of matches sailed by the first class yachts represented by "Britannia," "Valkyrie II," "Satanita," and "Calluna." The deep fin keel was fully developed in these vessels, and, although the old-school yachtsmen proclaimed that the craft shared every element in construction and design that a yacht ought not to own, it can be truly said that the boats were faster and more capable in heavy weather and open sea, and enormously superior in moderate and light winds to the yachts of any previous generation.

Excepting in a hard reaching breeze "Satanita" could not hold a candle to either "Britannia" or "Valkyrie II," and as "Calluna" was also comparatively a failure, the honours fell mainly to the Watson pair.

In the twenty-one matches in which these two vessels met, "Valkyrie II" led home twelve times, and "Britannia" nine times, and as far as can be judged by that trial, the former was a trifle the faster of the two.

To lend additional interest to one of the best seasons on record, the American yacht "Navahoe" came over towards the end of July, and was got ready to try the mettle of the British yachts.

Her first match was on July 31st at Cowes, when "Britannia," "Valkyrie II," "Satanita," "Calluna," and "Iverna" were ready to try conclusions with the Herreshoff yacht in a fresh breeze, for the Royal London Yacht Club's prize.

Such a flutter of excitement had not been seen in Cowes Roads since the "America" made her *début* forty-two years before, and it was not diminished when the American cutter finished the first round, leading her five opponents. She kept ahead as they ran down to the Warner Lightship, and rounded it for the second time, when the real windward trial of the match commenced. The breeze had freshened a little, and was blowing steadier than before, and "Valkyrie II" and "Britannia" fairly collared the "Navahoe," the Prince of Wales's cutter taking the lead off the Horse Fort, and keeping it until she sailed into Cowes Roads, a meritorious winner. "Valkyrie II" was second, and "Navahoe" in third place.

"Britannia" repeated her success by beating "Navahoe" every time they met excepting in the case of the match for the Brenton Reef Cup. Leaving flukes out of the question, the Prince's cutter beat "Navahoe" on an average by five minutes thirty-eight seconds.

In the race for the Brenton Reef Cup "Britannia" finished fifty-seven seconds ahead of "Navahoe," but as she started fifty-five seconds ahead and by an arrangement made before the match the difference at starting was to be added or deducted at the finish, as the case might be, "Britannia" had a balance in her favour of two seconds only. "Navahoe" protested that, the boat-mark having been moved from its original place, the finishing line was not the same as the starting line, and that she had to sail over more water to reach it. This she claimed made a difference to her of several seconds, and after hearing the evidence, the Royal Yacht Squadron, who were responsible for the alteration of the position of the mark, awarded the match to "Navahoe." The match, it may be mentioned, finished at night, and the captain of the mark-boat had shifted out of the fair way.

The visit of another American yacht, the "Vigilant," to our shores in 1894 added greatly to the interest of yacht-racing. Her meeting with "Britannia" was looked forward to with much excitement, and the result affords a notable example of the uncertainty of racing. On public

form "Valkyrie II" was somewhat better than "Britannia," the former having beaten the latter twelve times in twenty-one matches, as already mentioned. "Vigilant" was built to defend the America Cup, challenged for by "Valkyrie II," and defeated the latter in New York Bay; and "Britannia" somewhat easily defeated "Vigilant" in British waters. Either "Britannia" must have enormously improved with age, or "Valkyrie II" or "Vigilant" did not sail up to their true form on strange waters. The season was a very good one, but was, however, marred by an unfortunate accident on the Clyde. While manœuvring for the start at Hunter's Quay, "Satanita" ran down and sank "Valkyrie II," and was herself seriously disabled.

"Britannia" beat "Vigilant" eleven times, including a series of seven successive victories; and "Vigilant" beat "Britannia" five times, including the private match at Cowes on August 3rd. The result of this race, however, was not altogether satisfactory as, shortly after the start, when standing in towards the mainland, the yachts having started to the westward, "Vigilant" hailed "Britannia" for water and, owing to some misunderstanding, did not put about herself, and the error gave her a considerable advantage.

The most notable feature in the year 1895 was the production of the two large racing cutters, "Ailsa" and "Valkyrie III." The first-named, designed by Mr. W. Fife, jun., made a brilliant display in the Mediterranean, but subsequently was not so successful in home waters, whilst the third "Valkyrie," was from Mr. G. L. Watson's board.

The *début* of "Valkyrie III" on the Clyde left her practically an unknown quantity, as she only raced three times before she went across the Atlantic to contest for the America Cup.

"Britannia" won thirty-eight first prizes during the whole year, out of fifty starts, and £3,039 in money, against "Ailsa's" twelve first prizes out of forty-one starts and £2,362, so Britannia was again the champion cutter of the year. However, Mr. Watson had not matters entirely to himself, for in the second-class (the forties) there were two additions, "Isolde," by Mr. W. Fife, jun., and "Caress," by Mr. Watson. The Fife boat proved by far the better all-round performer of the pair, winning thirty-one first prizes to "Caress's" seven.

In 1896 Mr. Watson designed a new "Meteor," for the German Emperor, in the place of his old "Meteor," *née* "Thistle." The last named, having been re-christened for the third time, is now known as "Comet." The new cutter was built at Messrs. Henderson's, on the Clyde, the cradle of most of the crack racing yachts of later years. She was the first big cutter built under the present rule, which came into force in the season of 1896, and Mr. Watson may be credited with having turned out a magnificent and in every respect a highly successful vessel, a repetition, in fact, of his success with "Yarana" under the previous rule eight years before.

"Meteor" had some rivals worthy of her steel, as "Ailsa" was showing improved form, and even had a better record at the end of the season than "Britannia." The result of the season's racing was briefly as follows:—

	Starts.	First.	Other Prizes.	Total.	Value.
Ailsa	60	21	13	34	£2,020
Meteor	22	13	4	17	1,465
Britannia	58	14	10	24	1,562

About this time it became evident that the dimensions reached by the big cutters were becoming too great for safety, comfort and the general prospects of first-class cutter racing; and the Yacht Racing Association, with the object of discouraging the building of yachts over ninety rating, made an alteration, already described, in the time allowances under the new Linear Rating Rule, in the direction of slightly penalising yachts above that rating.

Mr. G. L. Watson's production of 1897 was "Bona," of 82 rating, built for the Duke d'Abruzzi, and with the advantage of the alteration in the time scale, she had a lion's chance with "Meteor."

There can be no doubt that the new cutter is a more handy-sized craft for match sailing than "Meteor" or "Valkyrie III." She is a beautiful vessel, and her record of sixteen first prizes out of twenty-six starts against "Meteor's" thirteen out of twenty-nine showed her to be in every respect equal to her predecessors. "Britannia's" record for 1897, including her racing in the Mediterranean, was ten first prizes in twenty starts.

Considering that "Britannia" was not pre-eminent when she first came out, and that her record in 1897, her fifth season, was much on an average with that of her other seasons, an almost unique performance in yacht racing, it would not appear that the Length and Sail area rule was inadequate for the development of the nearest possible approach to perfection in racing vessels.

"Aurora," designed by Mr. F. E. Soper, was the only other first-class cutter built in 1897. She was not a success.

The following is a table of the dimensions of some of the first-class cutters mentioned above.

	Year.	Length.	Breadth	Draught approximate.	Length over all.	Sail area
Valkyrie I.	1883	69·6	13·10	13·3½	94	6,026
Satanita	1893	87	24·7	16·5	131	9,923
Britannia	1893	87	23·6	15·6	121	10,328
Valkyrie II.	1893	85	22·4	16·6	117	10,271
Calluna	1893	82	24·3	15	—	10,303
Vigilant	1894	86	23	13	128	12,330
Valkyrie III	1895	88·85	26	19·8	129	13,900
Meteor	1896	89	24·28	18	124	12,326
Bona	1897	75·8	18·1	14·1	105	7,597

"Valkyrie III," when she raced for the America Cup, had a main boom of 105 feet. That of the "Vigilant" measured 97 feet 6 inches. The "Meteor's" boom was 96 feet 6 inches in length, whilst the "Bona's" spar is of far more handy dimensions, being only 78 feet long.

It may be concluded, therefore, from this review, that prior to the advent of the "America," a short full bow and long fine after body was in vogue. From the time that famous schooner came to our shores the system was partially reversed, and a long fine bow and comparatively short run was introduced. Yachts then gradually became longer, narrower, and deeper, relying less and less on beam, and more and more on lead for stability, until the year 1887, when craft were again given more beam in proportion to their length.

The cutting away of all dead wood to avoid skin friction led to the development of a hollow longitudinal vertical section forward, and this caused the forward transverse sections to become shallow and spread out. The natural development from this was the "spoon" or "pram" bow.

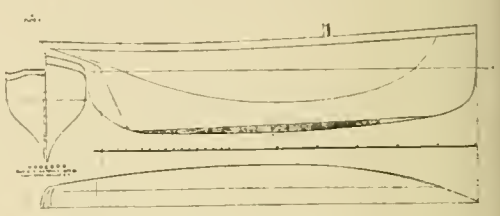
The craving to obtain speed by reducing the proportion of displacement to sail carrying capacity, resulted in a shallow body and deep keel, which further developed into the short-deep fin keel in the shape of a shark's fin in the small yachts, and the longer fin in larger craft, and subsequently to the fairly general use of the plate and bulb keel in vessels up to about 30 tons B.M.

It is interesting to note that a modern yacht's entrance is not unlike the old "wave line" concave bow with all the fore foot cut away; and that the "America" lengthened by the stern, her buttock lines eased, and her dead-wood entirely cut away would bear a strong resemblance to "Valkyries II and III" and "Britannia."

Whether modern vessels are more speedy than old time craft, and, if so, to what extent, it is very difficult to say. Enormous improvements have been made in sail cloth and in the cutting of sails, in the scientific staying of masts, in the substitution of steel wire for hemp ropes, in the manufacture of gear of all kinds, and especially in the adoption of methods of construction which have tended to greatly reduce weight. Discounting all these advantages and judging by recorded races, it would seem that flyers of fifty years ago sailed off the wind about as fast as the modern clippers; but the present-day racer sailing *over* the water, rather than punching through it as in days of yore, attains a far higher rate of speed close hauled than was possible for its predecessors and is possessed of qualities of weatherliness and handiness that formerly were quite unknown.

Many scientific men have tried to prove their theories regarding the "shape of the solid of least resistance," but no hard and fast mechanical or geometrical system of yacht designing has yet been discovered, and affairs remain to-day much as they did more than two and twenty years ago when Mr. G. L. Watson declared that "A good boat is simply a happy compromise in which Beam and Depth have the good taste not to come too prominently to the front in order that Length may give her speed; while Length returns their courtesy by not pushing herself into undue prominence and thereby sacrificing Power."

The twenties, though in all essentials miniature big ships, are yet sufficiently distinct to require separate treatment.



From *Yacht Architecture* (1885), by kind permission of Messrs. Dixon Kemp and Horace Cox.

The "Vanessa," built by the late Mr. Dan Hatcher in 1873, was one of the most remarkable 20-tonners ever launched in this country, not only on account of her successful career, which lasted from the year she came out until 1879, but also owing to a superiority in construction and design which was really many years in advance of her time.

It is difficult to describe "Vanessa's" beauties in words, for, unlike "Jullanar," "Clara," "Queen Mab," or other epoch making vessels in their several classes, there was nothing extreme about her; suffice it to say that her lines were blended in a series of beautiful curves and that the pith of her design was introduced into the successful twenties of later years.

When "Vanessa" was eventually out-classed it was by the introduction of really larger boats into the class. Designers worked on the weak point of the Thames and 1730 tonnage rules which, by their severe tax on beam, admitted vessels into the twenty ton class of but a few inches less beam than "Vanessa," but with several feet more length. The absence of any tax on sail area allowed of huge sail spreads, to carry which greatly increased displacement became necessary, and was supplied to such an extent that some of the later twenties were at least one-third larger in displacement than "Vanessa," and she may fairly be credited with competing successfully against larger craft which, in name only, were of the same tonnage. The same may be said of "Audrey" during the last two seasons as an instance of history repeating itself. No improvements on "Vanessa's" lines were made whilst the Thames tonnage rule was in force, and scarcely any under the

1730 rule which followed it. In 1874 she had "Sunshine," "Quickstep," "Fleetwing," and "Lizzie" against her. None of them could make much of a show with Dan Hatcher's beauty, and it was not until 1876 that a new boat came out that could do anything with her. The "Challenge," when she made her *début* in that year, became top of her class, but it is doubtful whether she was as good a boat as "Vanessa" in her best days.

1878 was another splendid season for twenties. "Maia," designed by Mr. C. P. Clayton, a steel built yacht, "Moira" and "Irene," iron boats, designed and built by Messrs. A. and J. Inglis, and "Frederica" came out in this year, as did also "Maggie," a 15-tonner from Hatcher's board, which raced with the twenties for several seasons; but in spite of these new antagonists, "Vanessa," in new hands, sailed by George Cranfield, won no less than twenty-four first prizes. "Challenge" was not competing in home waters this season; she had gone to France, where she swept the boards.

In 1879 "Sayonara" was built at Reid's, in Glasgow. She was a nice little composite cutter, and her principal opponents were "Louise," built at Payne's, Southampton, and the redoubtable "Vanessa." Both the new cracks were defeated by "Freda," designed by Mr. J. Beavor Webb for Sir Thomas Freke. She speedily went to the top of her class, and practically held her position for three successive years.

The introduction of the 1730 tonnage rule in 1881, which failed so signally in its intention to put a stop to increased length in proportion to beam, saw only three new 20-tonners built—namely, "Lenore," designed by Mr. W. Fife, jun., and built at the Fairlie yard in 1882, "Amathea," designed by Mr. A. Richardson, and built by G. Inman and Son, of Lymington, and "Clara," designed by W. Fife, and built at the Culzean Yard in 1884.

In 1883 "Lenore" and "Amathea" had some sporting matches round the coast. In this season "Lenore" won ten matches out of thirteen starts against "Freda," but the latter generally beat "Amathea" when they met. The most striking development of the 20-ton class, however, was "Clara." She was the last of the narrow vessels built under the 1730 rule, and in the eleven years that had elapsed between the births of the Thames Measurement crack, "Vanessa," and "Clara," it is interesting to note the remarkable alterations that had taken place in the size and type of vessel, in spite of the effort made in 1881 to bring about an increase of beam in proportion to length. "Vanessa's" dimensions were 47 feet in length on the water-line, and 9 feet 10 inches beam, and she carried 2,600 square feet of sail. "Clara" was 53 feet on the water-line, had 9 feet beam, and 3,500 square feet of sail area. Under the length and sail area rule, which came into operation in 1887, "Vanessa" would be 20 rating, but "Clara" would be 31 rating. There was little virtue in this style of development, which simply meant carrying the plank on edge type to excess, and increasing the cost of the vessel. "Clara" won seventeen matches the first year she came out, and in the following year, 1885, it was looked upon as hopeless to enter any existing twenty tonner in a race against her. It was not a very tempting task to build a still more slender plank on edge to try to lower her colours, and there was practically no racing. "Clara" was sold to go to America, and the twenty ton class became temporarily extinct. "Clara" had a very successful career in American waters, and with Mr. Wheeler's old 15-tonner, "Maggie," designed by Dan Hatcher, and "Madge," and later on the 40 rater, "Queen Mab," both designed by G. L. Watson, made among American yachtsmen a revolution similar to that made among British yachtsmen by the schooner "America" many years before.

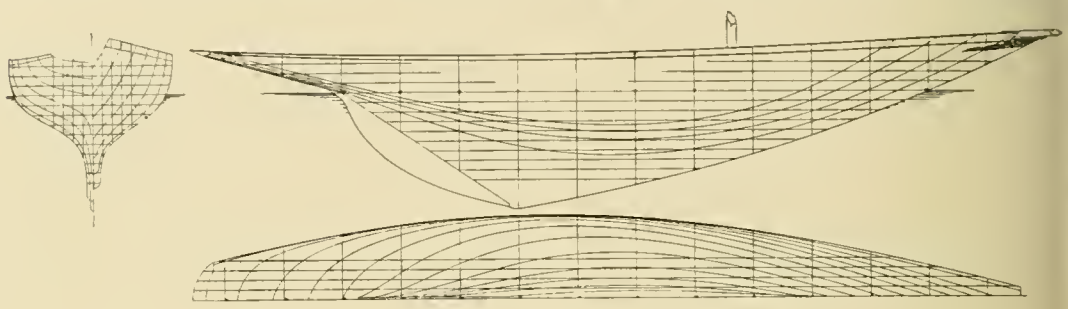
The twenty class was not revived until 1888, when "Vreda," designed by Mr. G. L. Watson, came out. She was the first 20 rater built under the Length and Sail area rule, and in displacement, length, breadth, and sail spread very closely resembled "Vanessa" as she was in 1873. "Vreda" had an easy task to gain her laurels, as she was only called upon to tackle the two old narrow ten tonners, "Melissa" and "Marguerite," which had become 20 raters under the new rule.

It is rather curious that under the Length and Sail area rule of 1887, old beamy twenty tonners built under the Thames measurement, such as "Vanessa," "Quickstep," or "Sunshine," worked out as 20 raters, and the extremely narrow 10-tonners, such as "Queen Mab," "Marguerite," and "Melissa," which were built towards the end of the era of the 1730 rule, which came into force in 1881, also worked out to be of 20 rating.

The next year, 1889, saw several new boats, "Dragon I," built for Mr. F. C. Hill, from designs by Mr. W. Fife, jun., "Mimosa" and "Windward," and the first-named was regarded as the best. "Chiquita" and "Siola" from Mr. Payne's board came out in 1890, whilst Mr. G. L. Watson turned out "Velzie," and Mr. C. P. Clayton designed the "Ghost." "Velzie" and "Ghost" had less beam, and slightly heavier displacement than their rivals, but as far as sailing powers went there was not much difference between the lot. A decided improvement, however, was made by Mr. W. Fife, jun., in 1891, when he turned out "Dragon II" for Mr. F. C. Hill. She won twenty-seven first prizes out of thirty-two starts, and as might be expected, took the heart out of racing in the following year.

1893, however, saw a tremendous revival.

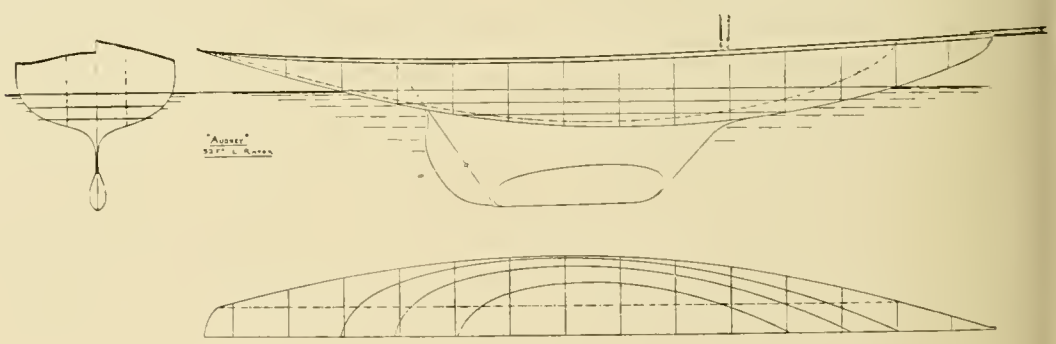
"Deirdré," designed by Mr. G. L. Watson and built by Reid for Lord Dunraven, the third of Mr. F. C. Hill's notable series of "Dragons," designed by Mr. Fife, jun.; "Maladetta," a semi-cruiser, designed by her owner, Mr. McGildowey, "Zinita," by Mr. Fife, jun., and "Vigorna," by Mr. Charles Nicholson, formed a splendid class. "Dragon" was the most successful, though "Deirdré" ran her very close; neither of them, however, went to the Clyde to meet "Zinita," which was unbeaten in her own waters. "Vigorna" was the first bulb keeled boat with a pram bow and a very shallow body, and turned out a complete failure.



PLAN OF "ZINITA."

The following season Mr. Fife, who may fairly claim to have turned out more successful twenties than any other designer, scored a great success with "Luna," built for Mr. F. B. Jameson, and she came out top after an eventful season's racing. The twenty class was in this season admitted into the Solent classes, which meant sailing in Solent waters from May 26th until the end of August—some fifty matches, with amateur helmsmen upon every occasion. As a result the twenties enjoyed a thoroughly sporting season, but the class was found to be a rather severe tax on the Solent Clubs in the matter of prize money. Five new boats were built in the Solent, in addition to "Luna," which hailed from her designer's own yard on the Clyde, so with "Dragon III" and "Deirdré," and the still practically untried "Zinita," which, by the way, was much more heavily fitted below than the rest of the class, there was no lack of interest in the racing. The famous twenties which raced in 1894, besides "Luna," which won twenty-one first prizes out of fifty starts, were "Inyoni," designed by Mr. Charles Nicholson for Lord Dudley, a very short beamy boat, with fin keel and large sail spread, which attained quite phenomenal speed in light weather; "Deirdré," "Dragon III" and "Zinita," built the previous year, "Thelma," a centreboard cutter, designed by Mr. Fife; "Asphodel," designed by Mr. J. L. Watson, and owned by H.R.H. the late Prince Henry of Battenberg; Prince Batthyany's "Stephanie," designed by Mr. Clayton and finally, towards the end of the season, "Audrey," designed by Lord Dunraven.

Numerous changes of ownership occurred during the seasons of 1893 and 1894. Mr. Hill sold "Dragon III" to Lord Dunraven, who subsequently sold her to Lord Brassey, and "Deirdré" was purchased by Lord Lonsdale.



PLAN OF "AUDREY."

Before the season of 1895 Lord Dunraven made considerable alteration in "Audrey." She was a round bodied boat with a wooden fin and bulb; the wooden fin was removed and a metal one fixed in its place, and the body of the yacht having been found too deep it was reduced about 6 inches by the transverse sections being taken in from the water-line downwards. The hull of the vessel was thus made shallower and flatter in the floor by practically

almost rebuilding her, though the original idea of design was retained.

To complement the reduction of draught of body, the buttock lines were drawn out and the boat given a slightly longer snout. She was greatly improved and turned out to be the only boat fit to tackle the Herreshoff fliers "Niagara" and "Isolde," which came over in 1895.

The peculiar characteristics of the American pair, which were said to be built from the same design, were the exaggerated overhanging pram bows, the full, almost boxy, quarters, and counters sawn off at the end. Where the plate keel met the body of the vessel, the angle was neatly filled in by two flanged plates, transforming the sections of the vessel into curves. The spars, gear, and canvas, and the scantling of these American boats were of the lightest and yet the most serviceable description. The hull was a mere shell sub-divided by lath and canvas bulkheads. "Niagara" was the best of the pair and displayed remarkable sailing powers, for although "Audrey" could tackle her in a nice whole sail breeze and was equal to her in a fresh wind, in really hard weather the American could generally turn tables on Lord Dunraven's cutter.

"AUDREY."

"Eucharis," launched at Fairlie from lines by Mr. W. Fife, jun., was the only new twenty built in 1895, and she turned out to be a very moderate vessel. She was a plate and bulb boat of the extreme type, but although she twice beat "Niagara" on the Clyde, she could do very little except on a reaching course

As to the result of the season's racing, "Niagara" won 25 firsts out of 46 starts, "Audrey" 16 first prizes out of 32 starts, and "Inyoni," still the crack in light weather, 15 firsts in 40 starts. It must be mentioned, however, that on leaving the South "Niagara" lost the competition of her formidable opponents "Audrey" and "Inyoni." On the Clyde, the Mersey, and at Torbay she met only "Eucharis," "Zimta," and "Mimosa," and eleven of her first prizes were practically walks over.

The first year of the Linear Rating or Girth rule saw the return to a rather more roomy type of boat, for "Penitent" and "The Saint," designed by Mr. A. E. Payne and Mr. W. Fife, jun., respectively, were somewhat deeper in the body than the bulb keelers of the previous season. "Penitent," indeed, was a keel boat not unlike an elongated "Dragon II," or "Luna" with fuller bow sections, whilst "The Saint" was a wooden fin keel boat, a kind of compromise between the "Penitent" type and the pure plate and bulb.

"Samphire," a plate and bulb boat designed and built by Mr. Chas. Sibbick, also made her appearance in the Mediterranean.

"Audrey." "Niagara," and "Isolde" were all brought out to do battle with the new cutters, all being in pretty much the same trim as 1895.

The year 1896, by reason of the trial of the different types, proved a most interesting season's racing, and the excellent performance of "Audrey" and "Niagara" with the new cutters speaks well for the value of the bulb keel type, for, looking at the dimensions of the boats, it will be seen that the newer craft had a decided advantage over them.

Yacht.	Built	Designer.	Length	Breadth	Sail area.
Audrey	1895	Lord Dunraven	44·33	13·15	2,699
Penitent	1896	Payne	47·0	12·52	3,076
The Saint ...	1896	Fife	46·84	12·20	2,975
Niagara	1895	Herreshoff	44·45	12·13	2,726

"The Saint" turned out the most successful prize winner. Out of a total of 57 matches sailed during the season she started 42 times and won 20 first prizes: "Niagara" started 43 times, winning 12; "Penitent" 50 times, winning 15 firsts; and "Audrey" won 7 firsts out of 28 starts. One of "Niagara's" wins, that by which she won outright the Challenge Cup presented to the Castle Yacht Club by Lord Dunraven can

hardly be estimated as a victory. "Audrey" handsomely defeated "Niagara," but lost the cup on a protest of the latter, on a technicality, namely, that "Audrey's" entry was not made according to the letter of the rule.

"The Saint," after her successful season in British waters, took her departure for Germany where an unfortunate accident befell her. Whilst in tow of a tug the hawser parted and the yacht drifted on the rocks and became a total wreck.

The new cutters were a compromise between an ordinary keel yacht and one of the fin keeled type, with rather deeper body than "The Saint"; in fact, their midship sections were not unlike "Dragon III," Mr. Fife's design of 1893: but they had the extreme rake of stern post, immense overhang and pram bows which were the developments of four seasons' competition in yacht designing.

"Penitent" was sold by her original owner,

"PENITENT."

Last season, 1897, saw two additions to the 52 foot class, both built at Fairlie from Mr. Fife's design, namely, "Morning Star" for Mr. Andrew Coates and "Senga" for Mr. F. A. Dubs.

They were about a foot longer on the L.W.L. than the same designer's creation of the previous season, being 47 feet 6 inches against "The Saint's" 46 feet 6 inches; their beam was identical with that of the latter vessel, and their sail area slightly larger.

Mr. C. D. Rose, to Mr. W. P. Burton, but she was not brought out until the Solent racing began in August. "Audrey," Lord Dunraven's cutter, now in her fourth season, or third since she was rebuilt, was tuned up in a wonderful fashion. Her owner had the angle of her plate and bilge padded to reduce her girth, which, under the present rule, allowed her nearly 100 feet additional sail area, though even then, with 2,780 square feet she had nearly 300 feet less sail area than "Penitent." The effect of

the alterations to "Audrey" was most satisfactory, for the old boat was quite as good as her rivals; the season's racing may be briefly summed up as follows:—

"Penitent," the keel boat, which was much better handled than in 1896, was most successful beating to windward in light and moderate weather; "Audrey," the plate and bulb boat, was the best in a breeze, especially in rough water; and "Morning Star," the semi-fin keeled cutter, proved a perfect flier in light weather.

It is safe to conclude that for all round sailing there was very little to choose between the trio, "Penitent" winning 9 firsts out of 16 starts, "Audrey" winning 10 firsts out of 37 starts, and "Morning Star" 17 firsts out of 37 starts whilst sailing in class races. A curious instance of the difference that sometimes occurs in the capabilities of yachts, although built to the same lines, may be found in "Senga," a cutter which, although a sister ship to the successful "Morning Star," was comparatively a failure, the case being one of "Niagara" and "Isolde," and "Annasona" and "Sleuth Hound" over again.

Looking at the annals of the twenty class during the last quarter of a century, although many changes have occurred in the shape of the yachts, the dimensions of the craft have kept tolerably level.

The length of a twenty has usually been from 45 feet 6 inches to 48 feet, and the sail area from 2,600 to 2,900 square feet.

"Clara" was the only wide departure from the rule; but "Audrey" and "Inyoni" have gone below the average in the matter of length, and "Penitent" exceeded the usual limit of sail area.

The beam of the 20-tonners in "Vanessa's" days was about 10 feet; in the time of "Freda," "Amathea," "Lenore," and "Clara," it fell gradually as low as 9 feet in the last-named vessel. In the early 20-raters, from 1888 to 1890, it was about the same as in old "Vanessa's" time, whilst latterly the beam has increased to from 12 to 13 feet.

With regard to the speed of the craft, there is no doubt that a modern 52-footer would complete the same course in less time than a yacht of "Clara's" type in any weather. The only possible chance for the narrow boat would be on a reaching course. The advantage of the bulb keel and pram bow combined is very evident in "Audrey," which, after three hard seasons' racing, could still hold her own with the boats built with deeper sections, such as the framers of the present rule anticipated it would produce, and her performances speak well for the prospects of bulb keel craft during the next three seasons during which the rule will be in force.

The dimensions and form of the latest 52 foot Linear raters differ but little from those of the boats built last year. The Fife boat "Viera" is very similar to "Morning Star," and Payne's "Eldred" to "Penitent." It is too early to comment on their performance, but they do not appear to show much improvement on "Penitent" or "Senga."

Appended is a table showing the dimensions of some of the principal twenties constructed during the last 25 years:—

Date.	Rule Built under.	Yacht.	Length on load water line.	Beam.	Sail area.	Measurement.
1873	Thames	Vanessa ...	47	9'9	2,600	20-tonner
1884	1,740	Clara	53	9	3,500	,,
1888	Length & Sail area	Vreda	45'4	10'1	2,641	20-rater.
1889	,,	Dragon I.	45'5	10'3	2,632	,,
1890	,,	Velzie	46	10'1	2,641	,,
1891	,,	Zinita	46'2	13'01	2,554[1]	,,
1895	,,	Audrey ...	44'33	13'15	2,699	,,
1897	Present rule	Audrey (altered)	44'03	13'15	2,780	52 ft. lin. rater.
1896	,,	Penitent...	47'9	12'52	3,076	,,
1897	,,	Morning Star	47'74	12'15	2,929	,,

1 "Zinita" now carries 2,838 feet of sail under the present rule to make her 52 feet linear rating.

Before dealing with the small classes in their present high state of perfection, it is necessary to glance briefly into the annals of small yacht racing as it existed in the "seventies," for if the past history and origin of the modern "rater" with its comparatively shallow body, bulb or fin keel, and hull so lightly yet skilfully and strongly put together that it is a masterpiece of the cabinetmaker's, rather than of the shipwright's, art, be disregarded, it would be impossible to recognise in her the logical outcome of the old time miniature racing cutter.

The five ton class, under the old Rule of Thames measurement, first came into existence on the lower reaches of the Thames, where the crack boats were the "Arrow," built by Stone of Erith in 1870, and four years later the "Virago" from the hands of the same builder.

In 1876 all the existing five tonners were eclipsed by the "Freda," which was designed by Mr. Beavor Webb, and built by the late Dan Hatcher for Sir Thomas Freke, and she may be said to have been the most successful boat of her size built under the Thames tonnage rule. During her first season she won fifteen matches out of seventeen starts; and in September of the same year her owner issued a challenge in the *Field* to sail any boat of her size belonging to the Clyde or Ireland, for £100 a side. The challenge was accepted by Mr. F. Lawson, owner of the Fairlie built "Camellia," and Mr. J. Lawrence, who owned the Watson designed "Vril"; and it was arranged that "Freda" should sail three races with each boat at Holyhead in May of the following year. The races

resulted in a decisive victory for the English craft, which thus vindicated her right to the title of champion 5-tonner.

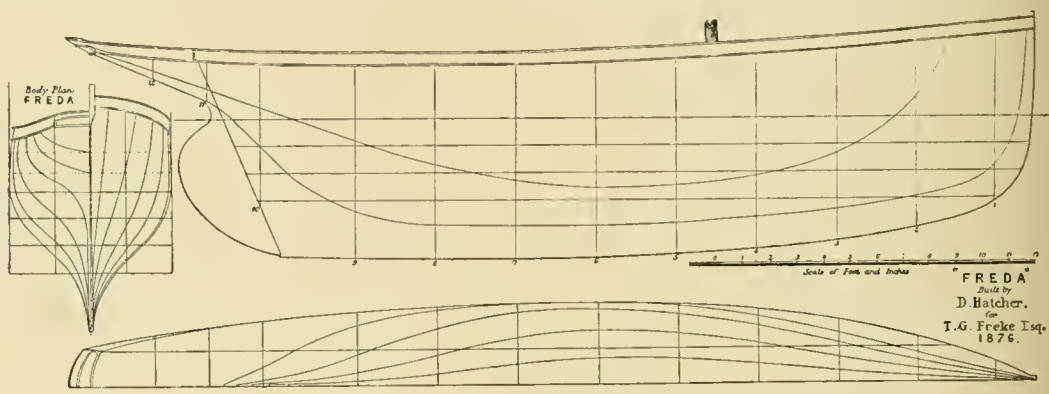
The "Thames" tonnage rule was found to tax beam rather severely, and in view of this Mr. Beavor Webb made "Freda" somewhat longer, narrower and deeper-draughted than her predecessors. She carried her lead lower, and consequently had more sail-carrying power. These advantages, coupled with the fact that she had exceptionally pretty lines for a boat built two and twenty years ago, ensured her success.

In 1880 came a change of Rule and the $\frac{(L+B)^2 \times B}{1730}$ measurement was introduced in the place of the Thames Rule with the hope of relieving what was considered an excessive tax on beam. However, in this respect the rule proved a failure, and the 5-tonners went on growing longer, narrower and heavier with a corresponding increase in sail plan and in weight of spars and gear. They became exceedingly costly craft into the bargain.

After the rule had been working a few years, builders began to turn out yachts which were of 5 tons measurement by dimensions, but displaced as much as 8, 10 or even 12 tons, instead of 5 tons as was the original intention.

When the 1730 rule was found to have the effect of increasing the cost of 5-tonners to a very considerable extent, a 3-ton class sprang into existence. These soon became boats of a very extreme type, long, narrow, deep, and very wet in a sea. The Clyde was the original home of this class, but they spread round the English coast, and in 1882 several of them were to be found on the Thames. The most noted of these little crafts that year were the "Snarley Yow" and "Mascotte" on the Thames and a Devonport built boat called the "Chittywee," designed by Mr. J. Ash, which was the best boat of the year. The masterpiece of the 3-ton fleet was fated, however, to come from the hands of that promising young designer, Mr. W. E. Paton, who lost his life in the wreck of the "Oona," off the East coast of Ireland, just when he had succeeded in making a name for himself, and in his creation, the "Currytush," was found a boat which was destined to prove the most successful 3-tonner in Southern waters. So successful indeed was the "Currytush" that no boat could be found to compete against her, and as any hope of building a craft to rival her appeared to mean going to great expense only to produce something still longer and narrower, small boat sailers fought shy of the task. As a result she was left alone in her glory, having practically extinguished the 3-ton class in the South.

On the Clyde, however, there was still a sporting class of narrow 3-tonners which kept up a series of matches for some years after the class had lost its popularity in the South: the best of these were "Ariel," "Cora," "Coila," "Rona," and "Daisy." The class may be fairly said to have died hard, for up to the year 1887 they still kept up races among themselves under the 1730 rule after it had been abolished and the Length and Sail area had become law.



From *Yacht Architecture* (1885), by kind permission of Messrs. Dixon Kemp and Horace Cox.

The following dimensions of fashionable small racing craft in the years 1885–6 will be looked at with astonishment by many modern yachtsmen.

Name.	Length.	Beam.	Draught	Displacement.	Sail area.	Tonnage.
	Feet.	Feet.	Feet.	Tons.		
Oona	34	5'5	8	12'5	1,750	5
Cocker	32	5'95	5'75	8'2	1,528	5
Jenny Wren	34	5'45	7'5	11'4	1,645	5
Currytush...	28'5	4'7	6	—	1,060	3
Eclipse	30	10	7'7½	13'6	2,280	33 feet Itchen Ferry Boat.
Keepsake ...	30	9'8	7	13'7	—	30
Verena	25	9	6'8	8'6	1,750	25

The overhanging stem was introduced into some of these little vessels, but owing to the narrowness of the water-lines forward it is obvious that but small advantage was gained by

J. Napier Hemy

In Falmouth Harbour

it. Another freak of construction, which first saw light in the days of the "plank-on-edge" type, but which did not become popular for many years after, was the hollow in the forward longitudinal vertical section, or what is colloquially termed the bow profile. All the crack "threes" and "fives" had their fore foot severely cut away, but we believe Mr. R. E. Froude, who designed and sailed the famous 5 tonner "Jenny Wren," was the pioneer in this respect. She, at any rate, was the first craft of the type of any note, although some yachtsmen will doubtless remember Mr. Bentall's long wall sided 10 tonner "Evolution," which carried her lead in a cigar-shaped bulb bolted on to a boiler-plate and had a profile not unlike some of the modern raters. "Evolution" was as big a failure as his great yawl "Jullanar" was a success. The dimensions of the "Evolution" were :—

Length on load line	51 ft.
Beam.....	6·5 ft.
Draught	10 ft.

She was built in 1881.

Apart from the Y.R.A. classes, various local types flourished round the coast. These boats, in nearly every instance, sailed under a pure length measurement and, broadly speaking, played a far less important part in the evolution of the modern "Rater" than the small tonnage rule classes, though they formed a capital school for amateur talent.

Many an amateur now-a-days—aye, and many a paid hand too—out of a "Solent Class" rater would be very much at sea in one of the Itchen Ferry 30 footers as they existed in their palmy days, with gigantic sail spread and a spinaker boom longer than the ship over all.

The Itchen Ferry boats, which sailed under a simple length on the load-water-line rule, were classified as follows : 30 feet, 25 feet, 21 feet, and 13 feet. The craft of course originated from the straight stemmed and square sterned Itchen Ferry fishing boats, which were fitted with iron keels and inside iron ballast. From these handy fisher craft, the keen competition of racing developed in a few years yachts of about three beams to their L.W.L. length, instead of three and a half, much fuller midship sections, and heavy lead keels coupled with greatly increased draught, whilst the sail spread was also carried to great excess.

These beamy length class boats had really very little to recommend them, and adverse criticism was general. They were unhandy and, in a seaway, jumped like porpoises; whilst the narrow tonnage rule yachts, on the other hand, though terribly wet, had the virtue of being fairly fast craft in a heavy sea, and in their time were regarded as wondrous weatherly vessels; in fact British yachtsmen a dozen years since were loth to believe that the plank-on-edge was not the beau ideal of a racing craft in the diminutive as well as in the large classes.

In much the same manner as "Currytush" had extinguished the three tonners, the 30 footers, "Eclipse" and "Curtsy," both designed by Mr. C. P. Clayton, settled the 30-foot length class, and "Bird of Freedom," designed by Feltham of Portsmouth, and "Verena," a similar boat, carried off most of the prizes in the 21-foot class. In 1886, the last year of the "1730" rule, small yacht racing was not in a flourishing condition anywhere; it was at its lowest ebb on the Solent, where the introduction of the Length and Sail area rule was hailed as a welcome change.

A crucial test of light versus heavy displacement, and beam versus depth, came about in August of the year 1887, and yachtsmen got an inkling of the potentialities of light displacement with plenty of beam under the new Length and Sail area measurement rule.

At the regatta of the Royal Irish Yacht Club at Kingstown, a remarkable trial took place between "Mischief," a Lough Erne boat, owned by Lieut. H. Gartside Tipping, and the crack Scotch five-tonner, "Doris"; the latter being Mr. G. L. Watson's happiest venture under the old narrow style. She was owned and sailed with an almost unbeaten record by Mr. Bryce Allan. The Lough Erne boat was a mere skimming dish; she had been originally fitted with a centre board, but the centre plate had given place to a fixed lead fin of about five tons weight, so that she was practically a forerunner of the modern type. Both boats measured 10 rating under the Length and Sail area rule.

"Mischief's" career had been somewhat eventful prior to her *début* in open waters at Kingstown. She had been carried across country from Lough Erne to the coast on a truck, and then sailed across to Birkenhead to have the before-mentioned keel fitted, and thence back to Kingstown to try her luck in the Bay. Her owner being anxious not to miss the trial with the Scotch champion, had not time to get her caulked, and she could hardly be kept afloat during the passage, as she leaked like a sieve. Old salts ridiculed the idea of this half walnut-shell attempting to lower "Doris's" colours, and her owner, on asking for his sailing instructions, was chaffingly told that if he followed "Doris," provided he could keep her slender taffrail in sight, he could not go wrong.

Great was the astonishment, however, when in a grand breeze, with reefed mainsails, "Mischief" completely out-sailed "Doris" on every point; it was emphatically an open-water trial, too, and there were some tearing squalls in the second round. Col. E. Saunderson, M.P., was at the helm of the Lough Erne boat, which won by seven minutes over a fourteen mile course.

In a light weather trial on the following day

"Mischief," this time steered by her owner, was again the victor, and her performance was considered even more remarkable than on the previous day, for the boat could only set lower canvas to keep her within the rating, whilst "Doris" had the advantage of jackyarder and jib topsail, and was driven for all she was worth.

Though "Doris" had her revenge at Kingstown in the Royal Alfred Regatta, when she got the best of the skimming dish going to windward, the result of the matches gave designers such an insight into what could be done with light displacement craft when well handled, that it is fair to regard Lieut. Gartside Tipping's plucky venture as one of the most important events in the annals of modern yacht racing.

The same summer of 1887 saw the commencement of what have since come to be called the "Solent classes," though the term is not altogether appropriate as, of course, the smaller Y.R.A. classes compete under identical conditions at other yachting centres.

The 2½-rating class sprung first into existence, and the first boats built to it were "Madcap," owned by Miss Mabel Cox, and "Thalassa," by Col. J. T. Bucknill, R.E.; they were only 21 feet on L.W.L., and set 690 square feet of sail—very small craft compared with the later competitors in the 2½ rating class; they had the first year of "Solent class" racing pretty much to themselves.

The following season was a fairly quiet one, as the new classes had scarcely become organised; in fact the duty of keeping small class racing alive devolved entirely upon the 2½ raters. Several new boats, such as Mr. T. W. Waller's "Lady Nan," "Chipmunk," owned by Mr. S. C. Watson, "Fairy," Captain J. W. Hughes, a 1·9 rater, "Ada," Mr. Manning, and "Tottie," a Thames 21-footer, a very deep narrow craft, which rated about 1·8, and was brought round from the river by Mr. Simpson, after having made a great reputation amongst boats of her own type in Sea Reach: these with "Madcap" and "Thalassa" kept up the class.

The 10-raters of 1888 were an equally scratch lot, consisting of "Dis," a smart clipper stemmed craft, designed by Mr. J. M. Soper; "Lollypop," of 6·5 rating, a straight stemmed cutter with her mast rather far forward, a short boat in comparison to her sail area; the old narrow five-tonner "Jenny Wren," designed by Mr. R. E. Froude, and sometimes the ancient square-sterned Itchen ferry boat, "Dolly Varden." "Dis" fairly eclipsed all comers, and carried off twenty-five first prizes out of twenty eight starts; but she occasionally met her match, and it was something of a surprise to see "Dolly Varden," which at that time was about fifteen years old, tuned up to racing trim and given a new lease of life by the change of rule, leading "Dis," round the course and getting the winning gun, as she did on one occasion at the Royal Southampton Club.

The summer of 1889 was a season of good whole sail breezes and the chief interest in the Solent amongst the small classes lay in the meeting of "Decima," a new 10 rater, designed by Mr. A. E. Payne, with "Dis," the champion of the previous year, and subsequently in her matches with the Clyde favourite "Yvonne." "Decima" had a nearly plumb stem, and was a deeper vessel than "Dis," and carried rather more canvas in her mainsail; both were about 36 feet on the water-line, and carried about 1660 square feet of canvas. The new cutter gave "Dis" a pretty good dressing, and could beat her soundly by the wind in a breeze, and her battles with the Clyde boats "Yvonne" and "Doris" caused immense excitement in the Solent at the time.

"Decima" beat "Yvonne" five times out of eight starts and "Doris" eleven times out of fourteen starts. So keen was the interest in the racing between the first-named pair, that an enthusiastic compiler of statistics went so far as to ascertain that in the three races in which "Yvonne" beat "Decima," they sailed one hundred miles, and "Yvonne" beat "Decima" 5·94 seconds per mile, and in the five races won by the latter they sailed 163 miles, and "Decima" beat "Yvonne" 9·68 seconds per mile. The 10-rating class in the South came to an end in 1890, and to this day has never been revived.

The 2½-raters had a capital season in 1889, and a new boat named "Humming Bird," designed by Mr. A. E. Payne for Capt. Hughes, came out and won 25 first prizes out of 38 starts. She was one of the first fin-keeled craft with straight stem and square stern.

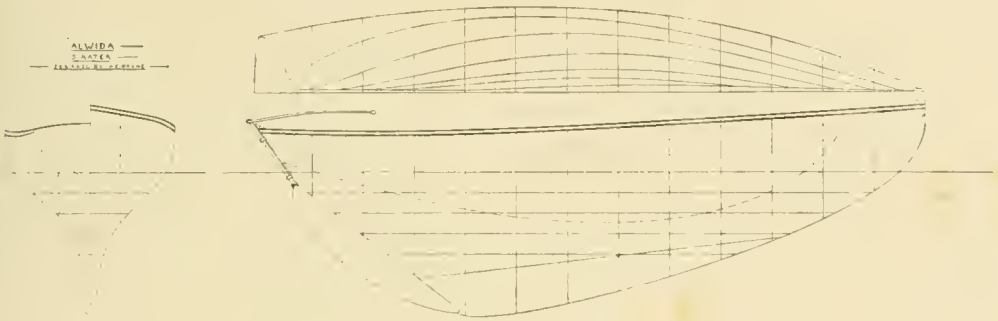
The "Fives," which first came to light in 1890 and have become increasingly popular ever since, have more than taken the place of their bigger sisters, the 10-raters.

The 5-raters which opened the ball were "Glycera," Mr. P. Perceval; "Alwida," Lord Dunraven; and the old straight-stemmed "Lollypop," Mr. W. P. Burton, all designed by Mr. A. E. Payne, and a centre-board boat "Archie" from the board of Mr. G. L. Watson.

They sailed upwards of 40 matches, and as a result "Alwida" and "Glycera" were very much on a par, though the latter had 19 firsts to "Alwida's" 14; "Lollypop" and "Archie" had 9 and 8 first prizes respectively.

The same season was a first-rate one for the 2½-raters. "The Babe" and "Cock-a-Whoop," Payne boats, and "Dolphin," designed by Mr. C. P. Clayton, were the best of the fleet. Mr. Arthur Payne, with his numerous additions to the Solent fleet during the years 1890, 1891, 1892, set the pattern of the modern small rater, and by his originality may fairly claim in these years to have done more than any other

designer in the development of the type. Nearly all the racing craft became deep draught fin-keel boats, with what is known as a sawn-off counter, the overhang aft finishing about where it ceased to touch the water when the vessel was heeled over, with the very sensible object of getting rid of all superfluous weight. The innovation was certainly unsightly, but a boat like "The Babe" was much superior on every point of sailing to



the old type of craft built under the Thames and 1730 Tonnage rules. The characteristics of the new boats were extreme quickness in stays, handiness and power of thrashing to windward in broken water. Changes were made in the rig as well as in the design of racing craft, and by the season of 1891 almost all boats had adopted the standing lug in place of the gaff mainsail.

There being no tax on beam under the Length and Sail Area form of measurement, the boats were treated to a liberal amount of it. Five years' experience of the rule made it manifest that by reducing displacement as much as possible, and sail area slightly, and proportionately increasing the load water-line, a faster type could be produced.

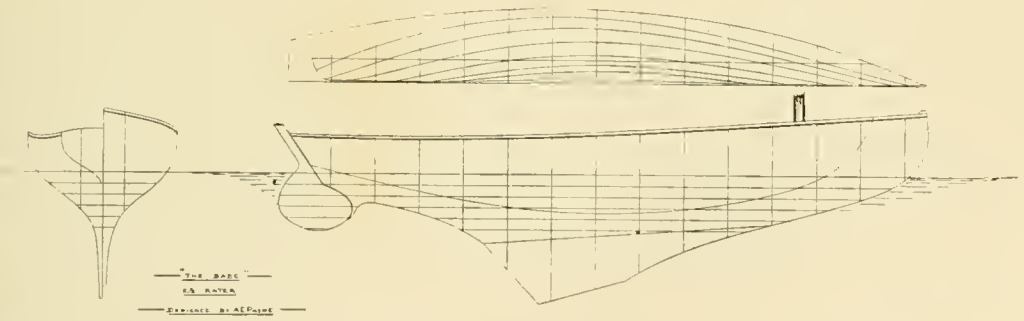
Hence it will be found that nearly all the $2\frac{1}{2}$-raters produced in 1891 and 1892 measured 28 feet in length on the water line, whereas 25 was the average in the previous season, and only 21 in the opening year; whilst 33 feet was found to be about the most suitable length for a 5-rater.

Mrs. Schenley's "Windfall," designed by Mr. A. E. Payne, proved the best of the 5-raters in 1891, whilst "Savourna," owned by Mr. P. Perceval, from the board of the same designer, was a good second. "Iernia," a Fife boat, owned by Mr. H. R. Langrishe, and "Quinque," designed by her owner, Col. J. T. Bucknill, were less successful.

In the $2\frac{1}{2}$-rating class "The Babe" still held the sway, winning no less than 36 first prizes out of 45 starts, although several new boats competed with her. Her record was an excellent one, and small boat sailers will have a vivid recollection of the masterly manner in which she was handled by her owner.

This season was the first year of the $1\frac{1}{2}$-rating classes, but mixed races were often indulged in, Y.R.A. time allowance being given between the classes.

This method of sailing was not satisfactory, as the excitement of small boat racing, more than in any phase of yacht racing, lies in the close work when rounding marks, cross tacking and finishing; and the introduction of time allowance naturally spoiled the fun of the game; it was consequently decided to keep the classes entirely separate in the future.



Perhaps the best $\frac{1}{2}$-raters built in this season were "Dee Dee," designed by Mr. A. E. Payne, and "Coquette," from lines by Mr. Chas. Nicholson, whilst "Unit" in the 1-rating class from the board of Mr. G. F. Flemmich, was a handy little craft.

The following year, 1892, "Cyane," owned by Lord Dunraven, and "Squall," both Payne

boats, came out in the 5-rating class, but were fairly eclipsed by another new craft, built for Mr. Langrishe and sold by him to Lord Dudley, the "Dacia," which was far and away the best boat in the South, and one of the most even performers that Mr. C. E. Nicholson, her designer and builder, ever produced. Her success was phenomenal; indeed, the only 5-rater which could be compared with "Dacia" in 1892 was the Scotch boat "Natica," designed by Mr. G. L. Watson, and as both these boats had proved themselves to be irresistible in their own waters—the one in the south of England and the other on the Clyde—their owners arranged to meet in Torbay and try conclusions in a series of three matches for £200 a side. The course in the first and third match was a triangular one, and in the second match they had a dead to leeward and dead to windward trial. "Dacia" won the first race in a summer breeze by 30 seconds. The second match fell to "Natica," who ghosted along in the lightest of airs in a remarkable manner and won comfortably. In the concluding match "Dacia" led from start to finish, coming home with a lead of 1 minute 5 seconds, but she was disqualified for a slight foul. On neither of the three days did "Dacia" get that amount of wind which suited her, or her performances would have been still better.

2½-RATER

The season of 1892 amongst the 2½-raters exceeded all previous years, there being no less than 14 competitors on the Solent, whilst on the Clyde they were equally numerous.

"Gareth," which came out half way through the season, owned by Mr. A. Henderson and designed by Mr. Charles Nicholson, was the crack in fresh winds on the Solent, and "Faugh-a-Ballagh" and "Polynia," both Payne boats, were the best in light weather. In Scotch waters "Wenonah," designed and built by Herreshoff in America, came over and showed a marked superiority over the local fleet. This year the 1-raters had their first notable season. "Doushka," by Payne, and two boats, "Mahatma" and "Kitten," built at a newly started yard in Cowes, made a creditable display; the first-named was from Mr. G. F. Flemmich's design.

If these were not the first they were, at any rate, the first racing boats of any note built at a yard, the name of which was destined to become a household word in connection with small yacht racing. The success of Mr. Chas. Sibbick's designs in yachts up to 5-rating and the immense number of craft that have been turned out from the Cowes yard is truly remarkable, and during the last seven years Sibbick's raters have made a name far beyond the Solent. The season of 1892 will also be remembered by the success of the little Herreshoff boat, "Wee Winn," in the ½-rating class.

Before the commencement of the season of 1893 the Yacht Racing Association fixed a limit to the number of hands allowed on board yachts of 10-rating and under, when racing, the rule applying to both paid hands and amateurs.

The allotment to the different classes was as follows:—

Class.	Number of persons allowed on board.
½ Rating	2 persons.
1 ,, ...	3 ,,
2½ ,, ...	5 ,,
5 ,, ...	7 ,,
10 ,, ...	9 ,,

The motive of the new regulation was to put a stop to "live ballast," for in some of the light displacement 1-raters and ½-raters the practice of crowding five or six passengers on the weather gunwale whenever there was a fresh wind seemed to be becoming general.

The 5-rating class was reinforced in 1893 by "Red Lancer," designed by Fife, but "Dacia" held her own bravely until the following year, her principal opponents being the new boat, and "Squall," which had been re-named "Fleur-de-Lys."

No improvement was made over "Gareth" in the 2½-rating class, and she proved herself without exception the best performer in fresh winds ever built under the Length and Sail area rule; indeed, in a strong head wind and lumpy sea it is probable that, to this day, Mr. Nicholson's production of 1892 is equal to any of the more modern boats. She is a remarkable instance of what may be done with a well-balanced plate-and-bulb craft.

Although "Gareth" was the best boat of the year, "Meneen," a Herreshoff production, made a great name as a light weather flier, and created quite as much sensation as did the Herreshoff ½-rater, "Wee Winn," in the previous season.

On the Clyde an interesting class of 2½-raters

continued in fashion, but "Wenonah," the American crack, still held the sway.

The Herreshoff boats about this period played an important part in British waters, for Miss Sutton's "Morwena" more than held her own against the Solent fleet of 1-raters, of which the Payne designed "Sacharissa," and the Sibbick designed "Tartar" were the most conspicuous. The little American fliers were very light displacement craft, and their success to a great extent precipitated the introduction of the "pram" bow in our waters, as this was a prominent feature in all the Herreshoff designs.

The 5-rating class in 1894 was strengthened by several additions. They consisted of a new "Fleur de Lys," designed by Mr. Fife, the first "Fleur de Lys" having been turned into a cruiser, and her name changed to "Dragon Fly," "Delanagh," designed by Mr. G. L. Watson, and "Flat Fish," built at Messrs. Fay's Yard, Southampton, from lines by Mr. F. E. Soper. The last-named was a remarkable production, being an absolute exponent of the skimming dish type; her floor was as flat as a hat, and she carried an abnormally deep plate and bulb, she had great beam, her L.W.L. length not exceeding three times her breadth.

The initial stability of such a craft was enormous. In hard winds she sailed merrily along on practically an even keel, and consequently the strain on hull and gear was so great that by the end of the season the vessel was badly buckled. When in a hard wind she could get through a match without a carry away, she was all of five minutes better than any of her rivals, but mishaps were so frequent with her that the Fife boat "Fleur de Lys," which was very fast on a reach though an indifferent performer to windward, had the best string of flags at the close of the season.

In the $2\frac{1}{2}$ class "Gareth" and "Meneen" easily defeated all newcomers, the former winning in heavy weather and the latter in light breezes. The 1-raters became too numerous to enumerate; Mr. Arthur Payne's creation "Red Rover" was the most weatherly of the fleet, while some of the host of Sibbick raters were fastest on a reach. The old saying that over the Solent courses "'tis the reaching that wins the matches" proved very true.

In the season of 1895 the number of starters in the Solent matches in all classes, except the 5-rating class, continued to increase, and it is not too much to say that the season must be regarded as one of the most remarkable in the history of the sport.

The doings of the 5-raters are soon recorded; "Fleur de Lys" went out to the Mediterranean, where she found a new owner, and did not return to take part in the English racing; "Delanagh" followed suit; Mrs. Schenley sold the remarkable "Flat Fish," and under her new flag the yacht took very little part in class racing. Two new craft were built for the Solent—namely, "Norman," for Captain J. Orr Ewing, from Mr. Charles Sibbick's board, and "Sea Shell," from lines by Mr. G. L. Watson, for Captain J. A. Orr Ewing; on the Clyde, "Almida," designed by Mr. W. Fife, jun., proved a great success.

"Norman" completely outsailed "Sea Shell," and secured a perfectly wonderful record, winning fifty-one first prizes out of fifty-six starts; however, she had very little opposition, for she only met "Flat Fish" five times in the whole season.

The first two of these trials were sailed in hard winds. "Flat Fish" won the first match by three minutes, and the Sibbick boat the second trial by the same margin; on the second occasion, there was less wind and rather more close hauled work, which seemed to favour "Norman." The three remaining races were in light weather, and "Flat Fish" was completely outclassed. It was unfortunate that "Norman" never met the Clyde five, "Almida," as a contest between the pair would have proved instructive.

"Norman" was the last and the most famous 5-rater built before the advent of the present rating rule. She was essentially a skimming dish, being 30 feet on the L.W.L. by 10 feet 9 inches beam, and 50 feet over all, whilst her depth from deck to keelson was only 3 feet 6 inches. She was rigged, like most of the raters of the time, with standing lug, single head sail, and no bowsprit.

In the $2\frac{1}{2}$- and 1-rating classes it is curious to note that British designers, having made a study of light displacement craft, turned out some boats that could completely outsail the representatives from Mr. Herreshoff's board "Vaquero" $2\frac{1}{2}$-rater, and "Lagopa," 1-rater, that were shipped across the Atlantic to compete in Solent waters. The Sibbick $2\frac{1}{2}$-rater "Lorette," which, as an all-round performer, was about on a par with "Gareth," and Mr. Nicholson's 1895 production "Corolla," met "Vaquero," the Herreshoff boat, five times, defeated her on four occasions, and was some distance ahead when she took the ground during the fifth match.

H.R.H. the Duke of York owned the Sibbick built 1-rater "White Rose" during this season, which recalls the fact that a royal Prince had not been seen at the tiller of a small racing boat since the days of the Cowes Una boats, from 1880 to 1886, when the Prince of Wales used to sail his smart little "Belle Lurette," against the Marquis of Stafford's craft "The Unknown," and Viscount Dursley's "Merry Duchess." "White Rose" has now found a quiet repose on the placid surface of Virginia Water.

Great has been the increase of racing during the years under review, and old-time yachtsmen will wonder when they realise the fact that whereas in 1876, in the palmy days of the

Thames Measurement rule, some 400 matches were sailed by the forty-tonners, twenty-tonners, fifteen-tonners, ten-tonners, and five-tonners, in 1885, under the "1730" rule, nearly 600 matches took place, and in 1895 no less than 1,700 matches were sailed under the Length and Sail area rule. This great increase was mainly due to the development of the small classes.

By this time the process of evolution from the old-fashioned keel miniature yacht of the eighties had been completed. With the exception of a few centreboard craft, the entire fleet of Solent raters had adopted the fixed plate and lead bulb system of ballasting, an improvement and modification of arrangement which, as has already been mentioned, was for the first time fitted to the ten-tonner "Evolution" by Mr. Bentall, some fifteen years before. It seems passing strange that after such a phenomenally successful season as that of 1895, the Y.R.A. should bring in a change of measurement; but nevertheless such is the fact, and the present Linear Rating rule was introduced in the face of a strong current of adverse criticism from small yacht owners.

"Westra."

Sporting instincts proved, however, too strong for pride or prejudice and shoals of yachts were built in 1896 to the new Y.R.A. classes of 36 feet Linear Rating and under. Though undoubtedly the new rating Rule was unpopular with the majority of owners, the pastime in the Solent did not in any way suffer from its introduction. Exciting and crowded starts and beam and beam matches were still innumerable, but, as is often the case with the commencement of a new era of measurement, the opening season was not remarkable for any great change in construction or design. The first productions under the new rule showed a very slight increase in displacement, a decrease in draught, and a considerable increase in sail area; whilst the body form of the boats, though it still kept to the plate and bulb in most cases, showed a tendency towards a deepening of the midship section, and pinching in of the beam, while the overhang and "pram" bow form continued to become exaggerated.

The season opened in the 36 foot class with four new boats from the Albert yard, all from Mr. C. Sibbick's design: these were "Heartsease" for Mr. C. L. Orr-Ewing, M.P., "Ermin," Mr. C. A. Tonge, "Silvia," Mr. A. H. E. Wood, and "Westra," Mr. J. C. Connell; they averaged about 31 feet on the L.W.L. with 9 feet 6 inches beam, and 5 feet 9 inches draught, and carried 1250 to 1300 square feet of canvas. Two additions came from Messrs. Camper and Nicholson's at Gosport, but neither were of much account. Mr. Fife had one new boat "Fern," and Mr. Arthur Payne produced "Emerald"; whilst Mr. C. P. Clayton made a bold move and built a heavy displacement boat with an O.G. section. The result of the racing was that "Westra" and "Heartsease" were the pick of the fleet, whilst "Emerald" had too heavy a bulb, and Mr. Clayton's boat, "Edie," had overdone it in the way of displacement. "Westra" and "Emerald" were the best performers in hard winds, but the balance was considerably in favour of the former, and "Norman," of 1895 fame, had a good look in when it blew very hard.

In rig the boats, with the exception of "Westra" and "Fern," which still kept to the lug sail, reverted to the style of the old 5-tonners, for they all set cutters' canvas with jack yarders and jib headers, though of course bowsprits were more stumpy and spinaker booms of a more handy length than in former days.

"Heartsease's" record of 26 firsts out of 50 starts; and "Westra's" 24 firsts out of 34 starts constituted the best performances of the year; and, as both these boats were the lightest in displacement craft of the whole fleet, things did not look very promising for the resurrection of the V-sectioned type anticipated by the framers of the new rule.

The 30 footers had a good season and Mr. Sibbick turned out the best boat in the fleet in "Lora" for Mr. A. C. Connell and she was sailed to perfection by her owner. The other 30 foot boats, built during the season of 1896, were "Tatters," for Mr. H. Welch Thornton. "Florence" for the Marchese di

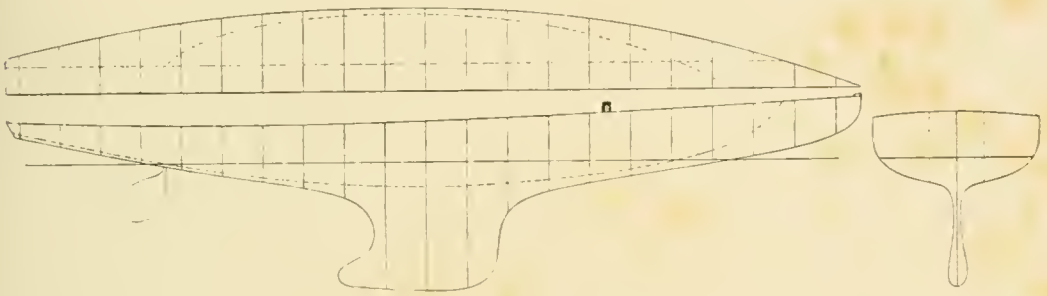
Serramazzana at the Cowes yard, "Valeria I" for Lord Albemarle at Messrs. Summers and Payne's, and "Memsahib" at Gosport from Mr. C. Nicholson's design.

The entire fleet of 30 footers were plate and bulb boats, and their average dimensions were—

L.W.L.	26 ft.
Beam	7 ft. 6 ins.
Draught	4 ft. 6 ins. to 5 ft.

All were lug rigged, with bowsprits, with the exception of "Valeria," which set a gaff mainsail.

As the honours in the 36 and 30 foot classes rested with the Albert yard, Cowes, so success in the 24 foot class went to Messrs. Summers and Payne, who without doubt have in "Speedwell" produced the best 24 footer built up to the present time. The "Speedwell" bears a strong resemblance to the American 20-rater "Niagara" in miniature, and like that vessel



24-FOOT LINEAR RATER.

her best point of sailing is at close hauled work in a breeze.

She had, in 1896, a serious rival in the Sibbick boat, "Bodagh"; "Bodagh's" best point of sailing was on a reach, and when she came by the wind she was clean out of it with "Speedwell," and though, owing to the fact that reaching winds are prevalent in the Solent, "Bodagh's" record was slightly the best, there can be no doubt that "Speedwell" was the better boat. "Bodagh" beat "Speedwell" 21 times and "Speedwell" was victorious over "Bodagh" on 16 occasions.

An incident is worth recording that occurred at Ryde in the season of 1896 when Miss Hughes sailed Miss Cox's "Speedwell" over the course in a hard wind, only one boat of the whole fleet of fourteen 24 footers having temerity enough to turn out against her. This was practically a repetition of the same bold show which occurred a year or two before, when Miss Sutton sailed over the same course in the Herreshoff boat "Morwena" on a day when many owners felt safer and drier on the broader decks of Ryde Pier Head.

The season of 1897 was a remarkable one amongst the 36 foot and 30 foot classes from a sporting point of view, though it proved a still greater surprise to the backers of the Linear Rating than the result of the first season had done. Instead of establishing the advantages of heavier displacement the experience of 1897 makes for the contrary conclusion, for an 1896 boat which had her displacement reduced finished the season with the longest string of flags in the class. This occurred in the case of the Payne designed cutter "Emerald," which had some lead removed from her bulb and was thereby greatly improved. Indeed she and the 1896 Sibbick lugger, "Westra," which had no alteration made to her hull, were undoubtedly the best pair of the season of 1897.

Captain J. Orr Ewing had a new keel boat "Hermes" built, and "Diamond," nearly a sister ship to her, was launched for Mr. A. H. E. Wood. Both were designed by Mr. Sibbick and they were very fast boats in light weather, but as luck would have it fresh and strong breezes predominated in jubilee year, and the new craft made very moderate records. A third keel boat, "Forella," was built by W. Fife for Mr. Evelyn Parker, but they appeared unable to ascertain her proper trim, for she did little until the latter part of the season. When her balance was eventually found she proved a fair boat, but scarcely up to the form of "Emerald" or "Westra." The most that can be said for these additions to the fleet is that they were fine handsome cutters, but it is a question if their performances were satisfactory enough to warrant a belief in the merits of greater displacement keel boats.

The cutter rig being introduced into the 30 foot class was the only innovation last year so far as they were concerned.

"Carol," a fin-keel boat built at Nicholson's, "Gwendolin," a plate and bulb boat with fairly deep body by Sibbick, the 1896 "Lora" and another new Sibbick boat, "Tattoo," may be fairly said to have divided the honours between them.

A change has been introduced during the present year by the Yacht Racing Association, which will beneficially affect the 18 foot class by

stamping out the unsafe and capsizable, though undoubtedly swift, type of diminutive racing machine, which has been so prevalent during the last three or four seasons in Solent waters and elsewhere. This kind of boat has, in fact, become almost universal on rivers, such as the Thames, where the "Sorceress," 1-rater designed by Mr. Linton Hope, was sailed during the season of 1894 with phenomenal success. She was the first of a series of the same type from the board of the same designer, who proved the ability of the unballasted rater to take prizes by sweeping the Solent with the ½-raters "Lotus" in 1895, and "Kismet" in the following year. The American Sneak boat or Devil's Coffin may be said to be a facsimile of this type of craft, minus the long elegant stern of the rater.

The Association, with a view to putting an end to the antics of these fliers, has effectually eliminated them from the Register with a sweep of the pen by decreeing that no certificate of rating shall be granted to any yacht weighing less than 15 cwt. without crew.

What is known as the "one boat one design" class has become very popular of late. The creation of this class in the Solent was due to the initiative of Major the Hon. C. Colville and Lieut.-Colonel Bucknill in the summer of 1895, the object being to encourage sport in racing in small crafts, and, as an important means of so doing, to diminish the expense incidental to it.

These yachts are charming little vessels: they are excellent sea boats, fast, and have, for their size, very fair accommodation. This consists of a forecastle large enough for the two paid hands which are allowed, and a nice little cabin. They are decked all over, but have a well or cockpit large enough to accommodate half a dozen. No limit is placed upon the number of amateurs that may sail in races, but only two paid hands are allowed. The wages of the paid hands are limited to a fixed amount, as is also their racing money.

As the name "one boat one design" signifies, all these little craft are built from one and the same model. No alteration in lead keel or hull or sail plan is allowed, neither can any alteration be made in the cockpit without the consent of the captain of the class; but in staying the mast, and in all matters of that kind, owners have a perfectly free hand.

Up to the end of the season of 1896, three lower sails only were allowed; but since that date small topsails containing about forty square feet of canvas have been permitted. The lead keel weighs 2·65 tons, and is in all cases weighed in the presence of the captain of the class or of his deputy. Each boat has to carry 200 pounds weight of ground tackle, and the stores and fittings common to all boats of the class.

The racing is very close and very keen; and for 16 to 18 boats to start together is a common occurrence. Though in a class containing this number of boats, even though they are as far as is humanly possible identical, one or two are almost certain to show some slight superiority over the others, still they are so nearly alike that success depends upon skill in handling and skilful pilotage, perhaps more than in any other kind of racing.

The one design class, therefore, acts as a very wholesome stimulus to seamanship of all kinds, and affords most excellent sport. It does not, of course, develop yacht designing to any great extent; for as all the boats are alike, speed is a matter of comparative indifference.

Sailing cruisers, especially those which are devoted largely to racing, require only a few words of description. Everything that has been stated in reference to racing vessels applies, with certain modifications, to them; for there is no essential difference in form, structure, canvassing, or ballasting, between a racer and a cruiser. It is difficult to find a better sea boat than a racing vessel properly ballasted, sparred, and canvassed. The only variation in structure between the ideal racer and the ideal cruiser is that the former would probably be given more beam than is desirable for the latter. Racing vessels generally sail in smooth, or comparatively smooth, water, where initial natural stability derived from beam is advantageous. But when a ship has to be sailed over a heavy sea, the action of waves upon beam, as previously explained, comes into operation, and beam should, for sea-going purposes, be slightly reduced. In other respects, modification in detail is all that is necessary to transform a racer into a cruiser.

The enormous stability imparted to racers by heavy lead keels at great depth tells against them in a sea way: it causes their movements to be very rapid and violent; they plunge heavily, are very hard upon their gear, and particularly disagreeable to most human stomachs. A vessel to be easy in a sea way must not aspire to extraordinary speed; her ballast must not be too low; in fact, the less outside ballast she carries the better. Her stability and righting angle will be, of course, comparatively small, and she must be sparred and canvassed accordingly. That a tender ship is an easy ship is an ancient and true assertion.

It is frequently argued that the superiority in dryness, ease, and comfort in a sea way which vessels with the centre of gravity rather high possess, as compared with vessels having their centre of gravity very low, depends not at all on the relative amount and position of their ballast, but entirely upon the fact that the lightly ballasted ship carrying proportionately small sail goes relatively slower through the water: on the other hand, it is asserted that, in really heavy weather, a racing vessel or fast cruiser would have to be slowed down to such an extent that a smack or

trawler, for instance, would sail as fast and be much safer and more comfortable. There is some truth in both these arguments.

There are no bulwarks on racing vessels; they would hold too much wind. A ledge of from 1 inch to 6 inches in height, just sufficient for a man to rest his foot against, is sufficient for their purposes. But bulwarks are a mere matter of super-structure: they can be added to a vessel at any time, and conduce to comfort but not to safety. Good free board is desirable, but high bulwarks will not keep out heavy water; and if a green sea does come on board, the sooner it gets off again the better. With no bulwarks it runs off directly, while with high bulwarks tons and tons of water will be kept on deck for a considerable time.

A combination of superior racing and cruising qualities in one vessel is impossible of attainment, and owners, if they desire satisfaction, should make up their minds which of the two they want. If they desire to race, speed is the prime necessity, and seaworthiness and comfort must be subordinated. If they purpose to go cruising, whether round our coasts or about the ocean, then ease at sea and comfort should be the first consideration, and speed must take second place. In this respect the alteration to the rating rule made in 1896 was a mistake. It aimed at producing a larger bodied type of vessel. Many complaints were made in many quarters about the want of accommodation in racing yachts, and the difficulty of getting any price for them after they had had their day. Well grounded complaints no doubt but, to satisfy them, speed has been sacrificed. Nobody wants to live in a 1-rater or even in a 5-rater. The 20-raters of the old rule, though quite habitable, were from lack of head room, not comfortable; but I don't think many owners wished to utilise them as houseboats. They used them for racing and lived in other vessels, or on shore. The accommodation in 40's was fairly good, though of course not so good as if they had been bigger and deeper in the body; and moreover the amount of waste space in the overhang fore and aft is immense. Above that size, accommodation and head room was ample under the old rule. Judging by the 52 footers and 65 footers built under the new rule, which correspond with the 20's and 40's built under the old rule, it is true a few inches of head room have been gained, but it is a question if there has been a corresponding gain in speed. No exact standard of comparison of size between vessels exists or can be found, and it is impossible therefore to prove that a yacht constructed under one rule is so much larger or smaller than one built under another rule; and as speed is in reference to size, their relative speeds cannot be definitely measured. But judging by the principal factors involved, the old rule seems to have been superior to the new. The modern 20 is longer—and length is the principal dimension affecting speed—she is heavier, carries more canvas, bigger spars, costs more, and requires more hands than the old 20. She may justly be reckoned to be considerably the larger vessel of the two, but her gain in speed is but small and certainly is not in proportion to her increase in size.

It is difficult, if not impossible, to express in terms the differentiation between a racer and a cruiser. The best definition of a *bona fide* cruiser would probably be, a vessel which habitually makes passages and voyages under her proper working sails. None of the thoroughbred, and but few, if any, of the half-bred, or cruiser-racing yachts, would dream of making a voyage to the Mediterranean, or a passage round to the Clyde, under their mainsail: they would start under trysails, with their mainsail stowed, and boom secured: and rightly so, for if caught in bad weather and a big sea with mainsail set, the consequences would probably be very seriously disastrous. On the other hand a real cruiser sails always under her working sails, and resorts to a trysail only in the extremity of bad weather. The huge sail, and long and heavy boom of a first-class racing cutter would be unmanageable, and would "take charge" in a blow, while the small sail and light boom—all in board—of a cruiser, could under similar circumstances be easily handled and reefed, or lowered and secured. But for racing no definition is possible, and sailing Committees must be left to their own judgment to decide whether a yacht is or is not eligible to sail in cruising races. All such races are sailed in what is called "cruising trim," that is to say, under certain restrictions as to sail and crew, jackyard topsails and extra hands being forbidden, and the ship must also carry her boats on board, and her anchors at the bow.

To turn from cruiser racing to cruising proper. Ocean cruising has become very popular among yachtsmen during the last half century. As long ago as between the years 1854 and 1863 yachts both under sail and steam, made voyages to Iceland, Spitzbergen, North and South America, the West India Islands, the coast of Africa, and round the Horn to Australia.

The voyage of the schooner "Foam" to Iceland, embodied by Lord Dufferin in his most delightful book *Letters from High Latitudes*, will be familiar to all. The love of the sea seems to have been deeply ingrained in the nature of that distinguished man; for during his long and brilliant diplomatic career he has never ceased to indulge in his favourite form of yachting, single-handed cruising, whenever the opportunity served, doubtless much to the astonishment of his *confrères* and other personages in foreign parts, who probably looked upon sailing about alone in a little vessel as one of the most curious

forms of relaxation which even a "mad Englishman" could indulge in. Lord Dufferin's little yawl, the "Lady Hermione," with her owner at the helm, is a familiar object to all yachtsmen who frequent the Solent waters, and long may she continue to be so.

The successful voyage round the Horn to Australia of the little schooner "Chance," of 72 tons y.m., owned by Mr. William Walker, is a good instance of the excellence of the construction of vessels of the pleasure navy, as well as the skill of yachtsmen as navigators. She sailed from Cowes on 13th January, 1861, and arrived at Sydney on the 3rd of June, having behaved admirably in all sorts of weather during a voyage of 141 days.

In the sixties, cruising became more general, and a run from Cowes to Gibraltar and up the Mediterranean, or a cruise to the Baltic and other northern waters, were events of nearly as common occurrence as they are at the present day.

In the year 1864, "Themis," a schooner of about 150 tons T.M., owned, commanded, and navigated by Mr. Thomas Hanham, made a round voyage to Madeira, Teneriffe, Rio Janeiro, the River Plate, round the Horn to Valparaiso, Callao, and Vancouver's Island, thence to the South Sea Islands, New Zealand, Australia, and the China Seas, and eventually home by the Cape of Good Hope.

Deep sea yachtsmen of the present day, who generally make voyages of this character in a 1500 ton steamer, or in the comparative luxury of such craft as Lord Brassey's 500 ton auxiliary, "Sunbeam," would regard Mr. Hanham's feat of thirty-four years ago as a remarkable one in the history of pleasure navigation. In these days of large vessels, the voyages made in former days by quite small craft seem very remarkable, and the discomfort which they must have entailed to owners and passengers would be hardly compatible with our ideas of pleasure in these modern and more luxurious times.

Mr. Knight's voyages to the coasts of South America, and up the rivers Parana and Paraguay, in the "Falcon," and to the desert island of Trinidada in the "Alerte," are well known, as they have been graphically described by him in two most interesting books, *The Cruise of the Falcon* and *The Cruise of the Alerte*. They are remarkable chiefly on account of the small size of the vessels, and for the fact that his crews were composed almost entirely of amateurs, and that many of those amateurs had never been to sea before. The "Falcon" was of only 18 tons register and 30 tons Thames measurement, and the ship's company consisted of Mr. Knight, who was owner, captain, and navigator, three amateurs, and one paid hand to do the cooking and cleaning up.

The "Alerte's" cruise was in search of a hidden treasure in the island of Trinidad, off the coast of Brazil, and it is scarcely necessary to say that though the island was found the treasure was not. But both his voyages were most interesting and instructive, and demonstrated the capacity of small vessels to keep the sea, and of amateurs, if properly commanded, to work them.

Two very notable voyages made by small yachts were those of the "Vivid" and "Alert." The "Vivid" was built in 1859 by Fife of Fairlie on the Clyde, for Mr. Ternan, an Irish gentleman. She was originally known as the "Scourge," and raced successfully in Dublin Bay in the year in which she was built, and was looked upon as a smart racing cutter. She was of 25 tons y.m. and 16 tons register. She afterwards became the property of Mr. Sidney Bert, who changed her name to the "Vivid." Her new owner took her out to Sydney in 1864, making a voyage of 16,000 miles in 130 days.

The "Alert," of 56 tons T.M., was built by Ratsey of Cowes, and was bought by Mr. William Walker, the owner of the schooner "Chance," already alluded to, and was sent out by him to Australia. She made an excellent voyage of 108 days from England to Sydney, including 5 days' detention at the Cape.

Another small vessel, the "Spray," of 33 tons Thames measurement and 20 tons register, made a voyage from Cowes to Hobart Town, under the command of Capt. Wylie. Previous to this, a still smaller cutter, of only 22 tons T.M., the "Teazer," had made voyages out to the West Indies and back; and the performances of quite a little boat, the "Pet," of only 8 tons T.M., which went out on a cruise to the Baltic and back, may be enumerated among the records of long cruises and passages undertaken by quite small sailing craft as proving that size is by no means necessary for safety, though very essential to comfort in deep sea sailing.

Probably the longest voyage ever undertaken by a yacht under sail alone was that of the schooner "Nyanza," of 218 tons y.m. She sailed on July 1st, 1887, for a cruise in the Pacific, with her owner, Capt. Dewar, and his wife on board, and was, I think, the first sailing yacht to reach the Pacific through Magellan's Straits. She cruised among the Sandwich Islands and on to Japan, but was wrecked in October, 1890, near the Caroline Islands, all hands being fortunately saved. Her cruise, though it had a disastrous ending, was remarkable. She sailed 42,784 nautical miles, and averaged 104 miles a day.

Few yachtsmen have had greater experience of yachts and of cruising in vessels of every description, than Lord Brassey, who has recounted his experience in craft ranging from 8 up to 552 tons. He has made voyages to Norway and Holland, has on twelve occasions been through the Straits up the Mediterranean, has four times circumnavigated Great Britain, has been once

round the world in the "Sunbeam," and has made voyages to India, the Straits Settlements, Borneo, Australia, and the West Indies. His yacht, the "Sunbeam," is one of the most successful auxiliary vessels ever built, and is equally handy under sail or steam. This type of vessel has of course been considerably improved since the days when the "Sunbeam" was built, by the introduction of steel as a material of construction, by new engineering inventions giving greater speed with less consumption of coal, and at the same time compactness of engine space, and by improvements in cabin accommodation of all kinds. An auxiliary craft of from, say, 300 to 500 tons, is probably on the whole the most luxurious and comfortable type of vessel for making long ocean voyages, and to gather some idea of the proportion of the distances traversed under steam or sail by ships of this kind, the log of the auxiliary yacht "Golden Fleece," of 261 tons y.m., owned by Mr. Ralli, may be referred to. She made a voyage round the world of 33,020 miles in the years 1886 and 1887, sailing 14,143 miles, and doing 18,877 miles under steam.

Of the large fleet of sailing vessels on commission in British and foreign waters, but a small proportion have at any period of their existence come into the category of racing vessels. By far the larger number are of the *bona fide* cruiser type, and although more attention is now given to speed than was the case in the early days of the Victorian era, when it was asserted by an old writer that with the advent of the famous "America" the first blow was struck at the healthy rule that the perfection of a gentleman's yacht should be a vessel combining speed with accommodation, most cruisers of the present day seem to fulfil the precepts of that old adage pretty well.

Of course the general form and type of racing vessels in fashion at different periods has influenced the form and type of cruising yachts. Prior to the arrival of the "America," short, bluff-bowed, narrow-sterned cruisers were in vogue; afterwards, the long, narrow, wall-sided type came into fashion, while in recent years yachts built exclusively for cruising have been given more beam, and in form of midship section and of hull generally, approximate to the shape and type of modern racing vessels.

This subject of cruising is a very wide one, but in yachts of, say, from 5 to 100 tons, there is not much to be said as to any distinctive difference between the type of vessel used for racing and for cruising. But pleasure craft used for cruising attain to the proportions of 2,000 tons. In the case of vessels over about 400 tons, steam power has for the last 35 years or so been used almost exclusively, though in some cases it has been adopted as auxiliary to sail power. The tendency, however, is to go into steam. A man builds a large auxiliary cruiser, and finds that though sail is very useful in making long ocean voyages, it is of comparatively little service to him when cruising about at home, or making short voyages, say up the Mediterranean or to Norway. He becomes dissatisfied with the speed of his vessel under sail, and gradually reduces his masts, till for sail-carrying purposes they disappear, and increases his steam power. Though steaming can never be so interesting as sailing, steam has numerous advantages in these busy days, and we may make up our minds that steam is destined to supersede sails in large yachts.

The huge vessels of from 1000 to 1500 and even 2000 tons built during the last few years are, for all practical purposes, steamers pure and simple. Several steam yachts were launched in the fifties, and in 1858 an iron vessel of 148 tons, a very big yacht for those days, was built. In 1859 the "Ceres," of 301 tons, then considered one of the finest steam yachts ever launched, was built for the late Duke of St. Albans. In 1864 the "Eothen," and in 1868 the "Cornelia," both iron vessels, were built for Mr. Ashbury and Lord Londonderry respectively, and in 1874 the "Sunbeam," a composite vessel and the first yacht exceeding 500 tons measurement was constructed for Lord Brassey.

Iron, though occasionally used in the construction of sailing vessels, may be said to have come into fashion at the same time that steam power was introduced. During the last twelve or fifteen years it has been superseded by steel, and since the introduction of that material steam yachts have largely increased, both in number and tonnage. In the year 1886, 907 steam yachts were in commission in European waters, as compared with 1436 in the year 1897, and during the same period the total tonnage of yachts has increased from 86,407 to practically double that amount, namely, 172,559 tons. It is curious to note the relative development of sail and steam during those years. In the year 1886, 2,942 sailing yachts were commissioned, having a total tonnage of 80,936 tons. At the present time 5,311 sailing yachts are afloat, with a total tonnage of 93,009 tons. That is to say while the number of steam yachts built during the last twelve years has increased by 60 per cent., their tonnage has increased 100 per cent., and during the same period the number of sailing craft has increased 80 per cent. but their tonnage shows an increase of 15 per cent. only. These figures demonstrate the number of large steam yachts that have been constructed during the last decade, and also the very large number of small sailing vessels which have been built, both for racing and cruising purposes.

With regard to the actual number of cruisers afloat: in the year 1886 there were only 23 steam yachts of over five hundred tons measurement in commission. Of these the largest vessel of British build was the "Amy," of 812

tons, built by Messrs. D. and W. Henderson, and designed by Mr. G. L. Watson. Notable for their size among the others was the "Bretagne," built for a French owner in America, the "Nourmahal," of 939 tons, and the "Namouna," of 740 tons, built in America from the design of a British naval architect, Mr. Sinclair Bryne.

During the present season (1898) no less than 71 steam yachts of over five hundred tons are in commission; 14 of these are over 1000 tons, and Mr. Vanderbilt's yacht, the "Valiant," exceeds 2000 tons. She is the largest yacht afloat, and measures 2184 tons y.m.; her length is 331 feet over all, and 293 feet on the load water-line, and she has 39 feet beam, and 29·3 feet depth. She is brig-rigged, carries 700 tons of coal, can average 14 knots, and can attain a speed of 17 knots under forced draught. She was built and engined by Messrs. Laird and Co., of Birkenhead, from the design of Mr. Sinclair Bryne.

A big steamer is the luxurious plaything of the few, while a trip in a 10 or 15 tonner affords amusement to the many, and it is probable that the Corinthian who skippers his own little craft has by far the greater share of pleasure and amusement.

All round the coasts are to be found plenty of yachtsmen who enjoy making passages in dirty weather in their little 5, 10, or 15 tonners: but, perhaps, if in search of the amateur capable of handling his own vessel in all weathers, and ready and able to bear a hand aloft or forward with equal readiness, the estuary of the Thames would be the best place to look. There on almost any day may be found scores of small craft, turning down Sea Reach in workmanlike fashion, flying the gold wreath and crown on blue ground, whose owners, when the ties of the Stock Exchange or Lloyd's or other business permits, are only too anxious to undertake more than a mere Saturday to Monday cruise.

In these expeditions paid hands are often voted more trouble than they are worth: amateurs do most of the work, if not all; and when a paid hand or two are shipped it is merely for the convenience of having someone to "cook and wash up."

It is of course impossible to particularise or describe cruises of this kind, but as an instance of what may be done in small vessels cruising in home waters, a glance at the log of the "Sonata," a 15 tonner in the year 1882, may suffice. She sailed from Brightlingsea on July 2nd, and made her first run of 506 miles to Inverness without putting into port. She then passed through the Caledonian Canal, visited the ports of the beautiful Firth of Clyde, Rothesay and Lamlash, in which latter place she was detained about four days by a violent gale of wind. She then sailed to Carlingford Lough, and from there to Kingstown. From Kingstown they made a run of 278 miles to Plymouth, where they stayed a day or two, and then made a passage of 281 miles to Brightlingsea, so completing the round trip in thirty days.

The ship's company consisted of the owner and two friends and two paid hands. The ship was entirely navigated by her owner, and he made all his ports without the assistance of a pilot. This may be looked upon as a good but fair sample of cruising in small yachts.

It is scarcely necessary to observe that in such a sport as yachting the amount of enjoyment derived depends a good deal upon the possession of some practical knowledge and technical skill. In a sailing craft something is occurring all the time and a man who commands his own vessel, or who understands all that is going on, will not find many idle hours pressing heavily on his brain. The pleasures incidental to command and exercise of responsibility are great, and moreover, to be a mere passenger on one's own ship, subject to the convenience and caprices of the skipper, is somewhat ignominious, and an owner will find many advantages in being able to form and express his own opinion. Seamanship, the handling of a vessel, is of course a highly technical art, and though there are and always have been, and I trust always will be, many amateurs who in seamanship are unsurpassable, their number must be comparatively few, for by natural aptitude and long experience only can a very high degree of excellence be attained. But long apprenticeship to the sea is not necessary to enable a man of average intelligence to acquire sufficient knowledge to get his own vessel under weigh, to bring her up, and to handle her under ordinary circumstances, and to judge of the weather for himself and be able to decide what the vessel can or cannot do.

The services of a professional sailing master cannot usually, at any rate in a vessel of any size, be dispensed with; and his advice should be taken. But in a very few years a yacht owner ought to be able to handle his own ship fairly well, and to be in a position to assert his authority as owner. He will then no longer feel diffident, abashed by his own servant; he will understand the reason for everything that is done, and will be constantly acquiring knowledge.

For cruising in home waters he ought to understand the use of charts and the lead, and should acquire some knowledge of plane and transverse sailing, and of tides, so as to be able to find his own way about. If he aspires to longer voyages, he should learn the practical rudiments, at any rate, of navigation, and the use of the sextant, and should understand compass deviation. He ought to be able to find his position at sea by the ordinary simple means, and to ascertain his compass error.

Should he take the trouble to pass the Board of Trade examination and get a master mariner's certificate of competency, he will not regret it. His sailing master and crew sign on to him, he is really master of his own ship, a position which in foreign ports and distant lands affords many advantages. Yacht skippers are as a rule excellent men, who understand their position and do not presume upon it, but they are human, and the position of an owner in a foreign port under a recalcitrant skipper, who is quite aware that his services cannot be dispensed with, is not a happy one. Moreover, nautical astronomy, and magnetism, are rather fascinating subjects, and their study may fill up agreeably many leisure hours, both on sea and on land.

Yet to all, whether instructed or not, the sea, if it appeals to them at all, exercises a fascination which cannot be described. Something of the "mystery of the sea" permeates their being. Yachtsmen are generally enthusiastic lovers of their favourite pastime, and no wonder, for in all its phases it conveys infinite delight and infinite charm. If a yachtsman is scientifically inclined, he can interest himself in nautical astronomy, in the scientific principles involved in the staying of masts and trimming of sails, and in everything connected with the action of wind on sails, and the action and effects of solids and fluids.

If he spends his leisure days in cruising about the Channel, in the shallow waters of the North Sea, or among the harbours and fiords of the beautiful Western sea-board of both islands, his favourite pursuit leads him to lovely scenery, affords him constant interest in the working of his own ship, and in watching the doings of merchantmen and fishing fleets, and of those who make their living upon the sea. It offers him excellent sport in the way of fishing, and it compels him to fresh breezes, and a natural, wholesome life. If he has time and money to go for long voyages, he sees the wonders of the great deep, and can visit all the most interesting parts of the world with the greatest comfort in his own home. And if he take delight in racing, he will find a sport most exciting, most interesting, and physically and morally healthy and clean.

DUNRAVEN.

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SAILING RULES, 1893.

1. All Races, and all Yachts sailing therein, shall be under the direction of the Flag Officers or Sailing Committee of the Club under whose auspices the Races are being sailed. All matters shall be subject to their approval and control; and all doubts, questions, and disputes which may arise shall be subject to their decision. Their decisions shall be based upon these Rules so far as they will apply, but as no rules can be devised capable of meeting every incident and accident of sailing, the Sailing Committee should keep in view the ordinary customs of the sea, and discourage all attempts to win a Race by other means than fair sailing and superior speed and skill. The decisions of the Sailing Committee shall be final, unless they think fit, on the application of the parties interested, or otherwise, to refer the questions at issue for the decision of the Council of the Yacht Racing Association, whose decision shall be final. Any such reference, if made on the application of any party interested, must be accompanied by a fee of £5 in the case of yachts exceeding 36 ft. rating, and of £3 for yachts not exceeding 36 ft. rating, payable by the party or parties on whose application the reference is made, and such fees shall go to the funds of the Yacht Racing Association in the event of the appeal not being sustained. It shall be the duty of the Sailing Committee whose decision is appealed against to forward to the Secretary of the Yacht Racing Association a statement of the case put before them, and their decision thereon accompanied by the fee. In the event of a protest involving the re-measurement of a yacht, the fees and expenses of such re-measurement shall be paid by the unsuccessful party to the protest, and in the case of a re-measurement demanded by an official measurer, acting under the authority of the Council, such expenses and fees shall be paid by the Y.R.A. if the certificate is upheld. No member of the Sailing Committee or Council shall take part in the discussion or decision upon any disputed question in which he is directly interested. The Sailing Committee, or any Officer appointed to take charge for the day, shall award the prizes, subject to Rule 29. If any Yacht be disqualified, the next in order shall be awarded the prize.

2. The Sailing Committee, or officer in charge for the day, shall have power to postpone any Race, should unfavourable weather render such a course desirable. Letter N of the commercial code hoisted over the flag denoting the race shall be the signal that a race has been postponed.

3. The rating of every Yacht entered to sail in a race shall be ascertained by adding together length (L), beam (B), 0·75 of girth (G), and 0·5 of the square root of the sail area (SA), and dividing the sum by two according to the following formula:—

$$\frac{L+B+0.75\,G+0.5\,\sqrt{SA}}{2}=\text{Rating.}$$

In all ratings, figures in the second place of decimals below 0·05 shall be disregarded, and those of 0·05 and upwards shall count as 0·1. The length shall be taken between the outer edges of the Official marks of the Y.R.A. as placed by the owner at the bow and stern of the Yacht, this length to represent the extreme length for immersion, provided always that if any part of the stem or stern-post or other part of the vessel below the marks for length project beyond the length taken as mentioned, such projection or projections shall, for the purposes of the rule, be added to the length taken as stated; and pieces of any form cut out of the stem, stern-post, or fair-line of the ridge of the counter, with the intention of shortening the length, shall not be allowed for in measurement of length, if at or immediately below the marks for the length, nor above if within six inches of the water level. The breadth shall be taken from outside to outside of the planking, in the broadest part of the Yacht, and no allowance shall be made for wales, doubling planks, or mouldings of any kind. The girth shall be taken from L.W.L. to L.W.L. under the keel at a station 0·6 of the distance between the outer edges of the length marks from the fore-end. The girth shall be measured along the actual outline of the vertical cross section at that station at right angles to the L.W.L. If the draught forward at that station (not including the girth of a bulb, if any) exceeds the draught at that station, twice such excess to be added to G. In taking these measurements all hollows in the fore and aft under-water profile of the vessel to be treated as filled up straight. Centre-boards or plates, whether ballasted or fitted with bulbs, or otherwise, to be measured as fixed keels. Owners shall mark the length for rating of their Yachts on both sides at the bow and stern in such manner as the Council may direct, with the Official marks supplied by the Y.R.A., which marks shall at all times represent the extreme length for immersion when the yacht is lying in smooth water in her usual racing trim, including racing crew on board at and about the mid overall length. Owners shall mark the points for measuring the girth as follows: by fixing three metal discs of suitable size on each side of the yacht, not less than 2 in. or more than 6 in. above the load water-line level, and parallel thereto, and not less than 3 ft., or more than 6 ft., from end to end, and so that the centre-mark of the three coincides with the distance 0·6 from the fore edges of the bow marks; and the owner shall also place a disc coinciding with this centre mark (perpendicular to the load water-line level), under the rail or covering board, and another on the side of the keel perpendicular to the load water-line level. The distances between the load water-line level and the horizontal marks to be measured when the yacht is afloat in smooth water, with crew on board according to the rule, and deducted from the girth as obtained from centre mark to centre mark

MEASUREMENT OF SAILS.—*Mainsail*—A. Measured from the top of the boom (under the pin for outhaul shackle on traveller, or clew side, when hauled chock out) to the gaff under the pin of the sheave of the topsail sheet, provided the peak cringle of the mainsail does not extend beyond the pin: in the case of the yacht having no top-sail, or of the peak cringle extending beyond the pin of the top-sail sheet sheave then the measurement to be taken to the pink lacing-hole. B. Perpendicular to A, measured to underside of gaff close in to the mast. C. Measured from top of boom over the pin of the sheave for outhaul or end of clew slide to underside of gaff close in to the mast. D. Perpendicular to C, measured in to the mast, in a line with a top of the boom, or to tack cringle of mainsail, if below top of boom. *Yard Topsail*—E.—Measured from upper side of gaff close in to the mast to pin of sheave for top-

sail sheet, or to lacing-hole in jackyard. F.—Perpendicular to E, measured to lacing-hole in yard. G.—From lacing-hole to lacing-hole in yard. H.—Perpendicular to G, measured to pin of sheave for topsail-sheet in gaff; or to lacing-hole in jackyard. *Jib Header*—K.—Measured from top of gaff close in to mast to pin of halyard-sheave in topmast. L.—Perpendicular to K, measured to pin of topsail-sheet sheave in gaff; or to lacing-hole in jackyard. *Head-Sails*—I.—The perpendicular I to be measured from the deck at the foreside of the mast to where the line of the luff of the foremost head-sail when extended cuts such perpendicular; in case a schooner has no fore-topmast, but a main topmast and a main spinaker, the perpendicular for the fore-triangle shall be measured from the deck to where the line of luff of such spinaker when extended cuts the main topmast. J.—To be measured from the foreside of the mast to where the line of the luff of the foremost head-sail when extended cuts the bowsprit, other spar hull, &c., as the case may be. In all cases if the distance from the centre fore and aft line of the mast to the outer end of spinaker boom (when shipped in its place and square to the keel) exceeds the distance from the foreside of the mast to the bowsprit end (where cut by the line of the luff of the foremost head-sail), the excess shall be added to the base of the triangle formed by the head-sails; and the area of the head-sail to be computed accordingly. In the case of a yacht having no head-sail, but carrying a spinaker, the area for head-sail shall be computed from the length of spinaker boom and the height from deck to where the line of the luff of the spinaker when extended cuts the mast. The length of head-stick or head-yard to spinaker shall not exceed one-twentieth the length of spinaker boom. Foot yards not allowed on spinakers. [In the case of a yacht carrying a square sail or square topsail, or raffee (together or separately) the actual area of the same shall be computed; and if such area exceed the area of the fore-triangle, the excess shall be used in the total area for determining the rating. *Foresail of Schooners*—A. Measured from foreside of mainmast (in a line with main boom goose-neck) to gaff under the pin of topsail-sheet sheave. B. Perpendicular to A, measured to underside of gaff close in to the mast. C. Measured from foreside of mainmast (in a line with main boom goose-neck) to gaff close in to the mast. D. Perpendicular to C, measured in to the mast in a line with the top of the fore boom or tack cringle.

Calculation of Sail Areas.—*Area of Mainsail*—To find the area of the mainsail—Multiply A by B and C by D, and add the two products together and divide by 2. *Area of Yard Topsail*—To find the area of yard topsail—Multiply E by F and G by H, and add the two products together and divide by 2. *Area of Jib Header*—To find the area of jib header—Multiply K by L and divide the product by 2. *Area of Head-Sails*—To find the area of head-sails, jib topsail or spinaker—Multiply I by J and divide by 2. *Area of Pole Mast Head-Sails*—To find the area of head-sail, for pole mast—Multiply I by J and divide by 2. *Area of Schooner's and Yawl's Sails*—The area of a schooner's sail or a yawl's sail would similarly be found; in the case of a yawl having a lug mizen the lacing-holes in the yard would be taken as the upper boundaries. *Areas of Lug-Sails and Head-Sails*—In the case of a lug-sail, standing lug-sail, or balance lug-sail being carried, the actual area of the same shall be computed; and if head-sail he also carried, the measurements for computing the area of the same shall be taken from foreside of mast, &c., in accordance with the method provided in the rule for head-sails. *Area bound by Curved Edges of Sails*—The area bound by the round in the foot, head, luff, or leach of a sail, if at any time extended by battens or otherwise beyond the line between the points for measurement, shall be computed as follows: Multiply the base E by two-thirds of the perpendicular P. In cases of disputed measurement of sail area, or if the necessary measurements cannot be obtained from the sail-maker, the sails can be measured in the manner following:—Take the length of boom from mast to pin of sheave for outhaul, and length of gaff from mast to pin of topsail-sheet sheave or lacing-hole as the case may require; then hoist the sail with the tack fast and set the peak and luff up taut, and let go the topping lifts so that the weight of the boom comes on the leach of the sail. With a line and tape measure the leach and luff and the diagonal, C. For the head-sail measure the height, I, and the distance, J, as provided for in the section dealing with head-sail. For topsail the sail would be hoisted and marked in a line with the gaff; then lowered and the other dimensions taken. From the measurements so taken a sail plan would be made and the areas calculated as described. In all calculations whether relating to length, sail area, or rating any fraction beyond the second place of decimals shall be disregarded. As soon as a yacht has been measured by the Official Measurer, a certificate of rating of the Yacht Racing Association shall be granted to her owner, unless from any peculiarity in the construction of the yacht, or other cause, the measurer shall be of opinion that the rule will not rate the yacht fairly; in which case he shall report the circumstances to the Council, who, after due inquiry, shall award such certificate of rating as they may consider equitable. The certificate of rating of the Yacht Racing Association shall cease to be valid as defining the yacht's rating for racing if any dimension measured for rating is found to exceed the measurement stated in the certificate. If it should arise from any cause whatever that one or both of the official marks of the Y.R.A., as placed by the owner at the bow and stern, fall within the length immersed when the yacht is lying in smooth water in her usual racing trim, with racing crew on board, at and about the mid overall length, or if any alteration be made so as to increase the beam or girth, or the length of any spar or spars, or the sail area, as respectively measured for rating, or if any mark denoting the yacht's length or girth is moved from its position, or if it should come to the knowledge of the owner or his representative that any dimension measured for rating exceeds the measurement stated in the certificate, the certificate becomes irregular; and the owner or his representative must give notice of such irregularity and the grounds thereof, in writing, signed by him and addressed and sent by registered post to the Secretary of the Yacht Racing Association, before the yacht is again started in any match, in order that the yacht, or her spars, or sails, may, if necessary, be re-measured, and a new certificate issued. It is especially incumbent on the owner, or his representative, to ascertain from time to time by inspection of the length marks, whether the immersion of the yacht has from any cause whatever become such as to render the certificate irregular. Yachts which have been raced previously to 1896, and which are over the new classes of linear rating (corresponding with the classes they competed in under the old rating rule) shall be allowed to compete in such new classes by allowing time on the excess rating, providing no alteration has been made in their hulls and no increase made in their load water-line length as defined by the Y.R.A. marks, and no increase made in their sail area since 1895. A duly regular certificate of rating of the Yacht Racing Association shall be held by every yacht starting in a match, unless the Sailing Committee give special permission in writing, before the start, that the yacht may compete without it; but in the event of any dispute as to the rating of a yacht so exempted or otherwise, she or her sails shall be measured by the Official Measurer before she can be entitled to a prize. No certificate of rating shall be granted to any yacht of less than 15 cwt. displacement without crew. If an infringement of any of the foregoing provisions in respect of the regularity of the certificate of a yacht should in the opinion of the Council be proved against any yacht, such yacht shall be liable to be disqualified by the Council from starting in any match sailed under Y.R.A. Rules for the remainder of the current year, or such period as the Council may elect, reckoning from the date at which her certificate is proved to have become invalid. Should the certificate under which a yacht has sailed in any match or matches be proved to have been incorrect, solely by reason of any error of measurement or calculation on the part of the Y.R.A. measurer, the Council may, after inquiry, assign such correction to the certificate as they may deem proper, and should the rating so corrected exceed the rating according to the incorrect certificate, the yacht shall concede in every such match sailed the scale of time allowance for such excess up to the limit rating of her class and double the scale allowance above that limit. Every owner sailing under Y.R.A. Rules shall permit all reasonable inspection by an official measurer and shall afford such measurer all reasonable facility to carry out such inspection in regard to measurements, marks, and such other matters within the scope of the measurer's duty.

4. In time for Rating Races, time shall be allowed on arrival for differences in rating, according to the annexed time scales, in proportion to the length of course. In all cases where time has to be allowed for difference of rating, it shall be computed by the rating and tenths of a unit of the rating in accordance with the time scales. Should it be necessary during a race to shorten the course, the signal flag denoting the race hoisted under the White Peter, or in case of fog or darkness two guns fired, shall show that the race is to finish with the round about to be completed, or at such mark as the Sailing Committee or officer of the day may appoint, and the time allowance shall be reduced in proportion.

5. Entries shall be made with the Secretary at least forty-eight hours previous to noon of the day appointed for starting each race. In case of a Sunday intervening, twenty-four hours shall be added. Entries may be made by telegram, and it shall be deemed sufficient that the same shall have been despatched before noon of the day on which the entries close, subject to the provision as to Sundays, but such entries by telegram must be confirmed on a duly executed form of entry and forwarded simultaneously with the telegram. A Sailing Committee may, if they consider it expedient, refuse any entry. Form of entry to be signed by the owner, or his representative, previous to the race:—

"Please to enter the Yacht for the Race at on the . Her distinguishing Flag is ; her rig is ; and her rating, in accordance with Y.R.A. Rule 3, is . And I agree to obey and be bound by the Sailing Rules of the Yacht Racing Association.

"Signed this day of ."

A yacht which did not start in the original race shall not be allowed to compete in a re-sailed race, and a yacht which has, in the opinion of the Sailing Committee, committed a breach of the rules in the original race shall not be allowed to compete in a re-sailed race, but no new entries shall be received under any circumstances whatever for a postponed race.

6. Each yacht entered for a race must be the *bona fide* property of the person or persons in whose name or names she is entered, who must be a member or members of a recognised Yacht Club. A Yacht Club shall not be considered a recognised Yacht Club within the meaning of this rule unless it shall have been proposed and accepted as such by the Council of the Yacht Racing Association, who shall have the power of cancelling such recognition should they deem it expedient so to do. A yacht, whilst let on hire, shall not be allowed to compete under these rules.

7. No owner shall be allowed to enter more than one yacht in a race, except in cases in which a prize is given for each rig, when one yacht of each rig may be entered, nor shall he be entitled to enter the same yacht under different rigs for any race. If a yacht is entered for two or more races which are to be sailed at the same time, the owner, before starting the yacht, shall (in writing or by showing in the rigging the signal flag denoting the race) declare to the Sailing Committee in which of the races the yacht will compete; but this section of the rule shall not apply to postponed or re-sailed races. An owner shall not steer any other yacht than his own in a race wherein his own yacht or yachts compete.

8. When a prize has been offered for competition any yacht duly

entered shall be entitled to sail over the course (subject, however, to Rule 2), and be entitled to a prize of not less than half the value of the first prize.

9. In the case of a yacht fitted with a centre board or plate, or other form of shifting keel, manual power only shall be employed in working it.

10. Every yacht sailing in a race shall have on board a member of a recognised Yacht Club, who, before the prize is awarded, shall sign a declaration that the yacht has strictly conformed to all the sailing regulations, as follows :—

"I, , a Member of the Yacht Club, do hereby declare that I was on board and in charge of the yacht while sailing in the race this day, and that all the Sailing Rules and Regulations were obeyed during that race."

(Signed).....

Date.....

11. Each yacht must carry, at her main topmast head, a rectangular distinguishing flag, of a suitable size, which must not be hauled down unless she gives up the race. If the topmast be lowered on deck or carried away, the flag must be rehoisted in a conspicuous place, as soon as possible.

12. Every yacht entered for a race shall, at the time of entry, or as soon after as possible, be supplied with written or printed instructions as to the conditions of the race, the course to be sailed, marks, &c. Nothing shall be considered as a mark in the course unless specially named as such in these instructions. Each yacht shall be given a number with the sailing directions, and should any yacht cross the line before the signal for the start has been made, her distinguishing numeral shall be exhibited as soon as conveniently may be as a recall, and kept displayed until the said yacht shall have either returned and recrossed the line to the satisfaction of the Sailing Committee, or have given up the race. The numbers to be in white on a black ground, and the figures not less than 2 ft. 6 in. in height.

13. There shall be no restrictions as to sails, or the manner of setting and working them; but manual power only may be used for hoisting and working them.

14. In yachts above 42 ft. rating there shall be no limit as to the number of paid hands, and no restrictions as to the number of friends. In yachts of 42 ft. rating and under, the total number of persons on board during a match shall not exceed the number set forth in the following table :—

	Persons.
Not exceeding 18-ft. rating	2
Exceeding 18-ft. and not exceeding 24-ft. rating . . .	3
Exceeding 24-ft. and not exceeding 33-ft. rating . . .	5
Exceeding 30-ft. and not exceeding 36-ft. rating . . .	7
Exceeding 36-ft. and not exceeding 42-ft. rating . . .	9

If an owner of a yacht elects to have such yacht measured for rating length with a smaller number of persons on board than set forth in the foregoing table, such number shall be stated on the certificate of rating, and shall not be exceeded in any race sailed under the certificate. No paid hands shall join or leave a yacht after the first gun has been fired, or the Blue Peter hoisted, except in case of accident or injury to any person on board. There shall be no restriction as to friends working.

15. All yachts exceeding a rating of 42 ft. shall be fitted below deck with the ordinary fittings of a yacht, including two transverse bulkheads of wood. The following shall apply to all yachts: their platforms shall be kept down, and bulkheads standing. No water shall be started from or taken into the tanks after the signal to start has been made. No more than the usual anchors and chains shall be carried during a race, which must not be used as shifting ballast, or for altering the trim of the yacht. No bags of shot shall be on board, and all ballast shall be properly stowed under the platform or in lockers, and no ballast or other dead weight (a centre plate or board excepted), shall be shifted or trimmed in any way whatever during a race. No ballast or other dead weight shall be shifted, shipped or unshipped so as to increase the length of immersion beyond the marks at the bow and stern, placed by the owners to define the rating length, after a yacht has been entered for a race. No ballast shall be shipped, unshipped, or shifted after 9 P.M. of the day previous to the race. A race re-sailed shall be regarded as a new race so far as the 9 P.M. condition is concerned.

16. Every yacht exceeding a rating of 60 ft. and under a rating of 80 ft. shall carry a boat on deck not less than 10 ft. in length and 3 ft. 6 in. beam, and every yacht rated at 80 ft. and over, one of not less than 12 ft. in length, and 3 ft. 6 in. beam, with oars lashed in them, ready for immediate use. Each yacht shall carry at least one lifebuoy on deck ready for use.

17. The yachts shall start from moorings, anchors, or under way, as directed by the Sailing Committee. Fifteen minutes before the time of starting one of the following flags of the Commercial Code shall be hoisted as a preparative flag for the yachts of each successive race; in case of a start from anchors or moorings, to take up their stations for the start with head-sails down, or all sails down, as the Sailing Committee may direct; or, in case the start be a flying one, to approach the starting line, viz. :—

B of Commercial Code for the yachts of the 1st race.
C—— 2nd ,,
D—— 3rd ,,
F—— 4th ,,

and so on. Five minutes before the start the preparative flag shall be lowered, a Blue Peter hoisted, and a gun fired; after which the yachts in the race shall be amenable to the rules. At the expiration of five minutes *exactly* the Blue Peter shall be hauled down and a second gun fired as a signal to start. If the start is to be made from anchors or moorings, lots shall be drawn for stations, and springs shall be allowed on the same bridle or anchor chain or warp as the bowfasts, but are not to be carried to a buoy, pier, other vessel, or fixed object. If any yacht lets go or parts her bridle before the signal to start, or if she drags any moorings or anchor to which she is made fast for the purpose of starting, she shall be liable to be disqualified, unless such parting or dragging be explained to the satisfaction of the Committee, or unless she has returned, after the signal to start, within the line of starting buoys so as not to obtain any advantage by the accident. In a flying start, if any yacht, or any part of her hull, spars, or other equipment be on or across the line before the signal to start is made, she must return and recross the line; a yacht so returning, or one working into position from the wrong side of the line after the signal to start has been made, must keep clear of all competing yachts. Should the gun miss fire, the lowering of the Blue Peter shall be the signal to start. A yacht shall have completed a race as soon as any part of the hull or spars be on or across the winning line.

18. When two yachts are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows, viz. :—A yacht which is running free shall keep out of the way of a yacht which is close-hauled. A yacht which is close-hauled on the port tack shall keep out of the way of a yacht which is close-hauled on the starboard tack. When both are running free with the wind on different sides, the yacht which has the wind on the port side shall keep out of the way of the other. When both are running free with the wind on the same side, the yacht which is to windward shall keep out of the way of the yacht which is to leeward. A yacht which has the wind aft shall keep out of the way of the other yacht.

19. When rounding any buoy or vessel used to mark out the course, if two yachts are not clear of each other at the time the leading yacht is close to, and actually rounding the mark, the outside yacht must give the other room to pass clear of it, whether it be the lee or weather yacht which is in danger of fouling the mark. No yacht shall be considered clear of another yacht unless so much ahead as to give a free choice to the other on which side she will pass. An overtaking yacht shall not, however, be justified in attempting to establish an overlap, and thus force a passage between the leading yacht and the mark after the latter yacht has altered her helm for the purpose of rounding.

20. When passing a pier, shoal, rock, vessel, or other obstruction to sea room, should yachts not be clear of each other, the outside yacht or yachts must give room to the yacht in danger of fouling such obstruction, whether she be the weather or the leeward yacht; provided always that an overlap has been established before an obstruction is actually reached.

21. A yacht overtaking any other shall keep out of the way of the overtaken yacht; and a yacht may luff as she pleases to prevent another yacht passing to windward, but must never bear away out of her course to hinder the other passing to leeward—the lee side to be considered that on which the leading yacht of the two carries her main boom. The overtaking vessel, if to leeward, must not luff until she has drawn clear ahead of the yacht she has overtaken.

22. If two yachts are standing towards a shore or shoal, or towards any buoy, boat or vessel, and the yacht to leeward is likely to run aground, or foul of such buoy, boat or vessel (a mark vessel excepted), and is not able to tack without coming into collision with the yacht to windward, the latter shall at once tack on being hailed to do so by the owner of the leeward yacht, or the person acting as the owner's representative, who shall be bound to see that the leeward yacht tacks at the same time.

23. Any yacht running on shore, or foul of a buoy, vessel, or other obstruction, may use her own anchors, boats, warps, &c., to get off, but may not receive any assistance except from the crew of the vessel fouled. Any anchor, boat, or warp used must be taken on board again before she continues the race.

24. Each yacht must go fairly round the course; and must not touch any buoy, boat, or vessel used to mark it out, but shall not be disqualified if wrongfully compelled to do so by another yacht. Any yacht causing a mark vessel to in any way shift her position to avoid being fouled by such yacht, shall be disqualified. If a yacht, in consequence of her neglect of any of these rules, shall foul another yacht, or compel other yachts to foul, she shall forfeit all claim to the prize, and shall pay all damages as provided by Rule 32.

25. No towing, sweeping, poling, or pushing, or any mode of propulsion except sails, shall be allowed except for the purpose set forth in Rule 23.

26. A yacht may anchor during a race, but must weigh her anchor again, and not slip. No yacht shall during a race make fast to any buoy, stage, pier, or other object, or send an anchor out in a boat, except for the purpose of Rule 23.

27. No other means of sounding than the lead and line allowed.

28. All yachts sailing in a race at night shall observe the Board of Trade rule as to the carrying of lights.

29. In case of a man falling overboard from a competing yacht, all other yachts in a position to do so shall use their utmost endeavours to render assistance; and if it should appear that any yacht was thereby prevented winning the race, the Committee shall have power to order it to be re-sailed between any yacht or yachts so prevented and the actual winner.

30. Should the owner of any yacht, or the person acting as the owner's representative, consider there is fair ground of complaint against another for foul sailing, or any violation of these rules, such owner or the owner's representative must, if it arise during the race, signify the same on first passing the Committee vessel, by showing an ensign conspicuously in the main rigging. The protest shall be made in writing, and under such regulations (if any) as the Sailing Committee may have determined, within two hours of the arrival of the protesting yacht, unless such arrival shall be after 9 o'clock P.M. and before 8 o'clock A.M., in which case the time shall be extended to 10 o'clock A.M., and the protest shall be heard by the Sailing Committee and decided, after such

inquiries as they may consider necessary. A protest made in writing shall not be withdrawn. Should it come to the knowledge of the Sailing Committee, or should they have reasonable grounds for supposing that a competitor in a race has in any way infringed these rules, they shall make due inquiries, and if an infringement or breach of the rules be proved, they shall disqualify the yacht accordingly.

31. Should any flag vessel or other mark be removed from its proper position, either by accident or design, the race shall be re-sailed, or not, at the discretion of the Sailing Committee.

32. Any yacht disobeying or infringing any of these rules, which shall apply to all yachts whether sailing in the same or different races, shall be disqualified from receiving any prize she would otherwise have won, and her owner shall be liable for all damages arising therefrom, not exceeding in amount and subject to the same limitations as provided by the Merchant Shipping Act of 1894. A breach of these rules shall be considered "improper navigation" within the meaning and for the purposes of that Act. Should a flagrant breach or infringement of any of these rules be proved against the owner of a yacht, or against the owner's representative or amateur helmsman, such owner, his representative, or amateur helmsman may be disqualified by the Council, for any time the Council may think fit, from sailing the yacht in any race held under the rules of the Yacht Racing Association; and should a flagrant breach of these rules be proved against any sailing master he may be disqualified by the Council, for such time as the Council may think fit, from sailing in any race held under the rules of the Yacht Racing Association.

33. When yachts are ordered to sail in cruising trim, the following rules are to be strictly observed:—1. No doors, tables, cabin skylights, or other cabin or deck fittings (davits excepted) shall be removed from their places before or during the race. 2. No sails or other gear shall be put into the main cabin in yachts exceeding a rating of 73 ft. 3. Anchors and chains suitable to the size of the yacht shall be carried, one at the cathead (or in yachts rated at 73 ft. and under, at the usual place on the bow), which anchor shall not be unshackled from the chain before or during the race. 4. Every yacht exceeding a rating of 60 ft. and under a rating of 80 ft. shall carry a boat on deck not less than 10 ft. in length and 3 ft. 6 in. beam—a yacht rated at 80 ft. and over, her usual cutter and dinghy. 5. No extra hands, except a pilot, beyond the regular crew of the yacht shall be allowed.

Appendix.

The Yacht Racing Association further recommend for the consideration of Sailing Committees:—1st. That as mixed races are no satisfactory test of the relative speed of yachts, the different rigs should, whenever practicable, be kept separate; but when mixed races are unavoidable, the following rule shall be observed:—The rating of schooners and yawls to be reckoned for time allowance as follows, viz., schooners at 0·85, and yawls at 0·92 of their actual rating; provided that in case of a yawl her mainsail does not exceed 0·37 of her total sail area, and that her mizen is not less than 0·06 of her total sail area. In the case of a pole-masted yawl, her mainsail shall not exceed 0·46 of her total sail area, and her mizen shall not be less than 0·075 of her total sail area. In schooners the foreside of the mainmast shall at the deck be not farther forward than the middle of the rating length. Ketches and luggers shall be reckoned for time allowance at 0·85 of their rating; provided that in a ketch the distance between the masts does not exceed half the rating length of the yacht, and that the smaller sail is carried aft. In the case of a lugger, to be entitled to the rig allowance, the yacht must have two or more masts, and the after, or the middle mast, at the deck must not be forward of the middle of the rating length, and in the case of a two-masted lugger, if the area of the after lug be less than half the area of the main lug, she will be rated as a yawl. In calculating the deduction for difference of rig, the rating by certificate to the exact fraction must be used. The time allowances to be calculated from each yacht's reduced rating; but schooners, ketches, luggers and yawls shall not be allowed to qualify to enter by their reduced rating in a class race. 2nd. In races for mixed rigs, the time allowances between yachts of the same rig must be calculated on each yacht's reduced rating. 3rd. That flying starts should be adopted when practicable, but no time should be allowed for delay in starting. 4th. That, as weatherliness is a quality which it is especially desirable to test in yacht racing, the courses should, wherever possible, be so laid out as to include a large proportion of windward work. 5th. That any limit to the time for concluding a race should be avoided as far as possible. 6th. That the classification of yachts should, when practicable, be as follows:—

For yachts whose rating, by Rule 3,				
does not exceed	. . . . .			18 ft.
Above 18 ft.	and not	exceeding		24 ft.
,, 24 ft.	,,	,,		30 ft.
,, 30 ft.	,,	,,		36 ft.
,, 36 ft.	,,	,,		42 ft
,, 42 ft.	,,	,,		52 ft.
,, 52 ft.	,,	,,		65 ft.
,, 79 ft.				

7th. That as distance is an important element in the calculation of time allowance, the marks and flag boats should be placed so as to mark as accurately as possible the length of the course, for which time is allowed. 8th. That in heavy weather it should be arranged, if practicable, for yachts to stay instead of gybe round marks. 9th. That Sailing Committees should be particularly careful to provide ample room between the points marking the starting line. 10th. That where, owing to the distance of the yachts from the signal station, or the crowded state of the roadstead, or from other reasons, it is difficult for the competing yachts to see their recall numbers, some suitable sound signal shall be given to call the attention of the competitors to the fact that a recall number is being displayed.

List of Recognised Yacht Clubs.

Royal Albert Yacht Club.
Royal Alfred Yacht Club.
Royal Anglesey Yacht Club.
Royal Bombay Yacht Club.
Bangor (Ireland) Corinthian Sailing Club.
Royal Barrow Yacht Club.
Bembridge Sailing Club.
Bristol Channel Yacht Club.
Cambridge University Cruising Club.
Castle (Calshot) Yacht Club.
Royal Channel Islands Yacht Club.
Cheshire Yacht Club.
Royal Cinque Ports Yacht Club.
Royal Clyde Yacht Club.
Clyde Corinthian Yacht Club.
Royal Corinthian Yacht Club.
Royal Cork Yacht Club.
Royal Cornwall Yacht Club.
Cruising Yacht Club.
Cultra Yacht Club.
Dart Boat Sailing Club.
Royal Dart Yacht Club.
Royal Dee Yacht Club.
Royal Dorset Yacht Club.
Dublin Bay Sailing Club.
Royal Eastern Yacht Club.
Royal Engineers Yacht Club.
Exe Yacht Club.
Royal Forth Yacht Club.
Fowey Yacht Club.
Royal Harwich Yacht Club.
Royal Highland Yacht Club.
Hythe (Southampton) Yacht Club.
Royal Irish Yacht Club.
Island Sailing Club.
Isle of Purbeck Yacht Club.
Royal Jamaica Yacht Club.
Royal Largs Yacht Club.
London Sailing Club.
Royal London Yacht Club.
Lough Derg Yacht Club.
Lough Erne Yacht Club.
Lytham Yacht Club.
Minima Yacht Club.
Medway Yacht Club.
Royal Mersey Yacht Club.
Mudhook Yacht Club.
Royal Munster Yacht Club.
New Brighton Sailing Club.
New Thames Yacht Club
Norfolk and Suffolk Yacht Club
Royal Northern Yacht Club.
Royal Nova Scotia Yacht Club.
Orwell Corinthian Yacht Club.
Penarth Yacht Club.
Royal Plymouth Corinthian Yacht Club
Poole Yacht Club.
Royal Portsmouth Corinthian Yacht Club
Royal St. George's Yacht Club.
Salcombe Sailing Club.
Seaview Yacht Club.
Solent Yacht Club.
Royal Southampton Yacht Club.
Royal Southern Yacht Club.
Southampton Corinthian Yacht Club.
Southport Corinthian Yacht Club.
Royal South-Western Yacht Club.
Start Bay Yacht Club.
Royal Tay Yacht Club.
Teignmouth Corinthian Sailing Club.
Royal Temple Yacht Club.
Royal Thames Yacht Club.
Torbay Sailing Club.
Royal Torbay Yacht Club.
Torquay Corinthian Sailing Club.
Royal Ulster Yacht Club.
Royal Victoria Yacht Club.
Royal Welsh Yacht Club
West Lancashire Yacht Club.
West of Scotland Yacht Club.
Royal Western (of England) Yacht Club.
Royal Western (of Scotland) Yacht Club.
Royal Windermere Yacht Club.
Royal Yacht Squadron.
Yare Sailing Club.
Royal Yorkshire Yacht Club.

N.B.—For the purposes of General Rule 3, and of 6 and 10 of the Sailing Rules, all yacht clubs of the United Kingdom which hold Admiralty warrants are recognised; and such other clubs (including those of the British Colonies) as may apply for recognition and be accepted by the Council under the second paragraph of Rule 6. The recognition of a yacht club does not necessarily, nor of itself, qualify a member of that club as an amateur.

Time Allowances.

In preparing the new Time Scale to come into operation with the new linear rating rule of 1896, the following equivalents between the ratings for the classes under the length and sail area rule and the new linear rating rule, were, on the recommendation of the yacht designers, adopted:—

Ratings under length and sail area rule.	Equivalents under linear rating rule.
0·5	18 ft.
1·0	24 ft.
2·5	30 ft.
5	36 ft.
10	42 ft.
20	52 ft.
40	65 ft.

85 rating, under the length and sail area rule, has also been taken as equivalent to 80 ft. rating under the new rule. The time allowances from 24 ft. to 80 ft. rating correspond nearly with those of the previous scale, but small alterations have been introduced to make the figures accord with a true curve, plotted with the vertical scale of seconds double the horizontal scale of feet. Above 80 ft. rating the time allowances accord with a tangent to the time scale curve from that point, increasing by 1·3 seconds per foot of rating. This principle has been followed with the object of increasing the time allowances to be given by yachts of the larger ratings. In like manner, the time allowances for ratings under 24 ft. accord with a tangent to the curve from that point. The allowance a yacht has to make to any smaller yacht is obtained by multiplying the difference between the times set against their respective ratings in the time tables, by the length of the course in knots. For example, the time a yacht of 70 ft. rating has to allow a yacht of 65 ft. rating, over a 50 knot course, is as follows:—

70 ft. . . .	199·20
65 ft. . . .	190·45
	8·75
	50
60	437·50

7·17·5 seconds.

When a fraction of a second equals or exceeds 0·5 it is to be counted as a second, but fractions less than 0·5 are to be disregarded. In the case illustrated above, the time allowance is, therefore, 7 minutes and 18 seconds. If one of the yachts is above and the other below 24 ft. rating, the time allowances in the two tables found, from their respective ratings, added together, and multiplied by the length of the course, will give the time the larger allows the smaller yacht.

At a general meeting of the Y.R.A. held on the 12th November, 1896, the time scale above 90 rating was altered as follows:—The tangential or constant difference of 1·3 seconds per foot previously mentioned, was increased by a cumulative addition of 10 per cent. or 0·13 for each foot, and the table has been altered accordingly.

AMERICAN YACHTING—**Historical**—The birth of American yachting, truly so called, may be said to have taken place in the cabin of the little schooner "Gimcrack," on the 30th of July, 1844, when the New York Yacht Club was organised. Doubtless there were pleasure craft worthy of the name of yachts before this time, but with hardly an exception they have left neither history nor legend behind them, and the consideration of the subject must, therefore, begin at this point.

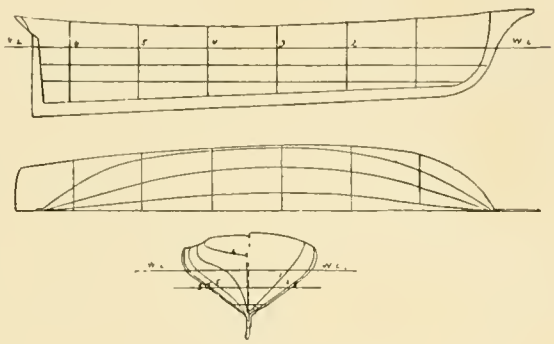
A number of gentlemen, representing most of the pleasure craft of any size owned in American waters, came together in the cabin of the "Gimcrack" by request of her owner, Mr. J. C. Stevens, to organise the club, whose history has been to a great extent the record of American yachting. The second yacht club in the United States was the Southern, of New Orleans, but this organisation never had more than a local interest, as its fleet was composed entirely of small open boats. Then followed the Neptune Yacht Club of the Highlands, which was organised in 1850, with headquarters on the Shrewsbury River, New Jersey, but, like its Southern sister, it was known only in its immediate vicinity. Next in order comes the Carolina, of Wilmington, North Carolina, in 1854; but it was not until 1857, when the Brooklyn Yacht Club was founded, that the New York Yacht Club had a rival.

The New York Yacht Club held its first regatta July 16th, 1845, and its rating for time allowance was 45 seconds per ton, Custom House measurement. The course was entirely an inside one in New York Bay, the outer mark being the South-west Spit Buoy. This was not only the first yacht regatta under the auspices of the Club, but the first recorded in America. Schooners and sloops were classed together, and the only dimension given was the tonnage, as follows:—Schooners: "Cygnet," 45 tons, W. Edgar; "Sybil," 42 tons, C. B. Miller; "Spray," 37 tons, H. Wilkes; "La Coquille," 27 tons, John C. Jay; "Minna," 30 tons, J. Waterbury; "Gimcrack," Com. J. C. Stevens. Sloops: "Newburgh," 33 tons, H. Robinson; "Adder," 17 tons, J. Rogers; "Lancet," 20 tons, G. B. Rollins. The "Cygnet" won.

With some exceptions, there cannot be stated from any data now extant the exact type of these boats, but some were keel and some, probably, centreboard craft. No light sails were then used, except, possibly, a maintopsail. Spinakers, balloon jib topsails, and even fore-and jib-topsails were unknown.

With a few words more about the clubs, it will be noticed how the type of the "La Coquille" and the "Cygnet," the comparatively blunt, low, and "mackerel stern," developed into the "wave-form" and the "fin-keel."

The general public interest in regattas was far greater then than it is to-day. The stores, exchanges, and banks were closed, and a general holiday prevailed. The shores of Bay Ridge, Staten Island, and that part of New Jersey from which a glimpse of the course could be obtained, were lined with people in holiday attire eager to catch the first view of the leader. As the number of clubs increased, however, and yachts



"CYGNET."

were seen in every bay and harbour, the interest, except in international contests, was confined to the yacht owners and their friends.

In 1858 the Jersey City Yacht Club was organised; seven years later the first New England Club, the Boston, was founded. This was after the close of the Civil War, in 1865; but there is not space to enumerate all the clubs, which rapidly multiplied until nearly every town on the seaboard of ten thousand inhabitants possessed its club signal and its house. Indeed, this statement need not be confined to the seaboard, for all the large places on the great lakes and many on the smaller ones had their yacht clubs. As early as 1867 the Golden Gate Yacht Club of San Francisco, California, was founded: so "the western slope" was only two years behind New England in opening its first home for the owners of pleasure craft. Among the later group of clubs in New York Bay or along the shores of Long Island Sound must be mentioned the Atlantic, founded in 1866, the Seawanhaka Corinthian in 1871, and the Larchmont in 1880—all organisations which are second only to the New York Yacht Club; in fact, it is highly probable that there is a larger number of expert sailors, who habitually sail and command their own vessels, in these last-named clubs than in the older organisation. This is particularly true of the Seawanhaka Club. Although New

England was somewhat late in the field, Boston is to-day more of a yachting centre than even New York, although she lacks Long Island Sound. Among her prominent clubs are the "Eastern" (founded in 1870), the "Beverly," the "Bunker Hill," the "Corinthian of Marblehead," and, in other New England towns, the "Hull," "New Haven," "Portland," Norwalk, "Riverside," Stamford, and many more.

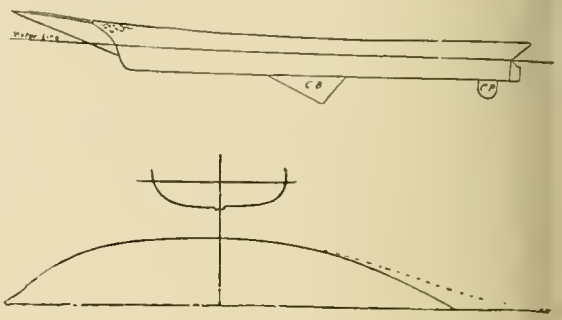
Among other clubs which have permanent homes on the various harbours of the Sound, are the New Rochelle, Corinthian Fleet, Sea Cliff, Hempstead Harbour, Riverside, Indian Harbour, and Huguenot. Most of these clubs, outside of those previously spoken of, are composed of comparatively small boats, and have but little place in the history or development of yachting, except, perhaps, locally.

Probably the first yacht built in America was the "Jefferson," constructed at Salem, Massachusetts, 1801, for Capt. George Crowninshield, and built by Christopher Turner. Very little is known of her beyond the fact that she was twenty-two tons burden; she was afterwards converted into a privateer, and took some prizes in the war of 1812.

Fifteen years later "Cleopatra's Barge" made her appearance, and was so much admired that many people visited her daily during the later days of her construction. She was brigantine-rigged and looked much more like a small war vessel of that period (1816) than a gentleman's pleasure-craft. Like her predecessor, she was built at Salem for the same owner, and was 83 feet on the water line and 91·41 tons, a keel boat drawing 11 feet of water. There was little yachting in America, however, until the years immediately preceding the formation of the New York Yacht Club, when there was a sufficient number of yachts in existence to form a nucleus for the young enterprise to work with. The first cruise of the squadron took place when the Club was just four days old, and was called by the Secretary, John C. Jay, in his minutes, "An expedition to Newport." They stopped at Huntington and New Haven, rendezvousing at White Stone.

Now appeared upon the field the first famous American yacht designer, George Steers. In 1839, when he was but fourteen years old, he built a sail-boat 17 feet long, called the "Martin Van Buren," which was considered a marvel of speed. In 1841 Steers constructed for Mr. (afterwards Com.) J. C. Stevens a sloop 30 feet long, which proved a successful craft.

The "Cygnet," a keel schooner built for Mr. Edgar, 45 tons, was launched in 1842, designed by the same hand, and was probably the best yacht of her kind produced in the country previous to the existence of the New York Yacht Club; but it was not until 1846, when Commodore Stevens, with Steers's help, constructed the "Maria," that the famous designer's name became noted beyond all others of his time. This celebrated sloop was 110 feet over all, 97 feet on load water-line, 26·6 feet beam, 5·2 feet draught, displacement 145 tons, sail area 5,850 square feet. For some time the "Maria"

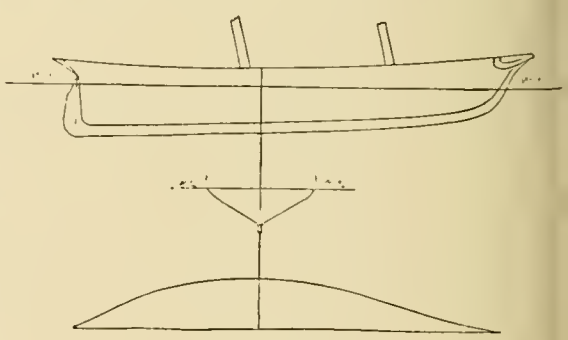


"MARIA."

was considered a marvel of perfection, although she was once beaten in a severe blow by a schooner. She was a centreboard, as her light draught would imply. Her first race was sailed October 6th, 1841, which was also the first Corinthian race in the country, the boats being handled exclusively by amateurs.

In 1847 Steers built for James Waterbury, Esq., the scarcely less noted "Una," originally a sloop, but since altered into a schooner. This later production was much smaller than the "Maria," being only 54 tons. The "Una" is still in existence, and is to-day a fine-looking boat, which speaks well for the "Steers" construction. Most of the vessels of this designer became historic in the yachting world, and all of them were more than ordinarily fast for that time.

The second great period of American yachting was ushered in by the advent of the famous "America," Steers's greatest triumph. She was built for Com. J. C. Stevens, owner of the "Maria," and was a keel schooner of 170 tons. The career of this vessel in foreign waters is so



"AMERICA."

well known as to need only a passing mention here. It may be well, however, to give her full dimensions. She was 94 feet on deck, 84 feet L.W.L., 82 feet keel, 22·6 beam, 11·6 draught,

mainmast 81 feet, foremast 79·6, maintopmast 33·6, main boom 58 feet, main gaff 28 feet, fore gaff 24 feet, bowsprit outboard 17 feet.

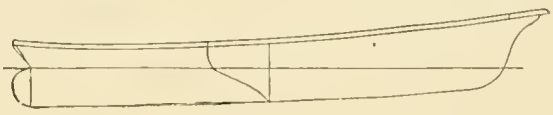
In this enterprise were associated with Commodore Stevens his friends, Hamilton Weeks, George L. Schuyler, James Hamilton, and J. B. Finlay. The "America" sailed for Europe early in July, 1851, and arrived at Havre twenty-one days later, in which port she was put in racing condition, and as soon as in trim sailed for Cowes, the headquarters of British yachting. The great race for the cup, now known as the "America's," was sailed August 22nd, 1851, the course being around the Isle of Wight. The American schooner finished at 8 h. 37 m., while the first yacht of the Royal Squadron crossed the line at 8 h. 55 m. This time-record, however, is hardly fair to the "America," as her nearest opponent, the cutter "Aurora," was some miles astern until near the finish, when a lucky "fluke," so common in yachting, made her a fair second; the thirteen remaining vessels, however, were hopelessly beaten. While in English waters, the "America" was easily successful in a match sailed with the schooner "Titania." Before speaking of other yachts it should be noted that the "America" was the first yacht that ever crossed the Atlantic in either direction. Like the "Una," she is still in existence, and in her modern rig is still rated as one of the fast sailers. During the season of 1897 this grand old schooner, in a cracking breeze and rigged in modern style, beat the swift and scarcely less famous Burgess schooner "Puritan" (formerly the cup defending sloop).

The next yacht worthy of mention is the centreboard sloop "Sylvie," 101 tons, drawing only $4\frac{1}{2}$ feet of water with her board up. She was owned by Louis Depau, Esq., and, like the "America," raced in English waters; but she was not successful. She had, however, the honour of being the first sloop-yacht to cross the Atlantic.

About the year 1854 balloon-sails and club and sprit-topsails came into use on racing yachts, though not such large ones as we see to-day. In this year appeared the famous and, for years, invincible sloop "Julia," owned by James Waterbury, Esq., former owner of the "Una." This new craft was also designed by Steers. Her dimensions were 80 tons, Custom House measurement; for some years she was the pride of the yachting world, and considered the best of the Steers's boats, with perhaps the exception of the ever famous "America." The "Julia" is still, like the "America," in existence, but is now the schooner "Nirvana"; she never was successful as a racer since her change of rig. The "Julia" was the last vessel of note modelled by Steers, as he died soon after at an early age.

In the next period in the yachting history of the country there was a dearth of great designers. Plenty of yachts were built, but they were not much better that those which preceded them. Although it was not until the days of Burgess that anything superior was designed, there was a gradual evolution in the construction of yachts which produced many good results. The Civil War for a short period turned men's thoughts in other directions and possibly delayed for a time advance in the sport. The schooner "Magic" was designed by R. J. Loper in 1857, and was afterwards famous for leading the New York Yacht Club fleet in winning the America's cup race of 1870, against the English schooner "Cambria," the owner of which, Mr. Ashbury, had offered the challenge. The "Magic" was 97·17 tons, and was always considered a good rather than a remarkable boat, until she won her fame in the race above alluded to. In 1865, or during the war, the "Henrietta," owned by James Gordon Bennett and designed by William Tooker, made her first appearance. She was a schooner of 230 tons, and was one of the famous three vessels participating in the celebrated ocean race in December, 1866.

The well-known schooners, "Idler," "Palmer," "Fleetwing," and "Vesta," all came off the ways during 1865. This was the beginning of what



"Magic."

might be called the schooner epoch, which lasted from 1865 until about 1885. This statement does not imply that the schooner was not a popular craft before, or that she disappeared from American waters at a later period, but simply that the schooner "craze" or "fad" reached its zenith during this epoch. Earlier than this many were satisfied with sloops of moderate size, and later the former owner of the sea-going schooner became possessed of the more luxurious but less picturesque steam yacht, that is, if he did not aspire to become a "single stick" cup defender.

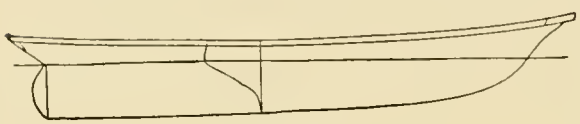
J. W. Herreshoff, father of the famous designer of the "Gloriana," first attracted the attention of yacht owners in 1861 by the appearance of the little sloop "Qui Vive," but it was not until many years later that he became celebrated as the "blind builder."

The year 1866 is famous in yachting annals for the great ocean race between the keel schooners "Henrietta" and "Fleetwing" and the centreboard schooner "Vesta." This race was probably for the largest purse ever known in the history of yachting—90,000 dollars—and the season selected was the most tempestuous of the year. The start was made December 11th, 1866. The yachts were owned as follows:—"Henrietta," James Gordon Bennett; "Fleet-

wing," Franklin and George A. Osgood; and "Vesta," Pierre Lorillard. The thermometer stood at 11° Fahrenheit when the yachts were towed down New York Bay and let go from the tug outside of Sandy Hook. They set every stitch of canvas, including a square sail, despite the severe winter gale.

The "Henrietta" won, having sailed 3,106 miles (or to the light-house on the west end of the Isle of Wight) in thirteen days, twenty-one hours, and fifty-five minutes. This was the first yacht-race across the Atlantic, and was one of the most courageous events in yachting history.

In 1867 the famous schooner "Sappho" first appeared, but was not very successful that season. She was built by the Poillons in Brooklyn, and they had great expectations as to



"Sappho."

her speed; but it was not until after she was hipped out that she became the fastest thing then afloat. Some little time before the "Sappho's" appearance, the "Dauntless" came out. At first, as "L'Hirondelle," she was owned by Mr. Bradford; from him she was purchased by Mr. Bennett, who had her name changed as above. This famous old schooner, after all her triumphs as a racer, is now laid up to rot in the Connecticut River.

In 1870, as before mentioned, Mr. James Ashbury challenged for the America's Cup with the schooner "Cambria," and after much correspondence with the representatives of the New York Yacht Club a race was arranged. The New York Yacht Club course was settled on, namely, from Owl's Head around the Sandy Hook Light-ship and return. Mr. Ashbury desired to have a single vessel pitted against his schooner, but as the "America" had sailed the fleet of the Royal Squadron in English waters, the Committee decided that the "Cambria" should also sail against the New York Squadron in these waters. Shortly before the "Cambria" sailed for America, Mr. Bennett, who was abroad at the time with the "Dauntless," challenged Mr. Ashbury to sail an ocean race across the Atlantic. Mr. Ashbury immediately accepted, and on July 4th they started from England. At about one o'clock on July 27th the first one sighted proved to be the "Cambria," and she shortly afterwards passed the Sandy Hook Light-ship and rounded the point of Sandy Hook, beating the "Dauntless" by just one hour and seventeen minutes—a very close race considering the distance. August 8th was the day selected for the America's Cup Race, and a great fleet assembled, namely, the keel schooners "America," "Fleetwing," "Dauntless," "Restless," "Rambler," "Alarm," and "Tarolinta," and the centreboards "Tidal Wave," "Silvie," "Madge," "Phantom," "Madeline," "Idler," "Magic," "Jessie," "Halcyon," "Widgeon," "Calypso," "Josephine," "Eva," "Fleur de Lis," "Alice," and "Palmer." Yachts at that time started from their anchor, and the "Cambria" was given the weather position; but just before the time for giving the starting signal the wind changed, and placed her dead to leeward of all her rivals, which was extremely unfortunate for her. The "Magic" was the first to get her anchor, and was well on her course before many had weighed at all. The "America" was noticeably slow, and was the last to get away. The "Cambria" was beautifully handled, and, despite her unfortunate position, soon took a good place. The "Magic" never lost her lead, and finished at 3 h. 33 m. 54 sec. The times of a few of the leaders were: "Idler," second, 3 h. 37 m. 23 sec.; "Silvie," 3 h. 55 m. 12 sec.; "America," 3 h. 47 m. 54 sec.; "Dauntless," 3 h. 35 m. 28 sec.; "Madge," 3 h. 55 m. 7 sec.; "Phantom," 3 h. 55 m. 5 sec.; "Alice," 4 h. 18 m. 27½ sec.; "Halcyon," 4 h. 3 m. 8 sec.; "Cambria," 4 h. 0 m. 57 sec.; the corrected time of the same vessels were: "Magic," 3 h. 58 m. 26·2 sec.; "Idler," 4 h. 9 m. 51 sec.; "Silvie," 4 h. 23 m. 45·3 sec.; "America," 4 h. 23 m. 51 sec.; "Dauntless," 4 h. 29 m. 19½ sec.; "Madge," 4 h. 29 m. 57·1 sec.; "Phantom," 4 h. 30 m. 44·5 sec.; "Alice," 4 h. 34 m. 15 sec.; "Halcyon," 4 h. 0 m. 35·9 sec.; "Cambria," 4 h. 37 m. 38·9 sec.

The visiting schooner joined the fleet of the New York Yacht Club on its annual cruise, and sailed a number of races during that period, winning her full share.

Even as late as 1871 there was but little yachting outside of the New York Yacht Club, though the Brooklyn, Eastern, and Atlantic Clubs were beginning to force themselves into notice, with boats of a much smaller size. The Brooklyn, for instance, at this time had but two schooners enrolled—the flagship "Madeline" and the "Fleur de Lis"—though the Club was second only to the New York. A few years later, however (1873), the Boston had thirteen schooners, twenty-five sloops, and two steamers; but the Brooklyn had already begun to decline, and the Boston was more nearly approached in this year by the Atlantic than by any of the smaller clubs.

Of the sloops of this time, the "Fannie" and "Gracie" were undoubtedly in the lead of the large ones, though the "Vision" and "Meta" were close rivals. The "Meta" was afterwards changed into a schooner, but was not improved by the alteration.

During the annual cruise of the New York Yacht Club, that organisation was again challenged for the America's Cup by Mr. Ashbury

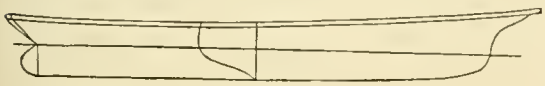
with his new schooner "Livonia." After much correspondence it was decided that the "Livonia" should not sail the entire New York Fleet, but that the Cup Committee should select four vessels, any one of which they could name to sail the "Livonia" on the morning of the race. The agreement also stated that there should be a series of seven races, four of which must be won by the representative boats of the New York Yacht Club or by the challenger, in order to retain or obtain the cup. The four boats selected by the Committee of the New York Yacht Club were the schooners "Dauntless," J. G. Bennett; "Sappho," W. P. Douglas; "Palmer," Rutherford Stuyvesant; and "Columbia," Franklin Osgood. October 16th was named as the day for the first race, and the "Columbia" (centreboard) was the schooner chosen to meet the "Livonia." The wind was light and from the north-west, and the time of finish was: "Columbia," 4 h. 57 m. 32 sec.; "Livonia," 5 h. 23 m. 0 sec.

The second race, October 18th, was in a very strong breeze outside the Light-ship, and the "Columbia" again sailed, winning by ten minutes andthirty-three seconds, Mr. Ashbury protesting that the "Columbia" rounded the outer mark in the wrong way; the protest was over-ruled by Committee.

The third race, October 19th, was over the New York Yacht Club course. The "Dauntless" meeting with an accident and the "Sappho" and "Palmer" not being on hand, the "Columbia" was again named (per force). The "Columbia" broke down, and the English yacht won by 15 m. 10 sec.

For the fourth race the "Sappho" was named, and beat the "Livonia" 30 m. 21 sec. over ocean course.

In the fifth race the "Sappho" again beat the "Livonia" on New York Yacht Club, inside course, 28 m. 27 sec. This ended the series, the American yachts "Columbia" and "Sappho" having won two races each. The "Livonia"



"COLUMBIA."

sailed a match with the "Dauntless" before the close of the season, which the latter yacht won by 10 m. 31 sec.

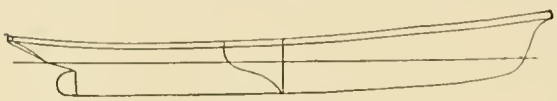
The next two or three years were not very eventful in yachting. The usual number of races were sailed, but no vessels of any historic interest appeared. The "Sappho" was, probably, still the fastest schooner in the waters of the United States, though the "Comet," owned by Mr. W. H. Langley, and the "Estelle," owned by Commodore Smith, were attracting some notice. The large schooners "Dreadnaught" and "Resolute" were magnificent vessels, though not especially successful as racers.

On June 9th, 1875, was launched the unfortunate "Mohawk," built by Mr. Joseph Van Dusen for Mr. Garner. She was probably the largest centreboard pleasure vessel afloat, being 121 feet on water line, 30 feet 4 inches beam, and 9 feet 4 inches depth of hold. In the autumn of this year the "Mohawk" sailed several races, and did not attract attention for her speedy qualities. In this year also the famous sloop "Arrow," built and designed by David Kirby for Mr. D. C. Edgar, first made her appearance, beating the "Fannie," "Gracie," and "Vision" with ease. The "Arrow" has been laid up a long time at Cold Spring, L. I., and is so dilapidated and apparently decayed that she looks as though she would never stretch her canvas again. The "Arrow," although she joined the New York Yacht Club cruise in 1875, did very little racing until the following year, when she won all the annuals in which she started, and also the special Centennial Regatta. The schooner prizes of this famous race were awarded to the "Dreadnaught" and "Peerless" in their respective classes. This race was also celebrated for the first appearance in these waters of the catamaran ("Amaryllis"). She was designed and built by Herreshoff, then coming into prominence. She distanced the entire fleet, but was ruled out by the Committee. Strange to say, this type of craft has never become very popular, though undoubtedly the fastest of all sailing vessels. In this year Mr. John Hyslop designed and launched, for his own private use, the first true wave-form boat (in this country, at all events), the trim little "Petrel." She was a keel craft, and, for her size, was very successful, being only 32 feet over all.

Towards the close of July, 1876, an accident occurred which gave the most severe blow that yachting has ever suffered in this country. The schooner "Mohawk" lying at anchor off Staten Island, with all sails set, was struck by a hard squall and capsized. The owner, Mr. Garner, his wife, and several other ladies lost their lives. How much the schooner's model had to do with this accident, it is impossible to say; but it seems strange that a vessel of her size should have turned over before her spars were carried away.

1876 was also the year in which another America's Cup challenge was received and the race sailed. This time, however, the challenge came, not from England, but from Canada. Major Charles Gifford, Vice-Commodore of the Royal Canadian Yacht Club, was the challenger, with his schooner "Countess of Dufferin," and the New York Yacht Club selected Commodore Voorhis's schooner "Madeline" to be its representative. After the usual large amount of

correspondence, the first race was set for August 11th, the victory to be decided by the best two out of three races. The result of the first race over the New York Yacht Club inside course was 9 m. 58 sec. in favour of the "Madeline"; the race of the following day, over an ocean course from Sandy Hook 20 miles to

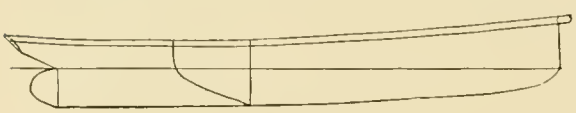


"MADELINE."

windward and return, was also in the "Madeline's" favour by even a greater margin, 27 m. 14 sec. This decided the contest. The "Madeline" was modelled and built by David Kirby (designer of the famous "Arrow") in 1868, and rigged as a sloop. She was afterwards altered into a schooner and lengthened, in which rig she gained her reputation for speed.

The years 1877 and 1878 were not eventful in the yachting world. The usual number of boats were, of course, constructed, and the usual races were sailed without any special interest. This year there was built the first genuine English cutter in this country by John F. Munn, for Robert Center, Esq. She was 40 feet on water line, 12 feet beam, 6 feet 10 inches deep, and carried outside lead. This may be considered the start of what is known as the "cutter craze," and that class of vessel soon became as common in our waters as the old "skimming dish" sloop had been, and its effect has certainly been most beneficial in the modifying of the less seaworthy type.

The year 1879 was noteworthy for an ocean race by four small sloops in the month of October. The course was from Sandy Hook to Cape May Light-ship and return, all the vessels being of the centreboard type. They were the "Mischief," J. B. Buck, 67 feet 5 inches over



"MISCHIEF."

all, 67 feet L.W.L., 19 feet 10 inches beam, 7 feet 9 inches depth; "Regina," W. W. W. Stewart, 50 feet 8 inches over all, 47 feet 3 inches water-line, 16 feet 3 inches beam, 5 feet 6 inches depth; "Wave," Dr. J. G. Barron, 41 feet 8 inches over all, 38 feet 7 inches water-line, 14 feet 8 inches beam, 4 feet 3 inches depth; "Blanche," 41 feet over all, 38 feet 6 inches water-line, 14 feet 6 inches beam, 4 feet 4 inches depth. It is hardly necessary to say the "Mischief" won, but it may be of more interest to learn that all returned in safety, which is somewhat surprising.

In March, 1881, another challenge for the America's Cup was sent from Canada, and this time by a big "single sticker," the "Atlanta," from the Bay of Quinte Yacht Club. She was designed by Captain Cuthbert, the designer of the Canadian schooner which had raced the "Madeline" in 1876. The New York Yacht Club immediately sent an order to David Kirby to build an "improved" "Arrow"—that sloop herself being no longer in the Club. This boat (the "Pocahontas") was built, but proved a total failure in the trial races with the "Gracie," "Mischief," and "Hildegarde." The "Arrow" would have easily defeated any of the sloops named above. The "Atlanta" arriving late in the season, the first race did not come off until November 9th. The "Mischief" having been successful in the trials, was selected to defend the cup. Dimensions of "Atlanta"—centreboard sloop 70 feet over all, 54 feet L.W.L., 19 feet beam, 6 feet 10 inches depth of hold, draught 5 feet 6 inches. The result of the first race at the finish was:

	Elapsed time. h. m. sec.
"Mischief"	4 17 9
"Atlanta"	4 48 24¼

This race was over the inside course of the New York Yacht Club, and was sailed in a heavy breeze. The next day's race was from the point of Sandy Hook, 20 miles to sea and return, and was won by the "Mischief" by over thirty-eight minutes.

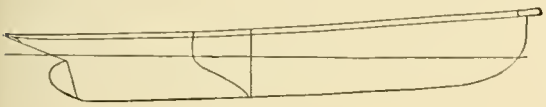
This same year there came to the United States from Scotland the little cutter "Madge," 46 feet 1 inch over all; "at home she was rated as a 10-tonner." She raced with such yachts as the "Schemer" and "Wave," and the famous Boston sloop "Shadow," beating them, to the surprise of American yachtsmen, for they then considered them their best boats.

Between 1882 and 1885, in which year the next cup challenge was sent from Sir Richard Sutton, owner of the "Genesta," the following boats made their appearance: the "Fanita," 50 feet over all, 44 L.W.L., beam 17 feet, and draught 5 feet, probably the fastest centreboard sloop previous to the Burgess period. She was modelled by Philip Ellsworth for J. G. Prague, Esq. Then came the schooner "Grayling," designed by the same hand for Com. L. A. Fish, and the "Fortuna" of Boston for Com. Henry S. Hovey, of the Eastern Yacht Club, designed by Mr. A. Cary Smith.

These gentlemen were probably the best American designers of yachts between the death of Steers and the advent of Burgess. Ellsworth was responsible for the celebrated schooners "Grayling," "Montauk," and "Comet," and the scarcely less famous sloops "Fanita," "Elephant," "Crocodile," "Sasqua," "Arab," and "Atlantic" (the last not much of a success), while A. Cary Smith produced among others

the cup defender "Mischief," and the schooners "Prospero," "Harbinger," and "Fortuna"; his "Vindex" was also celebrated in her day. The "Montauk" had the honour of making the best time over the New York Yacht Club course; the "Grayling" won the noted race around Long Island and two of the famous Goelet Cup contests. The "Goelet Cups," so called, were prizes annually presented for a number of years by the late Ogden Goelet, Esq., and were to be sailed for at Newport during the cruise of the New York Yacht Club. The "Fanita" won the match race around Long Island with the "Ulida," beating that cutter four hours and eleven minutes.

Great preparations were made by the New York Yacht Club to meet the "Genesta" in the America's Cup Race of 1885. Two new boats were built and appeared at the trial races, one, the "Priscilla," designed by A. Cary Smith for James Gordon Bennett, and the other the "Puritan," designed by Edward Burgess. The "Puritan" proved herself the superior, and was selected to meet the English cutter. The first

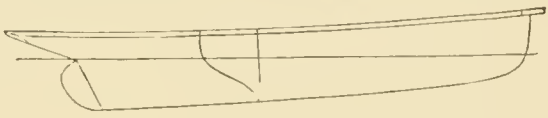


"PURITAN."

race was sailed September 14th over the inside course. Several attempts had been made before this over the ocean course, but they had been failures owing to lack of wind, except on one occasion when a foul had occurred. The result of this first (completed) race was in the "Puritan's" favour by 16 m. 47 sec. The second race was sailed on September 16th in a gale of wind, and resulted in favour of the "Puritan" by the small margin of 1 m. 38 sec. This settled the race for the America's Cup, but the English cutter won that autumn the Brenton's Reef and Cape May Challenge Cups. The schooner "Dauntless" and not the sloop "Puritan," however, was her opponent. She did have one good race outside Sandy Hook, that fall, with some of the best American yachts of the older style, and she beat the "Gracie" by over 29 m.

The "Puritan's" dimensions were: Length over all, 93 feet; L.W.L., 81 feet 1 inch; beam, 22 feet 7 inches; draught, 8 feet 10 inches; sail area, 7,370 square feet.

The following year, 1886, Lieut. Henn brought over the "Galatea," another English cutter, to race for the much-coveted cup, and the New York Yacht Club had another boat of the famous Boston designer's to meet her. Ellsworth had also designed for a syndicate of the Atlantic Yacht Club the sloop "Atlantic," but she was defeated by the new Burgess boat "Mayflower," as were the "Puritan" and "Priscilla" in the trial races. The "Mayflower" was somewhat larger than the American champion of the year before, being 100 feet over all; L.W.L., 85½ feet; beam, 23½ feet: draught, 9¾ feet; sail area, 8,500 square feet. The "Galatea" was probably not so good a yacht as the "Genesta,"



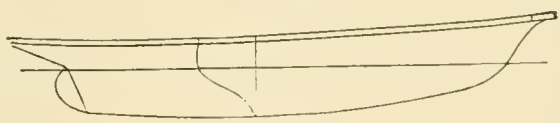
"MAYFLOWER."

and, as the "Mayflower" was better than the "Puritan," the races were not very exciting. The first race was September 7th, 1886, and the "Mayflower" won over the inside course by 12 m. 2 sec. The outside race, called for September 9th, was a failure, both yachts running into a fog; but the decisive race was sailed on the eleventh of the month, and the "Mayflower" won by 29 m. 48 sec.

The following year Vice-Commodore James Bell, of the Royal Clyde Yacht Club, challenged for the same cup, and another new Burgess sloop, the "Volunteer," built for Gen. Paine, was selected to meet her. Again, the size was slightly increased, the "Volunteer's" dimensions being 106 feet over all, 85 feet L.W.L., 23 feet beam, 10 feet draught. The "Thistle's" length over all was 108 feet 5 inches; L.W.L., 89·46; beam, 20·3: depth of hold, 14·3.

The first race was sailed September 27th over the inside course, and "Volunteer" won by 19 m. 23¾ sec. The outside race was not sailed until September 30th, when, in a good breeze, the "Volunteer" won by 11 m. 48 sec.

The year 1888 was principally noted for the popularity of the Burgess "40-footers," a class of yachts that sailed many races during that



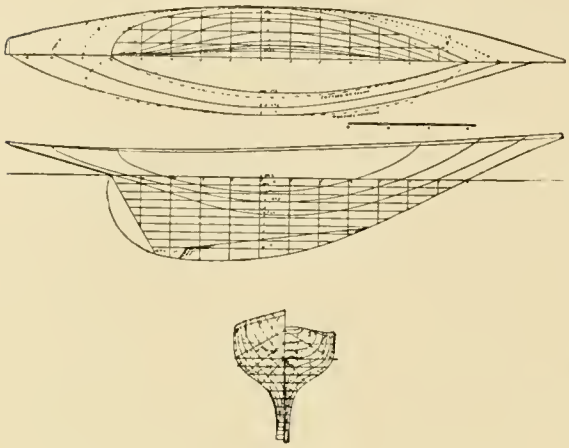
"VOLUNTEER."

season and the next. The most successful of these were the "Papoose," "Banshee," "Chispa," "Tomahawk," "Nymph," "Choctaw," and "Gossoon." There may be added also the Gardiner yacht "Lyris"; but it is doubtful if any of these equalled, as they certainly did not excel, the famous Fife cutter "Minerva." Probably the "Gossoon" came nearest to her.

There was much talk of a challenge for the cup in 1889, but nothing came of it. There was, however, some very pretty racing this year (outside of the forties) among the large sloops (70-footers), three new ones of merit having appeared—the "Shamrock," J. R. Maxwell, Esq.; the "Titania," C. O. Iselin, Esq.; and

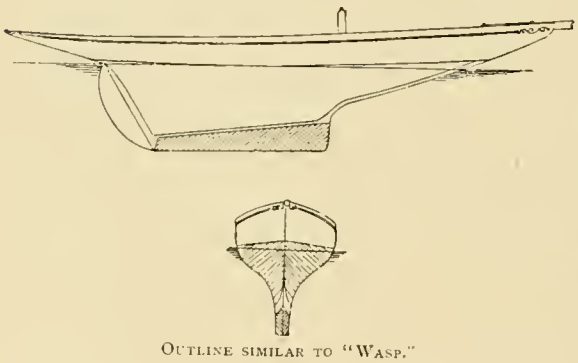
the "Katrina," Messrs. E. S. and H. D. Auchincloss. These yachts were so closely matched that the honours were nearly even.

In 1891 occurred the greatest blow to the advancement of yacht designing since the death of George Steers. This was the death of the celebrated Edward Burgess. He died on July 11th, at his home in Boston, of typhoid fever.



Design of a 46-foot Yacht similar to "Gloriana."

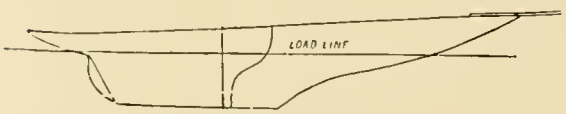
The 46-footers, which in popularity took the place of the forties, appeared this year (1891), and Herreshoff brought out the "Gloriana," the most speedy boat of the season. She was not



Outline similar to "Wasp."

defeated until a year later by the "Wasp," a production of the same designer.

In 1893 came another challenge for the cup from Lord Dunraven, owner of the "Valkyrie II." Several yachts were built to meet her—the "Jubilee," "Pilgrim," "Colonia," and



"Vigilant."

"Vigilant." The last, a Herreshoff production, was successful in the trial races, and was selected to defend the cup. Her dimensions were: Length over all, 130 feet; water-line, 85 feet; beam, 26 feet; and 14 feet draught. All the races were to be outside (best three in five). Without noting the races that were failures for want of wind, the results were:—

October 7th. First race, "Vigilant," won by 5 m. 48 sec., race sailed in moderate wind.

October 9th. Second race, "Vigilant," won by 10 m. 35 sec., over a triangular course in a heavy breeze.

October 13th. Third race, "Vigilant," won by 40 sec. in half a gale.

During this year the "Navahoe," another of Herreshoff's designs, owned by Royal Phelps Carroll, Esq., had been in British waters racing, but she had not been particularly successful, though she brought home the Brenton Reef Cup, won by the "Genesta."

In 1895 another challenge for the America's Cup came from Lord Dunraven, owner of another "Valkyrie," known as "Valkyrie III." There was but one boat constructed to meet her, the "Defender," designed by Herreshoff for a syndicate of well-known yachtsmen.

The first race was sailed on September 7th, and was won by "Defender," by 8 m. 49 sec., corrected time.

In the second race a foul occurred at the start: and, although the "Valkyrie" won, the race was awarded by the committee to "Defender."

In the third race "Valkyrie" crossed the line under lower sails only, and declined to go over the course. The race was necessarily awarded to "Defender."

As these races, the second and third, were decided upon technicalities, and not upon the sailing of the yachts, the reader desiring to pursue this matter further is referred to the printed report of the Cup Committee of the New York Yacht Club.

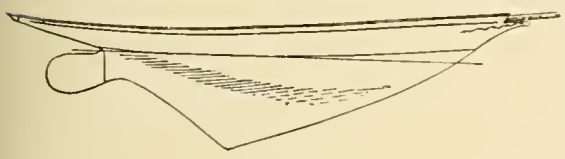
In 1895 a series of races was sailed on the lakes between the 51-foot Canadian cutter "Canada" and the United States cutter "Vancedor" for an international cup, which was won by the "Canada."

In conclusion, among the crack yachts of this year (1897) may be mentioned the schooners "Colonia" (formerly sloop), "Emerald," "Amorita," and "Quisetta"; and the sloops "Wasp," "Syce," and "Norota."

Sailing in Small Boats—Small boat sailing and racing started in the United States in the "skimming dish," "sand-bag" type of boats, and has now developed into the fin-keel. Among the boats of the first-mentioned type that won celebrity may be named the "Sousie S.," "Maud," "William T. Lee," W. F. David's, "Mary Emma," "Pluck and Luck," "Cruiser," "Fairy," and the Boston cat-boat "Fancy." These ranged from 15 to 30 feet over all, and were rigged both as sloops (jib and mainsail) and as cat-boats at different times. This change was easily accomplished by shifting the mast of the

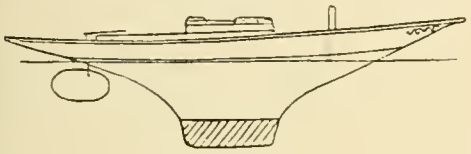
sloop forward to a step in the extreme bow, and taking off the bowsprit. Of late years the "sand-bagger" has become unpopular from its propensity to capsize in every ordinary squall when not properly handled.

In 1890 and 1891, 25-foot water-line keel and fin-keel sloops were built, with all outside lead, and were certainly a safer if not a more comfortable style of craft. Among the better known



"SMUGGLER."

of these were the "Smuggler," "Needle," and "Nameless," and later the "Pixie," and they sailed in many fine races.



"PIXIE."

In 1893 and 1894 the so-called "half-raters" appeared, and have since formed an interesting class. They were small boats of about 15-foot water-line, and of all shapes imaginable, including even the scow.

In 1895 the Seawanhaka-Corinthian Yacht Club offered an international challenge cup for this class, which was won in a series of races by the "Ethelwyn" against the English boat "Spruce II"; but the following year (1896) the "Glencairn," a Canadian boat, succeeded in winning it from the "El Heire." And again, in 1897, the Seawanhaka-Corinthian boat "Momo," having challenged the Canadian, was defeated in two out of three well-contested races on Lake St. Louis, Canada, by the "Glencairn II."

In 1894 and 1895 a number of 30-foot fin-keel boats made their appearance, and formed a most interesting racing class, which had many important additions in the two following seasons. Among the most prominent were the "Vacquero," "May," "Raccoon," "Carolina," and "Musme."

In conclusion may be mentioned the 36-footers, including the "Acuspla," "Dragoon," and "Vorant II," which have sailed many good races; during the season of 1897 the "Surprise" and "Anoatok" were added to the class.

American Steam Yachting—It always has seemed to sailors and racing men that steam yachting was an agreeable and luxurious method of transportation and sight-seeing rather than a sport. Be this as it may, the steam yacht has long been popular in the United States, and the waters are filled with every kind of steam craft, from the 20-foot launch to the ocean-going steamer. Of late years the steam launch has almost entirely disappeared from American waters, to give place to the naphtha launch, and it looks now as though this craft in turn would be superseded, at no distant date, by the electric motor; but for larger craft steam still holds its sway. Some of these steam yachts, in smooth water, have attained an almost incredible speed, the maximum being over 30 knots an hour. Among these flyers are the "Vamoose," "Norwood," "Now Then," "Rob Roy," "Stiletto," and the little "Half Moon."

A race between the "Vamoose" and the "Norwood" was much talked of but never took place. Several steam-yacht races have occurred, but no records were broken. Of the larger ocean-going steam yachts, some are most graceful in appearance and costly in their appointments. The best known of these are the "Atlanta," "Corsair," "Utowana," "Electra," "Orienta," "Golden Rod," "Mai," "Sapphire," "Golden Fleece," "Alicia," "Conqueror," "Narada," "Valiant," and "Sovereign." Then there are the "auxiliary" schooners, which have a limited amount of steam power to enable them to keep off a lee shore in a gale or to make headway in a calm. Of these the "Intrepid" and "Sultana" are good representatives. The Herreshoffs have been great designers of steam as well as sailing yachts, and probably rank as high in one class as in the other. In steam navigation, since more depends upon the mechanical contrivance than upon the model of the boat itself, there is less attention given to the design of the hull, and much more to that of the engine.

In conclusion it must be regretted by true sportsmen that the steam yacht's popularity is increasing with many of the best American yachtsmen, who, a few years ago, were racing in their beautiful sloops and schooners.

CHAS. PRYER,

Ex.-Com. New Rochelle Yacht Club, and Corinthian Fleet of New Rochelle.

ICE YACHTING—The opportunities of ice-boating in England are so few and far between that it takes a long time to find out from our own experience the best form of boat, with the proper proportion of sail, length, beam, weight, &c., suitable for the thin ice we get on our lakes. I made my first attempt at an ice-boat in 1877, but not until 1895 did I arrive at anything I could thoroughly recommend. February of 1895 afforded a splendid opportunity of trying experiments and making improvements, as Windermere was frozen over, and the ice lasted a fortnight without any snow, and became 9 inches thick. On ice like this, American ice-boats would do very well, but they would be too heavy for the average ice we get in England, as I believe they are more than twice the weight of mine. Weight can easily be added by ballast if the ice is strong enough to carry it, and will be found of great advantage in beating to wind-

ward. The boat I have had for the last sixteen years weighs 6 cwt. 28 lbs. complete, but I am building one which will weigh 9½ cwt. ; this will be found quite heavy enough.

Ice-Boating on the Lakes—The English Lakes naturally afford the most room and the best ice for sailing in this country, and as they do not all freeze at once, snow and bad ice can generally be avoided by removing the boat from one lake to another. Esthwaite Water is generally the first to bear, for it is shallow, but there are dangerous places in it and often a great deal of air in the ice. There is a shallow ridge running right across the lake diagonally, so shallow that a man can nearly wade across, and, curiously enough, the ice over this ridge is never as thick as the rest. When Esthwaite is spoilt by snow, Windermere is generally on a fair way for bearing, but only in parts. Windermere is never frozen over completely, there being always large cracks right across it which never seem to freeze, and a mile or a mile and a half is the most one can ever expect to get on a straight run. The ferry track is always kept open, and there is nearly always a large piece of open water between Belle Grange and Millerground. Even in 1895 there was a crack about 9 feet wide over which it was impossible to skate or sail in this part. Rydal Lake is very much shut in by the hills and very small, being little more than a mile long,

(It is necessary to have permission from the lords of the manors of both Esthwaite and Rydal before one can sail on them, as no boats are allowed on the water.)

I will not dwell long on my first attempt at building an ice-boat, as it was a very rude machine, made in a day and a night, and consisted of a simple cross of yellow pine planks with upright pieces to strengthen them, a small lugsail, and two ordinary wooden skates screwed under the ends of the cross beam. I steered with the skates on my feet, one on the ice on either side.

The first time I tried it was on Esthwaite in a gale of wind from the south-east against which one could hardly skate. This was a grand opportunity of trying its speed over a measured mile, and a friend of mine skated ahead to take the time at the finish. I had great difficulty in shaping my course, as the boat would broach to, but at last, after several false starts, I managed to get her straight before the wind, and flew down the lake, keeping my feet as straight as I could on the ice. I had only one passenger on this occasion, an old salt who had been accustomed to nothing but full rigged ships, and he clung to the mast all the time with both his arms and all his might. I had taken the precaution to tie the end of the main sheet round my wrist so that I should not part company with the ship in any case.

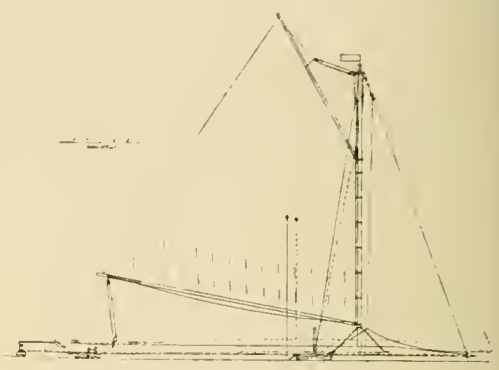
All went well till about half way, when the skate on my right foot came in contact with something on the ice and I was flung overboard in a trice. It was lucky I had taken the precaution to tie the main sheet round my wrist, as by it I hauled myself hand over hand up to the boat, and was very soon on board again, finishing the mile in exactly three minutes.

The next thing was to stop, but as the old man was far too terrified to let go the mast and lower the sail, I knew there were only two courses open, either to be dashed to pieces on the rocks, or to make as easy a capsize of it as possible. I chose the latter ; and having hailed the old man with a "Now then, look out," rounded to, and over she went.

I have a very indistinct recollection where the old man went to, though when we brought up he was still on the ice, and I should think the boat must have gone at least 70 yards on the mast head, with our runner up in the air, before it stopped, not many yards from some very ugly rocks.

I was so disgusted at the inefficiency of this boat that I at once set to work to make a new one, stronger, wider, longer, and with more sail ; with bevelled steel runners and steel rudder. I improved this boat from time to time by increasing the beam from 12 to 14 feet, by putting three short runners on each side instead of one long one, by placing the mast further forward, and by and by adding a jib, so that it is now exactly like the drawing and a fairly good machine. In 1895 I did a measured mile in it, with five people on board, in 2 minutes 15 seconds, and later with the same number on board, ⅜ of a mile in 36 seconds, or 38½ miles an hour.

In the hard winter of 1880, I tried a new ice-boat with a triangular sail supported by three light sheer legs,



Sail and Sheer Plan.

instead of a mast as shown in the illustration, but, though very fast off the wind, it was not much good to windward, and I had great difficulty in preventing the sail swinging about in stays. I very soon gave up this experiment and returned to the old plan.

On March 9th, 1886, I had a splendid breeze on Esthwaite from south-east, but though the ice was strong it was full of melted snow, white and very rough. The boat nearly flew, and we had a splendid sail, but in the evening, when it was beginning to get dark, we happened to come across a rotten piece of ice about 2½ inches thick, exactly over the shallow ridge previously mentioned. The lee runner made a perfectly straight cut through the ice about 30 yards long, and quietly settled down to leeward in the water. I was very soon up to my neck, and a lady sitting in front of me fell over to one side and afterwards told me that her foot touched the bottom. I could hardly believe this, for we were very nearly in the middle of the lake, but afterwards we found it was actually the fact. I think there were four of us on board, and we succeeded in climbing to the bows, which were up in the air, and eventually got on to strong ice and reached the shore.

We left the boat just as it was for the night, with the sail up, and the next day I went with a cart load of planks and ladders and got her out of the hole. The water was just about 3 feet deep at the stern and the stern was resting on the bottom.

Construction of Ice-Boat—The chief things to be considered in constructing an ice-boat are lightness, strength, and simplicity, with as little surface to meet the wind ahead as possible. I hope my drawings are sufficiently plain to show my method of arriving at this without much explanation, but the runners and rudder must be gone into at some length, as they are very important parts of the boat.

Frame—The main body of the boat is a long trough of 1 inch yellow pine hung under a bent T iron beam by a ¾ inch bolt, as shown in the plan, and the cross platform is also 1 inch yellow pine bolted to it.

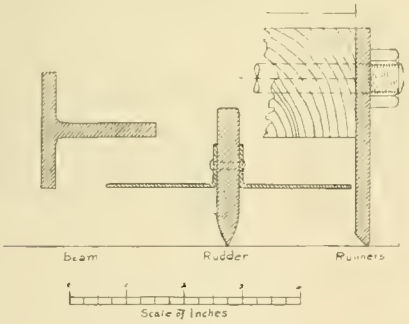
There is a strengthening piece about 12 feet long and and 1½ inch thick, laid in the bottom of the trough, to prevent the mast driving the bottom out. The sides of the trough are screwed into this and the cross platform is bolted through it, thus giving great additional strength. Over this is a triangular block of wood, as shown in the cross section, through which the ¾ inch bolt goes which keeps the trough from twisting over and keeps the iron beam upright at the same time.

The bent beam is ⊢ iron 2 inches × 2 inches and ¼ inch thick, and the thick lines in all three plans represent the edges of the flanges.

The wood of the cross platform is cut away to allow the horizontal flange to rest on the tops of the runners, and the lower flange is notched on to the runners so that the side is dead on them. The three runners on each side are bolted through blocks of elm 32 inches × 5¾ inches × 1¾ inches, and then there are two ⅝ inch rods 14 feet long, about 2 feet apart, which go right across the boat under the cross platform and through all the runners and elm blocks. These are tightened with nuts that the bridge may not drive the runners outward, thus binding the whole together.

The end of one of these rods is shown in the section of the outside runner, but not in the other plans, as it would only confuse them. The blocks of elm are bolted through the horizontal flange of the iron beam, one of the bolts on each side being used for the rigging. I have always screwed the steel runners to the blocks of elm with common screws, but think bolting them together right through would be better.

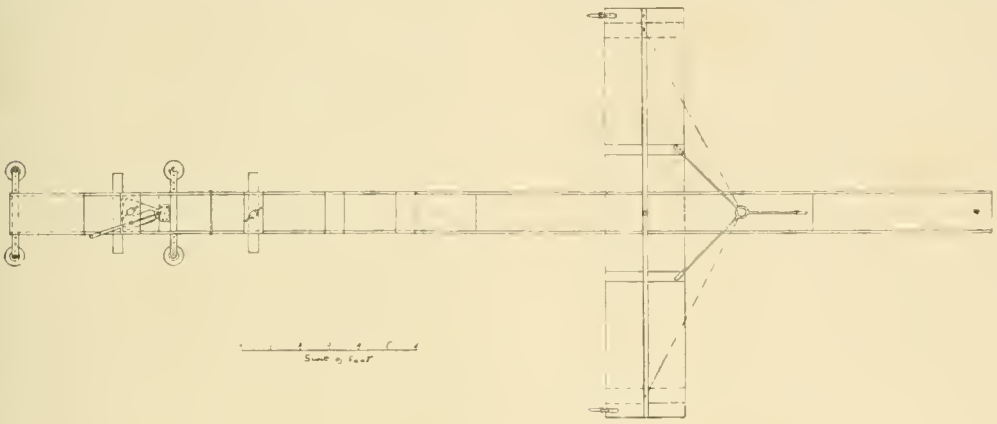
The mast is held in an ordinary tripod, and the shrouds and forestay, which are ⅝ inch iron rods, are tightened up with nuts, but perhaps right and left handed screw lanyards would be better. Wire rope would not do so well for an ice boat, for it would stretch under the great strain.



Beam, Rudder, &c.

The stern is carried by two beams resting on four glass bull's eyes, 8 inches in diameter and 1⅛ inches thick, clipped to blocks of wood with felt in between the wood and glass to prevent any sudden shock breaking the glass. I think I have broken only one in the many years I have had them. They are flat underneath, like curling stones, and run beautifully on ice, and, glass being a bad conductor of heat, they do not stick much after stopping; the steel runners have to be prised out of the ice in the morning unless a piece of wood has been put underneath them for the night.

Runners—The steel runners, six in number, are parallel to each other and side by side, as shown in the plan. I am not at all sure that three on each side are better than two, but I am sure two are better than one; however, I tried three with very good results. They cannot get into a crack unless the crack is a foot wide, and they have lateral resistance equal to one long runner touching the ice four feet, with the turning capacity of one, touching the ice only a foot and a half.



Body Plan.

The camber and bevel of the runners should be very carefully studied, as it makes all the difference in the sailing to windward. The most effective runners to windward I have tried are cambered $\frac{1}{16}$ of an inch in a foot and a half, which is practically their touching length when sailing, and the ends are rounded up in a fair curve from this. The bevel, which is of course outwards, is about 45 degrees; the outer edge is slightly bevelled back in a round form, as shown in the plan. I have tried runners perfectly sharp like chisels, but they simply chip the ice right away and let the boat drift to leeward.

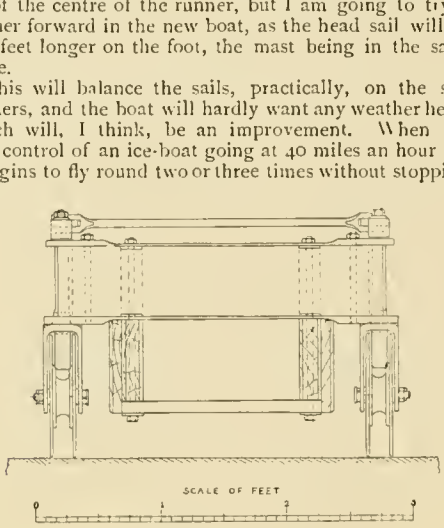
The round form makes for itself a hollow bed in the ice, which does not chip so easily, and prevents leeway. This rounded edge goes the whole length of the runner, so that the sharp edge is perfectly straight fore and aft. It is very necessary that the runners should oscillate fore and aft, so as to accommodate themselves to rough ice; but with the iron beam resting in the middle on the flattest part of the runners, the oscillation will be found quite sufficient. I should like to have made the three runners on each side oscillate independently of each other, but it would add more weight and complicate the construction.

Rudder—The rudder is somewhat in the form of a wood chopper with the handle turned up, and goes through a fan-shaped hole in the bottom of the trough. It is held at the fore end by a bolt in a close-fitting hinge, turning in two plates as shown in the plan, so that it is in a universal joint, and the rudder can be moved from side to side or up and down at pleasure. Going free, its own weight is generally sufficient to steer the boat; but, when beating to windward, it is often necessary to put one's entire weight on it; not to turn the boat, but to hinder it from turning too quickly and to keep it steady. The blade of the rudder is about ⅜ inch thick and sharpens in the form of a V. It is necessary to have a horizontal plate on each side of it that the cut ice may not fill the end of the trough, and cover one's clothes.

There is a hook under the board just over the tiller in which to set it when not wanted, which is handy when it is necessary to push the boat round quickly.

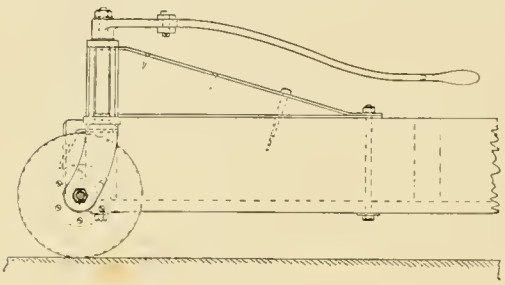
Sails—The sails I tried this year had a total area of 307·27 square feet, 241·71 in the mainsail, 105·56 in the jib. The combined centre of effort is just about 2 feet aft of the centre of the runner, but I am going to try it further forward in the new boat, as the head sail will be two feet longer on the foot, the mast being in the same place.

This will balance the sails, practically, on the side runners, and the boat will hardly want any weather helm, which will, I think, be an improvement. When you lose control of an ice-boat going at 40 miles an hour and it begins to fly round two or three times without stopping,



RUDDER (BACK).

the result is truly appalling, and I wish to prevent this by putting the centre of effort further forward; besides, I do not see any advantage in giving her so much weather helm, as it only stops her. The sails should be of fairly strong stuff, and I prefer a loose-footed mainsail to a laced one, as, in the latter, it is so difficult to reef without tearing out the reef points. With a laced



RUDDER (SIDE).

mainsail I once tore three sets of reef points clean out one after the other, and had to go home for a fresh sail.

In the winter of 1895 I tried a jib with sheets, but next time I shall try a staysail with hanks on an iron forestay, and a toggle running on a fixed iron horse. It is necessary to shift the top block strip forward on the boom with each reef taken in, so as not to break the boom.

The idea of an ice-boat sailing faster than the wind has often been ridiculed, but I will try to prove in a very simple way that it is possible to sail three times faster than the wind.

Take a metal plate with two grooves in it, running at right angles to each other, get two dies fitting these grooves, one in each, both bevelled to 45 degrees, and press one bevelled edge against the other. It will be found that they will both travel at exactly the same speed; but, if you bevel one at 15 degrees and the other at 75 degrees, it will be found that the one bevelled at 75 will have to travel three times faster than the one bevelled at 15, with the same process.

If the sail is let out to 45 degrees, it is impossible, under any circumstances, to go any faster than the wind; but if the sail is pulled in to 75 degrees the effect will be just the same as with the dies, and the boat will go three times faster than the wind. This, of course, is owing to the resistance not increasing in proportion to the wind pressure, as in an ordinary boat, and this is why ice-boats always sail best with their sheets close hauled.

Handling the Sails—The best point for sailing on ice is with the wind dead abeam and the sheet well in, not quite as close as *on* a wind, but very nearly. Although the wind is abeam, the burgee will fly at about 45 degrees, and, as there is no ripple on the ice to show any change of wind, it takes a remarkably clever man both at the mainsheet and at the tiller to make the best of it.

There is a certain point, combined with a certain angle of sail, at which the boat simply flies, but it is difficult to find and maintain, and I think the best plan is to keep the sheet well in and find it by slightly altering the course.

Sailing to windward, a good boat with good sails will easily go within four points of the wind, but I do not think any advantage will be gained by trying to go closer. In going about, the chief difficulty is to prevent the boat doing it too quickly, and the less tiller given the better. In a good wind, two seconds will see the boat full on the other tack and off. In beating to windward, it is necessary for everyone to keep as flat as possible, and a man standing on the weather runner, though often necessary, is a great detriment to speed.

No matter how strong the wind, the sail is always hanging straight up and down, and the main sheet trails on the ice, in fact it is difficult to keep it from getting foul of the rudder.

There is apparently not a breath of air, and a pipe can be lit with the greatest ease. Running before the wind is quite the slowest point in ice sailing, which will be thoroughly appreciated when you begin to luff and pull in the main sheet.

Going at a high speed it is necessary to be very careful, in any case never going anywhere where there is not at least a hundred yards room to turn in, and always keeping a perfectly steady hand on the tiller. Several times I have tried to turn too quickly, with the result that the boat has spun round two or three times without stopping, and the passengers have been flung in all directions. She sometimes goes round in a very ugly way, too, taking side jumps, and at each jump chiselling hollow basins out of the ice. When this manœuvre takes place the rudder becomes quite useless, simply filling the air with cut ice. It is very difficult to hang on, and at the same time to put all one's weight on the tiller; but I have a place just in front of me which I can catch hold of in a moment, and I never left the ship once last winter except of my own free will. I am afraid this was not the case with some of the passengers, but no one was seriously hurt.

The noise when sailing at a high speed is very great, and can be heard miles away; in fact, it is impossible to make any one hear on board without shouting, and I am afraid some of my words of command and opinions have been made known to those not intended to hear them.

It is not very difficult to make an ice-boat go fast in a strong wind, but it is very difficult to make it move at all in a very light wind, as there is always a certain amount of sticking, especially in the steel runners. However, I can keep my present boat in motion when once started with an ordinary piece of cotton thread, when there is no wind.

The grooves left in the ice are very slight, and do not interfere with skaters in the least. Sailing to windward, when they are deepest, they are not much more than $\frac{1}{16}$ inch deep and $\frac{1}{8}$ inch wide. It is very easy to calculate from these grooves exactly how close the boat can go to the wind, by measuring the angle formed in going about.

An ice-boat is stopped in exactly the same way as an ordinary boat, by rounding up head to wind. After it is stopped, the sheets should be considerably eased off, especially the jib, as a change of wind might start it

again ; and, if it did, there is no knowing when it would stop or what mischief it might do.

There is very li tle tendency to go astern, but to prevent the possibility of this I have two little spikes, like marline-spikes on hinges, as shown in the drawing, one on each side, just aft of the runners. These either trail on the ice when going ahead, or can be turned up. It is safer to let them trail, as they do no harm, and immediately dig in the ice when she wishes to go astern.

Boat designs.—I have ticked in on the drawings the side view of the new boat built this winter ; also the end view and cross section at the beam. It will be seen that it is 2 feet shorter at the stern and 2 feet longer at the bows than the old one, thus keeping the weight further forward, which is very desirable, and giving room for a larger head sail. It will also be seen from both plans that the trough is deeper and wider, giving the passengers room to sit inside it instead of on the top, and there are comfortable hack rests and handles outside to hold on by, screwed on to the sides. The extra depth gives additional strength, which is needed, as the old boat was too weak at the mast, and gave way towards the end of last winter. All the trough in front of the mast is closed in and made watertight, and I think part of the stern will be too. The cross section shows the extra beam and higher bridge, also an iron span in place of the triangular wooden block, which catches a good deal of wind.

I give separate drawings of the new wheel rudder, so as not to confuse the plan.

This rudder is only just finished, and as I have not had an opportunity of trying it yet cannot guarantee its efficiency. It is composed of four circular steel plates, bevelled as shown in the drawing, mounted in the form of castors, and running on ball bearings. The man steering sits *in* the trough, forward of the tiller in this case, instead of *on* the trough aft of the tiller, as the old type. This should be much more comfortable, and keep the weight further forward at the same time. When the weight is far aft the tendency to fly round is very much increased.

There will be no glass bull's-eyes required, as the weight will rest entirely on the wheels, which run with very little friction.

When a rudder cuts the ice, as in the old plan, there is always friction, but these wheels will crush it rather than cut it, and the only friction will be in the ball bearings. However, it remains to be proved how it will act, and whether it will steer the boat.

The boat is unfortunately rather heavy, and with three pieces of wood, the cross beam, and two triangular pieces weighs 128 lbs.

The new mast is stronger than the old one, being 4½ inches thick at the tripod, and 4 inches at the hounds. The boom is also stronger, being 3¼ inches thick at the thickest part.

I have done away with the after legs of the tripod, and put two ⅜ inch rods, shown by ticked lines, in their place ; also two extra shrouds, shown in the same way.

The centre of effort will now be only 1 foot 4 inches aft of the centre of the runners, instead of 2 feet, which will give her very little weather helm. The total area will be 327·31 square feet. The main sheet horse will be a foot further forward, to give the steersman more room.

HERBERT CROSSLEY.

ICE-YACHTING IN AMERICA.—This fascinating and exhilarating winter sport has at the present time reached a very high degree of perfection, and for pleasure sailing and racing is, one may say, practically confined to the frozen rivers and lakes of the United States and to some localities in Canada where the conditions favour it, as at Toronto and Kingston. It began to take definite shape some fifty years ago on the Hudson, where in 1861 the first regular club was organised and christened the Poughkeepsie Ice Yacht Club, to be followed, as the sport developed, by the formation of similar clubs from Sandy Hook on the Atlantic to the lakes in Minnesota, half-way across the continent.

Good ice-boating requires certain climatic conditions that are rarely combined over a large area of country. During the winter months in a very cold climate there is of course plenty of ice, but as it is usually covered with snow, more or less deep, that stays all winter, ice-boating is then out of the question. The best climate, therefore, seems to be one where there is during the winter months cold enough to make six or eight inches of clear ice to start with ; and then, after snow has covered this, frequent thaws or rains soak up and melt the snow, followed by a quick frost. That portion of the Hudson River Valley from Newburg to Hyde Park seems to fill best the conditions outlined above for the necessary development of the sport. Here, too, will be found the leading clubs and the fastest yachts. The distance on the river between the points named is about twenty-three miles. Including the Orange Lake Club, a sturdy organisation on the lake but a short distance back from the Hudson, there are five clubs. The Orange Lake Club claims ten yachts, the largest of which is a cat-rigged craft of 800 square feet, sail area.

The southmost club on the Hudson is the Carthage Club, possessing a fleet of twenty-six yachts, mostly of the jib and mainsail type, though some are cat-rigged and two are lateen. Of the latter, one is an uncommonly fast yacht. The largest yacht in the Carthage Club is of jib and mainsail rig, and spreads 950 square feet of canvas to the winter breezes. The remainder of the fleet will average about 400 square feet, sail area.

The New Hamburgh Ice Yacht Club, one of the older organisations, has twenty-three yachts enrolled, ranging from 900 to 250 square feet, sail area.

The Hudson River Ice Yacht Club, of Hyde Park, New York, which, without injustice to any of the others, may be styled the leading club of the United States, possesses a fleet of forty-one yachts of all types, the favourite one, however, and by far the most numerous, is the jib and mainsail. The yachts range in size from 800 square feet of sail area down to 200. Outside of the Hudson River some of the leading clubs are as follows :—The North Shrewsbury, at Red Bank, New Jersey, with some fourteen yachts averaging about 452 square feet, and one large boat of 800 square feet. At Lakes Minnetouka and Pepin in Minnesota, and at Toronto and Kingston, Canada, are many fine yachts and clubs, and it is to be hoped that some of the newer and younger devotees of the sport will try conclusions on the Hudson for the championship of America.

All the clubs mentioned are progressive and active associations, controlled by the usual officers—such as commodore, vice-commodore, treasurer, and secretary, along with a regatta or sailing committee, whose duty it is to take charge of the racing.

The ground work in the construction of an ice-yacht is rather simple, and consists of two pieces, one called the centre timber running fore and aft, on which is stepped the mast, the forward part constituting the bowsprit and the after part carrying the box and the rudder-post. The dimensions vary from about 28 feet to 50 feet in length, and from 4 to 6 inches in thickness, and from 8 to 15 inches in greatest depth. The other piece is called the runner-plank, a broad stout plank with some crown to it, from 12 to 17 inches wide, and from 3 to 7 inches thick in the middle, and from 14 to 28 feet long, tapered in thickness towards the ends to which the runners are attached, working in chocks. The centre timber rests on the runner-plank to which it is secured by a gammon iron. Stays leading from the ends are secured and set up to turn-buckles on the runner-plank. The mast is secured by shrouds leading on each side to the runner plank and by a fore-stay leading to the outer end of the centre timber. The early yachts of the Hudson River fleet were constructed a good deal on the lumber-box order. They were heavy, hard riding and hard-headed too, jib and mainsail rig, with the mast in line with the runner-plank and not some distance forward, as prevails at present. They carried short gaffs, long booms, moderate hoist of mainsail and big unwieldy jibs with jib booms.

This stepping the mast over the runner-plank, gave the boats a bad balance. That is, it brought the centre of effort, as well as the weight, too far aft; consequently the tendency in beating to windward was to luff, and this had to be avoided by keeping the boat's head off, and the weight of the mast being too far aft also brought additional pressure on the rudder. All this unnecessary friction caused a proportionate loss in speed, especially to windward.

This type of yacht reached its greatest development in the "Icicle," the largest ice-yacht ever constructed. She was built in 1869, and was improved and enlarged until she measured 68 feet 11 inches long, with sail-driving area of 1070 square feet. She was unquestionably the fastest in 1879 of any of the yachts on the river. It was not long, however, before an improved type of rig and construction made its appearance, and this was accomplished by stepping the mast about 3½ feet further forward or ahead of the runner-plank. This necessitated shortening the jib, making it more of a balance sail than before. Main booms, too, were cut off and gafis lengthened, bringing the sail more inboard, and thus placing the centre of effort in a much more proper relation to the centre of resistance. Side rails and cockpits gave way to wire guys with adjustable turn-buckles, and small elliptical boxes for the helmsmen.

The essential elements that all these yachts possess in common are: lightness, combining great strength of construction; a runner-plank that has considerable elasticity or spring to it, the effect of which is not only to make the boat more comfortable to the user, but I think also, in connection with the long runners, hung well back and rockered towards their forward ends, a great factor in attaining speed, as the impacts or blows resulting from inequalities of the ice are distributed easily and more slowly to the swiftly moving mass of the boat taken as a whole.

To explain: Take one of the large yachts; her weight would be at least 3000 lbs., including everything. Move this body, say, at the rate of 40 miles an hour, or $58\frac{8}{10}$ feet per second; a hard, frozen hummock of snow or ice is encountered; now if the plank is rigidly trussed and the runners straight or without rocker, the blow must be a severe one, and the shock to the other parts of the yacht much more severe, entailing heavier construction in all its parts, hence increased friction and a loss in speed. Whilst, on the other hand, with a properly-proportioned flexible runner-plank, and an easy, gradual rocker to the runners, the yacht so equipped will glide up the obstruction, and shooting ahead clear of the ice, drop down with very little perceptible jar, though the runner-plank may have been deflected, as I have often witnessed, 6 or 7 inches vertically from its normal arched position.

The angle or bevel of the runners is somewhat a matter of fancy, many of the fastest yachts having two sets of runners, the one with a sharp or acute V-shaped cutting edge for very hard ice, and the other pair of a more obtuse angle, just a trifle over 90°. The material used for runners is generally a hard cast-iron V-shaped shoe bolted to an upper part of well-seasoned oak. These are attached by a pin through a metal bushing in the runners to the chocks, which are in turn bolted securely and braced by knees to the runner-plank. The material used for these planks and also for the body of the yacht is either basswood or butternut. Ash is used for runner-planks when they are required to be very large or support considerable weight. The greatest care and attention are bestowed upon the sails, their quality, and the way they fit. Yachts of a few years ago spread very heavy canvas in comparison with the size of the sail. This has, I think, been found an error, and much lighter sails are now used. No doubt further improvement in this direction is desirable.

In the selection of material for a first class yacht, great pains are taken to get only the very best growth of timber, which is usually picked out on the stump and taken to the nearest mill to be properly sawed out. The finest crucible-steel wire should be used for shrouds, stays, and fore and aft side guys. Turn-buckles should be hand-forged. As windage plays an important part in the speed of ice-yachts, care is taken to reduce it as much as possible, and to that end masts and spars are as short and light as is consistent with properly setting the sails and the requirements of safety. All woodwork has the highest cabinet finish. The cost of a yacht such as I have described, and about 48 feet long, complete in every respect, would be about $8900.

Before closing it may be well to consider the wonderful and phenomenal speed attained by these interesting productions for winter sport and amusement.

Absolutely reliable data beyond the championship races are few and far between, for it is seldom a course over which other races take place is accurately measured. The distances for the pennant contests are known by marks on the shore which have been placed there permanently by surveys, and in placing the buoys or turning-marks on the ice the greatest pains are taken to have them accurately established. In order to examine this matter of speed, I have made a table of the races for the Challenge Pennant, showing all the particulars, especially the distances between the marks, and therefore the lengths of the courses sailed, and I believe these distances to be substantially as stated. The course on February 5, 1892, was surveyed, and also measured by a registering wheel. I have also plotted on paper the approximate distances an ice-yacht would actually sail in covering the various courses. These results are tabulated on the sailing card. In working this out the river was laid off as half a mile wide, which is about the average width where the races take place, and as most of these were sailed with a wind blowing or drawing nearly straight up or down the course, which also is always up and down the river, the calculated distances sailed should not deviate to any great extent from the real distances. At any rate the plan adopted has seemed to the writer the best way of arriving at anything like the truth.

The fastest time made in any of the races for the pennant was that of "Jack Frost," February 9, 1893. The 20-mile course was sailed in 0 h. 49 m. 30 s., or at the rate of a mile in 2 m. 28 s. for that distance, but the calculated distance the yacht sailed was 31·38 miles, and this means a mile in 1 m. 34 s. The slowest rate occurred February 18, 1885, when it took "Northern Light" 1 h. 8 m. 42 s. to sail the 20-mile course. This, it will be seen, is at the rate of a mile in 3 m. 26 s., but in reality 2 m. 11 s., as the calculated distance sailed was 31·36 miles.

The average rate of speed for these races is 1 m. 55 s. per calculated mile; and, as I believe a yacht in actual practice will sail over rather than under the calculated distances, it is safe to assume that the speed of an ice-yacht with a strong, steady breeze, over a true course to windward and return, is faster than this rate of a mile in 1 m. 55 s. The narrowness of the river forces the boat to tack or alter its course frequently when sailing either to windward or off the wind, which not only increases the time, but also the distance over a given course. One point must always be borne in mind, and that is, that an ice-yacht invariably sails close-hauled, that is, with her sails trimmed flat in, whether in beating to windward or driving off before the wind. This is easy to comprehend when going to windward, for here a boat on ice sails the same as one in the water, but off the wind or sailing free it is another matter. It can be readily understood that in this case if sheets were started and sails were allowed to go off, so as to be at or nearly a right angle to the wind, the yacht would not advance to leeward quite as fast as the wind, as some force must be expended in overcoming friction; hence it is that in sailing before the wind the sails are trimmed close aboard, so that the course of the yacht to reach a given point to leeward the fastest angle would be 150° or 13⅓ points from the wind, when the advance to leeward would be one and a half times that of the wind itself.

A. ROGERS.

YAK—The Yak or Grunting Ox (*Poephagus grunniens*, Linnæus), is found in its wild state on the highlands of Tibet, north of the Himalayas, not further west than Yarkund and Cashgar, and certainly as far east as Lassa, and probably much further. The bulls and cows herd separately, except in the rutting season, in October and November. During the rest of the year the bulls wander considerably and are found in herds of ten and twelve, long distances away from the cows. The largest specimen of a wild bull yak, shot by the writer in 1859, on the northern slopes of the Himalayas, north of Kumaon, measures as follows :—

	ft.	in.
Circumference of neck	4	2
Circumference of horn at base	1	6
Length of skull (stuffed) from the nose to the occipital ridge	2	5½
Width between the orbits	1	4
Length of each horn measured along the curve	3	0
Length from the nose to the root of the tail	10	10½
Do. to the extremity of the tail	13	11½
Height at withers	5	10
Girth behind the shoulders	10	1
Do. round belly	9	8
Length of tail	3	1
Circumference of fore foot	1	9¾
Do. do. hind foot	1	7

I shot another wild bull yak in the same year, of much the same size. One of these is set up entire in the Leeds Museum ; the other (the head only) is at Elkington Hall, near Louth, Lincolnshire. This also was set up entire, but unfortunately moths got in to the skin, and the head only has been preserved—a very fine specimen. Both of these were shot in July, the very worst season of the year for preserving the skins.

The yak is one of the very few animals existing both in a wild and domesticated state ; and as the former is not much known, a brief description is desirable. The general colour of its summer coat is a deep and rich brown, palest on the withers, where it is slightly freckled with grey, and becomes a darker brown in every direction as it recedes from this. The hair of the forehead is rather long, curly, and dark brown, the hairs tipped with grey, producing a grizzled appearance, which increases towards the nostrils, while the hair becomes short and close ; above the centre of the nostrils is a patch of white, which colour also pervades the lips, and slightly the chin. The muffle, or naked space between the nostrils, is contracted to less than an inch in breadth on the lip. On the ears, cheeks, lower jaws, and upper portion of the throat, the hair is rather long and black ; between the horns, and behind the occipital ridge, it is divergent and grizzled. The legs are very dark brown ; the fore legs, from the shoulders nearly to the knees, are covered with long black silky waved hair, as is very nearly the whole length of each flank, and a line rising obliquely across the buttocks, where the colour of the long hair changes to a brown hue. This long pendulous hair, which constitutes one of the chief characteristics of the species, attains its greatest length on the groin and tail. The tail at its origin is clothed with short adpressed hair, which rapidly increases in length, and forms a huge black whisk, completely hiding the remainder of the caudal extremity. Along the ridge of the neck is a dark brown streak, reaching nearly to the withers, which are free from any medial line ; but the lumbar region is traversed by a pale central streak, which becomes dark brown as it approaches the tail. From the hip a blackish line passes diagonally across the loins ; this is composed of slightly longer hair than that on the upper part of the body, the whole of which is short and close. In winter the long hair of the flanks probably extends much higher.

The horns are black, very strong, compact

YAK.

Av. ht. at shoulder, 66 *in. Max. single horn meas.* 36 *in.*

and roundish, diverging outwards at the base, and slightly forwards, then bending backwards with a bold curve, the tips converging towards each other. The hoofs are solid, compact, and black.

The grey hairs about the nostrils are found only in wild, not in domestic examples.

The wild yak is known by the people of Kumaon and Gurhwal as "*bunchour*."

My principal object in visiting Hoondes[1] and Tibet in 1853, was to get one or two wild yaks, at that time looked upon as almost fabulous animals. None, so far as I was aware, had ever been seen by an Englishman until 1852, when one was seen and shot by Mr. Beckett (a sportsman from Almorah) in Hoondes, just across the passes leading into that country from Almorah. The spoils (head and skin) were brought into Almorah in great triumph, and the event was very much talked about. In 1853 several were shot. I shot six (all bulls), five of them very near the place where Mr.

[1] That part of Chinese Tartary north of the district of Kumaon and Gurhwal, and of part of Nepal.

Beckett shot his. A party who went to the Mausurobur lake, about eighty miles to the east of where I was, shot three; and Wilson, the great Himalayan sportsman, shot one or two in Roopshu, 300 or 400 miles to the north-west of where I was, near the great Chumereri lake; and many have since been shot.

The yaks (tame and wild) are, like all other animals in Tibet, provided with the fleece of "pushum" wool, as a protection against the severe cold. This "pushum" is a great article of trade; it is manufactured into cloth. The yak "pushum" is very much coarser than the goat "pushum," and is not so valuable. The wild yaks are found in certain localities in different parts of Hoondes and Tibet: the bulls herd separate from the cows, and wander a good deal; while the cows, from what I learn, chiefly remain about the same place, in of course the very wildest places, where man scarcely ever goes. I never saw any cows, so I cannot speak from personal experience: but the party who went to the Mausurobur lake in 1853 appear to have seen an immense number of them—several herds of 100 and upwards.

The high mountains to the north of the "Milum" and "Neetee" passes from Almorah to Hoondes, where I shot all my wild yaks in 1853 (and '59, '60 and '61; since 1861 they appear to have deserted these hills, for I did not see or hear of any in after years when I visited that country), are visited by the wild bulls only, between April and September. Cows are never seen there. Some of these mountains rise as high as 24,000 feet above the sea. In 1853, I saw altogether fourteen yaks—nine one day in one herd, three another, and two another day—all bulls. They were in the most retired places: and I am told, and I think it true, that whenever they see a man, at whatever distance, off they pack, and do not stop anywhere within fifteen miles or so. I was led to believe they were very sagacious, but I found them easy enough to stalk, and stupid unwieldy animals after they were hit. I was also told they were very savage: and on my first meeting them (nine of them), and when by a judicious stalk I got within an easy distance, I certainly expected an adventure, but I was disappointed with all except one, which charged me, but which I knocked over with a bullet through his head when within ten yards of me. I got three out of this herd of nine. They were, when I first saw them, lying down at an elevation of about 18,000 feet, on the snow.

All the other yaks which I saw were very nearly at as high an elevation. They seem to go down to grass about sunset, feed all night, and are up again at this enormous elevation by a little after sunrise. I am talking of the months of July and August. Doubtless in the winter months they go as low as they can; the lowest valleys in this country are about 14,000 feet above the sea. I have seen their traces very numerous as high as 19,000 feet, and in the valleys as low as 15,000 feet. Those at the latter elevation were always old traces, doubtless of April, May and June, before the passes were open, and before a single man had arrived in the country.

E. Smyth.

ZEBRA—The zebras form a well-marked and distinctive group of equine species, found only in the continent of Africa. They are to be met with from the highlands of Abyssinia and Gallaland to the mountains of Cape Colony; some of them, as the true or mountain zebra, affecting only the wilder and more inaccessible sierras; others, as the well-known Burchell's zebra, frequenting by preference open plains or level thinly-bushed country. There are now only three species to be found in Africa, viz., (1) the true or mountain zebra (*Equus zebra*); (2) Grèvy's zebra (*Equus grèvyi*); (3) Burchell's zebra (*Equus burchelli*). Until about thirty years ago, a fourth and very well-known species, the quagga (*Equus quagga*), was to be found in Cape Colony and the Orange Free State. This handsome and very interesting animal has, however, been completely exterminated, and has now—probably for some twenty years or more—become extinct. The zebras were formerly found in immense numbers in various parts of Africa. They are still abundant in the more remote and less explored regions; but, as they are pretty easily shot, as their skins have some commercial value, and as they are a favourite food of natives, they are much hunted and, during the present century, have been subjected to a great deal of persecution. The quagga has vanished; the mountain zebra is becoming more and more rare, and it seems scarcely probable that, under present conditions, the remaining two species can resist the fate of extinction for more than a few score of years.

The True or Mountain Zebra (*Equus zebra*), familiar to the Hottentots as the *daow*, and to the Boers as the *wilde paard* (wild horse), has been known to Europeans ever since the first colonising of the Cape by the Dutch in the middle of the seventeenth century. It is peculiarly a mountain dweller, and has always had a singularly restricted habitat in Southern Africa. Formerly it seems to have been common upon every mountain range, from Great Namaqualand in the west to Swaziland in the east; but at the present day, thanks to incessant and senseless persecution, it is now much scarcer, and is only found in small troops of from five to a dozen or fifteen in certain mountains of Cape Colony (where it is as far as possible preserved), and here and there along the Drakensberg and Lebombo mountains towards Swaziland. In Cape Colony it

Zebra

may still be found in the Sneeuwberg, Great Winterhoek, Zwartberg, Tandtjesberg, and one or two other ranges, where it maintains its existence in the wildest and most remote parts of the mountains. The mountain zebra stands from 12 to 12½ hands in height, and, from its strong, sturdy, and compact build, is wonderfully adapted for getting about the difficult mountain country which it so peculiarly adorns. The legs are short and beautifully clean, the hoofs small, well-shaped, and hard as flints; the ears are long—much longer than those of the Burchell's zebra and quagga—and give to the animal a more asinine look than either of these two congeners. The body colouring is a clear, silvery white, and the markings of black, or very dark brown, extend to every part of the body except the stomach. The legs are perfectly and beautifully banded in black and white, right down to the hoofs. The head—except the ears, which are black and white—is finely and evenly marked in bright brown instead of black, and the muzzle is of a rich tan colour. The tail is shorter, thinner, and more ass-like in character than that of the Burchell's zebra. The stripings of the mountain zebra differ markedly from those in the other species, and especially from those of the quagga and Burchell's zebra. A glance at a good modern natural history—such, for instance, as the *Royal*—will at once indicate the peculiar variations in the markings of this very interesting equine group. In its own mountain-habitat the true zebra is a shy, solitude-loving beast, and, from the inaccessibility of its habitat and the ease with which it traverses the steep rocky sierras, is nowadays not very easily stalked. As a matter of fact, although to some extent preserved, it may be looked upon as a fast-vanishing species, and ought now never to be shot at. The mountain zebra is of a fierce, intractable temper, using its hoofs and teeth freely, and, unless taken very young, is practically untamable. In the old days at the Cape, when these animals were abundant, the Boers captured some numbers of the young, which were exported to Mauritius and there driven in their equipages by the French colonists. Upon the flat the mountain zebra has no very astonishing pace, and can be ridden into by a good horse. Its usual habitat is amid ranges of from 2,000 to 7,000 feet in altitude.

Grèvy's Zebra was, until the year 1882, practically unknown to Europeans. In that year a living specimen was sent by Menelek, King of Shoa—now King of Abyssinia—to M. Grèvy, the President of the French Republic. For a short period the animal survived in the Jardin des Plantes, where it attracted much notice. Grèvy's zebra, as it is now called, was thought at first to be merely a variety of the Cape mountain zebra. Since 1882, however, many travellers and hunters have penetrated into Somaliland and Gallaland, where this zebra has been found in large numbers, and a close examination of the skins procured has established the fact that the new zebra is a clear and distinct species. The animal is considerably larger than the true or mountain zebra, and exceeds in stature every other member of the group, adult specimens measuring as much as 14 hands at the withers. The body colour of this handsome zebra is of a clear white—as with the true zebra—but the black or chocolate-brown markings are much finer, thinner, and more numerously distributed. They are, in fact, pretty even in width all over the body. The ears are enormously large, exceeding in size even those of the mountain zebra.

Grèvy's zebra is found principally in Gallaland and in that part of Somaliland bordering upon the Galla country. Its habitat is described by Captain Swayne, who has made many sporting expeditions into Somaliland and the adjacent regions, as "low plateaux covered with scattered or thick thorn-bush, and tall, feathery 'durr' grass, with red gravelly soil, and rocks cropping up now and then." They are found in herds of a dozen, and when first encountered, were extremely tame and easily shot. In places they are often seen in large numbers. As they become more persecuted, it seems probable that they will gradually betake themselves to the higher mountain ranges.

Burchell's Zebra (*Equus burchelli*)—This, the Bonte quagga (pied quagga) of the Boers, often called, erroneously, the quagga, may be termed the zebra of the plains, and is quite the commonest, as it is the handsomest, of its group in all Africa. Its range was much wider and less restricted than was the case with the other striped *equidæ*, and, until comparatively recent times, it was found, in suitable country, roaming in immense herds from the Orange River to Northern Equatorial Africa. Even at the present day, after an extraordinary amount of persecution, it may be found pretty plentifully from the Pungwe River, Rhodesia, and Ngamiland in Southern Africa right away to the north of the equator. This zebra is best known to Europeans, and the various zoological gardens of this country and the continent are seldom without specimens. Sixty years ago it was found by Cornwallis Harris in the Transvaal and South Bechuanaland in "immense herds," but, thanks to wanton and incessant slaughter, the traveller in South Africa encounters it nowadays, first in Khama's country, Ngamiland, and Matabeleland. Its habitat is by preference open plains or rolling, thinly bushed country. Quite recently in Benguela, Portuguese West Africa, Mr. G. W. Penrice, an English hunter, has, however, found this zebra inhabiting absolutely hilly country. It is found in places abundantly in Central and East Central Africa, as far as Uganda and even beyond. In Northern and

North Western Africa the zebra seems to have been always unknown. Burchell's zebra stands about 13 hands at the shoulder. Its body-colouring varies from pale sienna to white. The black or deep chocolate stripings are quite differently arranged from those of the mountain and Grèvy's zebra. The head is light and elegant, and the small ears are more equine than asinine. The thick, upstanding mane is somewhat fuller than is the mountain zebra's, and comes down well over the forehead. The tail is white, and more flowing than that of the mountain zebra. In some localities the leg stripings of this zebra extend nearly to the hoofs, in others little beyond the shoulders or forearms. In specimens in which the leg stripings are fuller and more numerous, some naturalists have distinguished the animal as Chapman's variety of Burchell's zebra, and have dignified it by the scientific name—*Equus chapmani*. It is extremely doubtful, however, whether this can be looked upon as a good variety. Burchell's zebra is one of the softest and most easily slain of all the game animals of Africa, and a single bullet will usually suffice to turn the animal out of the troop, when it may be easily finished off. With a broken leg, the Burchell's zebra is—unlike the antelope and deer families—rendered at once quite helpless. Its paces in flat, open country are very good, and unless the hunter is exceedingly well mounted, a troop of these zebras will often gallop right away from him. The flesh is sweet and unpalatable to Europeans, and the fat very yellow; nearly all natives are, however, extremely fond of zebra meat. Of all animals, the lion is, perhaps, fondest of the zebra, and large numbers of Burchell's and Grèvy's zebras are slain annually by these carnivora, lying in wait near the drinking places. Zebras cannot resist thirst as can many of the antelopes, and usually drink each night or at very early morning. Of late years a good many of the young of Burchell's zebras have been captured alive by Dutch hunters. Some numbers of these were broken to harness and tried in Transvaal mail coaches and carts. It was found, however, after careful trial, that they were unable to stand the wear and tear of prolonged and heavy coach work so well as horses and mules, and the experiment has since been abandoned. Mr. Walter Rothschild has used four of these animals in a coach for light work in London and Hertfordshire with some success, and the animals appear to lend themselves to domestication more easily than any others of the various species of this group.

The Quagga (*Equus quagga*), which takes its name from the Hottentot word *quacha*—derived from the peculiar neigh or cry of the animal—was formerly extremely abundant in the Cape Colony, and, it is believed, parts of Griqualand West and the Orange Free State. Its habitat was curiously restricted, and it seldom or never seems to have wandered beyond these limits. So lately as the time of Cornwallis Harris (1837) the animal is described by that great naturalist and sportsman as inhabiting the plains of the country now known as the Orange Free State in "immense herds," and even in Gordon Cumming's time (1843–1850) it was quite common on the northern karroos of the Cape Colony. Its downfall was wrought entirely by the skin-hunting Boers, and its final extinction seems to have taken place somewhere between 1865 and 1870 in Cape Colony, and possibly a little later in the Orange Free State.

The quagga was invariably a denizen of wide, open plains, where it roamed in herds, numbering in the aggregate tens and hundreds of thousands. Upon the march, these animals usually moved in single file, in long lines; when grazing the animals scattered over the veld; and when really alarmed they fled together in dense troops. In height the quagga stood about 13 to 13½ hands—about that of the Burchell's zebra. It was, however, of more robust build than that zebra, while in colour and marking it differed widely from all others of this group. The upper body-colouring was pale rufous-brown, darker upon the face and neck, and the dark-brown stripings usually extended from the head only as far as the middle of the barrel, or, more often, a trifle behind the shoulder. The stomach and legs were pure white. A dark dorsal line ran from the mane to the tail. The ears and tail were more equine than asinine; the tail was white and flowing; the muzzle black; the crest high and arched; the mane full, upstanding, and marked in brown and white. Altogether, the quagga was an extremely handsome creature, which but for the senseless and short-sighted slaughter of the Dutch farmers, never ought to have become extinct in South Africa. In pace the quagga seems to have been slightly inferior to the Burchell's zebra, and the animal was usually to be ridden into by a light, well-mounted hunter. The species seems, under the exterminating rifles of the Boers, to have faded gradually from existence, and attention was first called to its actual extinction by the present writer in an article in the *Field* in 1888. Most unfortunately, the Natural History Museum only possesses an old and extremely poor stuffed specimen of this unique and now extinct animal. Specimens seem to be equally scarce in other museums of Europe.

H. A. Bryden.

GENERAL INDEX

GENERAL INDEX

Signed articles are printed in small capitals.

HIMALAYAN TAHR. (*See note on page* 655.)

INDEX OF AUTHORS

NOTE

Vol. I.

Page ix. Author of Bustard, *for* "Abel Chapman" *read* "Lieut.-Col. L. H. Irby."
,, 31. *Omit* "August" *add* "November."
,, 33. *Omit* "Aspidoparia Morar."
,, 160. *For* "S. H. Whithead" *read* "S. H. Whitbread."
,, 302. "Nick Sight" block inverted in error.
,, 476. Author of Gooral, *for* "A. F. Mackenzie" *read* "Donald Macintyre."

Vol. II.

Page 364. *For* "Dr. Holland" *read* "Mr. Wills."
,, 435. The illustration is of the Caucasian Tür.
,, 470. The illustrations to the Tobogganing article are kindly lent by Mr. T. A. Cook, from his *Notes on Tobogganing at St. Moritz*, published by Messrs. Rivington.

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