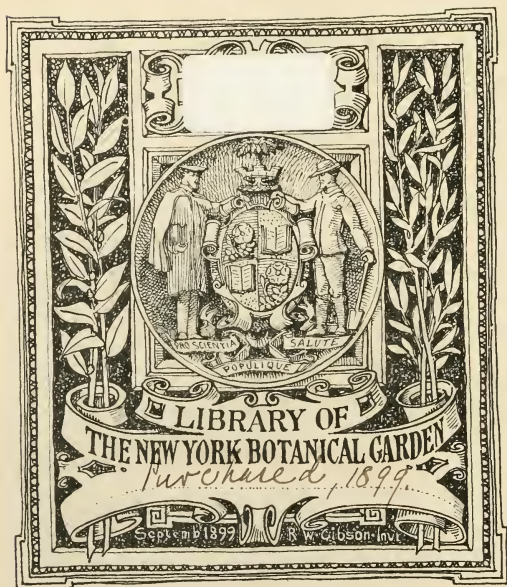




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NEW YORK  
BOTANICAL GARDEN.

1870  
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THE  
COUNTRY GENTLEMAN'S  
MAGAZINE

*WITH ONE HUNDRED AND EIGHTY-SEVEN ENGRAVINGS*

VOL I



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## PREFATORY NOTE.

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THERE is scarcely a class in society at the present time that is not represented more or less directly in the ranks of modern journalism. Setting aside that which may be considered the *crème de la crème* of professional periodical literature—namely, that which relates to “Law, Physic, and Divinity,” we have the “Bookseller,” representing the publishing interest; the “Builder” and its associates, keeping us *au courant* in all matters appertaining to stone and lime; “Engineering” and the “Engineer” require no explanation to indicate their special line, any more than the “Draper” or the “Grocer;” the “Baker’s Record,” redolent of flour and yeast, and eloquent on hot rolls; “Licensed Victuallers” under the protection of their own “Guardian;” while “Mine Uncle” drinketh in knowledge from the columns of the “Pawnbroker’s Gazette.”

When so much is done to represent “class interests” through the medium of the press, it is only natural to expect that such an important section of society as that which is included under the designation of “Country Gentlemen” would not be forgotten. Consequently, we do find that by no means an insignificant portion of the general as well as the periodical literature of the day is addressed to that class, and devoted to one or more of those points in which Country Gentlemen feel a special interest.

Time was when a Country Gentleman’s literary researches seldom extended further than a “Boke of Farriery,” while his lady

confined her attention to some treatise which discussed “Housewifrie,” and the preparation of those wonderful concoctions with which she treated the ailments of her humble dependents; but the Lady Bountiful and Squire Westerns of former days have long since passed away; and although ladies are as prone as ever to acts of kindness, and the exercise of a warm sympathy when occasion demands, they are now inclined, and very properly so, to leave the actual treatment of bodily ailments to the regular practitioner. There are so many things now-a-days which press upon the attention of the Country Gentleman that he cannot very well devote himself to any one special object. He may, indeed, have his particular “hobby,” but even in that case he is still obliged to turn his attention now and then to other matters. He must know a little of Farming, and even of Architecture and Landscape Gardening—gardening proper being more immediately the lady’s care—his “tall ancestral trees” demand that Arboriculture should not, in his case, be one of the occult sciences; he is a Magistrate, and, therefore, some familiarity with Legal matters is indispensable. The Stable and the Kennel are too important adjuncts of his establishment to be overlooked, while they contribute, with other things, to supply him with those healthful amusements to which the gentlemen of this country are universally attached. Some, indeed, manifest stronger proclivities for certain departments more than others. In some cases, for

instance, within our knowledge, the superior condition of the Woods and Plantations on an estate, is owing to the owner finding a source of gratification in making it his special business to attend to their management. Then, doth not the pages of "Coates' Herd-Book," and the records of Royal shows and Smithfield clubs, bear witness to the energy with which Country Gentlemen, of all ranks, have striven to maintain the national reputation in the article of British beef and mutton—a patriotic feeling inherent in the British mind, which was vastly stimulated by the sayings and doings of honest "Farmer George." We have sometimes heard gentlemen connected with the country, in the course of after-dinner speeches and farmers' gatherings, express their regret that they knew so little of country affairs; but as those who made the avowal, while allowing that their education on those matters had been neglected, announced their intention of repairing the deficiency with all possible speed, we may reasonably conclude that such cases are exceptional, and likely, we trust, to become more so.

With the special view, therefore, of assisting

gentlemen labouring under such a serious defect, as well as of contributing to the information of those who already take an interest in such matters, THE COUNTRY GENTLEMAN'S MAGAZINE has been projected, and it is hoped that the bill of fare, as described in the prospectus which has been issued of this undertaking, will ensure a friendly reception for it everywhere. THE COUNTRY GENTLEMAN'S MAGAZINE, besides containing articles on subjects of general interest, will deal with all matters relating to the various departments of Land and Estate Management; Rural Architecture, including Plans for the erection of Mansion Houses, Villas, Ornamental and Ordinary Cottages, Lodges, Farm Buildings and Offices, &c.; the Cultivation of Land, and the Breeding and Feeding of Live Stock; Arboriculture; Laying-out and Formation of Plantations, Roads, Drives, &c.; the Garden and Shrubberies; Field Sports, more especially the "Rod and Gun;" the Domestic Economy of the Country House; the Duties of the Country Gentleman as a Magistrate, &c., and, generally, every topic of interest to the Country Gentleman and his Household.

### POSTSCRIPT.

THE Proprietors of the well-known and long-established *Journal of Agriculture* having observed that the field proposed to be occupied by THE COUNTRY GENTLEMAN'S MAGAZINE was merely an extension of that which was already filled by it, have arranged with the projectors, that it shall be published in conjunction with the *Journal of Agriculture*, so that certain departments which have not hitherto occupied a prominent place in it, will henceforth receive more attention. In future, therefore, the *Journal of Agriculture* will be issued under the title of THE COUNTRY GENTLEMAN'S MAGAZINE AND JOURNAL OF AGRICULTURE.

THE  
COUNTRY GENTLEMAN'S MAGAZINE

JULY 1868.

*THE CONDITION OF THE RURAL LABOURER.*



**T**HAT the condition of the Agricultural Labourer is not, generally speaking, in a satisfactory state, no one can deny, but still it is not so bad as to warrant the outpouring of flowery sentimentalism, flavoured with downright abuse of employers of every grade, with which we have been made so familiar of late. There is a practical as well as a picturesque view of the question, and the agricultural world is indebted to Mr Bailey Denton\* for the able manner in which he has supported the first-named position, and brought his wide experience to bear on the question. The picturesque view is no doubt alluring to a certain class of writers, especially those who do not possess any practical knowledge of the subject, and whose sole object in meddling with it is merely to get up a sensational article where other topics of general interest are scarce. A great deal of misrepresentation has in this way become current; and it is therefore satisfactory when a man of Mr Bailey Denton's experience undertakes the task of setting forth the plain facts of the case, supported by evidence which it is impossible to gainsay.

Mr Denton starts with asserting that when the wages earned by the urban and by the rural labourer, respectively, are carefully dis-

sected, it will be seen that there does not exist that great difference between the two which there is generally supposed to be; and that if the rural labourer is in any way inferior to the urban operative class, it must arise from causes which limit his mental abilities, and prevent his increasing the value of his labour, while they depress his status in the social scale—causes, says Mr Denton, which it is the duty of the country to investigate and remedy.

In pursuing his investigation of the subject, Mr Denton proceeded to remove the misapprehensions that prevail as to the value of the farm labourer's occupation, and the amount of wages his services command. It is true that the rate of wages varies in different districts, but his conviction, founded on experience gained in nearly every county in England, is that, "measured by the real value of the services rendered by the agricultural labourers in different parts of England, the prices peculiar to different districts are as high as the return to be gained from those services will sanction." It is "a fallacy to suppose," says Mr Denton, "that the labourers of one district are as good workmen as the labourers of another, and that for the services of each, when applied to the same object, the same money should be paid." Every one who has given the slightest atten-

\* *Vide* his paper on this subject delivered before a recent meeting of the Society of Arts.



tion to the subject, from experience of labourers in different districts, will fully endorse Mr Denton's remarks, and agree with him that it is impossible, under present circumstances, to adopt a common standard of wages, as recommended by those who support combinations among agricultural labourers.

When it is stated that Mr Denton has been inquiring into the standing wages in nearly every part of England during the last seventeen years, in connexion with his special duty of reporting on the agricultural operations of the General Land Drainage and Improvement Company, it will readily be seen that he has had opportunities for obtaining information such as very few possess, and that any statements which come from him on this subject, must, therefore, be accepted as authoritative. The average weekly wages of the farm labourer he sets down as ranging from 10s. 6d. in the mid-southern and south-western districts to 14s. 6d. in the north-eastern district; the mean average throughout England, of able-bodied men, being 12s. 6d. This, however, is exclusive of extra allowances at hay time and harvest, and all payments for piece work and overtime, as well as the value of various perquisites in the shape of beer, milk, fuel, &c., and, we may add, in many instances, of cottage accommodation rent-free. When the value of these extras is taken into account, along with the direct money wages, Mr Denton considers that the farm labourer gains from 15s. to 16s. per week, taking the mean of England.

But even this aggregate does not include every thing, for the farm labourers have an advantage, as compared with town operatives, in the lower rents which they pay for their dwellings, and in having a garden wherein they may grow potatoes and vegetables, articles which cost an ordinary mechanic's family 2s. 6d. a week in a town. It is often the case also that the agricultural labourer is fortunate enough to have a rood of allotment ground—"which," says Mr Denton, "he ought invariably to have"—and this, cultivated after work hours, is sufficient to yield

him a return, after payment of rent and seed, of say at least £4 a year, which is rather more than 1s. 6d. a week. Through such means the wages of the agricultural labourer is raised to 19s. or 20s. a week, "independent of what his wife and children may make, and this frequently adds 25 per cent. to his income." Mr Denton does not take into account "the favourable difference in the cost of bread, meat, milk, &c., in the country compared with what it is in towns, nor the benefit our agricultural labourer is said to derive from "keeping a pig," as he is "doubtful whether anything is fairly gained by it." On this last point we entertain no doubt whatever. We know that it is a most important point in favour of the agricultural labourer that, for the most part, he can keep a pig, and even if the value of the carcase does nothing more than cover the cost of food purchased for the use of the live animal, there is the advantage of having a supply of wholesome animal food in the house for the use of the labourer's family as well as of himself. But a pig will do more than this; we have tested the point over and over again, and feel quite satisfied that money expended in extra food for the use of the pig is amply repaid, leaving the meat at a lower cost than it could be purchased from the butcher. There is also the manure for the allotment or the garden to be taken into consideration, and the mere fact of having a pig is a source of interest to every member of the cottager's family down to the youngest toddler. A well-filled bacon-rack is far from being a despicable article in the furnishing of a farm labourer's cottage. By all means, therefore, let him have his pig; and, we would add, fowls also, of a good sort, wherever it is practicable.

But, although Mr Denton has shewn that the position of the agricultural labourer is not so bad as it has been represented, still he allows that no one can say it is quite satisfactory. With the profits of farming as low and uncertain as they are, he considers that it must be acknowledged that the only way to justify an increase of labourers' wages is by rendering the value of the labour greater than it now is. Education is the first

step towards effecting this desirable end, but Mr Denton is not of opinion that our efforts should be confined merely to elementary school education. To this must be added "technical, that is, practical education," which he explains to be "practical tuition in those operations which men are called on to perform in the business of life." He shews the effects of the lack of such training in relation to agriculture, by referring to the difficulty of obtaining in many parts of the country, good shepherds, good horse-keepers, and cattlemen, who thoroughly understand their business. Great loss is also frequently sustained from the ignorance of farm labourers respecting the management and adjustment of costly machinery; and he adds that "there is hardly an operation in tillage that would not be done better, if the operator had early understood it." The same remark applies to other matters, such as hedging, ditching, draining, thatching, &c., and the way in which he proposes to remedy this unsatisfactory state of things is to place boys engaged on farms in special departments, such as under the shepherd, the cattleman, or the engineman, instead of placing them indiscriminately one day to do one thing and the next another. He proposes that the person in charge of each department should be paid a bonus for teaching the boy placed under his care, and that the youths should, at certain periods, undergo examinations, and, where practicable, be made to compete with other youths for prizes. This, we know, to be a good suggestion, having had opportunities of carrying it out in practice, so far as regards the apprenticeship, if we may so call it, of youths to special departments of farm labour, and keeping them at it, until they had acquired a knowledge of the details sufficient to render them of more value to an employer, and, therefore, able to earn a higher rate of wages than if they had been employed indiscriminately in all kinds of farm work.

Mr Bailey shewed the evil effects of beer, such as that which is used by English rural labourers, contrasting these with the good effects of beef, and recommended four objects as means of improving the condition of the agri-

cultural labourer. These were, first, a more general substitution of good cottages for bad ones; second, the provision of a proper means for the drainage of villages and cottages, and the utilisation of the refuse which may be discharged from them; third, the supply of pure wholesome water, in quantity sufficient to secure cleanliness and comfort to villages and cottages; and fourth, the provision of ground for the recreation of those children which, by common consent, it is determined shall be educated.

In addition to those objects, he also recommends the formation of benefit societies on proper principles, the establishment of garden allotments under a provident system of management; of village hospitals and infirmaries, and of co-operative societies. With reference to allotments, which we regard as a most important object, Mr J. K. Fowler, of the Prebendal Farms, Aylesbury, stated in course of the discussion which followed Mr Denton's paper, that "he gave each of his labourers half a rood of the best land on the farm, as near as possible to the farm-yard, and told them to take whatever manure they wanted. And once a year, when 'harvest home' came round, they had a little exhibition of the garden produce. All this had an excellent effect in keeping them from the beer-house, and in encouraging habits of independence and industry among them." We most cordially support Mr Denton and Mr Fowler in their advocacy of allotments, having seen in different parts of the kingdom, as well as in England, many instances of the immense good effected by that system. One of the most interesting exhibitions it has been our lot to attend, was the annual exhibition of garden produce grown on the allotments held by the labourers employed by the Earl of Bessborough, on his estate in the county of Kilkenny. The specimens exhibited were invariably of a most superior description, while the stocks from which those specimens were taken did not fall short of the samples. The results, as regards the labourers and their families, are highly beneficial; they are comfortably circumstanced in every respect, and altogether

the people are much superior to the ordinary run of Irish agricultural labourers. There is no doubt that the allotment system is a good one, and we should wish to see it established in every parish in the kingdom.

Mr Denton's paper cannot fail to produce good results. The question is beginning to be better understood, and the false colouring

which prevented many from discerning the real facts of the case, and the proper remedies to be applied, is being dispelled. To Mr Denton, and those who supported him, much of the credit will undoubtedly be due for bringing about a wholesome change in public opinion on this most important matter.

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### HIPPOPHAGY—SHALL WE EAT OUR HORSES?

THAT there is no accounting for tastes has long been acknowledged as a fact which cannot be disputed, and of which our daily experience supplies us with many examples. Ample illustrations of it are to be found in the various articles which form human food in different parts of the world; and here another proverb comes into play, for, truly, "what is one man's meat is very frequently another man's poison." In our own country we have instances of the great difference that exists in the matter of taste with respect to food. In some parts shell-fish, for instance, are loathed, and we have seen people who could not be persuaded that oysters and cockles were fit to be eaten, and, although they had almost inexhaustible supplies of those articles at their command, were actually on the verge of starvation. The English peasant considers bacon almost essential to his existence, and a pig the most useful animal in the world; while the Scotch Highlander, imbued apparently with semi-Hebraic notions, declines to "go the whole hog," living or dead.

We have been accustomed to consider animal food as limited to beef, mutton, and pork, with odds-and-ends of course, in the shape of poultry, fish, and game. Why horseflesh—we beg pardon—*chevaline*, has been excluded from the list seems difficult to say. The horse is fed on clean, wholesome food, hay or grass, oats and beans, and in this respect the diet is superior to that of the ox fed on linseed-oil cake, or of the pig, that scavenger of the farm-yard, and

wholesale consumer of all sorts of garbage and slops. Yet we ignore altogether the oilcake when we sit down to "the roast beef of old England," and no visions of the swill-tub interfere with our enjoyment of pig, when presented to us either in the shape of pork or bacon. The mere idea of horse-flesh as an article of diet is apt, however, to give us "a queer turn;" and in this way, a prejudice, for we believe it to be nothing else, is the means of sending annually a vast amount of wholesome meat to feed dogs and cats, which, but for this prejudice, would be hailed as a valuable addition to our insufficient supplies of animal food. It has been our lot, unfortunately, more than once, to have occasion to regret what was evidently a waste of valuable food, when a horse, in good condition, has come suddenly to grief, and gone literally to the dogs.

Of late, some strenuous efforts have been made to familiarize people with the use of chevaline, as horse-flesh is now somewhat euphonically designated, and those efforts have not been altogether without success. The dinner, which took place lately at the Langham Hotel, where chevaline in various forms was the sole description of animal food supplied, has done much to lessen the feeling of aversion against horse-flesh as an article of diet, at least among the better classes of society; for even the example of our neighbours in France was scarcely sufficient to overcome the prejudices of the British stomach in this matter, knowing that French cooks can turn even an old shoe into a tooth-



some dish, should necessarily demand the exercise of their talents in that way. That horse-flesh can be relished as an article of food is no longer doubted, and that it is perfectly wholesome we believe no one attempts to deny. We take it for granted, of course, that the animal is not affected with disease when slaughtered; but in that respect there is no difference between the horse and the ox, or the sheep; for if either oxen or sheep are diseased before death, their flesh is not fit to be used as human food, no matter how strong our prejudices may be in favour of it for that purpose.

Mr A. S. Bicknell, who appears to be a somewhat enthusiastic hippophagist, has embodied all the arguments for and against the horse as food for man in a paper recently read by him before the Society of Arts in London. He shews that the practice of eating horses existed in very early times, that it formed a standard dish at the birth-day feasts of the Persians; that the horse was certainly considered fit for food until at least the eighth century, and its disuse originated in certain prohibitions against it, issued by Pope Gregory III. and his successors, in consequence of one of the chief obstacles to the conversion of the Germans being found in their practice of sacrificing horses to idols, and the partiality of the people for the meat. The sturdy Icelanders, however, could not be persuaded that abstinence from horse-flesh was conducive to their spiritual benefit, and hence the Icelanders are hippophagists to the present day.

The modern movement in favour of horse-flesh as an article of food for man commenced in France in 1786, when Géraud, the distinguished physician, advocated its use, and told his countrymen that a large supply of good provision was wasted through the neglect of it. In 1811 a commission was appointed by the French Board of Health to consider the advantage of allowing horses to be used for food, and they unanimously reported in its favour. A similar result followed the deliberation of a Commission appointed by the Prefect of Police in 1825, and this view of the question was also taken up

by Larrey, chief of the medical staff during the Russian campaign. In 1830 a complete treatise on the subject was published by M. Villeroy, and in 1835, Parent-Duchâtelet, the Howard of France, in conjunction with two coadjutors appointed by the Board of Health, presented a second report, confirming the views expressed in the first; and from that time to the present a host of Frenchmen, distinguished in science, medicine, and literature, have testified in favour of using horses for food, and have strongly denounced the prevailing prejudice against it. On the 9th of June 1866, a decree legalised the slaughter of horses in special abattoirs, and the sale of the meat for human food; and, although the restrictions imposed were severe, 2312 horses were eaten in Paris during the first twelve months. At present there are twenty-three shops established in Paris for the sale of the article, and all are represented as carrying on a brisk trade.

The use of horse-flesh as food has prevailed in Denmark since 1807; hippophagy flourishes in the German States, but more especially in Belgium—from whence, by-the-bye, we get the well-known Bologna sausages—and Mr Bicknell feelingly remarks, that “among the civilized nations of the world there now remains but one great country,” and that is our own, “where either prejudice is so strong or ignorance so great that the flesh of the horse is looked upon as carrion and excites disgust.” He asks, “are we to assume, however, that because we shudder at the idea of such food it is never eaten by us?” and he points out that, without questioning the genuineness of various kinds of foreign sausages, and other forms of preserved meat which we consume in large quantities, it is startling to find that every week in London alone about 200,000 lb. of chevaline, free from bone, disappears, which exceeds the quantity bought by those who purvey for the wants of the cats and dogs of the Great Metropolis. Where, then, does the surplus meat go? None of it is thrown away, and the only conclusion we can arrive at is, that it is prepared in some shape or other for use as human food, and consumed unwittingly.

Mr Bicknell describes chevaline as strongly resembling beef, but it becomes darker in colour in a short time after the animal has been killed and cut up. It has a peculiar flavour, which some have compared to that of game and venison, but much depends on the age of the animal, an old horse yielding meat with a more decided taste than a young one. For soup, he avers, no meat answers better, but it requires somewhat longer cooking than beef.

Without entering at present into Mr Bicknell's refutation of the popular objections to hippophagy, which seem to be more sentimental than practical in their nature, or

his enumeration of its advantages, we may remark that a project by which an important addition might be made to the food of the people deserves at least to meet with serious consideration. Hippophagy is a subject in which those who are inclined to be funny may easily find ample scope for the exercise of their abilities, but Mr Bicknell is nevertheless right when he says—

“To-day many will laugh at the bare notion of feeding human beings upon horses, but does it not often happen that those who laugh at novelties to-day are the very first to bless them to-morrow?”

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### THE PAST, PRESENT, AND FUTURE OF SCOTTISH AGRICULTURE

THE state of agriculture in a country may always be regarded as a criterion of its civilization. A nation in a state of perpetual disturbance cannot be expected to cultivate successfully the arts of peace.

In the early age of this country, and down indeed to a comparatively recent period, war was the grand national employment. The attention of the people received a direction and the minds even of those not immediately engaged in that exciting game were thus distracted, and could not be brought to bear intensely on any other pursuit. Whatever amount of learning existed was engrossed either in the destructive and unprofitable profession of arms, or in the more peaceful vocation of the Church. Agriculture, therefore, was abandoned to the ignorant and illiterate; and this circumstance, perhaps, among other causes, tended to lower its conventional status. Unlike the view taken by the Romans, labouring in the dirty soil was looked upon, if not as a degrading, at least as a subordinate and vulgar occupation, quite unsuitable for a gentleman; and, indeed, it is only of late that this established impression of inferiority has begun to be dissipated.

The state of the channels of intercommunication, the primitive and miserably defective condition of the implements of agriculture, together with the absence of all emulation on the subject, necessarily obstructed vigorous action, and begot a desire to labour on the easiest principle. The portion of the farm, or holding, farthest removed from the dwelling was abandoned to the cattle. Here Dame Nature was left to herself, without the slightest attempt at intrusion. The animals, also left to themselves, ranged at will, browsed on all they could get, and through the agency of exposure and starvation had not much resemblance to their unwieldy descendants at our modern cattle shows.

A small portion of the farm contiguous to the dwelling was devoted to the plough. Here the theory and practice of agriculture, as at that time developed, were carried out and practised on the most approved principles. The ploughing, or “aring,” was a great affair. Ten oxen were frequently yoked to an extraordinary looking implement intended for turning over the furrow—the operation demanding, besides the ploughman, a “gadman” with a long pole, such as is used

to poke up bears in our travelling menageries, which he plied vigorously; so that with standing and starting, and twisting and turning and tumbling, the bovine rout formed altogether such a tumultuous mob (as they would say in Australia) as rendered the post of ploughman no sinecure, and made ploughing, in the proper sense of the term, impossible. In the absence of anything like waggons or carts, the mode of conveying what dung there was to the field was in baskets, strung across a horse's back, which, latterly, gave place to the improvement of the "sled," a thing somewhat like the body of an ill-made cart without the wheels, which might be capable of containing a pretty large modern barrowful, and was dragged to the land by a horse yoked to it by bramble or willow withes. Crops of all descriptions, whether green or white, were sown broadcast, year after year, on the same spot.

Whether plants of the same kind, grown successively in the same place, impoverish the soil by abstracting from it those ingredients which constitute the proper food of the plant, gradually rendering the matrix unproductive of that particular kind of crop, or if the plant thus perennially cultivated *in situ* leaves behind it something, totally disagreeing with plants of the same species, but not at all offensive to those of a different kind; or whether these two hypotheses are combined to form a well-known practical result, still among agriculturists, in some degree forms an open question. The second position proposed by De Candolle, it is true, is not now in favour, but there can be little dispute regarding the first, as it is well ascertained that plants do take up certain substances from the soil proper for their growth, and on this fact, indeed, is mainly founded the whole practice of manuring. But none of these vexed theoretical questions disquieted our agricultural forefathers. They continued to jog on contentedly in the old road. There is a story of one of these primitive farmers industriously engaged in the important operation of taking manure to the land. Down one side of each horse hung a basket containing dung, which was balanced on the

other side by another basket filled with stones. An intelligent neighbour passing by at the time criticised the operation, and recommended an improvement in the details. "Could you not," said he, "fill both baskets with dung, which would thus balance each other?" "Na, na," cried the indignant farmer, "I'll dae naething o' the kin'—my father did it this way, an' my father's father did it, an' my father's father's father did it, an' I'll daet tae." We do not mean to say that all the farmers of those days venerated antient institutions and sacred custom so highly as this conservative and orthodox agriculturist, but certainly there were, in cropping, no troublesome or vexatious deviations perpetrated from the good old rule.

The small portion of the occupancy situated immediately around the steading, thus devoted to the plough, was called intown or infield, while the outside portion, abandoned to the cattle, was called outfield. Had the droppings from the cattle been preserved and applied to the infield, the *vis stercoris* might, to a certain degree, have obviated the necessity of change of crop. But these animals, all except the "mairts," were permitted to roam at will on their own domain, on which there was little of any green thing except a luxuriant "bob" here and there around each dropping, which no animal of the same kind would look at.

As nature was left to herself in the outfield, so likewise in the infield was she neither coaxed nor coerced. Our worthy predecessors did not bother their heads about vexatious theories. Their whole "practice of agriculture," too, consisted in burying a cow's dung in the earth and casting seed over it to spring, grow, and mature as it pleased God. There was uniformly a most luxuriant crop on the land. Nature, never idle, sees that the ground shall be duly filled, and takes care that it be with the crop best suited to the soil. The constituent element of the particular artificial crop perennially committed to the land might, indeed, become exhausted, but the soil has various elements in its capacious stores; and consequently there appeared

in due time, on the face of the ground, the most beautiful and weighty crop of thistles, docks, charlock, and other occupants that the eye could see on a summer day. The few delicate stalks of corn that came up, in rearing their heads in the incipient "struggle for existence" with their robustious compeers, soon gave up the contest, and were never seen more till after harvest.

This was what may be termed the rudimentary period of agriculture; and the defective results were too apparent to be unobserved or unappreciated. When men of intelligence and education, therefore, began to turn their attention to the subject, it was evident such a state of things could not continue. The writer of the article "Agriculture" in the old "Encyclopædia Britannica," says, "after the peace of Aix-la-Chapelle, most of the nations of Europe, by a sort of tacit consent, applied themselves to the study of agriculture, and continue to do so, more or less, amidst the universal confusion that succeeded." How far this may be correct we will not pretend to say, nor might it be proper to assert how far agricultural improvement would not have had effect, although the celebrated event referred to had never taken place. Many things possibly conspired to bring about the new state of things, and among others, not the least ostensible was the march of intelligence through the gradual spread of general education.

We come now to the improved restrictive period, and the first great improvement that took place was the abolition of outfield and infield. This was accompanied by the adoption of a system by which the whole land in the hand of the occupier was laid out in a certain number of divisions, on each of which divisions the crop was to be changed every year; no crop of the same kind, especially corn crops, being sown in the same soil twice in succession. This plan not only enabled the succeeding crop to take up the food in the soil proper for its growth, which had been rejected and left in the ground by its predecessor, but by a system of laying out regularly and periodically a division of the ground without any crop, called *fallow-*

*ing*, an opportunity was offered, to a certain extent, for clearing the land of weeds, which by the previous plan there had been no possibility of effecting.

A great step in advance of husbandry certainly was the *rotation of crops* system. But, like many other improvements, the merits of which are usually not estimated at their proper value, but are either unjustly decried or unreasonably commended—it was immeasurably exalted; many farmers firmly believed in the finality of the process, and every proprietor came to the conclusion that the *ne plus ultra* of the practice of agriculture had been thereby arrived at.

Accordingly, the system was universally adopted, prescribed, and recommended; it became the subject of all eulogium, and the ideal of all theory; it formed the model for all practice, and the pole-star for all improvement, and all leases were framed and designed on its basis—constituting it the limit and land-mark of all law and practice on the subject.

In a primordial state of things, certain laws are laid down which are naturally grown out of. We smile at the wholesome restrictions that were necessarily imposed upon us while in our bib and tucker. The history of our country informs us even that that free and unfettered exercise of liberty, which we regard and boast as the natural right of every Briton, and which, from the spirit of the people, seems an inherent element in our constitution, has, in certain critical conjunctions of society, been found necessary to be superseded. But such abnormal social condition uniformly passed away with the emergency which evoked it.

It may, in like manner, have been expedient and proper at one time to impose on agriculture conditions having the quality of stringency, till the nature of the subject should be well ascertained and understood. This severity was the more expedient and excusable considering the admittedly superior nature of the substitute. Our leases are all drawn on the principle of the adoption of a certain alternate or interchangeable course of cropping (assumed doubtless to be the



best for the holding) and the prescribed track is hedged round with pains and penalties. The establishment of this regime of assumed infallibility, practically (and legally) precludes experiment, and excludes improvement, by binding down the tenant to a hard and fixed line—making the farmer, indeed, a mere cultivating machine.

Our position now is, however, that we have outgrown this system of leading-strings, and are entitled to be set at freedom. The tendency of the restriction is to preserve the land in heart for the benefit of the proprietor. A man who is unworthy now of such a trust is indeed unfit to be a farmer at all. On the assumption that the present restrictive plan has a determinate value, and that by another mode of procedure in cultivation the produce of the land should be increased without the staple of the soil suffering any exhaustion thereby, would it not be impolitic to forbid the change? If it be argued that the advantage of a change is only assumed and not proved to exist, our plea, notwithstanding, virtually remains the same, as by the present restrictions the benefit, even if proved, would be unavailing. The duty of the state is to endeavour to secure the welfare of the general community, and not to protect the interest of a class. It should, therefore, see that a door reasonably purporting to lead to an increased means of subsistence to the population is not by any party unduly barred against the trial.

Leases ought to be burdened with no unbending restrictions. Every fair opportunity should be afforded for judicious experiment. An *intelligent* man will thus have an opportunity to carry out rational improvement; an *honest* man will regard his own interest and that of his landlord as being both embarked in the same bottom, subject to the same laws, exposed to the same vicissitudes, and obnoxious to shipwreck through the same disaster. To a man possessed of these qualities much may safely be committed; such a man will require few rules for his guidance. An individual possessing none of these qualities ought not to be in the situation under any system of rules. As to the expediency of

the absence of rules such as have been judged necessary to be imposed in our leases, Mr J. C. Morton, in remarking on an admirable article by Dr Voelcker in the "Cyclopædia of Agriculture" very judiciously observes, "Whatever (be) the cause of the increased poverty of land under repeated crops of corn, it may be so enriched by the artificial application of manure, and even by such cultivation as shall enable the full use of natural sources of fertility, as entirely to counteract the exhausting influence of any method of cropping that it may be deemed advisable to adopt. So that while adherence to a well-defined rotation of crops may practically be a security for the permanent value of the land, that can (as well) be insured by the intelligent cultivator under any method of cropping which markets may suggest for his adoption."

As to the past and present state of agriculture there is little or no difficulty, if we carefully examine the facts before us. With regard to the time to come the case is different. We can then only reason from antecedent to consequent, by inferring one general from several particular propositions, and we therefore offer, with hesitancy, a general view of its probable future development.

There is no accounting for extravagances. We have heard of people warm in the support of a favourite hypothesis arguing even against *facts*. When assured of the existence of a fact hostile to their opinion, "So much the worse for the fact," returned they. The same may be said of the proposition of Mr Malthus. His position has been contradicted, argued against, and assailed in every possible way. It must be evident to any unprejudiced mind that population has a tendency to increase in a much greater ratio than the means of its support. Statistics, which we regard as equivalent to facts, shew that, under ordinary circumstances, population doubles itself every twenty-five years—and this ratio we may fairly presume to be not lessened in the future when the progress of science and ethics is considered; more particularly improvement in the medical art, a closer observance of the laws of hygiene,

and the adoption of moral arbitration in preference to the arbitrament of the sword. On these premises, then, supposing we take a place with a special limit or boundary, say a square mile, and that the population thereof is 100. Well, twenty-five years afterwards it would be 200; at the end of the century it would be 1600; whilst at the close of the second century at the same ratio—that is, doubling every twenty-five years—the number of inhabitants on the square mile would be 25,600, or more than *two hundred and fifty times* the original population. Now, the question comes to be, whether this same square mile would produce the means of subsistence to the number of inhabitants on its surface in the same ratio as the increase of its population? Suppose, for the sake of simplifying the matter, that the inhabitants overhead could each live on the moderate modicum of a couple of quarters of corn and a cwt. of beef in the year. At this rate the space of ground would require to produce 3000 quarters of corn, and 80 tons of beef at the end of the first century, whilst at the close of the second it would need 50,000 quarters of grain, and 128 tons of beef—equal to 500 prime oxen—besides every other requisite which we have not taken into account, and so on indefinitely. It will be no solution of the question to say, that now-a-days we can bring in supplies from without from all parts of the world, because although, practically, it will take a long time before all the world shall be similarly circumstanced, yet, theoretically, every place is in the same position, and in process of time the whole habitable globe will be absolutely the same as one experimental mile. It is therefore evident that unless the light of science strike out some royal road to the production of *protein* from the organic elements, the earth will, at some certain point of time, fail to render adequate supplies. Of course the overstock of population will at that point be kept in check by privation, disease, and accident, as well as by moral misery, and all the train of irritating circumstances which tend to shorten life by rendering it uncomfortable; and for the happiness

of the race it should therefore be the object of every one to endeavour, as much as in him lies, to assist in removing that point as far off as possible.

One partial obstacle, we may remark, in passing, to the means of support in Scotland, doubtless is the preference for recreation over the necessaries of life. A proprietor receives an offer for a certain extent of moor and heath, for sporting purposes, of a sum perhaps equivalent to a fair agricultural rent for the same breadth of arable land. As the money is easily found, and its gain entails no expense or risk, there is really no pecuniary inducement to the proprietor to encourage cultivation. As it is not silver and gold that constitutes wealth in the abstract, that breadth of land is thus *lost* to the race. But this cause is only local and temporary.

The great and main cause of deficient supply of food will be found in the present defective state of agriculture. The product of every kind of crop must have a limit, because, cultivate as you may, the earth will produce a certain amount and no more; but as regards cereal crops (which constitute probably three-fourths of the means of support of the human race) that limit, by the present orthodox system of husbandry, as practised in this country under the behest of authority, is very soon attained. Suppose the land to be in the highest state of tillage—the only result of manuring higher would be that the crop would fall down, or *lodge*, as it is technically termed, and become deteriorated to a degree greater than if the tillage had not been pushed so far.

In what mode of tillage, then, are we to find adequate supplies for the increasing demands of the population? We shall not be able by any mode of tillage to keep up indefinitely with this increasing demand, because the rate of progression of the population is in geometrical ratio, while the increase of the earth's production is in arithmetical; but it may be possible, by the aid of proper means, in making the most of what can be produced, to ward off for a longer term the unpleasant results.

Contemporaneously with the improved sys-



tem of tillage we have referred to, and which is at present authoritatively, or quasi-authoritatively adopted, was there another mode of tillage recommended. This was not exactly *invented*—for it was not new—but it may be said to have been *discovered* and applied by Jethro Tull—a man who was, and whose name will be handed down to posterity as one of the benefactors of mankind, as well as one of the most unique geniuses of any age or country. The origin of his scheme was this: While on the Continent he had observed the culture of the vine, and remarked that the low vineyards were planted in such regular order as to admit the agency of the plough between the rows. No manuring was resorted to, as the dung is said to spoil the taste of the wine. “It was from this practice,” he explains, “I took my vineyard scheme, observing that indifferent land produces an annual crop of grapes and wood without dung; and though there is annually carried off from an acre of vineyard as much in substance as is carried off in the crop of an acre of corn, produced on land of equal goodness, yet the vineyard soil is never impoverished unless the hoeing culture be denied; but a few annual crops of wheat without dung, in the common management, will impoverish and emaciate the soil.” (“Horse-Hoeing Husbandry,” chap. 6, note.)

Accordingly, Tull's mind ran at once into the idea that earth was the food of the plant, and that, therefore, continual stirring the soil was all that was needed to produce that food, by effecting always what he termed a new “internal superficies.” The “fine particles of the earth,” says he, “are the very *paubulum* on which the plant subsists,” dung simply serving the same end as the plough in pulverizing the soil through its mechanical and chemical properties. We give a very brief sketch of this extraordinary man's character by one who was well qualified to judge:—“The drill-husbandry has been probably known and practised for ages, but was first essayed upon a regular and permanent plan by the learned Jethro Tull, who professed to have caught the idea from the vine culture upon the Continent. In the course

of thirty years' culture of his own grounds, under every disadvantage of ruined health and embarrassed circumstances, did this enthusiastic and splenetic genius reduce the tillage, seeding, and weeding of land to a system, which, being founded in nature and philosophical truth, we may venture to predict no length of time will be able to overturn. Most of our drilling and hoeing implements are either copies or improvements upon the invention of Tull; and his book, in which theory and practice are properly blended, evincing the labour of an acute and penetrating mind, ought to be in the hands of every agriculturist who aims at principles, and who is laudably ambitious to take his draught of science at the fountain-head. The grand error of Tull has not always been fairly or accurately stated. He nowhere denies that dung is an improver of land; but with that inequality of reasoning, generally to be observed in men of strong prejudices, he weakly attempts to support the fanciful notion that dung acts merely by dividing the soil, without being in any sort the food of plants, which puality he attributes exclusively to earth—as if dung, to go no further, was not naturally and spontaneously convertible to earth. It is extremely probable this notion of Tull was the pure offspring of his spleen. But, whatever were his defects, it would probably be difficult to name a man whose works have conferred a more solid and permanent benefit upon his country; yet, whilst so many others, for services of a very different nature and tendency, have enjoyed the most splendid rewards, Jethro Tull, whose honest labours were to contribute to the feeding and employment of countless millions, was suffered to pine out his days in misery and distress: his reward consists in the glory of being hailed by posterity as *the illustrious father of horse-hoeing husbandry.*”

Considering that one erroneous maxim of Tull was, “never to plough below the staple,” whereby he shut himself out from the subsoil, and precluded the introduction of all new matter for the nutriment of the plant, it is astonishing how, without any application of manure, he could have had crops at all; and

the fact that he had crops, and good crops too—although, from various causes, he never could get above the world—is one strong proof of the inherent vitality and value of the system—the sole support of the crop under his manipulation having been derived from the air, with what little exhausted remains of inorganic matter, in a limited depth of the soil, were developed by repeated and constant pulverization.

Our root and green crops—viz., potatoes, turnips, &c., are the only crops to which we have applied Tull's system. There is, indeed, a form of drilling cereal crops, but to speak of it as carrying out the system of Tull is a miserable mockery. The system developed by Tull cannot be carried out in its integrity without the free access of air to all parts of the plant, which involves a sufficiency of space to afford the means of supply to the roots also, as well as the leaves, by repeated and constant trituration. But the interstices startle the belief of our cautious agriculturists, which they are apt to regard as dead loss; and, possibly, in the greater part of our presently ill-farmed land it would not be successful—but perseverance sometimes works wonders. It must have been a very great stretch of faith at first to observe the turnip intervals!

“How Tull's system of wheat cultivation was tried and then dropped,” said the Rev. Mr Smith of Lois-Weedon, who carried on for nearly a quarter of a century a modification of Tull's plan most satisfactorily and profitably—“how the necessary width of the fallow intervals, together with the perilous operations of the plough at spring and before winter, so lowered the average produce as to hold out little inducement even to the most sanguine practical farmer to leave the beaten track of husbandry, would occupy too great a space to dwell upon here.”

Notwithstanding all our high farming, we have never yet got our land into such a state of tilth as that possessed by an *aul' wife's* *kail-yard*. This must yet be done; and when that is accomplished, under the broadcast system, *the crops will fall and rot*. Such a catastrophe plainly points out the invalidity

of the system, independently of any other objection, and demands improvement. The succedaneum will be found in the row culture. Under that system, from the increased strength of the straw, the rearing of a healthy plant, and bringing it successfully to maturity, will be compatible with the highest state of tilth of which the soil is susceptible.

Then will be the period of scientific husbandry. In it will be the adoption of moderately large farms—the range say betwixt 50 and 500 acres—a useful medium being between 200 and 300 acres, for in *very large* farms there will uniformly be found a *waste* that could support several individuals. The reason of the farm being tolerably large, is that, as well as intelligence, capital will be required to carry out the improvements. The row culture fulfils two great desiderata—more labour and more money to pay for it; whilst the grand principle will be attained, an increased supply of food, which constitutes the real wealth of a nation.

From the progress of mechanical skill, since the advent of the present century, many of our agricultural implements are nearly perfect. Our ploughs for preparing the soil for the crop, and our machinery for thrashing that crop when harvested, are perhaps all that could be desired. Some improvement, probably, is still capable of being admitted to our carts, which are too clumsy and heavy, and—did the good taste and sense of profit of our farmers only supersede their parsimony or laziness, so as to permit them to improve their roads—these carts would be much more advantageous if set on springs. Our reaping implements are sadly behind; but this is due probably less to inventive genius than to the defective system that evokes them. A great deal of mechanical skill has been expended on the perfecting of an implement for cutting down our cereal crops. It never occurred to the inventors that agriculture is in a *transition* state, and that on the existing order of things passing away the present ingenious, but necessarily ungainly implement, will be left high and dry—a curious relic in the history of agriculture of the misapplication of mediæval ingenuity. The fact of the

existence of no appliance for obviating the effects of wet during the obnoxious and exposed condition of our reaped cereal crops in harvest, is scarcely a compliment to our inventive skill. The good old maxim, "what the rain weets lat the win' dry," still obtains in all its primeval integrity. True, under the drill system there will be less occasion for such an expedient, but its use in our variable climate will never during this period be entirely dispensed with.

But the condition of nothing is permanent, and the time will come when this state of things we have referred to will in its turn pass away. The disturbed equilibrium betwixt demand and supply will again call for a readjustment of the balance. The row-culture, from its normality, its individualism, preciseness, and unity—especially viewed in

contrast with the empiricism and recklessness of the system it replaced—will probably remain a permanent institution. But its condition will be modified. The horse-hoe will now be laid aside, and agriculture will be resolved into a species of gardening. The quality of the grain will then not be judged of in the aggregate, but each seed will, in planting, be subjected to the same scrutiny as a suspected shilling. And then, in all things, will be observed the true practice of the science of economics, all arising from the imperious demands of a grim and rigid necessity.

Such has been, is, and, probably, will be the state of agriculture in Scotland—the science taking its shape and form from the existing and changing conditions of society.

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### THE GRAIN PRODUCING STATES OF AMERICA.

NOTHING seems more difficult than to estimate, with anything approaching to certainty, the course of prices in the grain market. This seems all the more difficult since 1846, for now the mind that would seek to form any just conception of the quantity of grain available for consumption in the course of a year, extending from one harvest to another, requires to obtain reliable statistics from quarters so numerous and so varied, that even the very shrewdest and most far-seeing produce-merchant finds very often that some error has upset all his calculations. Of one thing all feel certain that the price in Mark Lane regulates, to a very great extent, the price of grain in the Northern hemisphere, for the surplus production of other countries finds there its natural market. Those who have made any study of the wheat products and consumption of Britain, are aware that about two-thirds of her annual necessary supply is grown within her own bounds, but that for the remaining third she is dependent on foreign supplies. A large portion of that comes, no doubt, from

the Baltic and Black Seas; but, on an average, England must look for the half of her imported wheat to the North American continent. And it can scarcely, we think, fail to be interesting to agriculturists to learn something of the routes by which some 30,000,000 bushels of wheat find their way from the prairies of the far west to the seaboard, some 2000 miles, before it is shipped in its ocean vessels.

Those who have any knowledge of the American continent are aware that the Eastern States have long ago ceased to yield any surplus grain, but, on the contrary, have become vast grain-consuming communities, deriving their supplies from the great West. The Eastern States are now inhabited by a manufacturing population, obtaining their bread-stuffs from the West and sending their manufactured goods in exchange. It is almost impossible to conceive with what rapidity these Western States have developed. Fifty years ago they contained only a few straggling forts and trading points, now they contain about one-third of the whole population north

of the Gulf of Mexico. Within twenty-five years cities have grown up, now numbering 250,000 inhabitants; and the exports from one lake—Michigan—alone, equal about 90,000,000 of bushels per annum. To take an example of an individual State—Minnesota—as late as 1859 she imported wheat for consumption, in 1865 she harvested 10,000,000 of bushels, and this is but an earnest of what is for coming years to be reaped from her 52,000,000 of acres. That is but the most recent example of a new State beginning to open up. When we look at that vast territory and its grain-producing capacity, we need have no fear for the next half-century as to the food supply for the rapid increase of the population. All that is required is labour in the Far West, and greater facilities for carrying grain to the sea-board: thus reducing the price in transit, and consequently giving the producer greater remuneration. It is estimated that the surplus products of the West, moving eastward to the Atlantic States and other markets, exceeds 9,000,000 tons annually. The grain that is therefore exported for England, even at its largest computation, is a mere fraction of the produce of even one of these States. But it is not our object at present to refer to the extent of these food-producing states to the west of the great lakes, yet we may remind our readers that they embrace an area of over 262,000,000 acres, of which not one-third has as yet been occupied. We do not at present wish to enter upon the discussion of the character of these soils and the manner in which crops are grown and harvested; but this we may remark, that the soil is of course virgin and rich, that 99 per cent. of the farming community are in total ignorance of scientific agriculture, that the air is innocent of the smell of guano, and broken British weather seldom worries the life of the prairie farmer as he reaps his autumn yield.

But however rich and productive these States may be, they undoubtedly labour under the great disadvantage of lying at such a distance from the sea-board, as to render the cost of transport of produce very great. Yet this is not so great as at first sight might be

anticipated; for these States can be reached by navigation—on the one side by the St Lawrence and the Lakes, a distance of 2500 miles inland; and on the other, by the Mississippi, a distance of 2000 miles. Such views of inland navigation quite stagger the mind that has not been beyond its island home. Water transport, when easily carried on, will always, for heavy produce, be preferred to the railway. In fact, the railway must be content to make its profits out of passenger traffic and lighter goods. The Mississippi and the St Lawrence may therefore be regarded as the great natural channels for the western trade. The former of these, till 1825, was almost the sole outlet, because around the falls and rapids of the St Lawrence no canals had been cut. But since then, except for the southern markets, the northern route is necessarily the favourite for traffic. New Orleans is the ocean port of the Mississippi, but the cost to that port is greater, the route to Europe longer, and the climate not so favourable for preserving the grain from heating. On the shores of the Lakes it was naturally to be expected that cities would grow up at which grain would be collected and forwarded to the East and ocean ports. But no one could possibly have formed any conception of a growth within a quarter of a century of such cities as Chicago and Milwaukee, the great trading centres of the West. From these points produce is forwarded to its particular destination. If intended for Europe, the most natural route is by the St Lawrence to Montreal, there to be transhipped to ocean-going vessels. This would be an easy route, but for the Falls of Niagara and the Rapids of the St Lawrence. These have to be overcome by a series of magnificent canals and locks. To overcome the Falls of the Niagara River, some 270 feet, a canal, twenty-eight miles, with twenty-seven locks, has been constructed; but, unfortunately, allowance was not made for the great and rapid development of the West, and these locks will only pass vessels of 350 tons. Besides this there are forty-seven more miles of canals, with twenty-seven more locks, to overcome the Rapids of the St Lawrence. At Montreal



ocean steamers of 3000 tons, drawing 20 feet of water, are ready to meet the grain which has been brought from the West by barge or steamer. With their usual ingenuity and ability, the Americans have, however, sought to gain a large share of the benefit of this western produce, and have tapped the current at Buffalo on Lake Erie, and at Oswego on Lake Ontario, and by a canal of 569 miles have connected Erie with the Hudson River and New York. A large portion of the western produce thus finds its way through the Erie Canal to the East, and more especially to New York as an exporting port. From various causes ocean freights are generally lower in New York than Montreal, but the cost of inland transport from the West is greater to the former than the latter city. There are other water communications of lesser importance. But besides these there are five great trunk lines, of an aggregate of 8000 miles, extending to the Atlantic seaboard. And it is by these that in winter grain has to be transported, and not unfrequently in summer also, when the inland shipping companies are unable to forward produce fast enough. The termini of these railway lines are Quebec, Portland, Boston, New York, Philadelphia, and Baltimore. But mere railway termini can never compete as ocean ports with cities at the mouth of inland navigation. This is seen, even during the past year, in the fact that the Cunard line have withdrawn from Boston to New York; and a steam shipping company which made an attempt last year to establish a line between England and Boston were glad, after a few months trial, to dispose of their property at prices immensely below prime cost. We therefore look to New York and Montreal as the great shipping ports for the west. And if Canada be true to her duties, and at once enlarges her canals and locks to the largest convenient capacity for steamers of 800 or 900 tons, Montreal should be the great summer shipping port for western produce. The great disadvantage of the small-sized locks is, that the produce has to be either carried in small quantities or else transhipped at the canals, in either case adding very materially

to the cost of transport; but that immense volume of produce will soon burst these narrow channels, and force one for itself to meet the wants of the European markets.

We had intended to go into much more minute details and statistics, but we fear the difficulty of interesting our farmers in American matters; and yet they find in American farmers their stimulus, and to some extent their rivals. But has the British farmer much to fear from the western producer? Seriously, we think that he has not. In the first place, the prairie farmer has expensive labour and little skill; then he has the expense, in many cases no small item, of getting his grain over bad roads, with an imperfect railway system, to Milwaukie or Chicago. He has then to pay 6s. to 8s. per quarter to get his grain to sea-board. He has ocean freight, varying from 4s. to 8s. a quarter, to be added to previous expenses, before his produce reaches the market, which the British farmer has at his own door. If, with systematic farming, a comparative command of labour, the advantage of improved machinery, artificial manures, and a ready market, the farmers of Britain cannot compete, and that remuneratively, even when paying comparatively high rents, with proprietors of small holdings in the far west, working their own lands, then the sooner they turn to some other occupation the better for themselves and for the agricultural world.

The Norfolk or East-Lothian farmer, who can enjoy the pleasure and satisfaction of viewing the level field of full-eared wheat, swaying in undulating waves beneath a bright sun, giving to the grain a last golden tinge, before the reaper enters on its clattering work, can almost to a nicety tell you that there he will thrash from that field his 50 or his 60 bushels an acre. And so long as he can do that, with even a tolerably high rent, he is able to set at defiance all the competition of the Baltic or Black Seas, as well as the not less formidable rival of a young western world, where many will perhaps be astonished to learn that the average yield per acre, over the whole wheat-producing breadth, is only about 15 bushels per acre.

*AMATEUR FARMING A HUNDRED YEARS AGO.*

ARTHUR YOUNG, in his "Rural Economy," has some very apposite remarks relative to gentlemen farming their own land, which are not quite out of place even at the present day. The heading of the chapter is "Considerations on the Economical Conduct of such Gentlemen as make Agriculture either their Business or Amusement." He proceeds as follows :—

Perhaps we might, without any great impropriety, call farming the reigning taste of the present times. There is scarce a nobleman without his farm: most of the country gentlemen are farmers; and that in a much greater extent of the word than when all the country business was left to the management of the stewards, who governed, in matters of wheat and barley, as absolutely as in covenants of leases, and the merits of tenants; for now the master oversees all the operations of his farm, dictates the management, and often delights in setting the country a staring at the novelties he introduces. The practice gives a turn to conversation, and husbandry usurps something on the territories of the stable and the kennel—an acquisition which, I believe, with reasonable people, will be voted legal conquest.

But to speak in another strain, all parts of rural economics are, at present, much studied, and no less practised. It is impossible but this admirable spirit, which does so much honour to the present age, must be attended with great effects. For men of education and parts cannot apply to anything without diffusing a light around them; much more so when they give their attention to a business that hitherto has occupied few besides the most contracted and most ignorant set of people in the world. And facts, as far as they have been discovered, warrant this opinion; for, I apprehend, no one will dispute there having been more experiments, more discoveries, and more general good sense displayed within these ten years in the

walk of agriculture than in a hundred preceding ones. If this noble spirit continues, we shall soon see husbandry in perfection, as well understood, and built upon as just and philosophic principles as the art of medicine.

This general pursuit hurries all kinds of people to farming. Even citizens, who breathe the smoke of London five days in the week throughout the year, are farmers the other two; but, what is more to the present purpose, many young fellows of small fortune, who have been brought up in the country, addict themselves to agriculture; numbers even desert the occupations to which they were brought up, and apply to a trade so much more pleasant and independent.

Many are the young people whose relations having left them a farm or two (by no means to make them country gentlemen, but as a fund to raise money for prosecuting the business perhaps of a counting-house, or a shop) they are captivated at once with the idea of living in the country, upon their own estates, and turning over a book or two of husbandry (they can scarce lay their hands on one but will promise them a fortune in six weeks) find nothing so easy as to make a great income by farming. So flattering a resolution is soon taken, and they commence their new profession. Nor is this the only instance; all sorts of people, not absolutely fixed in other employments, partake of the fashion, and turn farmers. Physicians, lawyers, clergymen, soldiers, sailors, merchants—the farming tribe is now made up of all ranks, from a duke to an apprentice.

No fault is to be found with this rage for agriculture; in whatever manner it is conducted, many beneficial effects must inevitably flow from it; but what I shall aim at in this little sketch is to offer some cool advice to those who embrace husbandry as a trade, without knowing anything of its practice; who embark themselves and their fortunes in a ship which



may either be perfectly sound or equally rotten, for anything they know of the matter : to such, a few cautions relative to the economical parts of their new business cannot be unimportant. In one respect the consequences may be exceedingly beneficial ; a little prudent attention may prevent losses and ruin, which will bring discredit, however unjustly, on the business in general ; a circumstance which all who love agriculture should do their utmost endeavours to prevent.

The first and grand evil to which adventurers in husbandry lay themselves open, is the want of money to conduct their farm properly. In this respect they mistake worse than common farmers, who never proportion their land to their fortune as they ought ; but gentlemen should apply a much larger sum of money to it than farmers, for reasons obvious to all the world.

No human power can control or remedy this error while persisted in ; it must inevitably grow every day worse and worse till utter ruin succeeds. And here I speak of the most common practice, without going into any expenses but those usual in agriculture. But if any account is taken of experimental husbandry, or the practice of what is met with in books, all this becomes ten times stronger. As this matter is the most important of all others in the conduct of young beginners, I shall beg leave to enter a little more into the nature of the case.

The great error of common farmers is the hiring too much land in proportion to their fortunes. We constantly, through three-fourths of their lives, see the effects of this, notwithstanding their practising the most severe economy, notwithstanding their constant attention to their business, and their even labouring very hard themselves. The inconvenience must in necessity be much greater with a person who can neither labour, practise a regular economy, nor give a constant attention to his business, and who, added to all this, knows nothing of the matter. If he depends on the advice and assistance of another person, that person must be paid : so that in whatever light we view the case, he is undoubtedly under a stronger

necessity of having a sufficiency of money than any common farmer.

A gentleman of small fortune walks over a farm of perhaps two hundred acres of land ; he sees an old waggon or two, three or four carts, some ploughs and harrows, seven or eight shabby-looking horses, a cow or two, and a few ragged sheep. He goes into the house and sees the men feeding on fat pork, or bread and cheese : he views nothing that gives him any idea of expense. Very possibly all he sees might be purchased for a hundred pounds, and this apparent want of but little money must give him a notion that a trifling sum will stock such a farm. Nothing is further from his head than conceiving the prodigious expense dependent on every thing he sees. If he looks at an old rotten plough that lies in the yard, it never occurs to his mind what a train of expenses that instrument, which may not be worth five shillings, draws after it. If he asks advice, it will probably be of some farmer or bailiff he designs to employ : now, the event is too much their interest to undeceive him, however mistaken, for his ruin cannot ensue without their being much the richer for it. These suppositions may appear somewhat far stretched, but not to those who have had experience of the lower kind of country life.

There is no doubt but a gentleman may turn farming to good account, and yet be cheated for some time by the people around him. He pays for experience, but then he gets it, and that will, with good management, afterwards pay him again ; but then large sums of money are requisite for this, and in the stocking a farm good allowances ought to be made for such unseen expenses.

After the view of such a farm as I now supposed, which convinced the gentleman that a small sum of money would do for farming, we will say he hires it. From that day he will be very busy in viewing his land, in pointing out improvements, and talking the whole matter over with his assistant or adviser. Every hour (if he has the least genius) will disclose something or other that wants to be done. His men will tell him, very plausibly and sensibly too, that such a ditch

should be cleaned; that this field wants draining most terribly; that that pond would pay exceedingly well for emptying; and, in a word, a hundred things that plainly ought to be executed. This crowd of business renders him desirous to know what others have done in the same situation: he turns to books, a new world starts upon him at once; all he has been advised is demonstrated to be right, and a million of things besides, he never dreamt of, proved as clearly as any axiom in Euclid. His first half year's rent is not paid before he wants money.

The truth of the matter is this: every common labourer can point out many things that should be done, the bailiff many more, and books ten thousand times as many as both the others put together. Now, in this immense mass of advice, the mischief (to such a gentleman) is, that much of it is very rational and good. If all was absurd the whole would probably be rejected, but the best advice upon earth cannot be executed without money. It matters not a groat that a work is demonstrated to be expedient, and even necessary, if I have not cash to execute it.

The great point, therefore, is the assigning a proper sum of money to the business; and if a man trades upon his all, to take no more land than he can perfectly manage, with proper allowances for his not being experienced in the business. As to the particular sums requisite for given quantities of land, it is impossible to sketch anything of that sort in the bounds of an essay; but I have treated that matter pretty largely in another work, called "The Farmer's Guide." One hint, however, I shall give here: when the gentleman has made all inquiries and estimates, let him quadruple the amount, and he will be much nearer the truth. Every consideration that can have influence on a man thus engaging himself in agriculture call on him to be cautious in not taking too much land. If he purposes to make his business an amusement, sure there is more pleasure in viewing a few fields in a neat and garden-like order, than in wandering over a great many that exhibit no mark of being cultivated by a gentleman.

If experimental agriculture, or the practice of such methods of culture as are recommended in books, be thought of, it can alone be practised by having little land, but much money. If a gentleman would shine among his neighbours, if he would farm (as many, by-the-bye, do) that he may talk of farming, he should, by all means, confine himself to such a space as he can absolutely command; for none of his company would give sixpence to be shewn a parcel of common crops managed no better than by a common farmer: such will not afford him matter for conversation. One acre, cultivated in a masterly manner, will, in this respect, be a much more fruitful source, than a hundred managed like his neighbours. But all this requires plenty of money, which no man can have who overtrades himself.

Respecting the providing money, one remark is requisite. A person, at the beginning of his practice, who designs to make agriculture a trade, should undoubtedly possess the sum he throws into it, clear of all debts whatever: for borrowed money may be an excellent means of advancement to a man who has laid a stout foundation in a handsome sum of his own, and much experience, but a very fatal one where these requisites are wanting. When once a man has really gained, and probably paid for experience, finds that his business, though small, is profitable; that he could dispose of a sum of money to good advantage, in some addition that he has tried with success; in such a case money should undoubtedly be had, and if a farmer possesses it not himself, he should borrow it of another. A spirited resolution is as necessary for advancement by husbandry as prudence. In gaining due experience it is impossible to be too prudent; whatever is doubtful requires much caution, but when uncertainty gives way to conviction, real prudence consists in discarding caution; and having once determined a measure to be right, to execute it with spirit and celerity. A situation in which borrowing large sums of money may be the highest prudence. All men, whatever be their business, that act not upon these principles, want either prudence or resolution:

the one is as necessary as the other. The want of the first, will overthrow him in the very beginning of his career, and the absence of the second will sink him when in sight of the goal.

Another point which a person who begins farming has to consider, is the employment of a bailiff. He will find this determination a matter of some consequence, and ought to be well reflected on. Many reasons are to be offered for, and many against it. It may, in the first case, be asserted, that in every species of business, the master should know more, or, at least, as much as the man, that no errors may pass in the conduct of the latter, without being seen and understood by the former. That the question does not turn on the employment or non-employment of such an excellent bailiff as may easily be described, but of such a one as chance or the common course of such matters will probably discover; in which case he may be supposed bad, or indifferent, as well as good, and the master without the requisite knowledge to discover whether he is the one or the other. That the idea common in most countries is, that of nine bailiffs out of ten being knaves, which notion could not become general without having some foundation in truth: nor is this any wise surprising, for a servant placed in a trust which in itself abounds with the temptation of breaking it, and over-looked by a master ignorant of the business, most certainly is a situation that would, in any other trade, as well as farming, prove wonderfully fertile in creating knaves.

That a bailiff, from the nature of his office, has so many opportunities of being unfaithful without detection; that he may, in one year, defraud his master of more money than twenty labourers or servants can cheat him of; that the expense of one proper to oversee and regulate a business is so great, that it would swallow up all the profit of a small farm; consequently can never, with propriety, be recommended but in a large business; and such no gentleman, ignorant of husbandry, should at once venture on. That a bailiff having been brought up totally in the common practice, has an aversion (found among

all farmers) to new practices, and could, therefore, give his master no assistance in many cases wherein he might want it; but, on the contrary, would probably thwart his measures, and occasion a want of success. For these, and many other reasons, bailiffs are thought in most cases useless, and in many detrimental.

On the other hand, it is alleged that a young practitioner in farming must necessarily be so much at a loss about a great variety of matters that come before him, of which he is ignorant, that if he does not keep a bailiff his whole business will infallibly suffer; his servants will impose upon him in a hundred points, and assert everything to be the custom of the country; his labourers will do the same in all their work and prices; his cattle will be ill-managed, and his crops spoiled—consequences much more fatal than the dishonesty of any bailiff, be he ever such a knave. That a gentleman who does not employ a person of this sort must, so far from rendering his business a pleasure, submit to it as a slave. He must be absent from home no more than the lowest farmer; and he must at all seasons, hours, and weathers, attend to every motion of his people. He must ride about the country to fairs; he must frequent markets; in a word, he must let himself down to the lowest company; and if he has the least taste, or the ideas of a gentleman, suffer continual uneasiness. That, by the employment of such a person, he not only escapes all these disagreeable circumstances, but likewise learns, at the same time, the principles and the practice of his business. By the help of a bailiff, well skilled in common husbandry, he will, in a few years, acquire an equal knowledge; and consequently, have it fully in his power to oversee and control the bailiff himself, and never lay himself open, through his ignorance, to be imposed upon. That the propriety of keeping a bailiff, even in an economical view, is proved by the practice of most great farmers, a set of people so sharp-sighted to their interest in these matters that they would never suffer a constant, or, indeed, any train of imposition. That all gentlemen, whether they have farmed a long or a shro



time, but especially beginners, find that servants and labourers will not obey them so well as a person nearer their own level in life. Gentlemen never have the work done that common farmers have; but a bailiff will procure as much for his master as any farmer has, provided the master encourages this head servant, and makes it his interest to use him well. For these reasons, as well as others that might be urged, the expediency of employing bailiffs is asserted.

Sir Roger's decision, "much may be said on both sides," is here very applicable, for neither opinion should be embraced in absolute exclusion of the other. It may, therefore, be of some use to point out, in the supposed conduct of the gentleman just going to farming, such a course of management as may obviate, if not remove, the objections of both parties.

The most difficult point is the size of the farm, as nothing but a considerable business will pay the expense of a bailiff; and there can be no doubt of the imprudence of beginning with a large farm, dependent wholly on the honesty and skill of another man. I think, for this reason, the gentleman should begin with a small farm, not under the expectation or the notion of making a shilling of profit, but for the more important advantage of gaining experience enough to keep a bailiff when he enters on a larger business. I am sensible there are objections to this conduct; but none in difficult points can be invented that is free from them—the only choice is that which has the fewest.

In a small farm he will not find the trouble of gaining a pretty tolerable stock of knowledge and experience so great a drudgery as some may think. He will learn the prices of the country, of all sorts, and discover the proportions between price and labour in such a manner that he will not be much to seek, in any country—the common management of arable lands. He will soon gain the application of manures, as known by country farmers; and such a knowledge of cattle as will, at least, prevent his falling into gross errors. In his conversation with labourers

and farmers he should make inquiries after different methods of farming, and make memorandums of such replies as he thinks most sensible. But a greater source than all this is observation—let him look over his hedges, and see what his neighbours do with their land—let him walk about the country for the same purpose, and compare the practice which he sees with the opinions which he hears. It would be for his interest to be acquainted with one or two decent sensible farmers, that will not take a pleasure in misleading him. Such are everywhere to be found; it only wants a little penetration to discover the proper people to apply to. Let him invite them to dinner, and now and then give them a bottle of generous wine, and chat freely about country business. He will find it no difficult matter to learn from them the chief of what they know.

Now, I do not offer these means as an instruction how to make himself a complete master of agriculture, or to make at once a fortune by it; all I pretend he will gain by it, is such a ground-work as will afterwards allow him to erect the wished-for building on. He will, in this manner, gain experience sufficient to venture, I should apprehend, in three years, on a large farm, with the assistance of a bailiff. There is no reason for a man of small fortune, or rather of not a large one, repining at his time sacrificed merely to experience in common husbandry.

One of the chief objections to a bailiff is the ignorance of the master. By such an apprenticeship as I propose, he will know enough of the business to direct the bailiff what he would have done, without fearing to expose himself by absurd orders (I am here speaking of the common practices), and without any necessity for its being conducted without his own assistance. He will also know enough of prices to direct the bailiff how far he should bid for any commodity at a fair or a market, and the price he will allow him to sell at—all which are powerful means of controlling even the allowed knavery of such a servant.

*WATER-FARMING.*

THE civic population of the United Kingdom are deeply interested in all matters relating to the supply of provisions, and the active co-operation of every art that can increase the quantity is imperatively required. From the science of pisciculture, which in Britain is yet in its infancy, important results may be obtained, and the object of the present paper is to shew how much may be done to increase the supply of fish from our rivers and streamlets, and how many a piece of land, at present worthless, might easily be converted into a pond, and made capable of yielding a revenue far exceeding that of highly cultivated fields.

In France the art of aquaculture has produced the most startling results. Many rivers there have been re-stocked with fish, employment given to hundreds of poor fishermen, and the food of the people greatly increased. To such an extent, and so liberally, has this important matter been carried out, that the Government are now making distributions of the eggs of the best kinds of fish gratuitously to all who will undertake to hatch and rear them, and make a return of the quantity reproduced.

With regard to the artificial production of salmon, the establishment at Stormontfield, is now a household word, and when we contrast the profit derived from this mode of water-farming with any other kind of farming, the pecuniary advantage in favour of the former is fully apparent. "If," says Mr Buckland, "to the first cost of an animal reared and fattened on a farm we add the risks that are run in maintaining him in health and condition until he is fit for human food, the profit for feeding is not very great; but in the case of the salmon we can send a fish down to the sea which even by this artificial means does not cost a farthing, and he there grows and fattens without either care or superintendence, without cost or trouble of any kind, and when he is in the highest condition he returns to us worth about as much as a prime

fed sheep, which has required to be watched and cared for till it reached that condition. Here, then, as Lord Essex said, 'is a mine of wealth under water as much as any under ground,' and if this be not a branch of public wealth that deserves cultivating we know of none that is." In Ireland the same success has attended the labours of the Messrs Ashworth, who have stocked with salmon thousands of acres of water in Galway by the artificial propagation of their ova. In the north and west of Scotland there are many thousands of acres of water which might become immensely valuable were this system to be carried out; and, indeed, unless the artificial rearing of salmon be speedily adopted many of these salmon rivers and lochs will decline in value from over-fishing, as was the case with the Tay, till the Stormontfield experiment was tried as a means of remedying the evil.

But not only by the rearing of salmon can much be done to increase our food supplies, every sheet of pure water may be turned into a means of rearing abundance of fish.

That the art of pisciculture was largely carried on in Britain in former times no one can doubt. Before the era of the Reformation, fish-ponds were attached to inland convents and monasteries, as fish were largely required for the wants of the church; but when the ecclesiastical property fell into the hands of laymen, the ponds were drained, or were allowed to become choked up with reeds and mud. In Holland, where much attention is paid to this subject, fish-ponds are made upon scientific principles. They are made in a series of two, three, or more, communicating by hatches with one another, so that when one is drained the others may remain full; and each or all of them can be raised or let down at pleasure. Ponds made after the Dutch manner should not exceed 80 yards in length, 30 in breadth, and 6 feet in depth. They may then, when suitably prepared by a layer of gravel at the bottom, be stocked with

trout, carp, or tench, and the return will be in proportion to the amount and suitability of the food given to them. Dog biscuits, soaked in water or skim milk, and mixed with coarse flour, grains, dropped garden refuse, cold boiled potatoes, bran, and such like, worked together into a sort of paste, and then subdivided into small pellets, will answer admirably for the purpose, and would not occupy the gamekeeper or gardener one hour a-day in their preparation and distribution. If these ponds have been stocked with fish artificially hatched, in the course of four or five years the return may be looked for; and as each of the ponds will contain conveniently 1000 fish, such harvest would, at a moderate calculation, yield 250, averaging 4 lb. each. This quantity, at 6d. per lb., would give the proprietor £25 for a single pond; and if we suppose the chain to consist of six, they will collectively produce an income of £150 per annum, an amount immeasurably greater than a similar surface of poor land could, by any possibility, be made to yield if employed agriculturally. This large return may also be obtained much sooner, if the ponds were to be stocked with half grown fish, which can easily be obtained from our rivers and lochs.

With reference to this subject, and the value of trout fishing in one of the Scottish lochs, the average weight of trout captured with the net at Loch Leven, is estimated at from 15,000 to 20,000 lb. annually, and gives a money value of from £750 to £1000; and this large sum is independent of the revenue derived from anglers, to whom the right of fishing is granted at the rate of 2s. 6d. per hour, for the use of a boat and two rowers.

Dr Peard the latest of the writers on pisciculture, very properly goes a step further, and argues that if so much can be gained by attention to our lakes and fish-ponds, equally satisfactory results will follow from the conversion of our numerous streamlets into profitable little water-farms. He says—

“The first step to be taken in the way of improvement is to enlarge and secure the safety of the pools, which will hereafter form pastures for the new stock we intend

to introduce. This must be done from one end of the rivulet to the other, so that, if possible, no part shall be unproductive or unprotected. As one pool will resemble another, we need only describe the mode of constructing the first, premising that, as we descend the stream, each will be somewhat larger than the one above; that is to say, in the ratio of the increasing volume of water. Commencing at the head of the brook, we will erect the first dam and enlarge the first pool at a point where the natural channel is about 10 feet in width; the alders and hazels which fringe the stream furnish ample materials for our work. The reader must suppose that we are accompanied by a couple of ordinary agricultural labourers, armed with hook, mallet, and spade, and these form for our purpose an ample corps of sappers and miners. Ten minutes will suffice to cut down and tie up two faggots of the required length, say about 5 feet. This will allow 12 inches at each end to be inserted into corresponding niches on either bank. A short stake driven through the extremities will prevent the possibility of their removal by floods or other accidents, and a few shovelful of stone and gravel, together with a layer of sods, complete the work and make a dam so effectual that it will last for ever; in fact, the winter freshets by adding sand, dead leaves, twigs, and such like, tend to keep it in continual repair. We have now erected our first weir, and by taking an acute triangular strip of turf 12 inches broad at the base, from each side above the barrier, have doubled the width of that portion of the stream, converting the original channel of 2 feet into 4. The next point is to construct a pond *below*, which we make about 5 feet wide and 10 feet long, and 3 feet in depth, gradually, however, becoming shallower as it approaches the run below. Having thus enclosed what may be called the first pasture in our small farm, the next thing to be done is to ensure the security of the stock we propose placing therein. To effect this, two stones of about a hundredweight each should be set in the centre of the pool, at a distance of 3 feet from each other, and over them a flat slab must be laid. This structure, resembling a subaqueous bridge, possesses two advantages—namely, affording shelter to the fish in hot weather, and protecting them almost absolutely from the assaults of night poachers. Descending the stream, we repeat the process about 50 yards below, and continue to do so at similar intervals till we reach the main river. This work might easily be effected by two



labourers, under judicious direction, in three weeks; and two or three days more might be occupied in a careful inspection and improvement of the various pools and dams; such, for example, as increasing the height of the falls by adding an additional faggot to some of the weirs, and raising a light turf embankment on either shore 10 or 12 inches in height, so as to correspond with the additional elevation given to the edge of the dam."

Having thus prepared the place for piscicultural operations, the next step is to fit up some hatching-boxes and nurseries for the stock, which should be of the best kinds of trout, such as can be got from Loch Leven, or from some of the best English rivers. This hatching process is so simple that it can be performed by any one who will give a few hours' study to the directions of Mr Francis, Mr Buckland, or any of the writers on this subject. Indeed, so simple is it that Mr Francis has said that he would undertake to hatch a hundred young salmon with the aid of a cheese plate and a tumbler of water.

The next step is to have a regular system of feeding the fish so as to secure their rapid growth. A few children may easily collect snails, slugs, worms, grubs, and larvæ of all kinds for this purpose, and distribute their gatherings about noon each day in the pools and dams.

"Having thus brought our management to this point we will epitomise," says Dr Peard, "and take a rapid glance at our improving property. A small stream, scarcely four miles in length, has been altered (on paper) to suit the requirements of fish-rearing. Three hundred and forty-eight ponds and dams have been cut, and have thus increased our available space enormously; one set of hatching boxes has proved amply sufficient for our wants, and, being carefully put up, have since continued in good working order, giving us 6000 or 7000 fry each spring.

"Meanwhile, our first hatch spawned in their season, and the produce added largely to the number of the fry artificially raised; in fact, our small farm by this time contained a stock as large as it could support. Our plan for feeding being based on principles as natural as economical, the fields, lanes, ditches, and hedge-rows yielded an abundant supply of food, and our small collectors have not been ill-paid at 3s. 6d. each per week.

"Had these results really been obtained at the end of the fourth year we should have been enabled to fish the pools and dams for market, and during the summer might have disposed of about 2000 trout, averaging a little over one pound each, which would have produced about £103. And now, in conclusion, let us glance at the expenses of our farm. Let us suppose the construction cost £15; the hatching boxes, with fittings, £6; and wages for portions of three years' feeding, £70; this will give £91 as the total outlay.

"We will assume therefore that something about the sum of £100 has been sunk on this petty water property; that the annual expenses are £50, and that its yearly production equals £100. Even at this rate, the farm would yield a clear annual interest of 50 per cent. on the outlay. But are we warranted in believing this to be the maximum of its produce? We think not; nay, we are confident it could be raised to a higher figure—for the number taken from each pond, about five, was very insignificant in comparison to what they might easily have spared. How trout, grayling, and other fresh-water fish can be increased, both in size and number, by mere preservation, many streams in Wiltshire, Hampshire, Shropshire, and other English counties prove. But preservation is only one amongst the ninety-nine points of good water-husbandry. If the science was applied in its entirety, what might *not* reasonably be expected from it?"

Such, then, is the scheme of water-farming so enthusiastically enunciated by Dr Peard, which seems to offer so many advantages, and which is well worthy of the attention of our landed gentry. The experiment may be tried not only with the common trout, but with grayling, charr, or any of the other kinds of fresh-water fish, whose ova are distributed at the great establishment of Huningue, under the management of the French Government.

From this establishment no less than 110 millions of fish were distributed during the first ten years of its existence, and, as was before remarked, it is producing the most beneficial results throughout the Continent.

On the whole then, water-farming seems to shew a reasonable prospect of remuneration for the capital employed in it, and beyond this will confer on our population a social benefit the extent of which cannot be easily overrated.

## The Country House.

### CHOICE OF A SITE FOR BUILDING.

IN a great number of instances people begin "to think about building," as the phrase goes, prompted by a liking to some particular site which their walking abroad may have discovered, and which to their mind comprises everything that is delightful and to be desired as a place upon which to pitch their tent. Whether this be the experience of as many as we suspect it is, certain it is that the points connected with a choice of site are of the utmost importance, and should be well considered even before the planning of the house which is to occupy it is gone into. That some deem these points of little or no importance, is evident enough if we examine the sites of some houses, which could not have been worse chosen had the object been to take pains to get a bad in place of a good site. In our experience we have met with not a few houses which were placed in positions the worst possible, both as regards the health of their occupants and the shutting out of pleasant views. It will be well, therefore to glance briefly at the points involved in the choice of a site, what it ought and what it ought not to possess. A shrewd piece of advice has been given on this subject worthy of consideration, and it is to the effect that one should examine the site in the worst, not in the best, weather. There is a large amount of suggestiveness in this, for under the influence of a bright sun and cheerful sky the worst place will have an aspect of cheerfulness, and the converse holds equally true; and one may rest pretty well assured that they have chosen a site which will be very pleasant in fine weather, if in bad it presents but one or two aspects of pleasantness. But while the position of the site with reference to the surrounding landscape is of importance, its position with reference to the land

immediately surrounding it is of no less importance. Hence, the plot of ground on which the house is actually to stand must be considered: if a rising part presents itself, choose that, and by all means carefully avoid, what some seem to think highly of, building in a hole. Some choose a depressed part as very likely to be a sheltered spot, but this is quite a mistake; for, independently of the difficulty there is in draining the house, the chances are all on the side of winds beating upon the house as angrily in its low situation as if it was placed upon rising ground near it. Stronger winds oftener blow through the lowest part of a valley than along its sides, or even sometimes upon their summit. The site of a house is often chosen on account of its proximity to a piece of water, this last being considered as "such a pretty object in the landscape." No doubt water viewed from a house, especially if surrounded with clumps of trees or waving willows near its banks, is a pleasing object, but whether it is good to have it near the house is another question; it is more probably true that distance rather than proximity will lend enchantment to the view; and it is almost certain that actual proximity to water is not a healthy thing. As a rule, it will be found that delicately constituted people rarely are in good health while living in houses in immediate proximity to water. The bad features of the case are intensified if, in addition to being near the water, the house is placed on a level with its margin; and worse still, as is sometimes the case, a little below it. The site of the house will in these cases always be more or less damp, than which there is no greater evil to be encountered in a house. Again, do not build at the foot of a sharply-rising ground or the face of a precipice. Some

have chosen such a site as this from the idea that they would be protected from the north wind, utterly forgetful of the fact, that not only would the site of the house be exposed to all the drainage-water of the hill above, but that chimneys would smoke in nearly every high wind that blew, from its being drawn down or deflected from the surface of the rising ground behind the house.

It is to be noted that while attention is to be paid to the general aspect of the site, the special aspect of the house which occupies it must not be overlooked. The site in its general features may be admirable, it may command the finest view, take in the grand aspect of forest and mountain, or the quieter points of river, lake, or rural scenery; it may occupy the healthiest position, and yet many of the advantages may be lost by not paying attention to the peculiar position of the house or the ground actually occupied by it. It is not enough to have a good site, then; it is necessary also to place the house upon that site in the best position. We have seen a house placed so that all the advantages of a fine view which the site commanded are utterly lost; or so placed that all the cheerfulness was excluded, all the gloominess secured. A little forethought would have avoided all this. Of all the aspects which can be given to a house the south-east is the best—*i. e.*, the best aspect for the rooms which are most frequently occupied in the day-time. This aspect is not only the most cheerful, but it is the healthiest; healthy because cheerful; inasmuch as the cheerfulness is derived mainly from the large amount of light secured by the aspect; and light, or rather plenty of it, is perhaps one of the things most conducive to health. But while the south-east is as a rule secured as the aspect of the majority of the windows of the house, it will conduce much to the pleasure of its occupancy, if one at least of the living or entertaining rooms be provided with a window or windows having a due western aspect. This is by no means so difficult a thing to attain as one might suppose; a very little consideration in the planning of a house will secure it, and it is worthy of being secured even by a good deal of considera-

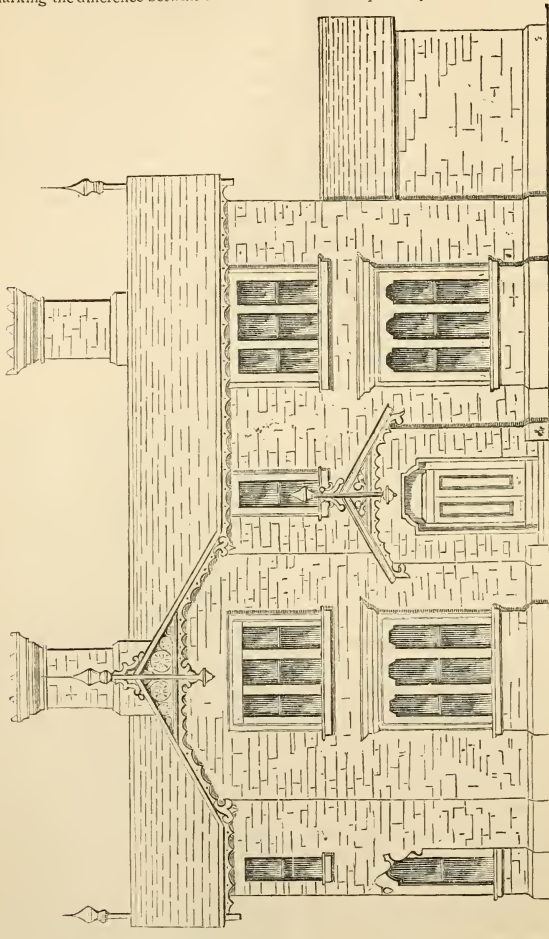
tion, if that was demanded. For the afternoon aspect of a house, which this western look-out will secure, is perhaps as important as a morning one, perhaps more so, as business and the cares and labours of the day give place to the rest and repose of the evening, when good aspect can best be enjoyed; and there is perhaps nothing more enjoyable than the look-out from a sofa or an easy chair upon all the glories of the evening western sky, with its golden sunset, or its shade of clouds. Aspect and prospect are too often confounded, treated of, and considered as synonymous terms, but they are not so—they mean indeed very different things. What they do mean, and what are the considerations involved in them, the following remarks by Mr. Repton convey much, and conveying much, are therefore worthy of a place here:—

“Nothing is more common than for those who intend to build to consult many advisers and collect different plans, from which they suppose it possible to make one perfect whole; but they might as well expect to make an epic poem by selecting detached verses from the works of different poets. Others take a plan, and fancy it may be adapted to any situation, but, in reality, the plan must be made, not only to suit the spot, but it ought actually to be made on the spot, that every door and window may be adapted to the aspects and prospects of the situation. It was a remark of my venerable friend Mr Carr of York, after four score years of experience as an architect, that to build a house we had only to provide all that was wanted and no more, than to place the best rooms to the best aspects and the best views. Simple as this apothegm may appear, it contains more truth in theory and more difficulty in practice than all the rules that have ever been laid down in books by architects, or the remarks of all the admirers of rural scenery with whom I have conversed. The former never think of aspects, and the latter think of nothing but prospects. I will therefore beg leave to enlarge upon these two subjects.

“I consider the aspect of infinitely more consequence to the enjoyment and comfort of the inhabitant than any prospect whatever; and every common observer must be convinced that in this climate a southern aspect is most desirable, but few are aware of the total difference in the effect of turning the front of the house a few points to the east or to the west of the south, because, although the south-east is the best, yet the south-west is the worst of all possible aspects, for this reason, that all blustering winds and driving rains come from the south-west, and consequently the

windows are so covered with wet as to render the landscape hardly visible. My attention was drawn to this subject by travelling so much in post carriages, and often remarking the difference betwixt the window

of wind and rain, we accidentally went into the butler's pantry, which looked towards the south-east, where we found the storm abated, and the view from the window perfectly clear and free from wet; but, on



Design for a Suburban Villa.—Front Elevation.—See page 31.

to the south-west and the window to the south-east, during a shower of rain or immediately afterwards, when the sun shining on the drops causes an unpleasant glitter, obstructing the prospect, while the view towards the south-east remains perfectly visible.

“At Organ Hall, in Herefordshire, the living room was towards the south-west, and, during a heavy storm

returning into the other rooms, the storm appeared as violent as ever, and the windows entirely covered with drops, which obstructed all view. On considering the prevalence of south-west winds, it was determined to reverse the aspect of the house by changing the uses of the rooms, thus making a very comfortable house of one which, from its aspect before, was hardly inhabit-

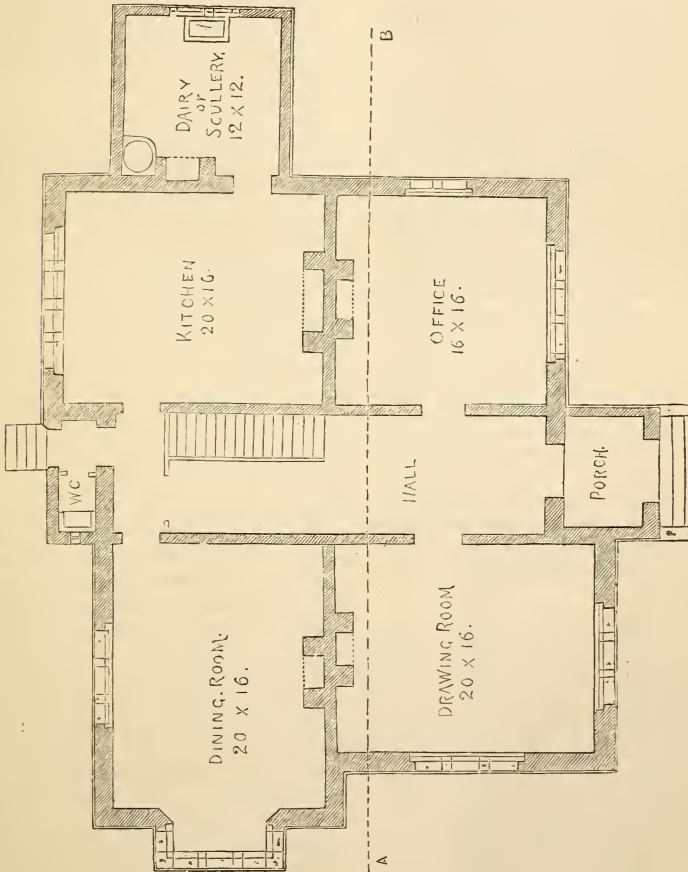


able, since no window, nor hardly any brick wall, will keep out the wet where a front is exposed to the south-west; for this reason, it has been found necessary, in many places, to cover the walls with slates, and to use double sashes to the windows so situated. If we had only one front or one aspect to consider, our difficulty would soon vanish; but the prevailing partiality

“2dly—the aspect due east is not much better, because there the sun only shines whilst we are in bed.

“3dly—the aspect due west is intolerable, from excess of sun dazzling the eye through the greatest part of the day.

“Hence we may conclude, that a square house, placed with its four sides opposite the cardinal points, will have one good and three bad aspects.



Design for a Suburban Villa—Ground Plan.—See page 31.

for variety of prospect seems to require that in every direction the views should be retained; and as the opposite side must be parallel, and the corners, and right angles, we must consider the effect on each of the four sides.

“1st—the aspect due north is apt to be gloomy, because no sunshine ever cheers a room so placed.

“Let us now consider the effect of turning the principal front towards the south-east. In this case the opposite front will be to the north-west, an aspect far better than either due north or due east, because some sunshine may be preserved when its beams are less potent than in the west, and the scene will be illuminated by those catching lights, so much studied



by painters, especially when the landscape consists of large masses of forest trees, and thickets richly hanging down the sides of an opposite hill. An aspect open to the north-east would be objectionable during the cold winds of spring, unless the building could be effectually sheltered by an impenetrable screen of trees, rising ground, or other defence against the wind."

The author further remarks that the south-west aspect should be sheltered by a plantation, and the offices should be erected in that situation, and again says :—

"It is very common for admirers of landscape or natural scenery, to overlook the difference between a tree and a pole, or between a grove of old trees and a plantation of young ones. We fancy that time will reconcile us to the difference, but alas! we grow old as fast as the trees, and while we dot and clump a few straddling saplings on an open lawn, we indulge hopes of seeing trees, while, in fact, we only live to see the clumsy fence by which, for many years, they must be protected. Happy is the proprietor of the soil who becomes possessed of large trees already growing on the land he purchases, since no price can buy the effect of years, or create a full-grown wood; and without this we may possess a garden or a shrubbery, but not a landscape. This consideration alone is sufficient to attach us to the venerable avenue, which it would be a sort of sacrilege to desert, and whose age and beauty will give an immediate degree of importance to the house, which could never be expected in any more open part of an estate."

After *aspect*, Repton gives some excellent suggestions on other important essentials in selecting a site for a house. This second is that of *levels*; and regarding these he speaks as follows :—

"This is an object of much more importance than is generally supposed. We frequently see houses placed, for the sake of the prospect, so high, that they are annoyed by every wind; and others, for the sake of shelter, so low, that they are flooded by every heavy fall of rain, or by the sudden melting of the snow. The site should be on a sufficient eminence to enjoy prospect, and yet to be sheltered from the sea winds; the ground should, by *nature*, fall gently from it in every direction, except towards the north; and in that direction it can easily be made to do so by *art*; this is necessary to prevent any dampness from the hill, and to provide a sufficient drainage for the house and offices, all of which will require very little cost or labour. If this be done the site may be pronounced perfect with respect to its levels.

"3dly, *Objects of convenience* should be studied, of which the first is the *supply of water*. This is an object of great importance, yet I have frequently seen large houses placed where no water can be had, but by aqueducts, or distant land-carriage; and, as it is

not only for the constant use of the family, that water is essential, but as a security in case of fire, some great reservoir, or tank, ought always to be provided near the house.

"4thly, There should be *sufficient space* to contain all the numerous appendages of comfort and convenience, as offices and office-courts, stables, and yards for wood, coals, linen, &c., all which should be near; and others, at no great distance, such as kitchen-garden, melon-ground, poultry-yard, timber-yard, ice-house, &c. These, if possible, should be on the contrary side of the house to the flower-garden, conservatory, and pheasantry, which are naturally connected with pleasure-ground.

"5thly, *Relative objects*, or such as, though not immediately belonging, must be considered as relating to the place, and, therefore, must be properly connected with it—viz., the post-towns, the church and village, and the sea; to all which there must be roads, and these may be made highly ornamental, useful, and convenient, or the contrary.

Another important point in the placing of the house on the site is the relation of trees to the house. "Happy the man," some one has remarked, "who obtains a site on which there are already trees the growth of bye-past years;" but there are always two sides to a question, and it may be said, *per contra*, that "Happy is the man who has to plant trees near the site of his house, and lives to see them grow," for in the latter case it can always be said that such satisfaction is obtainable, as can be obtained, from the circumstance that associations, generally of a pleasant character, cluster round these clumps and scattered patches. His own hand has planted them, or his taste directed in what position they were to be planted; they are the owner's own trees—his "very own;" he has watched them in their first feebleness, rejoiced in their growing strength, and may look forward to the time, if he does not speedily enjoy it, when he may find shelter in their shade. On the other hand, if the site is already furnished with trees which other hands planted, and the gradual growth of which other eyes have watched and waited for, there is in the fact something worth being satisfied with. They are to his mind, and under the directions of his taste—or the want of it—whether they are to be ruthlessly cut down, or to be left to adorn his house with all the dignity of gnarled trunk and bole, and all the splen-

dour of their leafy shade. For if planting fresh trees brings pleasure, it also brings pain; for we grow old faster than do the trees, and while we hope to see them in their vigour and to enjoy them in their beauty, we only, in fact, as Repton suggestively puts it, "look for years upon the fence which protects them." But in any case, whether the site selected has already its growth of trees, or whether they must be planted, it is of importance to consider their relation to the house which is to occupy the site. We frequently see trees planted right in front of the house, the very worst position which they can occupy; for if the prospect and aspect chosen are chosen upon the principle and for the reasons we have already explained, what can trees in such a position do but mar and spoil them? Trees always give dignity to a house when they flank, rarely when they front them. Nor should the degree of their contiguity to the house be everlooked, as overlooked it often

is, although a point of great importance. Shelter is never obtained in its full and most useful effect from trees except when they are in masses, and masses always have a bad effect upon a house when placed near it. They exclude light and air, and create dampness; and to such an extent do they do all this, that we venture to maintain that, so placed, they always make a house unhealthy. Shelter is best obtained—we here speak of direct shelter—by the arrangement of the house itself, and by the use of that feature, which is too seldom the feature of the farmhouse—the verandah. But if trees are made to flank a house, and at a good distance from it, they add to the site one of the finest ornaments, one of the highest sources of pleasure; not but what an isolated tree or two, placed or kept in proper relative position to the house door, may be made in like manner to please the eye and gratify the taste.

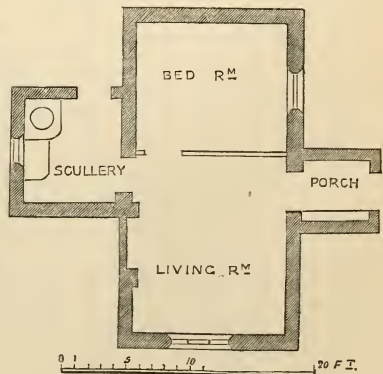
DESIGNS FOR MANSIONS, VILLAS, AND COTTAGES.

IN placing before our readers designs for the erection of mansions, villas, and cottages, we find it impossible to lay down any fixed rule as to the order in which they shall appear. This month we give

1. Elevation and Ground Plan of a Suburban Villa, suitable for a small family (see pages 28 and 29) and
2. Front and Side Elevation and Ground Plan of a Cottage suitable for an Entrance Lodge or Gardener's House.

The first plan is designed with the view of the greatest amount of accommodation, at the least possible outlay. The ground plan sufficiently explains itself: if any objection to it can be advanced, it is that the entrance door of the dining-room is placed at the end of the passage opposite the kitchen. It should have been made at the end nearest the drawing-room; for although objectionable even in that position, from its proximity to the fire-place, that is the lesser evil of the two. The plan of the chamber floor is not shewn; but it contains four bedrooms and a dressing-closet and

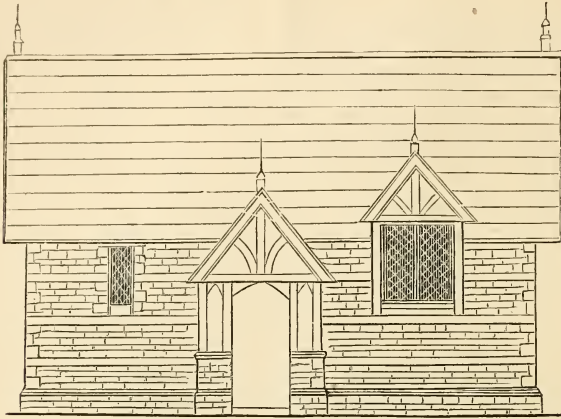
bath-room, the latter being over the hall. The attics, which are to the back, contain a servant's bed-room and two other rooms. The estimated cost is £1160.



Design for an Entrance Lodge—Ground Plan.

Design, No. 2. is adapted for an entrance-lodge, gardeners' house, or labourer's cottage; and contains the least accommodation which

should exist for a man and his wife without children. It contains a porch (without which no cottage, however small, should be built), the so-called ornamental cottages which cluster round our large towns have very little of the ornamental about them except in name,



Design for an Entrance Lodge—Front Elevation.

a living-room, bed-room, scullery, &c. The coal-cellar, ash-pit, and other conveniences are at the back, but are not shewn for want of room. The estimated cost is £108. even among the better class of dwellings; while in the country, with few exceptions, almost all are built after the same bare, tame, unmeaning model, presenting no ageeable



Design for an Entrance Lodge—Side Elevation.

In both these designs, while the strictest diversity, no charming variety; so that, when economy has been studied, picturesqueness you have seen one of them you have a pretty of effect has not been lost sight of. As a rule, correct notion of all the rest.

## The Farm.

### MEADOWS AND HAYMAKING.

IT is an exceedingly suggestive circumstance that of the very numerous varieties of grasses which grow in the British Isles, but a comparatively small number are found in our meadows, from which the supply of forage is obtained, and of this number only a proportion are to be classed amongst the really useful grasses. Thus we find that the good, or rather the best, do not exceed eight varieties, these being found only on the best deep meadow soils. We may here name them: 1, The Meadow foxtail (*Alopecurus pratensis*); 2, Timothy grass or catstail (*Phleum pratense*); 3, Perennial rye-grass (*Lolium perenne*); 4, Smooth meadow grass (*Poa pratensis*); 5, Rough meadow grass (*Poa trivialis*); 6, Cocksfoot (*Dactylis glomerata*); 7, Meadow fescue (*Festuca pratensis*); 8, Slender fescue (*Festuca loliacea*). In shallower meadow soils we find nine varieties, as—1, The sweet-scented vernal grass (*Anthoxanthum odoratum*); 2, Boehmeri catstail (*Phleum Boehmeri*); 3, White bent (*Agrostis alba*, var.); 4, Common bent (*Agrostis vulgaris*); 5, Crested-hair grass (*Aira cristata*); 6, Meadow barley (*Hordeum pratense*); 7, Sheep's fescue (*Festuca ovina*); 8, Hard fescue (*Festuca duriuscula*); 9, Upright brome (*Bromus erectus*). If we now glance at the poorer soils and the upland districts, we find the really useful grasses reduced to a much less number. Thus, in poor clay soils we find three only, as—1, Soft grass (*Holcus lanatus*); 2, Crested dogstail (*Cynosurus cristatus*); 3, Quaking grass (*Briza media*). In the uplands we have four useful grasses—1, Wavy hair grass (*Aira flexuosa*); 2, Oat-like grass (*Arrhenatherum avenaceum*); 3, Hairy oat grass (*Avena pubescens*); 4, Yellow oat grass

(*Avena flavescens*). From these statements we perceive how necessary it is that the most be made of our meadows, the really useful grasses being so few. Hence the advantage of carefully considering the modes of cultivation best adapted, not only to increase the quantity or yield of the grasses grown, but to see that those grasses are the best adapted for the soil and the locality. Various mixtures are recommended by recognised authorities for various soils and for conditions of husbandry, whether these be under the "permanent" or the "artificial" system; but it is obvious, in considering many of these mixtures, that they are merely conventional, and are arranged apparently upon the principle that as they have been found good for one or two soils and localities, they will be found good for all, or at least many others—a most fallacious principle, and one which has led to many grievous errors, and equally grievous disappointments in practice; for we know that a grass which will grow, and grow well, in one soil and locality will be stunted in growth or altogether starved in another. Hence this department of farming requires a much higher degree of care and consideration than is often accorded to it; and in all cases where grasses are to be sown down, either in alternate husbandry or for permanent meadows, a very careful consideration should be given to the nature and quality of the soil, the position of the fields in which they are to be sown, with relation to other parts of the locality, their exposure to determinating influences, and even to the locality itself. The same care requires to be given to the selection and use of manures. That judiciously chosen manures, and these applied with no stinted hand, are required, is obvious enough, when we consider the exhaust-



ing nature of the hay crop. This, in fact, removes from the soil more than any other of the farm crops—thus, while wheat carries off 10 lb. of nitrogen per acre from the soil, the hay crop will take off 14 lb., or nearly one-half as much. The manures used are farm-yard dung and composts, and artificial manures. The time of applying the two former manures is a disputed point in farming, some advocating the mode of applying it early in the autumn, immediately after the second or the last crop has been taken off the land; others preferring to do it in the early winter, while others again insist upon the advantages obtained by applying it early in the spring. The stones and other substances which would interfere with the process of mowing, and which are taken in the manure, or crop up from the land, must be carefully gathered sometime after the manures have been applied, and rolling must be carefully attended to. The artificial manures employed are pretty numerous, and it is in the choice and use of these that the chief care of the farmer must be exercised. Indiscriminate application will not do; some, indeed, will do so little good as simply to be thrown away, costly as they are, others may do positive harm.

Advice of a general kind, to meet all cases, cannot be given here; all the points of soil, its nature and quality, climate, locality, all must be taken into account, and the circumstances dealt with accordingly, and dealt carefully; for it is worth while repeating what we have already said, that in some cases to apply certain artificial manures to certain soils is simply to throw away the money spent upon them, and the wages in using them. Indeed, it is the opinion of more than one high authority, that the exhaustive qualities of the hay crop are best met by the use of farm-yard dung and rich composts, to the exclusion altogether of artificial manures. The hay chiefly exhausts the mineral constituents of the soil, and these, if attempted to be replaced through the agency of artificial manures, are very costly. Thus, the application of bones or superphosphate of lime seems in every way better adapted to worn

out pastures than to meadow lands. In some cases, indeed even in pasture lands, bones are almost useless—such lands being those rich in lime. Farm-yard manure has this great advantage, that it not only restores the mineral constituents of the soil withdrawn by the hay crop, but brings on at the same time a considerable quantity of nitrogen. The best artificial manures are Peruvian guano, Phospho guano, nitrate of soda, and sulphate of ammonia. Of these, the two first supply, in addition to the nitrogen, the phosphates which are so useful in the hay-crop—the two latter nitrogen only. As a rule, nitrogenous manures greatly increase the quantity of grass, although they reduce the quality—the latter point, however, is open to doubt; phosphatic manures materially improve the quality of the grass. It is a settled axiom that what the farmer gets from the soil is just in proportion to what he gives to it. Manure, therefore, should be liberally dispensed, and no mistake is more fruitful of mischief than that which is too often made in practice—namely, giving niggardly supplies. The maxim is one which should always be in mind, that the “safest and soundest economy is to obtain the effect at once, and not by niggardly or piecemeal applications.”

As before stated, the best kind of manure to employ for grass lands is farm-yard dung, although artificial manures may be and are employed with great advantage. And, in the use of these, it is worth remembering, that if quantity is required, nitrogenous manures, as nitrate of soda or guano, must be employed; if quality, phosphatic manures, as bones or superphosphates. But, in employing artificial manures, the nature of the soil must not be overlooked, for if so, it may happen as it often does happen, that the manure and the money it costs may simply be thrown away.

With regard to the second point, the grasses to be sown, we have little more to add to what we have said, than this, that attention must be paid to the soil, climate, and locality. Supposing, then, that the best grasses have been selected, that the soil in which they are sown has been carefully prepared for their

reception, and that every attention has been paid to the manuring of the grasses resulting, and the eradication of the weeds which will be sure, in a greater or less degree, to infest them, we come now to consider the first of the points connected with the process of *haymaking*; and that is the cutting of the grass. And in connexion with this, the two points are before us—first, the period at which the grasses should be cut, and, second, the mode in which the grasses should be cut. And, first, as to the period. All good authorities agree that grasses should not be allowed to be uncut till the seeds are matured; the best period is when they are in full flower. Unfortunately, all grasses in mixed meadows are not in flower at the same time, but the nearest approach to an average should be carefully arrived at. Very frequently, when the meadow grasses are at their best stage for cutting, the farmer fancies or believes that the crop is light, and that a further growth will greatly benefit it; but it may be taken as an axiom that further growth will deteriorate rather than increase the value of the crop. As soon as the grasses have seeded, each day's further growth only tends to bring about a change in their nature, which is to be, if possible, avoided. When a plant seeds, the whole, or nearly the whole, of its vigour is given to perfect the seed to the loss of the fibre of the stalk and leaves; and as in hay the very opposite result to that which, in the case of corn, is aimed at, we ought to cut the grasses of which it is composed at that stage in which the nutritive juices are in the stalk and leaves, and before they go into the seed. As before stated, the times of flowering of the plants vary; and, further, we find that some plants permit of a longer period of growth without deterioration of the value of the stalk and leaves than others. Thus, in the case of perennial or ordinary ryegrass (*Lolium perenne*) we may allow it to remain uncut till it produces the flowers, while in the case of Italian ryegrass (*Lolium italicum*) it

flowering; while, moreover, another condition comes into play in view of this fast-growing faculty—namely, that succeeding cuttings may be obtained in the same season if the first crop is taken off, where it is grown specially or alone. Further, we find that clover may be best cut when the flowers are in full blossom.

We have said that the period of cutting the grasses materially influences the nutritive quality of the hay procured from it. Thus, let us take the case of clover (red). Dr Wolff found clover, cut while beginning to flower on the 11th of June, yielded of nutritive substances 55.43 per cent.; while cut in full flower on the 25th of June, only 46.07 per cent. This result does not bear out what we have above stated—namely, that the best time to cut clover is when in full flower; yet another experiment made on Alsike clover does bear it out, for the result was in favour of the sample cut in full flower. But the truth is, that we have yet a good deal to learn on the subject. At present we only reason from analogy in favour of cutting grasses before they mature their seed. We are in want of much trustworthy evidence as to the exact influence upon the nutritive properties of grasses according to the time during which they are allowed to grow. Some experiments we have gone to shew that—in the case of some grasses at least—the hay is the most valuable when the seeds are ripe; thus, in the case of two specimens of Cocksfoot grass (*Dactylis glomerata*), the amount of nutritive principles in the grass, cut when coming into flower, was 18.30 per cent., while in the case of the specimen cut when the seeds were fully ripe, the amount of nutritive matter had increased to 24.38 per cent. But, as stated above, we have much yet to learn in connexion with these points, and it would be well if our Agricultural Societies would direct their attention to the matter. Their interests would not suffer, while those of the farming community would be greatly advanced, if a little of the money and the time which they give to other matters, not a whit more important, were given to this. It is, to say the least of it, a

curiously suggestive circumstance, that our Societies, almost without exception, give the most of their attention and distribute the largest amount of their prizes to stock, while no attention and no money is given, or if given, given only at rare intervals and with a grudging hand, to the food and the modes of producing it with which the stock are fed.

A few words as to the mode by which the grasses are cut when ready. Up to a comparatively recent date, the scythe was the *only* implement employed; but now, mowing machines compete, and compete successfully, with it. So superior indeed is the mowing machine, not only in view of the work which it does, but also with respect to the rapidity with which it does that work, that we have no hesitation in saying that it will be worth the best consideration of the farmer who now uses the scythe to allow it, and at once, to be superseded by the mowing machine, only bearing in mind this word of warning—let the machine be a good one.

But to return to the subject, if the grasses are cut too late, and the seeds allowed thoroughly to ripen, then the fibres become of a woody character, and the hay will be found comparatively valueless as a truly nourishing food; hence, as above stated, the middle point between these two extremes will be found to be the best. Although it may be said, and said truly enough, that there is not the same inducement to obtain the finest quality of hay as there is to obtain the finest quality of other crops of the farm, inasmuch as there is not the same difference between the price of good and comparatively bad hay as there is between good and bad corn; still, as the principle holds good in this department as in other departments, that which is worth doing at all is worth doing well, it is, or ought to be, the aim of the farmer to get his hay saved in the best possible manner. To judge, however, from the slovenly, careless, happy-go-lucky way in which haymaking is carried on in some districts, we would be very apt to believe that this is not the aim of the farmer at all. It is an axiom in haymaking, that the quicker the hay is made the better, consistent with certain results which must be

attained, these results being indicated by the clear green colour—pale rather than dark—and the glossy texture of the stalks, and a certain condition of dryness, which last point is perhaps best ascertained by taking a handful of the hay and applying it to the face. This test we have found enables one to ascertain with considerable accuracy its hygrometric condition, and to know whether the hay is dry enough. Now, let us contrast the axiom named above, and the conditions of the hay which shew that the points indicated by it have been attained, with the mode in which, in many districts, hay is made. In place of being made as quickly as possible, the grass is cut, and when cut, allowed to lie for a considerable time in swathe, exposed either to the effects of the rain or of the sun, or rotted by the grass springing, perhaps, up from beneath. The grass thus treated or rather maltreated, is put up with little or no winnowing or air-drying into “cocks,” which are allowed to stand, occupying much space which should be growing a fresh crop for the foggage or aftermath, and the cuticles of which are bleached by the sun and washed by the rain.

In making hay under proper conditions, one essential condition is that plenty of hands be engaged in the work. It is the most mistaken economy to forego abundance of assistance in the field. We have known a capital crop of grass lost as hay entirely through a lack of hands, the fine weather being allowed to pass away, and the rain to come on, while the loss could easily have been avoided by having hands sufficient to work the grass while the good weather lasted. The saying is in no way so appropriate—and, indeed, cannot well be otherwise—“Make hay while the sun shines,” and to do this have plenty of hands to make it. From the time the grass is cut let it be in almost continual movement, so that the air and sun can have access to every stalk. We do not here, of course, refer to clover hay, which has to be treated in a different way, and merely turned over—not tossed and teded. As soon as the grass is cut, which should be done early in the morning, not only because time is thus saved, but be-

cause the grass will cut, all the easier with a little dew wetting it,—as soon as cut, the swathes should be shaken out with the fork, and laid evenly and thinly out in the field. This should not be done, as it is unfortunately often done, carelessly, but, on the contrary, with great care, so that the heaps or lumps will be thoroughly disentangled, the object being to have all the mass thoroughly loosened, and each stalk independent of its neighbour. This is the “standard of efficiency”—a standard difficult to be attained, it must be confessed, but which should nevertheless be aimed at. If hands enough can be obtained, the turning over and spreading out of the grass should be done a second and even a third time before the dinner hour. The next operation is to rake the spread-out grass into rows, which is called “wind-rowing,” and which is done in such a way that the rows lie on the field parallel to one another, and distinct from each other, say 3 or 4 feet. A good deal of tact is required in arranging the workers so that they wind-row regularly and without interfering with each other’s work, and also with the work of the last operation of the day, which is putting the grass into small “cocks” or heaps; this being done by dividing the wind-rows into portions, and raking the grass in each portion into small heaps. In this, again, a good deal of time is either lost or gained, according as the workers operate, and interfere or not interfere with each other. If the weather is thoroughly settled, and the farmer thinks so, and cares to run the risk, the operation of “cocking” may be dispensed with on the evening of the first day, and the grass left in the wind-rows. The first operation in the morning of the second day—supposing the grass was cocked the evening previous—is to shake out the grass of the “cocks,” and spread it out evenly on the field. This, however, should not be done too early in the morning—not before the dew is pretty well off the ground, which will rarely be much before nine o’clock. After a certain period of exposure, the hay is “single wind-rowed,” then “double wind-rowed”—that is, two workers, or rows of

workers, work opposite each other, and with two single wind-rows between them, each raking towards himself, and thus bringing two single wind-rows into a double one. The last operation of the day is to rake the double wind-rows into “cocks,” these being larger than the cocks of the first day. These are all opened out next morning and spread evenly upon the ground, and turned over or tedded as often as possible. Wind-rowing and double wind-rowing are then gone through; and last, the whole is divided, and made up into great cocks preparatory to being carted off and made up into stack, or housed. Of course this rapid making presupposes the best possible condition of weather. Much will depend upon the weather, and modifications will necessarily have to be made. The best weather for haymaking is that in which a clear cloudless sky and a slight or briskish breeze are met with. With weather of this kind grudge no outlay in the employment of numerous hands, and let the grass be under continual movement; and see the work so arranged that all the workers keep pace with each other, and all work in unison, so that the making goes regularly on without interruption. In such weather, and with such management, the hay crop may be housed or stacked by the end of the third day, certainly by the middle of the fourth. In bad unsettled weather the process of haymaking is much more tedious than that above described, and it tries in many ways the patience of the farmer.

Haymaking has been vastly facilitated by the introduction of machines for mowing, tedding, and raking. The tedding machines, however, are not so applicable to clover hay, which, as stated above, requires to be carefully turned over, and handled in all the processes so as to prevent, as far as possible, the fine leaves of the clover from being lost, which would inevitably be the case, were the grass roughly handled. In the case of hay made from natural grasses, the tedding machines are employed with manifest advantage, and when these are followed by the hay rake, which gathers the hay into “wind-rows,” manual labour in haymaking, is



reduced to a minimum. In many parts of the kingdom, particularly in Scotland and Ireland, much time is unnecessarily lost in haymaking, and it is quite common to see "cocks" of various sizes remaining in the fields long after the hay should have been secured in the stack. This dilatoriness occasion a considerable amount of loss, owing to that portion which occupies the top and bottom of the cocks becoming spoilt by damp. In other cases—such as in some

parts of England—the hay is ricked before it is quite ready, and then we have heat generated, sometimes to such an extent as actually to set the rick on fire. A moderate degree of heat is by no means injurious to hay; but when it is suffered to proceed too far, the hay becomes sapless, and so full of dust as to be injurious to the horses which consume it, inducing, as we have frequently had reason to believe, broken wind and similar disorders.

### *TRANSPLANTING FOR FILLING UP BLANKS IN ROOT CROPS.*

THAT the hopes of the husbandman are not always realized is a trite saying; rather, indeed, would it be the better way to say, that they are more frequently doomed to disappointment than to realization. And in view of this, with which unfortunately every farmer is too familiar, everything is of importance bearing upon modes of operation, which have for their aim the averting of losses, or if not averting them, in lessening their extent. And hence we deem a few remarks upon a subject, of which it may be said, that if not much attention has hitherto been paid to it, at least deserves that attention should be paid to it. The fact that a practice is not followed is no reason why that practice may be bad, and it often happens that a good practice is long in working its way into what may be called thorough popularity. In this category we may place that which forms the subject of the present brief paper. That transplanting is a process more of gardening than of farming is true enough, but that it may be useful in the practice of the latter, as it undoubtedly is in that of the former calling, is also as true; not merely because transplanting is sometimes used in the farm, as in the case of cabbages, and because it might be further extended in the case of other crops, as for example in that of kohlrabi and of rape—the former of which crops we believe to give the best results when grown in

the field from transplanted plants—but because transplanting is eminently useful, and of high practical value, in the case of filling up of "blanks" in other crops, as turnips, mangold, and the like, do we deem a few remarks upon it likely to be useful. We say the plan is of high practical value, and this is evident when we consider that, by its adoption, much land may be availed of which is left blank in the case of failure of such crops as the turnip; for it is to be remembered that the point is, in such cases, not whether the farmer shall have a small crop on the blank spaces, but that it is certain if he leaves them blank he will have none. This seems a very absurd way of stating what must very evidently be to all a truth; it not only seems but really is, yet in some cases the only way to gain attention to a point of importance is thus to state it—the "reductio ad absurdum" is not always a useless way of arguing a point. If these blank spaces exist in our fields, it seems after all but a very reasonable way to put the matter, that it will be better to fill them up with some useful plant than to allow them to remain growing none. And we know of no plan of utilizing such spaces so valuable and so easily carried out withal, as filling them up with some useful forage crop, such as cabbage or the like.

That a large amount of land is really allowed to stand idle in the case of root

crops which have missed, is obvious enough if one draws to memory the number of fields which in certain seasons and districts he has seen, and the number of blank spaces on them. Taking, then, for granted, the fact that the mode of utilizing such spaces is worthy of adoption, we shall glance briefly at a few of the points connected with it. And first, as to the seed-bed in which the plants are to be raised. The situation of this should be in some sheltered spot, protected from cold and biting winds, and open to sunshine and balmy breezes, the great object being to obtain a number of plants in the highest stage of development within the short, or comparatively short space of time which lies between the period of sowing and transplanting them into the field. The soil of the seed-bed should be well and fully worked, and richly manured. Difference of opinion exists as to whether it is the better plan to sow the seed broadcast in the bed or the drills. One advantage of the drill system is, that hoeing and weeding can be well carried out; the disadvantage, if indeed it is one, is that more ground is required. The plants will be all the better for being thinned out, although many seem to think that all that is necessary is to put the seed in the bed, and let the plants grow as they list. But not only should the plants be thinned out, but correct theory as well as sound practice dictate that if the plants are what gardeners call "pricked out," they will be all the more valuable for field purposes. All this to some will be as "much ado about nothing," but, as we hold that what is worth doing at all is worth doing well, we think it best to say what *is* well doing. When the plants are about to be transferred from the seed-bed to the field, this transference should be carefully done. The best condition of the soil in which to remove the plants without injury is the moist one after a gentle rain. The plants can be pulled up easily without breaking off the roots, which can scarcely be avoided if the ground is hard and dry. The plants when taken up should be carefully laid in baskets, and in such a way as to preserve them as much as possible in the position which they assumed when growing.

The next point to be considered is the transplanting them in the field, and this brings up the question as to which is the best kind of soil for this operation. We have no hesitation in saying—because our practice and its results has shewn the opinion to be well founded—that the best state of soil in which to transplant is a moist one, or that met with after gentle rains. We are not here, in saying this, forgetting that some maintain the opposite view—namely, that the best state of soil in which to transplant is a dry one. In the one case we transplant after rain, in the other before it, and after dry weather. We, as above stated, believe the transplanting after rain to be the best. When so transplanted we have found very few of the plants fail—a result the very opposite of that which we found to be the case in transplanting in a dry soil. The advocates of the dry soil maintain that this is best, because after the plants are put in, although they may droop, still when rain comes it pushes vigorously on; whereas, when the plant is put into moist or wet soil, and the dry weather succeeds, the soil becomes hard and baked, and prevents the proper development of the plant. In the case of the dry soil, the advocates assume that after the plant is put into the soil rain will shortly come, whereas it may not come, and that, if put into the moist soil it will therefore become dry, whereas rain may come after they are put in as well as before, and then the soil will not become dry. The truth is, that the advocates of extreme views frequently assume extreme facts. It is just possible that in this question, as in others, the middle course is the best, and that neither a too dry nor a too wet soil is good—for our part we believe in a moderately moist soil as the best; and not only because we believe the plants do best, but because we know that there is a mechanical reason in favour of it. Those who have tried to make a good clear dibble hole in very dry soil will know what we mean. In soil of this character it is scarcely possible to make the hole clear, the dry soil will fall in and fill it up more or less. In moist soil the hole can be

made clear throughout its depth, so that the plant can be put into it in as natural a position as possible—that is, with its root in the same condition as when it grew in the seed-bed. And this we conceive to be a point of great importance. The root is an important part of the plant, otherwise it would not be there, and we do not, therefore, believe in the efficacy of nipping off the tap root. True, if the dibble hole is so badly made as to double up and contract the root, then, as this will bring about abnormal development and a weakly plant as a consequence, it would be better to nip off the root; but if the transplanting is properly done the dibble hole will be deep enough to take in the plant as it ought to be taken in. Hence it is that, if for no other reason, we advocate the dibbling in moist soil, because the operation can best be

mechanically done. In finishing our operation—which is one more quickly done than described—let the earth be brought to bear firmly up against the plant; more plants die from being left loose in the soil than from any other cause. If a plant cannot bear a good pull without giving way or coming up, the transplanting has not been properly done. After all that has been said, we fear that in the minds of some reader the quotation already given, of “much ado about nothing,” may come up; nevertheless, we believe that the subject of these remarks is worthy of consideration, and those who have followed it out in practice, and seen its benefits, may say in the words of the classic poet, in answer to those who object—“How small to others; yet, oh! how great to me!”

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#### *FINGER AND TOE IN THE TURNIP CROP.*

“**F**INGER-AND-TOE,” as distinguished from “anbury,” is a disease which arises from a malformation of the root, or rather we should say more correctly, it is malformation of the root which is the disease—this malformation taking the form of a series of offshoots of more or less convoluted, twisted, and stunted projections, which bear somewhat the same position and shape as the fingers or the toes bear to the hand or the foot, hence the name “finger-and-toe.” We believe that this malformation arises mainly—it is not possible to say in the present condition of agricultural science, altogether—from the mechanical condition of the soil, although it is possible that its chemical condition has also an influence in creating it. The mere malformation of the root, shewn in its curious offshoots, is, however, not the evil; for this malformation induces a marked change in the character of the flesh of the root, changing this from its healthy condition of a more or less dense vegetable substance, of a fairly homogeneous and nutritious nature, to one of a hard woody

and innutritious one. We say we believe that this abnormal form of the root, and its almost always accompanying deterioration in quality, is brought about mainly by the mechanical condition of the soil; but we have further to say, that an exciting cause is to be traced in cases where two or more plants are allowed to continue to grow together, thus either twisting and twining round one another in a most curiously contorted manner, often enough met with in badly thinned or singled turnips; or one, which while taking and keeping the lead, although growing larger than the other, grows in a form more or less abnormal, and always of less size and more woody character in its flesh than it otherwise would have been. It will be easy at this point in our argument—if the name of argument can be given to statements founded much upon conjecture, although we may claim for that conjecture a fairly sound basis of facts and of reasoning from analogy—to see that the same, or much of the same result, will be the case where the soil is in that unkindly and unyielding condition which does not admit of the root growing in the

circumstances calculated to yield the best form of root and quality of flesh; or rather, which compels it to assume these untoward conditions. There is a tendency in the root itself to keep to its own natural form, and even to return to it, when, by some means or other, it has been forced to lose it for a time; the result of which tendency, or, as we should rather say, of which character or habit of growth, is, that if grown in soil of that even and uniform condition which will permit the root to grow with equal ease in all directions, then we may safely predicate that it will assume its natural characteristic of form, whether that be globular like the turnip, or long and tapering like the carrot. Just as we find that a potato plant or a pea, for example, will shoot up a straight branch to reach the light and air; but which, if that light and air is at a distance from it, will be long and tortuous. The power of plants to seek after, if the expression may be allowed, the best conditions under which to thrive, has been much overlooked, and gives rise to some curious facts really worthy of examination. Thus, to continue our remarks upon abnormal development of turnip roots, we can easily understand how a root, endeavouring to avoid or get past an obstacle in the soil, whether that obstacle be a hard unyielding clod of the soil itself, or mass of stone in it, or a neighbouring root, or neighbouring roots which have been carelessly left to grow in juxtaposition with it, may throw out root developments of a more or less numerous and complicated character. From all this will be seen the importance of so preparing the soil that the root will be at liberty to grow as it likes, and to leave it unencumbered with neighbouring plants to act as competitors with it, so to say, for the riches which that soil possesses. The more carefully the soil, then, is prepared, so that a thorough uniformity of condition be secured, the fewer will be the chances that the roots growing in it will be deformed. As in sanitary science we find—if we look for them—abundance of facts to prove that a certain condition of circumstances in which we cause human beings to

live induces abnormal developments and diseases, so will we find in the science which concerns our readers more closely, that we may induce disease or abnormal growth by the way in which we place the plants we grow or attempt to grow in them. And if we do by some means or other grow plants in such a way that they are abnormally developed we shall find, as a likely concomitant, that development does not always rest at the point of what we may call their physical or external form, but frequently so weakens the healthy powers of the roots that we impart to them a strong tendency to become diseased, if not indeed bring actually about a state of disease—that disease assuming the form and being known by the name of “anbury.” This disease consists in the presence of a number of warty excrescences, which, if opened, are found to contain a soft juicy and sometimes fœtid matter, and not seldom also grubs. The opinion is generally held that this disease is caused by the presence of some chemical condition of the soil which acts deleteriously upon the plant, and for which the specific is lime. It is yet to be decided, if indeed science will ever be able to decide, what is the cause of this disease. Much conjecture has been thrown out concerning it, but the weight of evidence goes to prove that it is a chemical cause, which is to be met by the application of some substances to the soil—that substance, as above said, being generally lime.

As we have shewn above, there is a great likelihood that the abnormal development of the roots bring about this disease of anbury; but we are by no means sure of this, for a turnip may have “finger-and-toe” and yet not have “anbury,” while it may have “anbury” and yet not “finger-and-toe;” but—and to this we specially draw the notice of the reader who takes the popular view that the terms are synonymous—the turnip may have both diseases at the same time. In view of the losses sustained by anbury, many remedies have been proposed, some of these may be named here. First, on the supposition that frequent repetition of the root in the same soil is bad, making it, to coin a



phrase, "turnip sick," just as we say a soil is "clover sick;" it is recommended to break the succession of turnip crops, by growing either mangolds or carrots—mangolds being the best of these two crops. This, of course, precludes a stolen crop of summer turnips; and, by the way, stolen crops of all kinds are forbidden, as they tend to encourage the insect and other enemies of the crop. Secondly, to give up as much as possible

spring, and to adopt autumn preparation of the soil; and the working of the soil is to be done rather with the grubber than the plough, if spring working cannot be avoided. Third, to chalk or lime soils deficient in calcareous matter; to which we are inclined to add as a fourth remedy, to apply salt in all cases to the soil or the manure, to which, if ashes are added, the results will likely be more beneficial.

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### MALFORMATION OR "SPORT" IN SWEDE TURNIPS.

TOWARDS the close of last year a case of malformation in the swede turnip was described in the columns of *The Farmer* by Mr John Chisholm, Cairnsmore, Newton-Stewart, in Scotland; and as this is a subject of considerable importance, we shall briefly recapitulate the leading points as described by Mr Chisholm.

A field, consisting of about 12 imperial acres, on the farm of Cairnsmore, under Mr Chisholm's management, was sown with *three* different varieties of the swede turnip—namely, Bangholm, Sutton's Champion, and Skirving's. The field sloped to the south, and the drills or ridges ran from north to south. At about 80 yards from the lower end of the field there was a continuous strip, of about 10 yards in breadth, all across the field, which appeared as if sown with rape, while there was not a single plant presenting a similar appearance to be seen in any other part of the field. The whole field had been equally manured with a mixture of Peruvian guano and rough ground bones; and he further mentioned that the "sport" ran across all the drills, as far as the above-named varieties of swedes were sown, stopping at a flat of common yellow turnips, which shewed no sign of malformation, nor the appearance of any other plant growing among them. Rape had never been sown in that field, which, with the fact that the growth of plants having an

appearance like rape ceased where the swedes ended, while that growth was confined to one distinct part of the field, precluded any solution of the question on the assumption that the seed of rape had been lying dormant in the soil. If such had been the case, the rape plants must also have appeared across the drills of yellow turnip, as well as across those where swedes had been sown. That the sport or rape-like plants could not have arisen from any intermixture of spurious or defective seed was also evident, first, from the fact that there were three different varieties of swedes sown in the field, all of which were alike affected at one particular section of the field across which the drills ran, and it was not likely that each of the three kinds of seed had been grown from defective or degenerate plants, or had been otherwise mixed with impure seed; and next, from the still more significant fact that the "sport" was entirely confined to "a continuous strip of about 10 yards in breadth, all across the field," while there *was not*, as Mr Chisholm stated, "*a degenerate plant in all the rest of the field, or on another adjoining, sown with a part of the same seed.*" Supposing that the seed of each of the three varieties had been defective, it is evident that instead of being confined to "a continuous strip of about 10 yards in breadth all across the field," the "sport," or the degenerate plants, must have appeared all over the field, because it

was impossible that the defective seed could have remained in the boxes of the sowing machine until it reached a certain point in the drills, when it commenced to discharge, ceasing at another point, after the machine had gone ten yards, and that it should have done so in the case of every drill in so regular a manner as to form a continuous strip of ten yards in breadth all across, and about eighty yards from the end of the field.

The peculiarities of the case, as reported by Mr Chisholm, being quite in accordance with those of other instances of "sport" which have come under notice, and feeling that the difficulties of the case would never be removed by any amount of mere theorizing, however specious, our contemporary resolved on getting specimens of the sported plants from Cairnmore for the purpose of having them examined. This was done, and the plants so obtained were submitted to a gentleman well qualified to pronounce an opinion upon their nature. The engraving which accompanies this article is from a photograph of one of the Cairnmore plants; and it will be observed that it might easily be taken, if examined merely in a superficial manner, for a plant of rape, or at least something very like it. But it was found, notwithstanding its appearance, that it was still a swede plant, deformed, indeed, but possessing all the characteristics which distinguish a swede from rape.

There is one point, however, which should be noticed. The sported plants were all more or less white-fleshed. Now, the white-fleshed swede is scarcely known in Scotland, but in some parts of England and the Continent it is grown to a considerable extent. It is probably the hardiest of all swedes, but at the same time it is the coarsest, and no amount of selection or care seems able quite to overcome this peculiarity, as the best and most carefully selected stocks of it always produce many coarse-rooted "necky" plants, and not a few almost as deformed or malformed as the plants grown by Mr Chisholm.

An acute observer who has devoted much

attention to subjects of this nature seems to be of opinion that the white-fleshed swede may have been the first move to a bulbing plant from the wild *Brassica campestris*, and, if so, it may not unlikely be the case that when injured in some way or other, or exposed to deleterious influences from the condition of the soil or other causes, the yellow-fleshed varieties of the swede may make a retrograde movement and seek to go back to its parent. This would, to a large extent, account for the appearance of the sported plants, which we cannot look upon in any way as hybrids, but merely deteriorated swedes.

The identification of the sported plants with the swede was the first and an important step in the investigation into the nature of those plants, and, if possible, the causes which produce this degeneration. In the next steps the aid of the analytical chemist must be invoked—first, to ascertain what difference in composition, if any, exists between the sound and the malformed plants; and next, between the soil upon which sported plants are produced, as compared with that where sound swedes are grown.

While desirous to avoid, as much as possible, anything like theorising on this subject, we would remark that it seems probable that climatic influences have something to do with the matter, as we have noticed that cases of sport have prevailed more in some seasons, and in some parts of the country, than in others. In this, as well as in other respects, a diseased state of the swede plant leading to "sport" resembles disease in the potato. We cannot account for it, nor, so far as we have yet seen, can we prevent it. That it does not arise, at least in all cases, from want of care in selecting suitable bulbs for the purpose of growing seed is evident from the circumstance that "sport" is usually confined to one particular spot or portion of a field, or that while one field may be affected throughout, an adjoining field in which *the same seed* has been sown has been entirely free from "sport." Some of the worst cases of "sport" we have known have occurred

where the seed was the produce of large, first leaves of the plant, fly affecting the crown transplanted bulbs, selected with the utmost in its infant state, &c. Such causes act upon care ; and those bulbs were planted at a great the plant so as to make it produce in one distance from any flowering species of the year the effects seen in it when it is cultivated Brassica tribe, so that the change in cha- for seed. In the latter case we have the



A "spotted" Swede, grown at Cairasmore. From a Photograph.

racter could not be the result of any hybridizing.

It is well known that running to seed in turnip may arise from causes that cannot be prevented, such as a slight frost touching the

growth checked by winter, and fostered in spring ; in the former, the check given to the plant by the injury it receives throws it into a dormant state for a short time, and recovering this, it then passes over the inter-



mediate stage, and performs its last function as a biennial plant by going to seed. Such changes are, however, so far easily studied and accounted for, but it is different with checks given directly through the bulb itself. It is out of sight, and it is only when we see the effects that we guess something has happened, but the time for ascertaining what that is has passed. By close observation, however, we may

find that an early injury to the root may cause the highly-bred yellow-fleshed varieties of our swedes revert to the type of their coarser parent, the white-fleshed. It is in this direction we must look for a solution of the question, and not in any theory of rape, which the name "bastard stock" seems to permit; as all the so named "bastard stocks" that have been carefully examined have proved true, though degenerate swedes.

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### ADULTERATION OF SEEDS.

THE practice of "doctoring" certain seeds, particularly clover seed, has now become so well understood by skilful manipulators, that it may be considered a distinct branch of business. It is chiefly carried on in London, and so proficient are the operators, that even experienced seedsmen have occasionally been deceived when asked to pronounce on the genuineness and quality of a sample which had undergone the process of "doctoring." When such has been the case, it is not difficult to understand that there are few farmers who could detect the fraud.

But although it may have been the case that experienced seedsmen have been deceived when asked to decide off-hand as to the quality of a doctored sample, yet no seedsmen who has a character to lose would admit seeds of any kind whatsoever into his stock without proving them. This is done by counting out a hundred seeds, and placing them in a pot containing some fine mould, which is then plunged into a hot-bed, or kept in a warm room until the seeds have germinated. The number of plants are then counted, and the difference between the number of seeds sown and those which have germinated shews the value of the sample. This test could also be applied by farmers before sowing the seeds in the open fields, and in this way they would obtain that security against failure, as arising from the germinating power of the seeds, which it is considered necessary should be afforded, as in the event of a considerable proportion

of the seeds failing to start, the purchaser could have recourse to the seedsmen who had supplied him, before venturing on sowing the bulk in the field. There is no reason to suppose that respectable seedsmen, who pay proper attention to the details of their business, would hesitate to give such a guarantee as that recommended—namely, that the seeds supplied by them have not been 'doctored' or 'improved' in any way but are of the age stated, and in the natural state as grown. They would not hesitate, we think, to give a guarantee of this kind, because, before doing so, they would have fully tested and satisfied themselves as to the germinating powers of the seeds sold by them when taken into stock, although it is not a guarantee that the seeds will produce a crop. Still, we think it would be more satisfactory if farmers were also to adopt a similar test to that employed by seedsmen, and to keep a record of the results. Of course, there are many who would not take the trouble, and others might not attend to the details in a proper manner; at the same time it would be well were testing seeds more generally practised than it is by farmers.

The practice of adulteration has been stimulated by the demand for low-priced articles, and it is not until purchasers find they have something "nasty" as well as "cheap," that the question of quality comes uppermost; that competition in the seed trade,



as in almost every department of business, has cut down profits to such an extent that the prices charged by respectable merchants for the best qualities of seeds are not more than allow of a very moderate per-centage; and, therefore, when we find what professes to be the same article offered at a much lower rate than that at which it is quoted by seedsmen, in whom there is reason to believe confidence may be placed, we may consider there is not merely room for suspicion, but an absolute certainty that the article is not genuine; so that its seeming cheapness, instead of being a temptation to purchase, should rather teach us to avoid it. There cannot be a greater instance of mistaken economy than that of buying cheap seeds, which may be aptly illustrated by supposing that seed can be purchased one penny or twopence per pound cheaper from one seedsman than another, say red clover at 8d. and 10d. per lb. Now, if 90 per cent. of the 10d. per lb. seed grows, and only from 40 to 50 or even 60 per cent. of the 8d. per lb. seed, the purchaser is a great loser by the seeming cheapness of the one lot as compared with the other.

There is another point that has been urged, viz. that Parliament should pass a measure making any one guilty of such frauds as the adulteration of agricultural seeds, liable to punishment as a criminal, as in the case of France and other countries. In a leading article which recently appeared in *The Farmer*, the writer entered somewhat more fully into this part of the subject, from which we make the following extract—

“In this free country we are so very free that even swindling is protected; at least, there are certain forms in which it is manifested where the law appears to be powerless. ‘They manage things better in France,’ and the adoption of French law in this respect would prove of material advantage to the community. To adulterate in France is, in most instances, to run the risk of being ruined for life. Why should we not have inspectors of seeds, manures, and other goods, as well as of weights and measures, so that the interests of consumers might be protected, and men who would otherwise be honest not forced to swindle, as at present in not a few instances, or abandon their business. Let those who are detected adulterating their goods, whatever they may consist of, be subjected to fine and imprisonment, and their names published; and adul-

teration would soon be found to have received ‘a heavy blow and great discouragement.’ The expense of inspection would be amply repaid by the increased safety and comfort to consumers arising from purity, by cessation of trade in spurious articles, and by diverting the labour into honest channels of a perfect host of men, women, and children, who are at present doing nothing else but plying a nefarious calling of adulteration in one thing or other.”

The Legislature should be called upon to interfere in order that adulteration, in every shape and form, should be guarded against in the strictest manner, and punished severely when detected.

There is just one point more to which we shall allude, as connected with the germinating power of seeds. It is quite possible that seeds may stand the preliminary test in a perfectly satisfactory manner, and yet that the result in the open field may not be equally satisfactory. Setting aside an abnormal condition of the soil unfavourable to the healthy production of plants, as for instance where the soil is “clover-sick,” there may be occasionally a deficiency in the number of plants grown, which may lead to the supposition that there has been something wrong with the seed. Now, we need scarcely say that even a very little difference in the manner in which the seed has been covered will affect its germinating power to a considerable extent. The soil of even one field may not be of the same nature throughout, and in some parts the seeds may be much more easily covered to a greater depth than is consistent with successful germination than is the case in other parts of the field; and it has been proved that even a quarter of an inch of additional cover prevents a considerable per-centage of certain seeds from germinating. We merely mention this point, because it is sometimes apt to be overlooked, and we would therefore strongly advise every purchaser of seeds to satisfy himself beforehand of the germinating powers of the seeds with which he may have been supplied, by adopting the test used by seedsmen for that purpose. Should the seeds stand that test, then in the case of any failure in the field he may rest satisfied that it has been owing to some other cause than a lack of vitality.

Seedsmen argue that they have always looked upon farmers and gardeners, who are almost exclusively the retail purchasers of seeds, as being possessed of a full average amount of that intelligence which, with a little well-directed application, will enable them to judge for themselves in all matters pertaining to their profession, among which a knowledge of seeds is certainly not the least important; and that they do possess the requisite powers of discrimination is evident from the facility with which they detect those minute differences presented by samples of the many cultivated varieties of cereal grains and other large seeded plants with which they have to operate. Hence it may be safely concluded, that in order to acquire an equally discriminating acquaintance with the smaller seeds, such as those of clovers and grasses, they have only to accustom themselves to the use of the microscope, with which to magnify the smallest seeds to at least the sizes of wheat, oats, barley, beans, or others which they are accustomed to handle. Many look upon the use of the microscope as a mysterious and difficult operation, requiring far too much time, application, and bother for their having anything to do with it; but they have only to give it a fair trial in order to discover their mistake, disabuse themselves of all such absurd notions, and find, on the contrary, that it is in the highest degree interesting, instructive, and useful. And even as an occasional treat to the young, its wonders will, in their estimation, vie with, if not surpass, those of the magic lantern, the kaleidoscope, and the wheel of life, while they will have a more potent influence in providing an after taste for intellectual and useful research. Many of the smaller seeds which, to the unaided eye, seem very much alike, yet present remarkably diversified, and often very beautiful appearances when viewed through a microscope of only ordinary power; and when one is accustomed so to look at them, the transition is easy, to the investigation of the wide fields for microscopic observation which are embraced within the animal, vegetable, and mineral kingdoms.

Mixing, colouring, and killing, are all skilfully perpetrated in adulterating seeds; and all these arts, however artistically they may have been applied, are more or less capable of being detected by the microscope. Thus, with clovers and grass seeds, none are so exactly alike but that a difference can be observed by a skilful microscopist, and most of the injurious or worthless kinds employed in mixing are so dissimilar that their detection is comparatively easy. This is not the case, however, with seeds of the varieties of turnips and other brassicæ, although those of the different genera, such as common or rough-leaved turnip, swedish turnip, rape, and even of some of their individual varieties, possess sufficient distinctive characteristics to enable a careful observer to find out whether or not they are mixed. The art of colouring has in the case of clover seed attained to great perfection; yet careful and repeated observation of the position and shading of the natural colours in the genuine seeds will serve to shew the difference between them and the best examples of artificial colouring; which last is not nearly so applicable to grass and turnip seeds; but the sulphur smoking of the former, and the oil-dressing of the latter, serve to impart a freshness of appearance which the seeds do not actually possess.

Killing is generally done by oven-heating (sub-roasting); or want of vitality may arise from extreme age in the seeds; in either case the seeds will appear dry when bruised, which is peculiarly marked in turnip, rape, and other oleaginous seeds, from the comparative dryness or absence of oil which they exhibit when crushed. Most people are familiar with the difference between fresh and roasted peas, and a similar difference in appearance is presented, under the microscope, between fresh and roasted small seeds.

For further illustrating some of the preceding results we are enabled, through the kindness of Mr James Bryson, optician, Edinburgh, to give the four accompanying engravings from magnified photographs, prepared by him, the first three of which are from a sample of what, in market phrase, was termed "good red

clover seed," and the fourth from another of good yellow clover, medick, or trefoil seed.

No 1. shews really good plump seeds of red clover in different positions, when magnified by only a good pocket microscope. It is usually of a shaded purplish and yellowish

have taken them for those of the dodder, that pest of Dutch clover fields. In the sample from whence they were taken these were present in about the proportion of six per cent.

No. 3 exhibits different views of the rib-



FIG. 1.—Genuine Seeds of Red Clover.

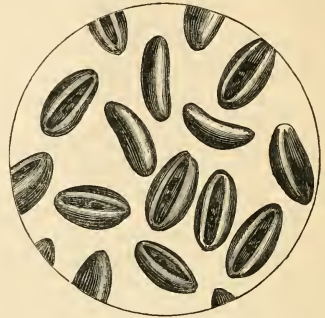


FIG. 3.—Rib Grass (*Plantago lanceolata*).

colour, some of the seeds being entirely yellow; and at the Great Exhibition of 1862 there was a Norwegian sample similar in colour to No. 4; although the form of the seeds shewed that they belonged to the true red clover—*Trifolium pratense*—some of our native wild varieties of which have also yellow seeds.

grass, common ribwort, or plantain seed—*Plantago lanceolata*—magnified on the same scale as the others. This was present in the sample to about 13 per cent; and, being of comparatively little value, it is too generally introduced among clover seeds for the purpose of adding a "paying per-centage" to the

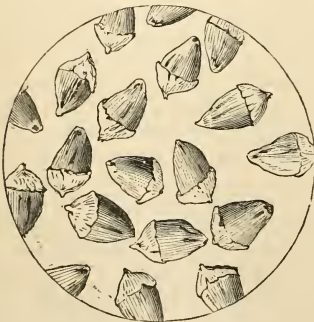


FIG. 2.—Unripe Seeds of Red Clover in the husk.

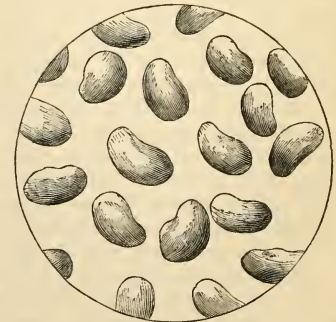


FIG. 4.—Genuine Seeds of Yellow Clover.

No. 2 represents imperfectly ripened seeds of red clover, enclosed in their still adhering husks. These, as shewn in the engraving, resemble small acorns with their cups attached; and in sample, they are so unlike the seeds of any of our field weeds that many

dealer's profits. It is, however, well-known by its deep brown colour, somewhat shining appearance, and different shape to that of the clover seed; and, being easily distinguished by the naked eye, those who purchase it from sample have themselves to blame.

No. 4. Yellow clover seed — *Medicago lupulina*—is of a uniform sulphury yellow colour, and more regular kidney-bean-like shape than the red clover seed, from which it also differs in possessing a distinct peculiarity of smell. None of this seed appeared in the sample from whence the preceding three were selected, although it is more employed than any other for adulterating red clover seed, both in its natural state, and when “improved” by colouring.

As noticed at page 46, really good growing seeds may sometimes fail from different and not easily-ascertained causes; hence the guaranteeing of quality might often lead to not easily-settled disputes, more especially that as there are unfair dealers among seedsmen, there are equally unscrupulous dealers

among seed purchasers, who are ever ready to catch at any pretext that will give them the semblance of an excuse for withholding payment of their seed account. While fraudulent dealers have everything to lose, the fair dealer has nothing to fear, but much to gain from microscopic or other investigation; for how often do we see careless cultivators blame the seedsmen for sending them a mixture of weed seeds, when the fault of weed growth was entirely their own. For instance, the unusually abundant growth of corn mustard last year was attributed by many to foul seed, when it undoubtedly arose from some peculiarity in the season which restricted the ravages of its natural enemy, the turnip fly, and allowed the mustard plants to grow and bloom in unrestricted luxuriance.

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### AGRICULTURAL WEIGHTS AND MEASURES.

ONE of the subjects recently discussed in the Scottish Chamber of Agriculture, was the irregularity which prevails in the existing system of weights and measures. The members present did not feel inclined to support the proposed introduction of a metric system, with a Frenchified nomenclature, but they were unanimous in condemning the existing system, which renders market quotations in many cases perfectly unintelligible. Who can tell what is a “boll”? It means different measures in different places; and the “quarter,” although understood to consist of eight bushels, is not in all cases correctly represented by that measure, for it is not unusual to make up the so-called quarter to a certain weight, irrespective of the actual number of bushels. And here, let us ask, what is a “bushel”? We shall be told by some that the weight of a bushel depends upon the quality of the grain. True enough, in some cases, but not in all, for a bushel of wheat is understood in one place to mean 70 lb., in another 75 lb., in a third 80 lb., in a fourth 63 lb., and so on. Then, again, a bushel of barley means in different localities 38 quarts, 39 quarts, 40

lb., 60 lb., 38 lb., 54 lb., 52½ lb., without any reference to the quality of the barley, or its actual weight per imperial bushel.

But if it is impossible to define accurately what is a quarter or a bushel, we shall find ourselves equally at a loss, when we come to speak of “bags,” “measures,” and “loads.” In some market towns a bag means 205 lb., and in others 230 lb., 220 lb., 221 lb., 240 lb., &c. A “measure” of wheat is understood to be 180 lb. in certain places, but not in all, while a “load” varies from 3 bushels to 5 quarters, or it is 144 quarts, or 416 lb., or 488 lb. according to locality. Then we have a number of nondescript measures, which puzzle even the initiated, and when we come to “hobbitts,” “windles,” and “coombs,” we are compelled to admit that to understand the grain market quotations of Great Britain is even more difficult than to comprehend the intricacies of “Bradshaw.”

The mystification does not end, however, with the grain trade. A pound of butter is supposed to consist of 16 ounces according to the imperial standard, but local “use and wont” overrides Acts of Parliament, and



hence, in some parts, the pound of butter means 17 oz., in others 18 oz., 20 oz., 21 oz., 22 oz., or 24 oz., and the stone may be the legal 14 lb. of 16 oz. to the lb., or 16 lb., each lb. consisting of 20 oz. But as if all this complication was not enough, we find that in some places, as at Ellesmere in Salop, butter is sold by the "dish," and in some other places by the "yard"! Cheshire farmers are obliged to sell cheese by the cwt. of 121 lb., while in London the person who buys from the Cheshire dairyman sells it at the legal 112 lb. to the cwt. In Scotland, also, the legal 14 lb. does not represent what is known as the stone of cheese, nor does the number of pounds which constitute a stone of cheese in one part of the country coincide with what is required to make a stone in another.

A "tod" of wool may be either 28 lb., 28½ lb., 29 lb., or 32 lb., and a stone of wool ranges from 4 lb. to 28 lb. The weight and value of fat stock is quoted according to the London stone, the imperial stone, or the Dutch stone, according to local usage; but we should weary our readers were we to give all the details of the absurdly diversified weights and measures in daily use where the sale of agricultural produce is concerned.

Surely it is high time that such an unsatisfactory state of matters should be amended. A uniform standard should be adopted and made compulsory, so that there may be no difficulty in arriving at the marketable value of agricultural commodities throughout the length and breadth of the land. There is little doubt that, ultimately, the metric or decimal system will be the rule, but it must be introduced gradually so as to accustom people by degrees to the change, and this is in fact being done at present. At Liverpool the cental, or 100 lb., has been for some time adopted as the standard weight, according to which grain is sold; and our 2s. pieces, or florins, is another step towards the ultimate introduction of a decimal system. In the meantime we consider that the substitution

of the legal lb., stone, cwt., and ton, in the sale of grain and other kinds of agricultural produce, instead of the present endless and unintelligible diversity, would tend to simplify matters very much, and the improvement would be even more decided were it settled that the cwt. should be 100 lb., the stone 10 lb., and the lb. 10 ozs. In the United States a cwt. is exactly what it is supposed to mean—namely, 100 lb., and the ton, as a matter of course, 2000 lb. It does not appear clear why a hundredweight in Great Britain should be 112 lb., seeing that the term surely means 100 lb.; and we consider that the propriety of making a change in this as well as in other matters connected with the general question of weights and measures deserves consideration. A few years ago an Act was passed rendering it illegal to sell grain or other agricultural produce in Ireland except by imperial pound, stone, hundredweight, and ton, and the measure, which swept away a vast number of abuses in the shape of over-weights, "casts of beam," &c., has been productive of much advantage. It is true that the corn merchants in Dublin, after obeying the Act for a week or two, appeared to find the calculation between "barrels" and cwts. too intricate for the extent of their arithmetical acquirements, and consequently set aside the Act, returning to their former system of selling and buying by the "barrel," the weight of which varies, according as the term is applied to wheat, or barley, or oats. But their resumption of an illegal mode of conducting business is no reason why a uniform system of selling grain by weight, and all other articles by the imperial standard should not be universally adopted and enforced. We trust that the question will be taken up by Chambers of Agriculture in all parts of Great Britain, and such representation made to Parliament as will lead to the abolition of the existing unseemly confusion and anomalies in agricultural weights and measures.

## PRICE OF SHORTHORNED BULLS.

THE sum of £20 for a yearling bull is a small amount to a breeder who pays hundreds for his stock; yet to a dairyman or small farmer that figure would in all probability represent the serving of his cows through the season at 10s. per head, and plenty of men may be met all over the country who would readily pay this price for a young bull of decent appearance and colour. There are two classes of bull buyers; those who possess a small herd, possibly of shorthorns, for breeding purposes, and who will pay up to 50 or 60 guineas, or even more, for a good young bull, and those who, possessing but dairy cows or common cattle, cannot afford so high a sum. This may be readily noticed at any shorthorn sale where the buyers at the higher price are few in comparison with those of the other class, and the result of the sale proves it. The average for bulls is almost invariably under that for cows—when it does exceed, it is mostly accounted for by a very high price paid for some fashionable animal. Take, for instance, the result of Mr Strafford's shorthorn sales last year; a year in which the yearly average was greater than on any occasion, besides being celebrated for the sale of a large herd of various tribes at Preston Hall, where the average was higher than has hitherto been obtained for any other herd of shorthorns on record. We find that 228 bulls averaged £47, 12s. 6d., nearly four pounds under the average for the 713 cows, but of these ten made upwards of 200 guineas each, averaging £380, 6s. 6d., leaving a little over 30 guineas a-piece for the remaining 218. The year before, 1866, at the few sales held in the autumn, during the abatement of the plague, the average for 98 head was only £23, 12s. 9d.; one of these made 100 guineas, and several were over 50 guineas. This, however, is hardly a fair estimate. Take 1863, which was a good year, 184 were sold for £28, 10s. 3d. each, the highest price being 400

and 160 guineas. In 1860, the highest annual number of shorthorns were sold by one auctioneer; 1203 averaged £37, 11s. 10d.—of which 267 were bulls, and they made £32, 18s.; seven sold from 100 to 330 guineas, averaging £176, 5s., reducing the average for the 260 bulls to about £29; so that it appears the average has generally been somewhat under £30 within the last ten years; and if the sales conducted by this gentleman during the previous ten years were taken, the average would be found considerably lower. It has been observed at many shorthorn sales in an enlightened district, that bids up to 25 guineas for a good coloured yearling bull are always plentiful and brisk, but above that sum they very soon stop.

One of the errors of shorthorn breeders, particularly when they begin, is of rearing too many bull calves, expecting to sell them at a considerable price over their market value, and asking exorbitant figures for inferior animals. It is admitted in most large herds that not above one bull in half a dozen is fit to be reared: when made into steers they save trouble and disappointment, and often bring a few pounds over the one pound for every month of their lives. If a bull is hired at a long price for the season, he must be put to a number of good cows, and the value of the blood attracts buyers: one or two of the best bull calves would make half or more of the cost of the hiring, the second best sell to small tenant farmers and dairy-men, whilst the worst pay well to make into steers. An aspirant to improvement is often frightened out of an attempt by the high sum demanded by young breeders for frequently a bad-coloured plain bull; it daunts him from making the experiment, besides preventing him becoming a better buyer at a future day, when he has seen, as he undoubtedly will, the improvement made by the pedigree sire.

Another evil is inattention to the dairy, along with the other excellent qualities of the shorthorn. How few breeders pay attention to it at all: if a cow does not give a fair supply of milk, the little that she does give is not increased by care, nor by putting her to a sire from a good milking tribe. It is a well-known fact, that unless the milking properties are encouraged, the inclination of the breed to develop fat lessens the lacteal secretion, and decreases the propensity to breed. Good milkers are prolific breeders, and the most numerous tribes of pure-bred animals will be found to be those that inherit this valuable quality. A herd of Ayrshires in their native district have their vessels and milking veins most carefully watched; and so far is this carried that no bull is used unless his breeding and formation be right. The want of these observations is possibly the reason why an Ayrshire herd so frequently fails in its dairy

properties after a few years' existence in the south. A dairy farmer, pleased with the heavy-fleshed shorthorns in his district, buys a young bull, uses him, and rears his offspring, which shew in course of time a decreased supply of milk, so that he returns to his old system of getting a common bull from a dairy herd. In beef-growing districts, such as Aberdeen and Banff, better prices are given for yearlings and bull calves, because their benefit is readily seen in their produce made into weighty steers; moreover, Scotchmen are quicker to perceive the merit of the pure-bred beast; but in the south cattle are not fed to such an extent, nor is breeding the principal feature of farming. It would be better if it were more so, as a greater source of profit to the farmer as well as to the outside public, in making us less dependent of the middling quality of the foreign supply, and providing a superior quality of meat for the table.

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### PORTRAITS OF DOMESTICATED CATTLE.

#### NO. 1.—"MISTLETO," A SHORT-HORNED COW.

WE take the following remarks relative to "Mistleto" from the account given of the herd belonging to Messrs Mitchell, which recently appeared in *The Farmer*.

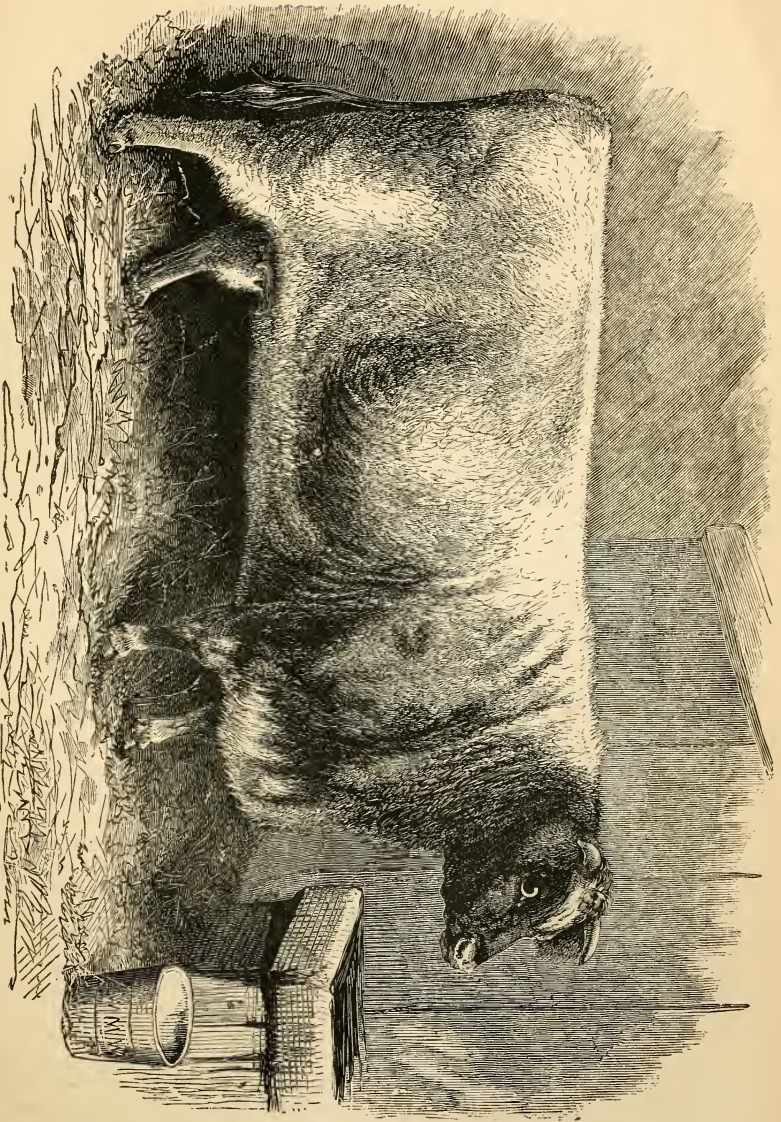
"This noble cow, now eight years old, and of which an admirable portrait, by Gourlay Steell, is possessed by Messrs Mitchell, was bred by Mr Crawley, Stockwood Park, but became the property of her present owners at an early age. She is by Welcome Guest (Booth's) from a Grand Turk dam, and at the Perth Highland and Agricultural Meeting in 1861 she was second to Soldier's Bride, and ultimately got the first prize, the Warlaby heifer not having qualified in time to claim it. Mistleto also stood well in a grand class at the Yorkshire in the following year, and at the Highland and Agricultural Society's Meetings at Stirling in 1864, she was at once put first in an unusually good cow section, besides winning five or six firsts at other exhibitions of less note. It was after her Perth

winning that it was confidently predicted, both in print and out of it, that she would never breed, and yet she has had a calf annually ever since, the only misfortune being, so far as the direct perpetuation of a Mistleto tribe is concerned, that all her calves have hitherto been bulls. Mistleto is a shorthorn all over—one of the sort that the longer she is looked at the better one likes her. She has a perfect head, a fine wide chest, good rib and loin, and excellent quarters. She is a little bare on the top of the shoulder, which age may have helped, but otherwise she is a heavy-fleshed, fine-boned cow, full of rich hair, and withal a great milker."

The following is Mistleto's pedigree:—

Roan, calved January 3, 1859, bred by Mr J. S. Crawley, Stockwood Park, the property of Messrs A. & A. Mitchell, Alloa; got by Welcome Guest (15497), dam (Miss Myrtle) by Grand Turk (12969), g d (Olive Branch) by Concord (11302), g g d (Oak Leaf) by Sir Launcelot (5166)—(Old Love) by Orville (4625)—by Tomboy (2765)—by Vesper (1547).





MISTLETOE, the Property of Messrs A. & A. Mitchell Allan. — From a Painting by Goult & Steel, R.S.A.





## GRASSES FOR PERMANENT PASTURE.

NO. I.—*FESTUCA PRATENSIS\** (Hudson) Meadow Fescue-Grass.

SYNONYMS—*Gramen loliaceum*; *Splico divisa* of Morrison, 1680; *Bucetum pratense* of Parnell; *Schedonorus pratensis* of Lindley; Sweet Grass of the N. W. American Settlers.

THE following is a botanical description of the *Festuca pratensis*:—Root perennial, fibrous; leaves all broad, flat, acute pointed, roughish on their upper surfaces, as well as on their terminal margins, smooth underneath, usually four and sometimes five on the stem, the upper being always much shorter than its smooth sheath; stems 4 or 5 jointed, 18 to 30 inches in height, hollow, round, smooth, striated, and frequently more or less decumbent towards the base; inflorescence in a simple panicle, which is upright at first, but becomes gracefully bent to one side after flowering, and having its lower branches, as well as its 4 or 5 terminal spikelets arising alternately on each side from a roughish rachis or centre stem; spikelets ovate-lanceolate in form, and containing five or six florets set in a calyx composed of two unequal, smooth, three-ribbed glumes or chaffy scales, the lateral ribs of the smaller being somewhat indented; florets composed each of two paleæ or seed scales, the outer of which is longer than the calyx, five-ribbed, membranous, and often bifid or forked at the summit; inner palea a narrow membranous scale, about equal in length to the outer, frequently bifid at the point, and having two fringed marginal green ribs. Flowers about the end of June or first week of July, and ripens its seed in from five to six weeks thereafter.

This species belongs to the section known as the broad-leaved Fescues, from the root leaves being as broad or broader than those of the stem; a characteristic which, taken with that of the awn or its rudimentary basis (when either are present) arising from behind the summit, instead of from the extremity of the outer palea, as in the narrow root-leaved

species, induced Parnell, in his "Grasses of Britain," to separate the former into a new genus under the name of *Bucetum*.

## NATURAL DISTRIBUTION.

Throughout Europe, from Italy to Lapland, the northern parts of North America, and at least in some districts of Northern Asia. In Britain it is comparatively rare at altitudes above 500 feet; although under favourable circumstances, as regards soil and shelter, it is occasionally found at from 600 to 800 feet, and its natural abundant presence is always indicative of superior pasturage, as well as of rich substantial soil, capable of producing excellent wheat and other agricultural crops. Asa Gray, in his "Botany of the Northern United States," describes it as common in fields and meadows, but supposes it to have been naturalised,—an opinion scarcely admissible, seeing that it is indisputably a native of British America, from the Atlantic to the Pacific Oceans. In Commander Richard C. Mayne's "Four Years in British Columbia and Vancouver's Island," he mentions *F. pratensis*, under the name of "sweet grass," as covering rich flats on the Fraser, Thompson, and Nicola rivers, "of which cattle and horses are so fond, and which has so wonderful an effect in fattening them. I have seen horses on Vancouver's Island, where the same grass grows, which had been turned out in autumn, brought in in April in splendid condition, and as fresh as if they had been most carefully treated all the time."

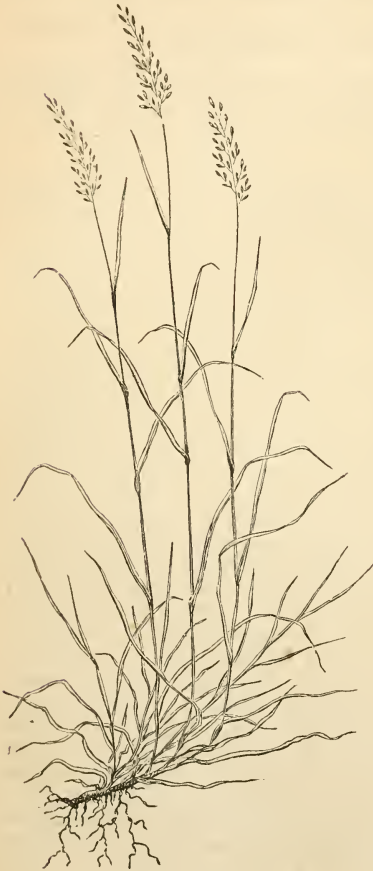
## QUALITIES AND USES.

The Meadow Fescue is one of the earliest, most productive, nutritious, and valuable of native grasses; and being eagerly eaten by cattle, horses, and sheep, both in its green and dried state, it should be largely introduced in mixtures for permanent meadows,

\* From the Celtic *fest*, food or pasturage, and the Latin *pratensis*, a meadow.

ornamental as well as ordinary pastures, and irrigated lands, especially where the soil, is of a clayey or stiffish nature, and it will also thrive on lightish dry soils if not under ordinary fertility; but as its productive powers

attract the early notice of grass cultivators; and although the London Society for the Encouragement of Arts, Manufactures, and Commerce awarded a premium in 1777 to Mr Wm. Gosse, of Hants, for collecting its seeds, and Mr G. Swayne, of Pucklechurch, included its seeds in a collection of eleven kinds, for which he in 1781 obtained a premium from the Bath Society, yet Dr Jas.



*Festuca pratensis*, reduced in size, shewing habit of growth.

are not fully developed till the second year of its growth, it is less suitable for alternate husbandry.

Notwithstanding the undoubted excellence and usefulness of the *F. pratensis*, it failed to



Calyx magnified.



Seed, natural size.



Seed magnified.

Anderson, of Monkshill, Aberdeenshire, took no notice of it in a list of indigenous grasses described, figured, and recommended for cultivation in the second volume of his essays relative to agriculture, published in 1784; and it was not till after Mr Sinclair's favourable report of its cultivation at Woburn, as given in the "Hortus Gramineus Woburnensis" in

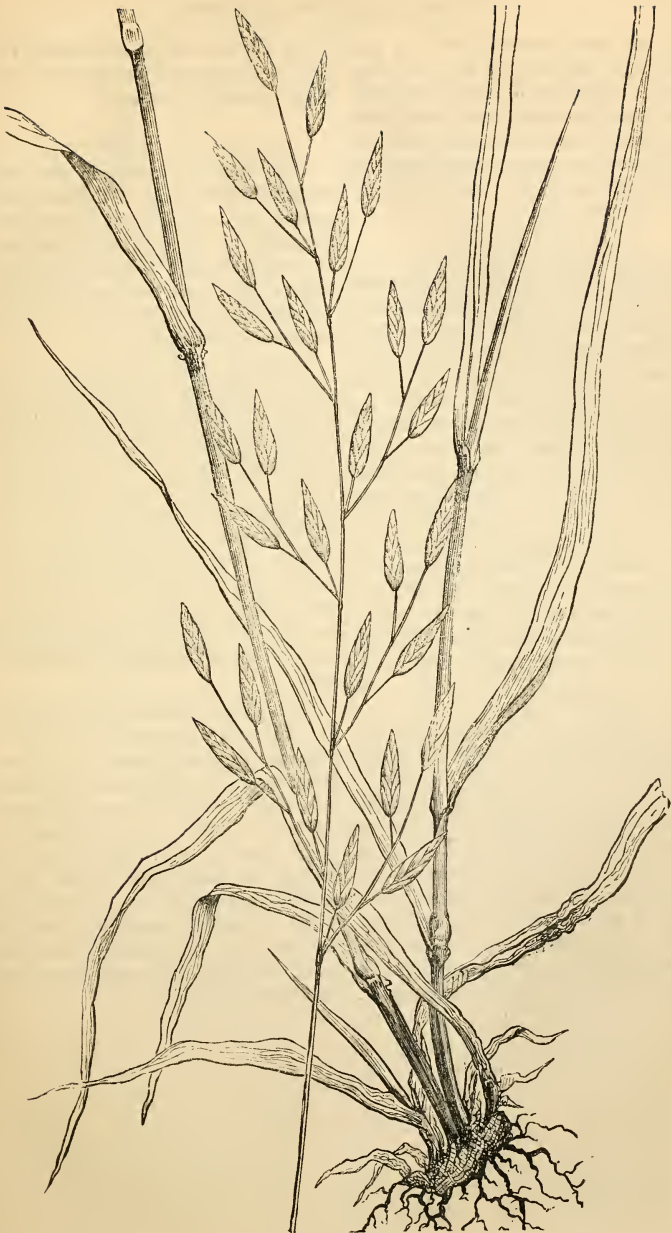


Floret magnified.



Spikelet magnified.

1824, that its real merits came to be appreciated; since which time its seeds have been in large demand. Grown on a fertile peat soil, with coal ashes as manure, in the Woburn grass garden, its produce, as cut on the 16th of April, was at the rate of 10,890 lb. per acre, 13,612 lb. at the time of flowering, which lost in drying 7146 lb.; while, at the time of seed ripening, the green



*Festuca pratensis*—Natural size.



produce was equivalent to 19,057 lb., and its product in hay to 7623 lb. It must, however, be borne in mind that the peat soil, with coal ashes, from which these results were obtained, was by no means well suited for it, as it thrives best upon strong rich clays, such as are common in the fens of England and the corses of Scotland.

#### SEED AND SOWING.

The average weight of seeds may be stated at 14 lb. per bushel, of which there are about 26,000 in one ounce; and the greatest number of these braird when not covered with more than half-an-inch of soil; only about half the same number come up when the covering is from three-quarters to an inch in depth; and none vegetate when buried under two and a-half inches of earth; so that they should only be sown on a previously well pulverised surface, and merely rolled in, or covered with a light grass-seed harrow. In grass seed mixtures for permanent pastures, 3 to 6 lb. per acre will generally be sufficient, or 8 lb. may be allowed if on very strong clays; but when sown alone, about 3 bushels or 40 lb. of seeds per acre will be needed.

#### CHEMICAL ANALYSIS.

Neither this nor any of the other broad-leaved Fescue grasses are included among those analysed by Professor Way of Cirencester, and we can, therefore, only quote the imperfect analysis recorded in the "Hortus Gramineus Woburnensis," which was made at a time when agricultural chemistry may be said to have been in its earliest infancy; and, according to which, grown on a fertile peat soil, with coal ashes for manure, as before stated, the nutritive extract on the 16th of April, amounted to about 383 lb. per acre, 957 lb.

at the time of flowering, only about 447 when allowed to stand till the seed was ripe, and 380 lb. from the latter-math.

#### VARIETIES.

Although not so variable in size and other characteristics as most of the other common grasses, yet plants of the Meadow Fescue may frequently be found, differing sufficiently to render a selection of the best varieties worthy of more attention at the hands of seed growers than they have yet received. The following two merit a passing notice:—

1. *Festuca pratensis loliacea* (F. loliacea and the F. loliacea Germanica of the seed shops).—This differs from the ordinary form in being somewhat stronger in growth, in having longer, lighter green, and much less branched panicles; its seeds are also somewhat larger, and it naturally affects a damper and heavier class of soils. Although its seeds are almost exclusively imported from Germany, yet this variety is by no means unfrequent in low, rich, clayey districts, such as the fenny counties of England; and the Merse, as well as the Corses of Gowrie and Falkirk in Scotland.

2. *F. loliacea spurea*.—This is figured as the Bucetum loliaceum by Parnell, and although frequently named F. loliacea by botanists, it is nothing but a spurious or impoverished form of F. pratensis, differing from the true F. loliacea in being dwarfer, more upright, having shorter spikelets, which, as well as the other parts of the plant, are generally more reddish or brownish green in colour, frequently containing fertile seeds, and by invariably becoming less or more branched or paniced when manured or transplanted to richer soils.

No. 2.—FESTUCA ELATIOR\* (*Linnaeus*)—Tall Fescue-Grass.

SYNONYMS—*Gramen pratense majus* of Buxbaum, 1728; *Gramen paniculatum dlatius* of Vaillant, 1747; *Bromus littoreus* of Willdenow; *Bucetum dlatius* of Parnell; *Festuca arundinacea* of Schrader and others; *Schedonorus elatior* of Lindley; Reed Fescue-Grass.

## DESCRIPTION.

Some botanical authors, among whom was the celebrated *Linnaeus*, have failed in detecting proper specific characters for distinguishing between this and the Meadow Fescue (page 55), and so have included them under one name. For agricultural purposes, however, they are, under all circumstances, sufficiently as well as permanently different. Both are perennial and fibrous-rooted, but *F. elatior* is readily distinguished by its more tufted growth, the much greater size of all its parts, and the consequently greatly-increased bulk and weight of its produce, its height being from 4 to 5 feet on ordinary soils, and from 5 to 6 feet when grown on those of a very rich, strong, and superior description; stems fine-jointed, of strong upright growth, terminated with large simple and compound-branched panicles, which are somewhat bent or drooping in their first and later stages, but upright when in flower. Flowers in the middle of July, and ripens its seeds in about five weeks afterwards; it is consequently ten days to a fortnight later than *F. pratensis*.

## NATURAL DISTRIBUTION.

The *Festuca elatior* seems co-extensive with the *F. pratensis*, in its geographical distribution; but in Britain it has a somewhat less range of altitudes, seldom extending to more than 500 feet above the level of the sea; and it is most frequently found in moist rich soils, by sides of rivers, streams, and other places where the water is not stagnant nor the ground too thickly overshadowed. As the term "tall" is occasionally prefixed to the sweet-grass of British N.-W. America (*F. pratensis*), it is probable that the colonists may include this along with that species.

\* From the Celtic *fest*, food or pasturage, and the Latin *elatior*, tall or lofty.

## QUALITIES AND USES.

The strong, coarse, and somewhat tufted growth of the *F. elatior* renders it unsuitable for ornamental pastures, and its not attaining to full growth till the second year is an objection to its being grown in alternate husbandry rotations, unless when the grass crop is intended to remain over two years; but its early as well as continuous growth, and the immense bulk of its produce, which, notwithstanding its seeming coarseness, is greedily eaten, both green and in hay, by live stock, renders it one of the most valuable grasses for permanent meadow and pasture lands, especially where the soil is moist and strong in texture, including irrigated grounds as well as places which are deficient in drainage outfall; and it is admirably adapted for cover by the sides of lakes, rivers, streamlets, clayey or alluvial sea-shores, and in open woodlands.

The Tall Fescue does not appear to have been specially recommended for cultivation prior to the publication of the "*Hortus Gramineus Woburnensis*" in 1824, although there is strong presumptive evidence that early experimenters may have associated it with *F. pratensis* under the name of Meadow Fescue. Thus, in the "*Letters and Papers of the Bath Society*" we find G. Swayne, of Pucklechurch, in a letter dated September 15, 1781, describing the Meadow Fescue (of which he had sent seeds, along with those of ten other commended sorts, to that Society) as being "rather a coarse grass, found universally in meadows and rich pastures"—a characteristic scarcely applicable to the true *F. pratensis*, which in coarseness of appearance scarcely surpasses the common rye-grass. In the Woburn grass garden, Mr Sinclair experimented with two varieties of *F. elatior*—viz., the barren and the fertile seeded. These presented no great disparity in the weight of their produce; but

as they were grown on different kinds of soil, the results are by no means conclusive as to which was really the best. The first, grown

were almost unaltered at seed-ripening, while the latter-math, consisting exclusively of green root foliage, was 15,654 lb. per acre. The fertile variety, grown on a black sandy loam, incumbent on clay, gave at flowering 54,450 lb. per acre, which lost in drying 30,628 lb., its hay thus weighing 23,821 lb., while that of the first was only 17,866 lb. When the hay



*Festuca elatior*, reduced in size, shewing habit of growth.

on a black rich loam, produced when flowering at the rate of 51,047 lb. per acre, which lost 33,180 lb. in drying; and these results



Calyx magnified.



Seed, natural size.



Seed magnified

is considered too coarse, it may be much improved by the aid of the straw-cutter, and mixing with other feeding substances.

#### SEED AND SOWING.

About 14 lb. per bushel is an ordinary average weight for the seeds, of which fully 20,000 are contained in a single ounce, the



Floret magnified.



Spikelet magnified.

number varying, however, in the different varieties. The greatest quantity of these come up when the earth covering does not exceed half-an-inch, about half as many when the covering is from 1 to 1 1/4 inch, and none when it is 2 3/4 inches in depth; so that the soil should be well prepared before sowing, and the seeds then covered by only rolling them in, or by passing



*Festuca elatior* - Natural size.



a light harrow over them before rolling. 40 lb. of seed will be sufficient for sowing an acre alone; but from 4 to 6 lb. will generally be found sufficient in permanent grass mixtures.

#### CHEMICAL ANALYSIS.

Not being included among the grasses operated upon by Professor Way, of Cirencester, we only give the imperfect analytical results obtained from the Woburn experiments, according to which the barren-seeded variety, from a black rich loam, gave at the time of its flowering 3988 lb. per acre of nutritive matter, about 2393 lb. at the time of seed-ripening, and 978 lb. from the latter-math; while the fertile-seeded variety, from a black sandy loam incumbent on clay, yielded about 4254 lb. of nutritive matter, or 266 lb. more than the other.

#### VARIETIES.

The *F. elatior* presents considerable diversity in the size, characteristics, and general appearance of its different plants, shewing that, by careful selections of these, highly improved varieties might be obtained for cultivation. The following are the best of the presently-known kinds:—

1. *F. elatior fertilis*, or Fertile-seeded Tall Fescue.—Generally known by its abundant production of fertile seeds.

2. *F. elatior sterilis*, or Barren-seeded Tall Fescue.—Distinguished by producing few or no fertile seeds, and the consequent more upright habit of its ripening panicles. This is in many districts the most common form of the species. And it has been questioned whether or not this barrenness arises from an imperfection in the inflorescence, or whether it is caused by injury from insects or disease. These may occasionally act injuriously, either singly or in combination; but there is no denying the fact that while some plants almost never produce fertile seeds, others, which have been long grown beside them, as invariably produce an abundance of good seeds. This was satisfactorily proved by the

late Mr T. Bishop, who acted during the greater part of a long life, first as gardener and then factor, on the extensive estates of Methven Castle in Perthshire, regarding whom none have devoted more careful and enduring attention to the discovery of improved varieties of hay and pasture grasses. Mr Bishop found plenty of sterile plants by the sides of the neighbouring river Almond; and only after persevering search did he at last discover a fertile one. This he at first carefully propagated by division, and next by seed, and was ever afterwards rewarded by good seed crops from both, although the barren plants growing in their vicinity scarcely produced any seeds capable of vegetation.

3. *F. elatior gigantea*.—The Gigantic-growing Tall Fescue differs from both the preceding, as its name implies, by its much more gigantic growth, its seeds being also considerably larger. For the introduction of this very valuable sort, cultivators are indebted to the German seed growers, who have now several varieties of it; and, having at one time devoted a little attention to its culture, we were enabled to select six very distinct sub-varieties, all of which were fertile seeded, but they differed remarkably in the comparative length, width, and colour of their foliage, as well as in their earliness and habit of growth. Notwithstanding their strong, coarse, reed-like appearance, cattle and horses were remarkably fond of them, both green and dried; while few other grasses equalled them for game cover.

4. *F. elatior variegata* has large spikelets, variegated with purple and white compact short-branched panicles, with broad leaves, which are hairy on their inner surface. This variety is common on clayey, sea, and river shores; its seeds are generally fertile, and although dwarfer than the ordinary forms of the species, there can be no doubt of its suitability for growing on exposed sea-coasts, wherever the soil is of a sufficiently substantial nature.

## THE HERDWICK BREED OF SHEEP.

IN the district of West Cumberland, and adjoining portions of East Cumberland, Westmoreland, and North Lancashire, a variety of sheep of antient but uncertain origin, has maintained from time unknown a character peculiarly adapted to the circumstances in which the breed is found existing, like West Highland cattle, in places where a less hardy race could not continue the struggle for life (places, in fact, often inaccessible to the heavier and less active kinds of stock), exposed to the suddenly-changing weather and frequent storms, and reared upon the poor scanty pasturage of the wildest mountains and the bleakest fells. It is known as the Herdwick breed—so named, we are told by an authority on Cumberland agriculture, because a practice has prevailed of farming out the sheep in *herds*—an application of the term *herd* instead of *flock*. The true derivation of the name, we imagine, is as obscure as the early history of the Herdwicks.

Tradition asserts their descent from a few animals washed ashore from the wreck of a Spanish ship, some centuries ago; but, to whatever source they owe their existence, the Herdwick sheep are now bred to the exclusion of all other sorts throughout a considerable proportion of the tract of country we have indicated; and if upon all farms this is not strictly the case, they are at least kept with scrupulous regard to purity, while farmers in the lower parts of the district select from the old ewes of the hill farmers for a cross with Leicester rams, to produce offspring capable of a very profitable growth on their richer lands.

The average weight of a moderately fat pure Herdwick wether (fed off at four years old) is about 12 lb. to the quarter, or a trifle over; fattened for Christmas consumption, or for any reason forced to an unusual weight, the larger specimens grow sometimes to as much as 24 lb. or 25 lb. a quarter. There are, however, two sub-varieties, one superior

to the other in size, and surpassing the lesser sort, probably to the extent of 3 lb. per quarter. It is sometimes spoken of as a breed distinct from the "little Herdwicks;" but as the same general description, except with regard to size, applies equally to both, and as the larger sheep are commonly known as Herdwicks, we include them when mentioning the breed, and class the two together without distinguishing the one from the other. The stock on different mountains, however, interchanged in blood, vary somewhat in size, colour, and other particulars.

The Herdwicks are remarkable for extremely fine bones and the quality and flavour of mutton, second to none, of choicest mountain growth. Their wool, varying in quality, but usually of a coarse character, averages about 3 lb. to the fleece, rather more on some farms; and certain mountains seem decidedly better than others for the production of wool of the more desirable quality. The selling price is nearly or about half that of Leicester wool. One extensive and successful breeder states that his thirty years' average is about  $7\frac{3}{4}$ d. per lb.; the lowest price, in 1848, about  $4\frac{3}{4}$ d.; and the highest in 1864, 1s. 1d. per lb. The sheep are most frequently white, some grey, or rather white, with a mixture of black. Their faces are of various colours—black, black-and-white, grey, or black with grey noses; some of the breeders, who are particular about *minutiae*, being very partial to dark faces and a "frosty" or grizzled muzzle. The head sometimes is black, or very dark, turning to an iron-grey about half-way down the face, and fading off to a pale grizzle, like that of an old sheep-dog, towards the end of the nose. The legs are grey or mottled. The Herdwick ewes are hornless; the male sheep mostly so; but a few, or more than a few, have horns, or rudimentary indications of horn.

The yield of lambs varies to the extent of

from 20 to 25, or even as much as 30 per cent., according to the situation of the farm on which breeding ewes are kept. We are enabled to state the average taken from four years' observation upon a farm favourably placed with regard to shelter. The average number of ewes yearly set apart for breeding purposes is 223; and of offspring living in the October of the following year, 184. During the ensuing winter a diminution of the younger portion of the flock takes place, and the lambs surviving in April (at that time a year old or nearly so) number 166. Thus it will be seen that 39 in 223, or rather more than 17 per cent. of the ewes turned with the rams, fail to rear, if not to produce offspring; and that, of the lambs safely brought through one summer, between 9 and 10 per cent. (18 in 184) perish during the first winter. The number, 39, includes non-breeding ewes—ewes producing dead lambs, and casual losses before, during, or shortly subsequent to the lambing season, which extends through the month of April and early part of May. Twin lambs are not common. Indeed, we may say that instances of more than one lamb at a birth are rare.

The only departure of the Herdwick from his mountain range, until he leaves it never to return, is for the term of this first winter of his existence, which he spends generally on some lowland arable farm. The sheep-breeder who can secure healthy winterage for his "hogs," usually agrees to give about 5s. per head, paying only for the survivors delivered to him in March—the winterage lasting from the 29th of October to Lady-day. Mr Dickinson, the writer of a prize report on Cumberland Farming, published in vol. xiii. of the *Journal of the Royal Agricultural Society of England*, and of an interesting essay on Agriculture in West Cumberland (which gained a premium given by the Rev. Canon Parkinson, Principal of St Bees' College), affords in his treatises much useful information respecting the Herdwick breed of sheep. He computes the loss of lambs during the first winter at from 5 to 10 per cent. The cost of winterage from October to the 25th of March he reckons at 3s. or 3s.

6d. This, however, is considerably exceeded in the present day, and we venture to believe that our estimate of 5s. will be found not far from the average actually paid.

The later management is very simple. The animals wander over their native hills, finding the herbage upon which they live and thrive. The flock of breeding ewes is, of course, kept up to the required number; drafts, from time to time (the selections being made irrespective of age), and annual additions from the young stock, helping to maintain a lot of healthy vigorous dams. The draft ewes ("crock" ewes as they are called in some districts) are bought by farmers who have suitable means of wintering them, and many of them are crossed, as we have already mentioned, with the Leicester ram—the produce being either killed as lambs or brought up for fattening purposes, and the ewes fed for the butcher after yielding and rearing through the summer their half-bred lambs. Much care, we may remark, is exercised by the Herdwick breeders to avoid alliances of near blood-relations. Rams bred from stock unconnected, or as remotely as possible connected, if at all, with the flocks to which they are to be introduced, are, in a great majority of cases, carefully chosen.

Mr Dickinson thus describes the practice, to which we have alluded, with reference to the derivation of the name of "Herdwick:"—

"A custom prevails of letting a number of sheep which belong to the landlord along with the farm: usually a fourth part or more within the number the farm, with its common-right, is supposed able, or is accustomed to carry. These consist of proportionate numbers of ewes, wethers, twinters, hogs, and tups; and are turned over from the offgoing to the incoming tenant by arbitrators—the landlord being made a party in payment, when any improvement in the flock is discovered, and in receipt when damages for deterioration are awarded. The flock is valued on every change of occupier, and bond required for maintaining the condition and number [why not quality?] and for due delivery at the end of the term. . . . The rent paid for sheep under such lettings, varies from 6d. to 1s. per head, according to circumstances, including common right, 0: 1s usually estimated at those prices in addition to the 10: of the enclosed farm."

To provide against the chances of loss

where the flocks range over large districts of unenclosed mountain, a book has been published, containing letterpress descriptions and wood engravings of the ear-marks, wool-marks, and tar-letter, used by the different sheep-owners within a compass of many miles. Each valley throughout the lake country has, at least, one copy of the book, bought by subscription among the farmers.

Those of our readers who may desire information concerning the systems of farming in the country of the Herdwick's, will do well to turn to Mr Dickinson's Report in the *Royal Agricultural Society's Journal*, and to his essay, bearing date 1850 (published by Whittaker & Co., Ave Maria Lane), in both of which will be found valuable details, interspersed with anecdote. In alluding to the healthy longevity of the mountain farmers, the writer relates a story of a person from the lower country who went to purchase sheep in the vale of Ulpha. During his examination of a draft of wethers, several broke away. "The patriarchal owner, who was stationed in his place to help to keep in the flock, called to the intending purchaser, in the peculiar dialect of the place, to 'tell that lad belaa (below) to gang raund t' house an torn

t' wethers at t' croft gap'—the lad being his eldest son, and eighty-three years of age." The incident bears resemblance to that of the mother, nearly a century old, mourning the loss of a daughter of eighty, and complaining of the fulfilment of her prophecy—"I always said I should never rear that child."

The Herdwick sheep, though roughly dealt with from their birth—obliged most frequently to seek a meagre sustenance on the brow of Helvellyn, among the clouded heights of Skiddaw, or along the bare and rugged ridges of neighbouring mountains—still receive close attention with a view to the improvement of their race. A society, called "The Fell Dales Association," has been formed specially for exhibitions of them, and for the encouragement of their breeders. The catalogue of the third annual meeting, held in Eskdale last October, contains the entries of seventy-five tups for sale or hire, and between five and six hundred competitors for honours, and shews among the prizes offered a five-guinea cup for the best pen of three three-year-old ewes, and two five-guinea silver challenge cups for single Herdwick rams of any age.

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### HIGH-BRED STOCK IN CANADA.

THE following account of the farm and live-stock belonging to Mr Cochrane, Montreal, who purchased "Rosedale" at the sale of the Duke of Montrose's herd last autumn, is taken from the *Canada Farmer*:—

"We must confess to a large amount of ignorance in respect to the style of farming in vogue in that part of our dominion, formerly known as Lower Canada, and now designated Quebec. The opportunity of making extended personal observations there has never been within our reach. We hope it may be at some future day. Meantime we are glad to be able to say that we have seen, if not a Quebec farm—the ground being all covered with snow—a farm-house,

the extensive steading, and a lot of choice animals, such as can hardly be equalled, certainly not surpassed, anywhere in the dominion of Canada.

By the invitation of its proprietor we lately made a flying visit to Hillhurst farm, near Compton village, the estate and country seat of M. H. Cochrane, Esq., a prosperous Montreal merchant. This gentleman having made money in the city, wisely determined to invest a portion of it in this country, and made choice of his native place, though at some distance from the scene of his business operations, as the spot where he would have a farm. Accordingly he purchased, one after another, a number of small holdings, until he



had secured 750 acres, nearly all of which is consolidated in a convenient block, with a public road on three sides, and a private road on the fourth side. To this estate the name of "Hillhurst Farm" has been given. It lies about a mile and a-half from Compton, a pretty little village of some 500 inhabitants, and three miles from the railway station called by the same name, which is 110 miles distant from Montreal, on the line of the G.T.R. to Portland. The locality is evidently one of the most lovely and picturesque in the eastern townships. Even in winter it is impossible not to admire the widely extended landscape, diversified as it is with hill and dale, belted by wood-crowned and snow-clad heights, and dotted with snug-looking farm houses. Imagination supplies the river that flows through the valley when the ice and snow have melted, while the railroad that skirts the stream is a visible reality, that, with its thundering trains and shrill engine-whistles, rouses the echoes and gives vivacity to the scene, all the year round.

Hillhurst consists of a noble stretch of fine rolling land, the soil a light loam of good depth, with a variety of subsoils, gravelly, rocky, and blue clay. The several buildings, which were on the small holdings of which the farm consists, make convenient dwellings for the men employed on the estate, as well as separate steadings for stock, which it is found desirable to keep apart. The homestead, a very commodious, neat, unpretending, yet tasteful and comfortable dwelling, surrounded with spacious and well-arranged buildings and premises, occupies a central position on the estate, and is at once adorned and sheltered by some ancestral maples, the like of which we could wish embowered every farm-house in Canada.

It is Mr Cochrane's ambition to distinguish himself as a breeder of choice stock, and especially of shorthorns. Already he has attained no small eminence, as the prize list of our last provincial exhibition testifies. The best aged cow, the best three-year-old cow, the best two-year-old heifer, and the best one-year-old heifer among the female shorthorns, were, to say nothing of Hereford

cattle, sheep, and hog prizes, surely glory enough for one show, and must have taken our older stockmen very much by surprise. We candidly own that, notwithstanding the honours won at the exhibition in question, we were not prepared to find so noble a collection of animals as we lately inspected at Hillhurst. The shorthorn herd already collected comprises no fewer than thirty-three pure-bred animals of various ages, and ten high grades. Among the pure shorthorns are at least from six to eight that will be hard to beat on the continent of America. The aged cow, Rosedale, is of world-wide celebrity, having won all possible distinction in the British show-yards, and retired from competition at the early age of two years and a-half. Snowdrop and Margaret III. have twice carried off the highest honours at our provincial shows. The 11th Duke of Thorndale, recently added to this herd at a cost of 3000 dols., has no superior as a two-year-old bull of Bates or Duchess blood. Baron Booth of Lancaster is of equal merit as a representative of the strain of shorthorns, that rivals the one just named. Maid of Athole is another first-class two-year-old, and beside her there are some yearlings of the highest excellence. Not content with thus mounting the highest pinnacle as a shorthorn man, Mr Cochrane is hardly less distinguished in the Hereford class. He had the best one-year-old bull, the best cow, and the best one-year-old heifer of this breed at the last provincial show. The young bull, Compton Lad, was a close competitor with his father, Guelph, for the diploma awarded to the best Hereford bull of any age. From our late inspection we predict a career of distinction for him, if no harm befalls him. He not only holds his own, but has improved greatly since the show. The Hillhurst herd of Herefords, comprising now thirteen animals, are a very choice lot, and will contend bravely with the notabilities of Morton in days to come for prize honours.

We must not omit mention of the beautiful Suffolk Punch stallion, that won the second prize for the best agricultural stallion and the diploma for the best stallion of any breed,

nor the first prize three-year-old filly of the same breed at the last provincial exhibition. Both these valuable animals are thriving finely, and bid fair to bring their owner something more substantial than the honours of the show-ring.

Next to the shorthorns, it must be fairly conceded that the sheep are the chief distinction of Hillhurst. No fewer than fifty-seven picked animals were imported last year from noted flocks in Britain. Eight of these were sold at high figures, and seventeen added from the best flocks in Canada, so that there are now sixty-six in all. Of these forty-three are Cotswolds, ten Leicesters, eight Oxford Downs, and seven Lincolns. Ten prizes were taken by this flock at the recent provincial show. Of these prize-takers the Oxford Downs and Lincolns were especially excellent—the shearling Oxford ewes taking first, second, and third prizes. Of the forty-three Cotswolds above named, forty are breeding ewes, all of which are in a healthy condition, and apparently with lamb. Seven of the Oxford Downs and five of the Lincolns, are ewes with lamb. At the date of our visit (Feb. 21), a number of the ewes were daily expected to drop their lambs.

We also found a choice lot of improved Berkshire pigs, comprising two distinct strains, so as to furnish pairs not akin. Three first prizes were taken by as many of these animals at the recent provincial fair. Three litters have come during the present winter and three more are expected soon."

[Portraits of Rosedale, 11th Duke of Thorndale, and Baron Booth of Lancaster, are given, and in continuation the writer in the *Canada Farmer* proceeds as follows :—]

"Rosedale, now seven years old, worthily carried off the first prize as the best aged shorthorn cow at the last provincial exhibition. For a full account of her pedigree, and the honours earned by her in Britain, we refer ourreaders to the *Canada Farmer* of Oct. 1867. When shewn last fall, she was only a fortnight off a long sea-voyage, during which she calved, and, therefore, did not appear to the best advantage, and when we saw her the other day she was getting only turnips and hay, without

grooming or special attention, yet at both the times referred to, even an uninitiated spectator could not fail to be struck with her beautiful proportions, perfect symmetry, and great beauty. Not only her present owner, but the stock-breeders of Canada may well be proud of this valuable addition to the shorthorn celebrities of our prosperous dominion. We will only add that Rosedale is supposed to be in calf to 11th Duke of Thorndale, and a brief account of whose characteristics and pedigree we now proceed to give.

Eleventh Duke of Thorndale is an equally valuable accession to the thorough-bred stock of this country. This choice animal is of pure Bates or Duchess blood, without the slightest admixture that can mar his reputation in the slightest degree. In all the shorthorn points, colour included, he is unexceptionable. It were too much, perhaps, to represent him as a paragon of perfection, but it would be difficult for the most experienced critic or connoisseur to say wherein he needs to be improved.

Baron Booth of Lancaster, the subject of our third illustration, is a young bull of great promise, and, from the purity of his Booth descent, represents the other popular family of shorthorns, as faithfully as the preceding animal does the Bates or Duchess tribe. He was imported in company with Rosedale, being only five months old at the date of his purchase by Mr Cochrane. Though of so tender an age, he bore the voyage well, and has greatly improved since his residence at Hillhurst. At the date of our visit he had just reached one year old. He is of a beautiful red colour, and remarkably developed for an animal of his age. He bids fair to attain great size. He is evenly fleshed, with upper and under lines perfect, soft and silky to the touch, and of very fine carriage. He is certainly a bull of no ordinary character, and unless we greatly mistake will make his mark at the exhibitions next autumn.

The prosperous condition of the Hillhurst flocks and herds, though chiefly attributable to the energy, intelligence, excellent judgment, and liberal outlays of capital on the part of

the proprietor, is also largely due to the co-operation of Mr Simon Beattie, the farm and stock manager, whose knowledge and experience enabled him to make most advantageous purchases in Britain on behalf of his employer, as well as most efficiently to superin-

tend things on the estate, during the necessary absence of the owner. Mr Cochrane is fortunate in having so able a right-hand man, and one so competent every way to second his plans and efforts as a breeder of choice cattle and sheep."

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### THE AMERICAN TUBE WELL.

THE long tract of dry weather we have experienced, while it has reduced the bulk of even considerable rivers, has dried up many streamlets which supplied water to grazing stock, rendering the cattle dependent on supplies brought to the fields daily by means of water-carts. That ample supplies of pure water are essential to the healthy condition of live stock of all kinds is too well known to require any argument to prove it, and for this reason it is of the utmost importance that not only all pasture fields, but also every farm-yard, shall be furnished with the means of procuring a sufficient supply at all seasons; and, of course, the more cheaply this can be effected it will be the better for all concerned.

We are therefore desirous to bring under the notice of our readers the Tube Well, which we believe is an American invention. During the American war it was used with great advantage by the Federal army, while its merits have also been successfully tested in the course of the Abyssinian campaign. The Emperor of the French had it tried in his own presence at St Cloud, with the most satisfactory results. Wells on this principle are now in operation at several public works, and also private establishments, and in every instance the experiment has succeeded—that is, of course, if water was to be found.

A great feature in Norton's Tube Well is its simplicity, and when one examines it and sees the manner in which the operation is conducted, it seems somewhat strange that the invention had not been hit upon long before this time. An iron tube, 12 feet in length, and  $1\frac{1}{4}$  inch in diameter, pointed

with steel, and perforated for about 2 feet from the bottom, is driven into the ground by a heavy weight, or "monkey," which is worked over pulleys attached to a tripod, by a couple of men. Should the first tube fail to reach water, a second tube is attached, and it may require even a third tube or more before the operation is finished, but in most instances one tube, or at most two tubes, have been sufficient. When water in sufficient quantity is indicated by the plumb-line the operation is complete, with the exception of fitting on a pump to the top of the tube. The rate of sinking depends, of course, on the nature of the ground, but in a trial which we saw the other day, water was got at a depth of 8 feet in twelve minutes. Half-an-hour is frequently sufficient to complete the whole operation of sinking the tube, fitting on the pump, and having the well in full working order.

But the simplicity of the Tube Well, and the ease with which it is made available, do not comprehend all its advantages. It is often impossible to sink wells, by the ordinary method, in running sand, but in such cases the Tube Well is perfectly effective, while the filtration of the water is secured by enclosing within the perforated portion of the tube an inner tube, which is also perforated, the vacant space between the inner and outer tubes being filled with wire gauze, which acts as a filter. Besides this, the water obtained from the Tube Well is always pure, as no sewage or surface water can find its way into it, as frequently happens in the case of ordinary wells. No doubt some of our readers will have experienced this in the case of wells

sunk in farm-yards near the manure pits, as the water in such cases is frequently rendered quite useless, owing to the soakage from the manure finding its way into the well. This is prevented, however, by the construction and action of the Tube Well.

With respect to the watering of pasture fields, it is a matter of every-day occurrence that such are totally without water for the stock, rendering it necessary to bring it by a water-cart, sometimes from a considerable distance, and always with considerable trouble and expense. From the circumstance that such fields, when under a regular rotation, seldom remain in grass for more than two or three years, leaving an interval of three or four years before they are again occupied by grazing stock, very few incur the expense of sinking wells for the convenience of such fields. When the Tube Well is employed the expense is reduced to a minimum; first, in the original cost, and, next, from the fact that when circumstances no longer require that a well shall exist in any particular field, the tube can be raised without difficulty and sunk elsewhere. This is a material point in its favour, as a means of supplying the pasture-fields on a farm with water. When two or three pasture-fields meet at a point, one Tube Well, sunk at that point, will be sufficient to supply all the four fields with water.

In farm-yards, or where water is required for the supply of a country house, the tube may be sunk, if necessary, close to the building, which cannot be safely done in all cases with the ordinary well. The tube may also be sunk close to, or even within the dairy or engine-house; and with reference to dairies, we may state that water obtained from the Tube Well is not only pure, but also cold. Where large quantities of water are required, if one tube, say of the largest size, is not sufficient, two, three, or even more tubes may be sunk, and these, when joined together at the top and worked by power, are found to keep

even very extensive works amply supplied. At a time when fires have, unfortunately, become so prevalent in farm-yards—owing, no doubt, in many cases, to the extensive use of machinery driven by steam—we need scarcely say that a constant and large supply of water, procurable by means of the Tube Well, is a matter of the utmost consequence.

There is another point in connexion with the application of the Tube Well in rural districts, to which we wish to direct attention. It is always very important that farm labourers' cottages, whether placed singly or in hamlets, shall be well supplied with wholesome water. Yet, how often do we find that such is not the case, and that the cottages are frequently entirely dependent upon a muddy ditch, or the drainage water of a field collected in a hole near the roadside, where it is open to dust and dirt of all kinds, to passing animals, and in fact to every pollution. Even where wells have been sunk more carefully, it is by no means rare that such are polluted by soakings from neighbouring ashpits and dung-hills; and it is a well-ascertained fact that the use of impure water has, in manifold instances, brought on malignant fever, cholera, and other fatal diseases. With the view of guarding against such calamities, cottages have sometimes been erected in objectionable and unsuitable situations, but conveniently situated as regards a supply of pure water. From what has been stated it will be evident, we think, that the tube well presents a ready, cheap, and effective means for reformation with respect to the water supply of country cottages and hamlets. The fearful epidemics which recently raged at the village of Terling in Essex, and some of the villages in Fifeshire, and which were distinctly traceable to the use of impure water, should act as warnings to those who have the control of such matters; and we are satisfied that they will find in the Tube Well an easy and effective preservative against similar disasters.



*FARM-YARD MANURE AND ITS MANAGEMENT.\**

WE have already seen that the soluble constituents of farm-yard manure are the most valuable, and that they increase during its fermentation; hence we should endeavour to prevent their loss, as far as it lies in our power. Now, as this is the case, it is obvious that with proper management we can retain all the valuable fertilizing substances of manure by non-exposure to rain. Therefore any system where manure can be made under cover will be the best, provided the cost of the building and the character of the farm will admit of this being done. In advocating the box system of feeding we have not merely to look to the increased value of the manure made, but in order to make it in such a way that fermentation shall proceed properly (for this cannot be attained by the use of an indiscriminate or superabundant supply of litter), we effect a great saving in straw, are thus able to keep a greater number of stock upon the farm, and consequently return to the land larger quantities, as well as a better quality, of manure than would otherwise be the case. I say this always provided it is considered desirable to use other food besides that grown on the farm, and in so doing a question arises that is not very often sufficiently looked to—viz., at what price can beef be made per lb., and can it be produced cheaper by oilcake or meal in conjunction with roots and straw, or by roots and straw alone? Now, these certainly will make meat, but the use of cake or corn enables us to do it more rapidly, and also saves the roots very much. Of course, if a man consumes his straw or turnips because the custom of the country won't allow him to do otherwise, he does not consider this point; but this return alone to the land will not tend to ultimately improve it, except under extraordinary cultivation. Although the feeding of cattle seems rather beside the question we are considering, it bears indirectly upon it, for if we cannot properly reduce our straw into good manure, and on some arable farms, where there is a great excess, without high feeding this is difficult to accomplish, it is perhaps a mistake at times not to dispose of it by sale, and return its, or more than its, manurial value; but provided there is accommodation, and a farmer knows that he can make beef at a profit on artificial food, he can always reduce any amount of straw. I think myself that the sale of straw cannot be advantageous except under very exceptional circumstances, such as close proximity to a town, where it may be readily delivered, and manure returned in its place. An excess,

if anywhere, will be found to exist on arable farms, which are often of a light character; and here, if the whole of the straw is not reduced by feeding cattle, the growth of an intermediate crop, such as vetches, which take a great portion of their food from the air, will enable a farmer to keep his waggon horses in the folds the cattle have occupied the previous winter, to consume this crop and make manure, instead of breaking the hedges and damaging the crops of growing cereals, as is so often the case. Whether feeding stock pays directly or not, it is now generally carried out on farms where stock is bred, where it must answer indirectly; for supposing this store stock was sold, it would be at such a price that a margin would be left for profit in feeding; thus to the man who rears there must be a profit to feed, or a loss in rearing.

Some argue that the best way to add an increased value of manure to the land is to get the elements of nutrition in excess in the natural product, by high feeding, even if this excess of manurial value, is counterbalanced by a corresponding loss upon the feeding itself. Superficially you may say that this is as broad as long, as you may as well lay out your money at once in artificial manure; but here comes the question whether this theory is correct or not, for cannot an excess of straw, where its sale is impracticable, thus be properly reduced into a much larger quantity of valuable manure than would otherwise be the case; and secondly, can the farmer determine what speciality he shall invest his money in, to the same advantage as he derives from the production of a universal manure, which accommodates itself, in the increase of fertility, to every variety of plant and soil under almost any circumstances.

## ARTIFICIAL FEEDING STUFFS.

By using assistants in feeding we know we can save a large amount of straw and turnips, and consequently feed to a greater extent; we find also that we get a very superior manure. That this is the case is an undisputed fact, a ton of oilcake consumed producing about 125½ lbs. of phosphoric acid, 50 lb. of potash, and 109 lb. of nitrogen, equal to 132½ lb. of ammonia.

Those who favour the application of artificial manures would say, by using one ton of best Peruvian guano, at perhaps £2 more cost, and, supposing it to contain 18 per cent. of ammonia (which is an extreme calculation), you would get 303 lb. of the ammonia as well as other fertilizers, or nearly 2½ times as much as from the ton of cake. They infer then, that supposing oilcake to be worth £11 per ton and guano £13, that £26 worth of oilcake is only equal to £13 worth of

\* Abstract of paper read before the Wenlock Farmers' Club, by Mr Bowen Jones.

guano, and that we consequently should not feed at all with a view to the improvement of the manure. But if we look a little more closely into this argument we shall find it founded on error, for the use of a ton of oilcake gives us a saving in feeding to the extent calculating 6 lb. of cake per day (to save 120 lb. of swedes per day, which is about the estimate), of 20 tons of swedes, or more than an average crop for an acre of land, as well as a large saving in litter, which, together with the production of manure in a form fit to be put on the land (even allowing a beast makes no profit in the feeding), more than overbalances the apparent difference in favour of the guano. We thus come to the conclusion that our system of feeding, as far as regards quantities and description of corn or cake used, must, to a great extent, depend upon the contrasting prices between each of them, and roots, hay, and straw, due regard being taken to consider the nutritive value of each separately; for if an artificial manure can be applied at a much less cost than the use of a particular kind of food will increase the value of farm-yard manure, it is folly not to apply it in that way, although there is always that practical difficulty of getting so good a distribution, and so great a variety of combinations as we attain in farm-yard manure. Our knowledge also at the present time is far from perfect as to many of the forms of combination in which the various elements of nutrition exist in natural manure, and therefore no artificial manure can be made to imitate it. The exclusive use of turnips or any other description of green food causes a considerably larger secretion of both solid and liquid excrements in the animal, and, consequently, a proportionate increase of litter is required for their absorption, while the manure, although made more bulky, is of less value. By thus feeding, therefore, it is to the disadvantage of the manure, and it is also the means of causing the animal to eat larger quantities of straw. The cost of reduction of this bulky material must again be placed to the credit of feeding, to form a good manure, as against purchasing the same in an artificial form. Morton, from experiments and data collected, calculates that the whole of the excrements of cattle fed upon the turnips and straw, amount to three-fourths of the food consumed, the remainder being taken up in the formation of structure and waste: of this the urine weighs one-half more than the solid dung. Putting the consumption of a full-grown animal at 200 lb. of swedes and 14 lb. of straw per day, we should by this calculation get a proportion of 95 lb. of liquid to 65 lb. of solid excrement per diem. Reducing the quantity of swedes to one-half, or 100 lb., and, in addition, giving 5 lb. or 6 lb. of cake, we shall probably find the straw eaten is rather less than in the above instances, say 8 lb. or 10 lb., instead of 14 lb. The weight of excrements voided from this diet would amount to about 90 lb., but it is found that, when a solid or mixed diet is given, the proportion of liquid is smaller to that of solid excrement, and may be taken as being about one-

half of it. We should in this case get about 46 lb. of each; thus, the amount of litter (putting the weight required at about one-third of the liquid excrements) would be, on the turnip and straw diet, about 32 lb. or 33 lb. per day, as against 22 lb. or 23 lb. on the mixed dietary, the general weight calculated for box use, although one-third of weight of straw to liquid would make it still less. Thus, by adopting the latter method of feeding, we should procure a greater value (because a better prepared and more concentrated manure), at this great saving of litter, which would be just sufficient to provide for the wants of half as many again animals, and we should get it at less cost, because the labour, both in supplying and reducing it, would be less. The increased amount of straw on the one hand is necessary for the thorough absorption of the larger amount of liquid produced, as well as for the comfort of the animal, but the action of straw is only as a vessel in this respect to hold these dilute substances in solution; the watery matter, in course of time is given off, and the woody fibre of the straw decomposes, forming humic and ulmic acids, which prevent, by their combination with ammonia, any escape of it from manure; all straw, in addition to the amount required for this purpose, is not much better than so much waste. The quantity of manure produced in boxes, with mixed food and litter, supplied in the proportions I have named, is about 27 cwt. per month, or at the rate of 16 to 17 tons per annum. The quality of this is such that it can be cut out and loaded with a spade, and at once carted to the land, without the slightest depreciation. The principal objection to the box system, I believe, is the expense. At the same time, of course, boxes would not be desirable for the rearing of young stock, but are best fitted for the production of good manure, and the preservation of its fertilizing qualities until carted to the land. The only objection raised to this system is the want of almost sufficient moisture to carry on a proper decomposition. This, however, has no reason to occur except by an injudicious use or an imperfect distribution of litter, which of course is a matter of detail; but still it is not unfrequently the case in these folds, as well indeed as in open ones, where there is a perfect system of tank drainage, to pump the liquid manure over the mixens in dry weather, or at intervals, in order to promote putrefaction, as well as re-absorb the liquid parts of the manure. Why, then, are not these superior systems carried out to a greater extent than is now the case? I think I should be answered by those who know more about buildings than I do, "Because it is too expensive, and won't pay." I am not prepared to go into the cost of the matter (not but that I think great modifications might be made on the extravagant estimates often suggested). I don't say again that the alteration of existing buildings to such an extent at once is scarcely compatible with the returns derived from the fair occupation of land, but I say this is a question that should not be lost sight of, for it must be to the interest of an owner of land to have its

fertility, and consequently its value, increased; and any outlay on his part that will attain this end can only be considered in the light of a profitable investment; while, on the other hand, any system that causes a loss of fertility in the soil lowers the return of produce, and depreciates the value of the occupation. However desirable such alterations may be, it hardly comes within the range of a tenant's duty to make a large outlay in the construction or alteration of farm buildings; still, if the landlord won't see his own interests, or, as others would put it, won't do his duty, and the tenant feels secure in his occupation, it remains an open question, in my mind, whether a little outlay in trying to preserve the good qualities of the manure produced at home would not prove quite as economical as the same amount laid out in the purchase of artificial manures.

#### LIQUID MANURE, ETC.

The question of the best means of disposing of the overflow of yards, which so commonly runs to waste at most homesteads, is worthy of a moment's consideration before quitting this part of the subject. We have seen by the analyses given to what an extent liquid manure varies; and when produced from the drainings of open yards, the manure of which is of but inferior quality, its composition will not be found to be such as to be very energetic in its character, still it contains all the most valuable elements of the manure, but in very weak solution. If the nature of the ground is suitable and the position of the buildings will admit of it, it cannot be better disposed of, than by a natural system of irrigation; but when this cannot be done it is not so easy to determine what use to make of it. The process of the pumping is expensive, and the manure being exposed does not require it in the winter, and in the summer it is removed, so that I think about the best thing to be done is to form a water-tight pit, the one side of which may be open, the bottom being a gradual inclined plane, and into which a cart may be backed. This receptacle may receive the drainage of all the folds and the sweeping and accumulations that are always in excess at a farmhouse, and generally form a heap of rubbish (miscalled manure), and by this amalgamation the good properties of the liquid will be absorbed and retained, and a good manure produced. Supposing our manure to be manufactured, we have next to determine what to do with it, and this will all depend upon the way in which it has been produced. If carefully made under cover it will be found in a fit state to cart out for direct application to the land, say every three months, but the produce of the open yard if generally water-soaked to that extent, that fermentation is checked, (for although it is absolutely necessary to have a certain amount of moisture and warmth before fermentation can be set up, an excess of water has exactly an opposite effect, and prevents it), this being the case the manure is generally in a raw state and unfit for immediate use. If it is turned up lightly in the yards to promote decomposition, its

elementary fertilizers, which are rendered more soluble during this process, become more accessible to rain both from their increased solubility, as well as from the looseness of the heap permitting the free admission of penetrating showers, to the continued injury of the manure. If carted to the fields and made into heaps, the expensive item of haulage is at least doubled (for the water contained in this sort of manure will be quite half the weight of the manure proper, due allowance having been made for evaporation and overflow), and the heaps will be more or less liable to the same influences as in the folds, with the difference that the more valuable drainings will run on the land, instead of probably to waste, and this is a doubtful advantage, as a particular spot gets too much of a good thing. Prevention therefore in this matter must be better than cure, as the farmer has everything to gain and nothing to lose by making a good article. If carting in mixens on the fields is a necessity (and where manure is going to stand all the summer it is preferable to turning it in yards) attention should be paid to preventing loss as much as possible. This will be best accomplished by selecting well-sheltered positions for the heaps, keeping them well sided up; and carting over the manure while the mixen is in the course of formation, the mass becomes thereby solidified, and is consequently more impervious to the action of rain. This solidification, however, rather retards the process of decomposition from the exclusion of the air, but as time is no object in such a case, putrefaction will have advanced sufficiently far before application. The practice of covering mixens with soil, road scrapings, gypsum, salt, &c., is all very well as far as their action depends upon throwing off an excess of rain, but I don't believe practically it is of much value—certainly not for the purpose of preventing the evaporation of ammonia, or as we often hear it put, of keeping all the goodness in: for we have already seen that nature has made a provision for fixing this fertilizer, which cannot be surpassed by any imitation we can suggest. The action of salt is useful enough occasionally in very badly formed manure, where a great excess of litter has been used, and a sort of dry decay has set in, but it has no power at all over ammonia; it merely attracts moisture. With regard to the concluding part of our inquiry—the application of farm-yard manure to land—no fixed rule can be laid down to suit all cases. The proper application depends upon the nature and character of the land, upon its condition, and state of cultivation, as well as being considerably influenced by the climate. Thus we find that different districts vary in their custom of applying manure with perfect success in each case. The condition of the manure itself must also affect the time of its application; and here it is that districts where bad manure is made might, in some instances, by improving its quality, improve at the same time the mode of application. Well-made farm-yard manure ought to be fit to be at once put on the land, and where this system can be consistently adopted, its application in

this way will be the most economical ; for, although we have seen that the fertilizing effects are more fully developed by manure becoming well rotted, there is a certain amount of loss attendant upon its reduction as well as usually great waste, which, instead of being otherwise dissipated, would under these circumstances be taken up by the soil or the plant. An objection might be raised that it is impossible at any time to apply manure to the land, and plough it under, but I do not see why the latter requisition should prevent the surface application, for we have dispelled, I trust, that great bugbear and illusion—I mean the supposition that valuable matters are evaporated—and the soil under these circumstances would get the benefit of any solutions the rain might wash out. The successful application, however, all depends upon taking into proper consideration the character of the land itself, and the crop to which it is applied. If fresh farm-yard manure is ploughed in at once, the soil will gradually absorb its elementary constituents as they are eliminated during the process of slow decomposition, and consequently such an application, although less active, is more durable in its effects, and the results will possibly be more apparent in the subsequent crop than in the one to which it is applied. The following experiment, which I recollect being tried, bears out in practice this theory, arrived at by the researches of chemistry. The land was of a rather heavy character, and might be called a calcareous clay. One and a-half acres were measured off and divided into three equal parts. Part 1 was manured with about 5 tons of fairly-rotten manure, in the middle of October, which was at once spread. Part 2 received at the same time about the same quantity, which was placed in small heaps. Part 3 was dressed also with about 5 tons, but this was not applied till the middle of March, at which time the three plots were ploughed. This ground was sown with swedes. Plot 1 produced 5 tons 18 cwt. ; plot 2, 5 tons 16 cwt. 1 qr. 20 lb. ; plot 3, 5 tons 18 cwt. This shews that the manure that had been exposed all the winter, spread on the ground, had as good an effect as that ploughed in fresh. The power of absorption and combination with manurial elements is much greater in some lands than others, especially in those soils that come under the category of clays. This faculty diminishes gradually in soils of a less retentive character, and is scarcely recognisable in the lighter sandy soils.

We here have it prepared in such a way, that the solid and liquid excrements are thoroughly mixed with just such a quantity of straw as will perform the functions I have adverted to ; the treading solidifies the mass, and we save both litter, manual labour, and

haulage as well as all the waste that occurs so much from exposure to weather.

#### STALL-FEEDING SYSTEM.

With regard to stalls, I may remark that the principal advantage supposed to be derived from their use is the small quantity of litter required by the feeding cattle on this system. This saving is effected by the drainage of the urine direct from the animals ; but if this liquid portion (which we have seen is of considerable value) is not made use of, its waste amounts to so much loss of fertilizing value out of the manure that is in the course of formation. The drains, however, usually run into the pit into which the clearings of the stalls are emptied two or three times a-day ; but instead of saturating the mixen, they very often enter it at the bottom for the sake of the fall. As the amount of litter used is small, we should here have no superfluous straw requiring saturation, in order to produce fermentation ; consequently, if, as is often the case, stall manure is thrown loosely twice a-day all through the winter into an open yard or pit, and exposed to the rain that falls upon it when in this very assailable condition, with perhaps, for want of spouting, the rainfall of the buildings also assisting in the washing process, it becomes greatly deteriorated of the valuable fertilizers which the good food used in its production have added to it. It is true this may be in a measure obviated by stalls being placed contiguous to young stock folds (and this is a point to which practical farmers should attend), as the rich and concentrated manure thrown out would become well trodden down and incorporated with that of an inferior description, in which an excess of straw, combined with its more compact position, would tend to some extent to save its good qualities from being so readily injured by the action of rain.

#### OPEN-YARD SYSTEM.

We next come to the open-yard system of making manure, and the one in which perhaps the larger proportion in this county is produced, and however many sources of loss we may be able to point out from this method being pursued, we cannot pretend that it is possible at once to alter it ; we should therefore first turn our attention towards its improvement as generally carried out. The principal cause of loss is the rainfall, but irrespective of this, the manure of yards generally being produced by the young stock on the farm, is of an inferior character to that produced by feeding cattle, for the reasons that young stock are stock. Practically we only require them for feeding purposes, and there is no question of their superiority over any other system, especially in the production of manure.



## AGRICULTURAL STATISTICS.

## I.—LIVE-STOCK.

A WRITER in *All the Year Round* says:—"The British, or rather the English farmer, has a peculiar dislike to answering the questions of an official. It is an ignorant prejudice, but it has a foundation in traditional reason. He learned from his father, who learned it from his grandfather, that in the days of that departed respectable top-booted gentleman the Government made many inquiries, which were generally followed by new taxes. The then exciseman wished to know, not only how much beer was brewed, but whether the farmer made any candles, or soap, or bricks, or tanned any hides, and whether he had paid duty on all the salt he used. Then, too, the parson of those deeply-regretted times was curious as to the yield of every crop, for he took his tithes in kind. Now farmers—who, as a rule, read little, and think the more of the past—still very often look on the parson as their natural enemy, and on the Government as a malicious powerful fiend that served them an ill turn nineteen years ago, that makes them alone of all producers pay a tax on produce, and is on the look-out to impose on them another. Therefore they detest the name of statistics. Besides, the English farmer is usually a tenant-at-will, paying a low rent as a compensation for a nominally precarious but practically permanent tenure. Tenants-at-will will labour under the delusion that they can keep their position and their profits or losses from the calculations of the landlord's agent—an ostrich-like delusion, but very firmly fixed.

For all these reasons the farmer has hitherto displayed a rooted aversion to anything like agricultural statistics, and has successfully resisted attempts, even endorsed by noblemen considered "farmers' friends," to collect the sort of agricultural information which is furnished annually to the Governments of the United States and of the Australian colonies, as well as to all the governments of continental Europe.

Thus, when cattle were dying off at the rate of some thousands a week, we positively did not know, within a couple of millions, more or less, how many cattle, sheep, and pigs there were for the British meat-cater to fall back on when the foreign trade in live cattle was entirely stopped—that foreign cattle trade which in 1864 brought us as many animals as have since perished by the plague.

One indirect result of the cattle plague was to obtain official, though non-compulsory, returns of the numbers of horned stock, sheep, and pigs in Great Britain, Ireland having for several years been the subject of an annual statistical inquiry. The English tables are now before us. They are not very satisfactory, for the in-

quiries were conducted by the officers of the Inland Revenue, and it is amongst the traditions of that office to afford no more information than the law requires.

Nothing, therefore, is given but the bare figures of the return, which are thrown, as though grudgingly, before the public, like the pieces of a child's puzzle, to be put together as we can. We are not told how many schedules were distributed, how many defaulters there were, or the number of owners, or the estimate of stock unreturned. Neither are we informed of what is equally important—the particulars of the breed of the stock, and whether they were stores or fat stock. In some counties lambs were embodied with sheep; other returns in the colder counties were made before the lambs were yeaned; but intelligible notes for the useful reading of the naked statistics do not appear.

The number of cattle before the outbreak of the *Rinderpest* in Great Britain, excluding Ireland and the islands, has been estimated at nearly 5,000,000. The return falls short of that number by some 6000; but this first voluntary census may be wrong by that number either way. The *Rinderpest*, up to October 1866, had by the plague or the pole-axe destroyed over 200,000 head, or something like 5 per cent of the average stock—a serious loss, not easily to be replaced, especially under the restrictions which have become indispensable to guard the country against a second introduction of the disease. The sheep of 1866 were counted at over 22,000,000, and the pigs at 2,500,000. Sheep, although not absolutely free from *Rinderpest*, suffered to the extent of less than 8000.

We have not included the live stock of Ireland in these figures, because the sea-passage that divides the green island from England makes the importation just as difficult as from Holland and North Germany, and more difficult than from the Channel ports of France. But Ireland, although still understocked, for want of capital and confidence amongst graziers, makes a very respectable display in the statistical tables. The cattle amount to 3,500,000 (we throughout quote round numbers); the sheep are only a very little more numerous than the cattle, and the pigs reach 1,300,000.

A writer in the *Journal of the Royal Agricultural Society* has given us the area in acres and the population of the principal Continental States and of the United States, and shews the proportion of live stock of each kind to each hundred acres of area and each hundred of population. According to these tables, Holland and Belgium—butter and cheese exporting countries—stand highest in proportionate number of cattle to acreage, but rather low in the

proportion of their total stock to the number of their population—Belgium being, as compared with the United Kingdom, as 50 to 130, our inferior number of cattle being made up by the superior number of sheep. On these tables Professor Rogers of Oxford, has constructed a theory that the number of live stock in Great Britain is decreasing, in consequence of the tendency of small farms to be amalgamated into large ones. All existing evidence is opposed to this theory, and is in favour of the assumption that there is a steady increase in the quantity of live meat produced on every acre of land occupied for farming and grazing in the three kingdoms—more especially in Scotland and England, the countries of large farms. Indeed, a very little consideration will shew that the naked figures of these comparative tables give the least possible information of any useful kind. Thus Ireland, from its moist climate, is essentially a grass country: indeed, it is now often called “the natural home of the shorthorn,” the most profitable meat-producing breed in the world. Within the recollection of middle-aged men of the present generation, the cattle of Ireland were of the unprofitable, slow-growing, long-horned, thick-skinned breed. These have been superseded, on nearly all but high mountain ranges and the poorest wastes, by the shorthorn and its crosses. In nearly all the grazing counties of Ireland, for the last twenty years, the long-horns were year after year turned into oxen and exported, the breeders resorting to imported shorthorn bulls only. The steady sale of lean stock to English graziers assisted the change. The consequence is, that not only is Ireland stocked with the modern breed, but it has become the country on which English graziers chiefly rely for the young stock, technically “stores,” which they grow into beef.

Now, if we were to judge only from figures, we should decide that Ireland was better supplied with live stock than Scotland, and was even better farmed, while the exact reverse is the fact. Scotland has very little beef-feeding pasture as compared with Ireland—although Scotch turnips are the very best in the world—but what she has is grazed by the choicest beef-makers. All her good land is well stocked; but an enormous per-centage of the acreage of Scotland is irreclaimable waste. The prime joints of metropolitan markets are of Scotch beef. Valleys and moorland and mountain top, that formerly fed such half-starved wild cattle as Rob Roy “lifted,” are now more profitably given up to sheep—Cheviots and blackfaces, both migrants from England. Again, since easy conveyance and good markets, with the spread of root cultivation, have led the Scotch to fatten a great number of their beeves at home on turnips, English graziers have been obliged to look more to Ireland for their supply of store cattle, horned manure makers, and consumers of root-crops; while, until the outbreak of the *Rinderpest*, not only did the dairies of the metropolis depend largely on Holland for milch cows, but Norfolk and other feeding counties began to draw “stores” from the Continent. On the

other hand, neither the climate nor the genius of the Irish people is so well suited to the growth of sheep, although there is no doubt that whenever Ireland becomes really tranquil, the number of long-woolled sheep—than which no animal is more profitable—suited to the climate will be largely increased. The peasant-farmers of Ireland contributed next to nothing to the stock of beef-producing animals, and nothing to that of mutton. The export to England is drawn from the great farms of the grazing districts.

The comparisons of the number of cattle and sheep in Great Britain and in France or Germany are, to say the least, very unprofitable, because the first elements of comparison are wanting. It is like the early Japanese trade of exchanging gold for silver by weight. In France, for instance, in 1862, there were nearly 6,000,000 cows and 8,000,000 of other cattle, 14,000,000 in all, for a population of 37,000,000; while Great Britain, with not quite 5,000,000 cattle, had a population of over 23,000,000 to feed. Yet meat (much more largely eaten by the English than by the French) is not dearer in England than in France, where the best cuts of horseflesh fetch 5*l.* a pound. The reason of this great power of meat consumption in Great Britain is to be found in the fact that we grow meat, while in France and Germany, with the exception of limited areas which grow beef for England and Paris, they allow skin, bone, meat, and muscle to exist for the purpose of the dairy or harness, or both combined.

It may be assumed that every head of horned stock included in our statistical returns is either a dairy cow or a beef-making animal, and that on an average it produces twice as much of the best joints of beef as the French animal, because it comes to the butcher at half the age, and fattened, thanks to root and cake, on one-fourth of the area. Normandy and Brittany have recently sent us a few shorthorn crosses, equal to those from Warwickshire or Yorkshire. The balance in weight and quality of British sheep and pigs, taking early maturity into consideration, is still greater. We have no doubt that the ordinary cultivated acreage of England and Scotland produces four times as much beef, mutton and pork annually as the same acreage in France or Germany, excepting always the exceptionally well-cultivated farms in Prussia, equal to, and exceeding in extent, our greatest west Norfolk farms. We have it on the high authority of M. Le Play, the Chief Commissioner of the French Exhibition that the efforts of the French Government, carried out most judiciously for more than forty years, to improve the meat-making live stock of France, have proved, as far as the peasant proprietor is concerned, of no more effect than “water poured on sand.” The peasant proprietor cannot afford to buy, nor to feed, nor to use a beef-making beast; he wants muscle, not flesh. As for sheep, he has neither the space for a crop of roots, nor the money nor the inclination to find the essential corn or cake for winter food.

But although, in the absence of complete agricultural statistics, all the evidence is in favour of a great increase in the meat-producing powers of this country, founded on the increased use of artificial manures, still the fact remains that the supply is not equal to the demand created by increased population, and still more by the improved condition of a population that expects to eat fresh meat where their fathers, more poorly clad, were compelled to be contented with a little bacon, or a little of the salt beef of a worn-out dairy cow. We are constantly, so far as London and the great towns of England are concerned, largely dependent on the foreigner. Our first foreign supply was drawn from Northern Europe, from parts of Denmark, from Germany, and from Holland. Spain and Portugal sent and send for a limited number of fat bullocks, magnificent animals, dove-coloured, meek-eyed, with enormous branching horns—chiefly working bullocks, fatted on Indian corn, producing “meat mottled like marble, and nearly as hard,” cheap, nutritious, and tough, but of great value for soup and stews, if only our labourers’ wives knew how to cook.

About two years ago the French began to ship a number of their best oxen to us, chiefly Normands

crossed with shorthorns. The year before the cattle-plague one English cattle salesman remitted £10,000 to France, the purchase-money of fat bullocks for one season. Sheep came to us from Germany and Holstein in enormously increasing numbers; many merinoes, which furnish a large quantity of small tough joints at a very low price. The North German exporters, whose centre is Hamburg, send thousands of excellent animals called Dutch sheep, which are crosses from good English Leicester and Cotswold rams. Flocks of pure and crosses of Downs are also kept in the largest towns in sandy Prussia. It not unfrequently happens that one-third of the live stock exhibited in the metropolitan market is foreign. At the time the cattle plague broke out, railways having been opened up to Eastern Europe, we had tapped the grassy plains of Poland and Hungary, and had even one importation from Russia. Our salesmen were in communication with the cattle dealers in Berlin and Vienna, and the grey cattle with straight long horns, which are supposed to be the descendants of Oriental cattle brought by the first Tartar invasion into Europe, were to be seen in the streets of London. These were, no doubt, directly or indirectly, the cause of all our woes.

## II.—GRAIN.

The *Saturday Review* of the 18th May says:—“The publication of the Agricultural Returns for Great Britain has been followed by a commentary upon them, prepared by Mr Caird, and read by him to the Statistical Society. Mr Caird did well to record his thankfulness ‘that in the House of Commons he was the instrument of carrying a resolution which led to the collection of the returns;’ but he went beyond what the facts warrant when he proceeded to the assertion ‘that the returns have given us the power of answering with accuracy and in good time the question whence the 30,000,000 of people who live within the narrow limits of the British islands shall year by year be provided with their daily bread.’ We have recently pointed out and complained that the returns just stop short of giving the materials that would enable the public to answer for themselves this annually recurring and most important question. We may be permitted to recapitulate the substance of what we have on a previous occasion said, which was, that so far as the returns go, the information afforded is undoubtedly ample, but that it is necessary that the future returns should include accounts of what crops have actually been grown from year to year. A slight increase of labour and expense would make the returns complete in this respect, and we urged that, to make them useful, the additional trouble ought not to be spared. For although, as Mr Caird says, “Government may very well leave all parties interested to ascertain for themselves the *relative* yield of each harvest, and to act as each sees fit on his own sources of information,” yet it is clear that the public ought to be

supplied with the materials which are the basis of each annual calculation—namely, accounts shewing what is actually an average crop of wheat in the United Kingdom. When that is known, the surplus or deficiency of any harvest can be estimated correctly enough immediately after harvest time. Mr Caird tells the Statistical Society that he differed from such authorities on the subject as Mr Jacob, Mr Took, Mr Newmarch, and Mr M’Culloch, when, as *Times’* Commissioner, he put forth an estimate of an average crop in 1850. He still thinks that his estimate was correct, and, subject to ‘careful inquiry and observation’ since made, he still puts down a lower figure as the limit of an average crop of wheat per acre than we think would be found to be correct if extensive inquiry were made. Such inquiries on a narrow scale, limited by the means at the disposal of private ‘parties interested,’ have been undertaken, and, so far as we have been able to ascertain them, the results go to show that, in estimating an average crop of wheat in England to be 28 bushels per acre, Mr Caird is below the mark. We believe that only one public journal, *The Farmer*, has obtained from its correspondents their estimates of the crops, in the form of so many bushels of corn or so many tons of roots, per acre; in the other agricultural journals in which crop reports are published, the estimates of quantity are made with reference to that unknown quantity, an ‘average crop,’ and are described as being less or more below or above. The information given by *The Farmer* has also the merit of being classified, not, as is usual, by counties, but according to the character of the soil or geological formation.



Now we stated (*Saturday Review*, November 27, 1867) that the average of the estimate of its correspondents in England and Wales gave 24.4 bushels per acre as to the yield for 1867. But to this 24.4 are to be added 2 bushels per acre as a correction, because, 'remembering the several soils under cultivation, the fact must not be passed over that an average taken from the aggregate averages' (of each kind of soil) 'cannot possibly be correct, since the wheat lands are fully two-thirds of the drift, tertiary, and cretaceous groups, and these this year give an average of 28 bushels per acre, which is lowered by the poorer averages of the soils of Devonshire, Durham, and other counties, &c. &c.' This estimate, then, gives 26.4 bushels per acre as the yield for 1867, and that yield is recognised as being fully 20 per cent. short of an average crop, or, in other words, 4-5ths of an average. Adding to this 26.4 bushels  $\frac{1}{4}$ th of itself, or 6.6, we obtain 33 bushels per acre as the figure representing an average annual crop of England and Wales, if *The Farmer's* correspondents were correct (in the month of November, and after experiment had been made) in their estimate of the 1867 crop, and if general opinion, in which Mr Caird appears to concur, does not err in setting down the deficiency at 20 per cent. This figure agrees so remarkably with those which, we are informed, have been obtained by diligent private inquirers, that, for our part, we are inclined to place greater faith in it than in the estimate which Mr Caird somewhat dogmatically put forth of 28 bushels per acre, without giving his hearers the materials on which it had been based. There are, however, no means of judging whether either Mr Caird's or any other estimate be the truth, and there will not be until we shall have been provided for a series of years with an account of the actual results of the industry of our farmers. The wide difference between the figures adopted by various respectable authorities is so important as to be in itself a sufficient argument for the supply of an authoritative statement of what an average crop of wheat really is, based upon facts collected from the whole of the cultivators. When the public have that, then, as Mr Caird said, Government may leave all parties interested to ascertain for themselves the *relative* yield of each harvest."

The following remarks on this subject appeared in *Dornbusch's Floating List* of the 19th ult. :— "To obtain correct information of this year's harvest, will be of far more importance than in ordinary years, from the fact of the ruling high prices—the general exhaustion of stocks of all kinds of grain, and the at present doubtful prospects of next harvest. It is therefore very desirable and important to the nation, that all the farmers and occupiers of land should assist in rendering this information as complete as possible, and it is to be hoped that enlightened persons in every locality will use their influence to remove whatever prejudice may still exist in the minds of some farmers on the subject of agricultural statistics. The idea of some farmers, and other persons too, that to afford

little or to give no information to the public can in any way be advantageous to themselves, is a fallacy which must disappear in proportion as the immense value of statistics becomes better understood. Not less absurd is the idea, that such information would be used as an engine against farmers for purposes of special taxation. The nation at large is the farmer's best customer. All the million-mouthed breadeaters and consumers of agricultural produce which to human existence is as necessary as air and water—are deeply interested in obtaining cheap food. But cheap food cannot be had, if the producer is heavily taxed. In the price paid for an article is included the sum total cost of production, so that the consumer always pays, in the last instance, all expenses incurred up to delivery at his door, not excepting any taxes, which the producer is called upon to pay. The advantages of agricultural information are not confined to a single class only, but the whole community shares in it. In the present state of *statistical* ignorance—uncertainty and anxiety constantly perplex the farmer as well as the corn-merchant, and frequently entail on both heavy losses, which might easily be lessened or avoided—by the information now sought for. At present, prices rule very irregular and are subject to many changes, because governed by no fixed principle, but decided on no better ground than the rule of the thumb. Most calculations are mere guess work, and men of business, amongst whom farmers also rank, are obliged to conduct their operations in a haphazard way, instead of basing them on a real foundation of positive knowledge. Individual farmers cannot, in their isolated position, form an accurate opinion of the value of their own produce, which can only be ascertained by the aggregate yield of a whole country. They cannot judge of values by merely taking account of the extent of crops on their own farms or the immediate neighbourhood in which they live. This might have been the case when their market town was the centre of attraction, when roads were few and the range of communication confined within a small circle. Steam, railways, electric cables, and telegraphs have changed all these things. The farmer is compelled to look beyond his own homestead, or he will be left behind in the onward march of the world. He must ascertain not only what has been growing on his own farm, but how his brother-farmers all over the country have fared—and the more extensive his information is, the more correct will be his deductions and conclusions, and the better able will he be to shape his operations. The price of corn is regulated by the sum-total of all circumstances combined, extending over the whole country, modified by foreign importation. The agriculturists are quite as much interested in knowing accurately the real state and extent of their crops and the volume of their produce as the grain merchant and consumer; and the small occupier of land has not less an interest in it than the large farmer, for he, the small occupier, may also, by making good use of agricultural statistics, one day become a large farmer. No



one is injured by too much knowledge, but infinite mischief is done by ignorance—by which all suffer.

“To the agriculturist, accurate statistics of the extent of crops under cultivation are of far more importance than to any other class of the community, for he is the largest dealer in corn. All the corn in existence must pass through his hands before it reaches the corn factor, miller, merchant, or consumer. Therefore the agriculturist, above all other men, ought to know accurately of any deficiency that exists in the yield, and to what extent, that he may, by higher prices, be compensated for the loss in quantity. If Heaven has blest him with a good harvest, he will be no loser by knowing the extent of his blessing, for it will enable him to make his calculations, when and at what price to sell his crop, or when to withhold it. At present, in the uncertainty arising from want of accurate information, the farmer is entirely at the mercy of chance. He sells—perhaps just because he wants straw—on the very eve of a rise in prices, when he ought to have kept his corn. Or, he may lose an opportunity to sell at the right time, and hold his corn just when he ought to part with it. The farmer, in respect to the state of the market, is generally behind-hand with the factor or merchant, and often, instead of reaping the full benefit of his care and toil, by the most advantageous disposal of his pro-

duce, he loses it, and has to pay the inevitable penalty of ignorance. While the merchant, who generally takes every pains to be well informed of whatever refers to the prospective supplies and imports, has in this respect the advantage over the farmer, and justly obtains the legitimate benefit of superior information. The axiom that ‘knowledge is power’ applies to commerce as well as to farming, and to every other pursuit. ‘Ignorance,’ on the contrary, ‘is weakness’—it proceeds from selfishness, the effect of which always strikes back upon itself, in obedience to the eternal law of compensation and retribution. Sufficient has been said here to shew that farmers, by withholding the little information required of them—which each can and ought to give, of the extent of crops under their own cultivation, are their own enemies, entailing upon themselves losses and disappointments which they might easily avert. No class of men more than the agriculturists themselves would be benefited by accurate information with regard to the extent of the crops grown. It is to be hoped that all our farmers will cheerfully undertake the little trouble of filling up the few items in the papers, which will be sent to them through the Board of Trade. By facilitating the collection of agricultural statistics they will best serve themselves, and by it be, above all others, the greatest gainers.”

## Farm Architecture.

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### NEW FARM BUILDINGS AT KINNETTLES IN FORFAR.

DESIGNED BY MR R. BLACKADDER, C.E., DUNDEE.

THE plans which we give of Mr Paterson's farm-steading, together with others of a similar kind which we shall insert occasionally, will, we trust, be found useful in assisting those who contemplate carrying on improvements of this nature. There is nothing which marks more decidedly the state of agriculture in every district, than the prevailing style of farm buildings. The plan of such erections must vary, of course, to the nature of the farm for which they are intended, and the system of management pursued; but suitable buildings are as necessary to the husbandman as implements and machinery, for without them, or where they are not of a proper kind, he is seriously hampered in his proceedings, and therefore precluded from deriving that benefit from his farm which he has reason to expect. Imperfect or unsuitable buildings detract from the unusual value of a farm, and are therefore a source of loss to the landlord as well as the tenant while badly planned farm steadings, even occasion, when of a superior character, loss of time, and otherwise, often inconvenience to the tenant.

The farm buildings, of which plans are given on the following pages, have been erected at Kinnettles, in Forfarshire, by Mr James Paterson, the proprietor of that estate.

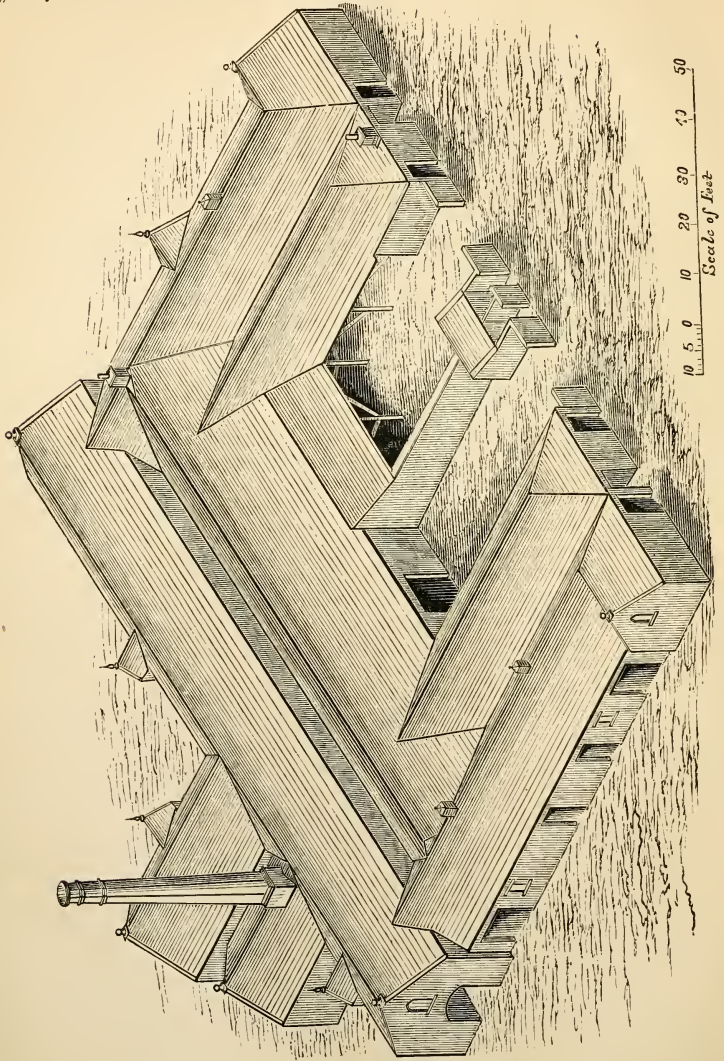
The estate of Kinnettles is about 12 miles from Dundee, and 3 miles from Forfar, and occupies the whole of the south slope of Brighton Hill down to the Kerbet water. It has, therefore, a beautiful exposure to the south; while it is sheltered from the north and east by the woodland on the summit of the hill. The soil is remarkably rich and fertile, and the fields are neatly divided by hedge-

rows; while there are numerous old trees spread over the property, which at once beautify it, and give evidence of the extent of time it has been under cultivation. The main public road from the Vale of Strathmore to Inverarity and Fotheringham passes through the middle of the estate, and altogether it is a most desirable residential property.

Mr Paterson purchased the estate in 1864, and shortly after taking possession he commenced to make improvements. He has erected a handsome mansion-house in the old Scotch baronial style, which harmonizes remarkably well with the site. He also laid out anew the policies and garden, and erected garden offices, stables, coach-houses, lodge, &c., so that it is now considered one of the most elegant residences in the county of Forfar.

Numerous improvements have also been made upon the home farm. The old stead-ing has been entirely removed, and a new stead-ing, of which we give the plan and isometrical view, has been erected in its place. The design is somewhat ornate; but at the same time it is very compact, and an attentive inspection will shew that all the various apartments are conveniently arranged. The thrashing-mill, which is driven by a steam-engine, and the corn barn are placed in a wing which projects to the north, and the straw barn is exactly in the centre of the stead-ing, with a covered passage along one side of it leading to the byres, courts, and stables. The turnip shed is divided in two—one on each side of the stead-ing, and close to the cattle byres, where the turnips are required. The bothy, which the farmers in Forfarshire

seem determined to maintain, is in the east wing is occupied with the cow byre, calves' wing, away from the farm-house, and close to house, gig house, and riding stable. The

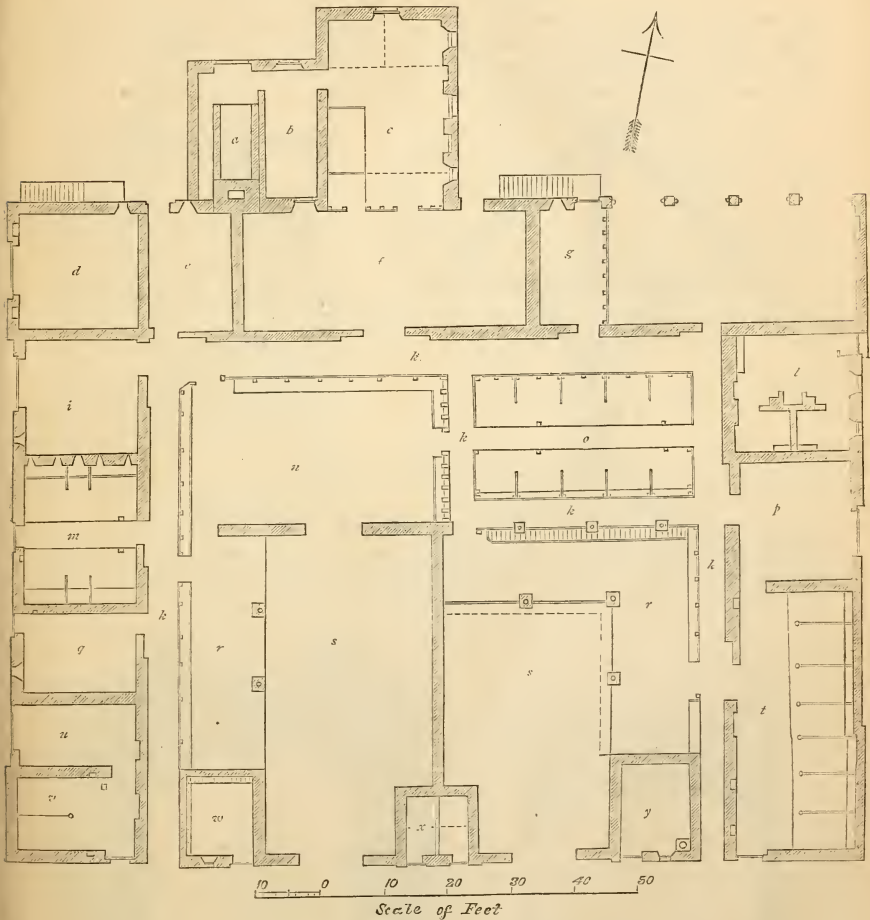


New Farm Buildings at Kinnetles—Isometrical Projection.

the work stable. The cart-shed faces the steading, as a whole, is remarkably well north, with the granary over it; and the west arranged; but we notice the want of a build-

ing for steaming and preparing food, which in a steading of such pretensions should not have been neglected.

Numerous other improvements have been made on the estate, such as draining, fencing, clearing, planting, and thinning.



New Farm Buildings at Kinnettles.—Ground Plan.

- |                    |                         |                         |                   |
|--------------------|-------------------------|-------------------------|-------------------|
| a. Boiler House.   | g. Oilcake and Manures. | n. Cattle-Feeding Shed. | z. Work Stable.   |
| b. Engine House.   | h. Cartshed.            | o. Feeding Byre.        | aa. Gig House.    |
| c. Barn.           | i. Turnip-Shed.         | p. Turnip-Shed.         | w. Hen House.     |
| d. Implement Shed. | k k. Feeding Passages.  | q. Extra House.         | rr. Cattle Sheds. |
| e. Calves' House.  | l. Bothy.               | r r. Cattle Sheds.      | x. Piggeries.     |
| f. Straw Barn.     | m. Cow Byre             | s s. Cattle Courts.     | y. Boiling House. |

The Granaries are above d, e, g, and h.



RUSTIC FARM-YARD STRUCTURES.

AMONGST the popular errors which find a place—shall we say a too ready place?—with us respecting our continental neighbours, is one to the effect that their in many departments *our* workmen could, if they would, learn a vast deal which would be of practical service to them. Take, for instance, the case of structures erected almost

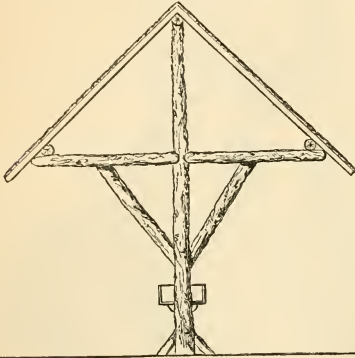


Fig. 1. Field Shelter Shed—End Section.

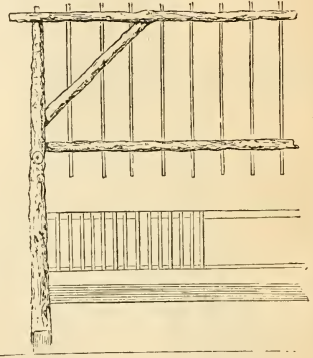


Fig. 2. Field Shelter Shed—Side Section.

workmen engaged in what we call the constructive arts, building, &c., are very clumsy at their work, and by no means tasteful in their designing. We do not hold this opinion,

entirely of wood. At the Paris Exposition abundant evidence was to be obtained that continental workmen know how not only to erect economical, but tasteful structures. A

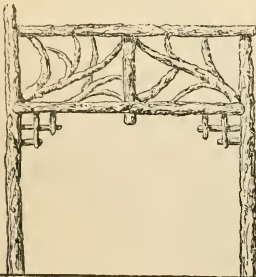


Fig. 3. Entrance Door to Cattle Shed.

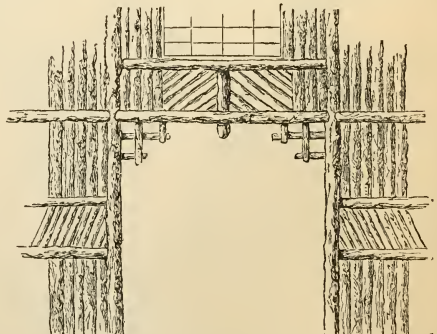


Fig. 4. Entrance Door to Cattle Shed.

or we have made it our business to see into what really is the nature and style of work carried out by continental workmen, and we have not the slightest hesitation in saying that

very little taste goes a long way, and we would draw especial attention in corroboration of this to the sheds which were erected for the shelter of the stock at the island of Billan-

court, and of the exceedingly clever way in which native timber, in its rough state, was made use of to give effective-looking and really pretty structures. And, as for the use of

sands of insects which torment our poor cattle.

Figs. 3 and 4 are entrance gates or doors to cattle sheds.

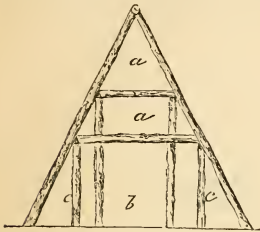


Fig. 5.

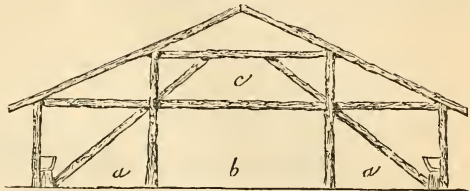


Fig. 6.

ornamental or cut wood-work, we have no hesitation in saying that our carpenters and joiners have everything to learn in connexion with it.

Figs. 5, 6, and 7 illustrate various forms of rural or farm structures, adapted for cattle and forage sheds, all constructed of rough timber.

Fig. 8 illustrates an arrangement for divid-

We here present a few sketches of parts of

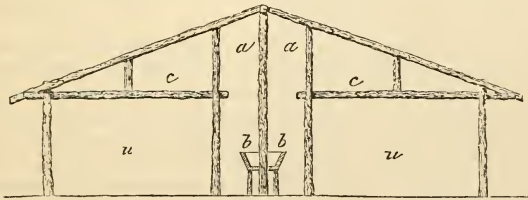


Fig. 7.

rural structures, composed of rough timber. Fig. 1 is a field shelter shed, designed by the Marquis of Havrincourt of Havrincourt, Pas de Calais, and is constructed entirely of timber in the rough, or poles and branches

ing the stalls in stables; *aa* is the back post, *bcc* the manger. The usual form of "travis" is supplied by the pole *ee*, suspended to the front of the manger by the chain *d*; the other end is suspended by the chain *fg*; the end *n*

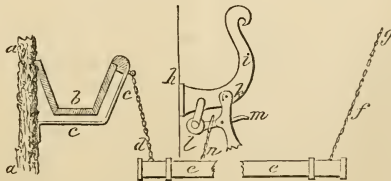


Fig. 8.

with the bark on, and looks neat and effective; and, what is more, forms a pleasant shelter in times when the sun beats down upon the fields, and urges into vindictive life the

corresponds to the end *g*, and is taken up and passed over the lever *m*, jointed at *l*, and the end of which lever *m* is held by a catch in the lever jointed at *k* to the bracket *ii*, secured

to the foot-post *h*. By lifting the lever jointed at *k*, the catch is released of the lever *m*, which drops and allows the pole *ee* to drop also, by releasing the cord or chain *n*. This sketch of an appliance used on the Continent is given here as suggestive, not of what is worthy, but what may not be worthy of adop-

tion. To which of these two classes it belongs the reader will judge. To point out what is defective is as often as practically useful as what is good and perfect; or, to put it in the words of an agricultural authority of no mean repute, the "answer *no* is frequently as useful as the answer *yes*."

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## Summary of Agricultural Events.

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### THE SEASON AND CROPS.

THE weather during June has been warm, but dry and parching, so that, on light lands especially, and also in very stiff soils, the crops are not so promising as they were some time ago. Wheat in general looks well, but oats and barley have suffered much from the drought, and the former, in numerous instances, have also been seriously damaged by grub. We have seen several fields which were almost bare of plants, and we learn that fields which had been sown with oats or barley have been ploughed up with the intention of sowing turnips in them. The turnip plants, where early sown, have mostly made satisfactory progress, but the seed of the later sown kinds lie dormant from lack of sufficient moisture to start them. Beans are stunted; potatoes generally look well, but, like all the other crops, require more rain than has yet fallen. Pastures are bare even in the best parts of the country, and on light lands, in many parts of the kingdom, have been quite burned up. The weather, however, has been very favourable for hay-making, and while the crop is certainly light in many places, still, on the whole, the reports regarding it are not unfavourable. There have been some heavy thunderstorms towards the latter end of the month, and vegetation was refreshed by the rains which accompanied the thunder, although not sufficient to penetrate far into the soil. Samples

of the new crop are expected to be early in hand, and moist warm weather would still exercise a powerful influence in bringing forward those crops which at present are backward in their growth.

### THE GRAIN TRADE.

The markets, as reported all over the kingdom, shewed constantly declining rates for wheat all through May, and the last week of that month reduced the value most of all; yet the fall on any market day was not sufficient to stimulate demand. On the 1st of June, at Mark Lane, the corn trade continued heavy, the value of white English wheat being further reduced 4s., red 6s., and foreign sorts 3s. per qr. Flour, also, was 1s. per sack cheaper, or 3s. to 4s. under previous rates. In like manner barley went down 1s. to 2s. per qr., oats alone remaining firm, but still not selling freely. Country markets generally followed the Mark Lane lead, although farmers did not force their stocks on the market, and supplies were small. A shade of improvement was visible on the 8th of June, and the provincial markets in most cases during that week reported a higher advance than was obtained at Mark Lane, other articles, except flour, being also dearer. Flour, both in London and at country markets, was cheaper. The value continued to improve at the rate of 1s. to 1s. 6d. per qr. on wheat; and on June 22d a small supply

of English wheat at Mark Lane realized previous rates; oats, however, were cheaper, other articles being unaltered.

#### THE LIVE STOCK TRADE.

The dryness of the weather, having affected pastures, checked the demand for lean stock, both sheep and cattle, while it caused the forcing of partially prepared fat stock into the markets in some instances. Prices for the top qualities of fat stock have ranged as follows:—At London, beef, 3s. 10d. to 5s., and latterly 5s. 2d. per 8 lb.; mutton, 4s. to 4s. 8d. and 4s. 10d. per do. At Newcastle, beef, from 8s. 3d. to 9s. 6d. per 14 lb.; mutton, 6¼d. to 7¼d. per lb. At Edinburgh, beef, from 8s. 6d. to 9s. 6d. per 14 lb.; mutton, 6½d. to 8d. per lb. At Dublin, beef, from 56s. to 67s. 6d. per cwt.; mutton, 6d. to 7d. per lb.

The most important sale of shorthorns which occurred during the month, was that of Sir Curtis M. Lampson's herd, Rowfant, Sussex, conducted by Mr Strafford. The average of 23 females sold was £69, 2s. 9d.; the highest price being given by Mr A. J. Robarts for Fancy, by 4th Duke of Thornsdale—viz., £315. Her daughter, Fancy 2d, fetched £152, 5s., at which price Mr Cheney secured her, and Fancy 3d, another daughter, just two months old, was purchased by Mr Sartoris for £52, 10s.—mother and two daughters realizing together £520.

#### THE WOOL TRADE.

Various markets and fairs have been held in England, and prices have a firm aspect, although buyers are cautious, as they believe there is nothing in the state of trade to justify higher prices for English wool. Colonial and foreign wool has experienced a fair demand. The London sales closed somewhat heavily, buyers having gone to the continental markets.

#### THE HEALTH OF STOCK.

Reports of pleuro-pneumonia are still re-

ceived from some parts of the country, but Professor Ferguson states, after a searching inquiry, that stock in Ireland is healthy.

#### AGRICULTURAL SOCIETIES.

A number of shows have been held during the month, the most important being the show of the Bath and West of England Society, held at Falmouth; the Metropolitan Horse Show at the Agricultural Hall, Islington; the show of the Glasgow Agricultural Society, the East Kilbride Society, the Linlithgowshire Society, and the Stirling Agricultural Society in Scotland. Also a show of stock and poultry at Thorne, in England; of the Norfolk Agricultural Society; of the Hants and Berks Agricultural Society, and of the Bedfordshire Agricultural Society: and, in Ireland, of the North-East Agricultural Association. The Birmingham Horse and Hound Show was also held on June 23, and three following days.

Valuable paper on the condition of the rural labourer was read at a meeting of the Society of Arts, by Mr Bailey Denton; and Mr Mechi lectured at Birmingham, at a meeting of the Midland Farmers' Club, on the exhaustion of the soil. The Galashiels Club discussed that never-failing subject the turnip-fly, and also the propriety of milking ewes; and the Counties Committee of the Scottish Chamber of Agriculture took into consideration the question of agricultural weights and measures, the annoyance arising from the unsettled state of the "terms" in Scotland, and also the subject of a Minister of Agriculture, as discussed in Parliament under Mr Acland's motion. It was agreed that "Cattle Traffic" should be the question for discussion at the general meeting of the Chamber, which will be held at Aberdeen during the show of the Highland and Agricultural Society; and from the interest which Aberdeenshire agriculturists have in that question, it is expected that a considerable amount of valuable information will be elicited.



## The Garden.

### GRASS LAWNS AND CROQUET GROUNDS.

AT the present period of the year, when the enjoyments of out-door promenading, bowling, cricket, croquet, and golf are most generally participated in, on the unrivalled soft, dry, and cool grassy lawns and playing-fields of Britain, the kinds and qualities of those grasses which form the best surfaces, as well as of the weeds which mar them, form subjects for frequent conversation and comment. Permanency of verdure, fineness or narrowness in the foliage, firmness of texture, slowness as well as uniformity of growth, and persistency of root are all essential properties for good lawn grasses, and at no period of the season are these characteristics more easily seen and judged of than in the present month, when the different kinds have put forth their flower and seed-bearing stems, as they grow in natural exuberance by waysides and in old pastures.

Turfing and sowing are the two generally recommended modes of forming grass lawns; inoculating or transplanting, which may be termed an intermediate mode, has also been recommended, but although applicable in some cases it is seldom practised. For sloping terraces, margins, and wherever immediate effect is desired, turfing is preferable to sowing, provided good clean natural turf, suitable for the soil and situation, can be procured; and such turf has also the further advantage of containing a mixture of very serviceable plants, such as the vernal sedge (*Carex præcox*), the *Luzula campestris*, wild thyme, and others, the seeds of which are so difficult to collect as to prevent their being included in seed mixture. Turfing has the objection, however, of being an expensive process, more especially when attended with distant carriage. Whether turfing, sowing, or inoculating

be the mode adopted, it is most essentially necessary that the ground be clear of weed seeds and roots; and particularly those of perennial weeds, for unless this be attended to no satisfactory after results need be looked for, although the best and cleanest turf may have been selected, and the purest samples of seeds sown. Nor is it only necessary that fine clean turf be fixed upon, but it must further be composed of grasses suitable for, and which will not grow too strong or weedy on the soil where it is to be laid. Thus, if taken from an upland locality, where the common quaking-grass (*Briza media*), the heath grass (*Triodia decumbens*), the wavy mountain hair-grass (*Aira flexuosa*), the sheep's fescue grass (*Festuca ovina*), and the common bent grass (*Agrostis vulgaris*), enters largely into its composition, and if such be laid in a city, suburban, or low country situation, the four first will nearly all, if not altogether, die out; while the last, together with the invariably accompanying white clover, and others which may have originally been scarcely perceptible, will occupy their places, with an enlarged and consequently coarse growth, supplemented, very likely, with the worst weeds which are peculiar to the locality. And the like results may be expected with the finest of turf, which forms dry seaside pastures or closely carpeted downs. On the other hand, for such as the before-mentioned situations, no turf will be effective and enduring, unless the hard fescue grass (*Festuca duriuscula*) and the crested dogstail grass (*Cynosurus cristatus*) form its principal constituents, associated with the rough-stalked meadow grass (*Poa trivialis*), and it may be with the yellowish oat grass (*Trisetum flavescens*), in less profusion, while

their coarser growing companions, such as the foxtail grass (*Alopecurus pratensis*), cocksfoot grass (*Dactylis glomerata*), and the Timothy grass (*Phleum pratense*), are wholly inadmissible; and no turf wherein they naturally exist should be chosen.

In one or other of the different lists of mixed seeds for short grass, published by recognised authorities, all the following twenty-two kinds of true grasses and other plants are enumerated:—

I—TRUE GRASSES.

1. *Anthoxanthum odoratum*—sweet vernal grass.
2. *Alopecurus pratensis*—meadow foxtail grass.
3. *Cynosurus cristatus*—crested dogstail grass.
4. *Dactylis glomerata*—rough cocksfoot grass.
5. *Festuca duriuscula*—hard fescue grass.
6. *Festuca heterophylla*—various-leaved fescue grass.
7. *Festuca ovina*—sheep's fescue grass.
8. *Festuca pratensis*—meadow fescue grass.
9. *Festuca rubra*—red or creeping fescue grass.
10. *Festuca tenuifolia*—fine-leaved fescue grass.
11. *Lolium perenne*—perennial ryegrass in several varieties.
12. *Phleum pratense*—Timothy or cat's tail grass.
13. *Poa annua*—annual meadow grass.
14. *Poa nemoralis*—wood or grove meadow grass.
15. *Poa nemoralis sempervirens*—evergreen wood meadow grass.
16. *Poa pratensis*—smooth-stalked meadow grass.
17. *Poa trivialis*—rough-stalked meadow grass.
18. *Trisetum flavescens*—yellowish oat grass.

II—OTHER PLANTS THAN GRASSES.

19. *Achillea Millefolium*—Yarrow or milfoil.
20. *Medicago lupulina*—yellow trefoil.
21. *Trifolium filiforme*—yellow-suckling clover.
22. *Trifolium repens*—white clover.

Of the preceding, Nos. 2, 4, and 12 are, as before stated, wholly inadmissible, as their coarse and rapid growth places them among the most unsightly of lawn weeds. Although Nos. 1, 6, 7, 8, 9, 16, 20, and 22 are scarcely so objectionable as the last, they had better be almost invariably left out. The sheep's fescue, No. 7, has, no doubt, the requisite properties of hardness and fineness in its foliage, but its small tufted or round brush-like growth renders it unsightly. And although the white clover, No. 22, was a universal favourite before the invention of mowing machines, in consequence of its greatly facilitating the operation of scythe-cutting, by its softness and its long retention of moisture, it should now be generally discarded wherever the mowing machine is to be used, and dryness of surface desiderated.

Nos. 10, 13, 14, 15, and 18 are all admissible under particular circumstances—thus, that troublesome weed, the *Poa annua*, No. 13, yields good verdure in overshadowed city greens, where no other grasses will grow, and the wood meadow grasses, Nos. 14 and 15, surpass all the others in the closeness of their growth in groves, or under the thick shade of large trees. With these deductions, the list of really generally useful grasses and other plants for lawns or greens, becomes reduced from the before-named twenty-two kinds, to the following six, viz.:—

1. *Cynosurus cristatus*—crested dogstail grass.
2. *Festuca duriuscula*—hard fescue grass.
3. *Lolium perenne*—perennial ryegrass.
4. *Poa trivialis*—rough stalked meadow grass.
5. *Achillea Millefolium*—Yarrow or milfoil.
6. *Trifolium filiforme*—yellow suckling clover.

The *Cynosurus cristatus*, is one of the commonest and least variable of our native grasses; hence improved varieties of it, either for horticultural or agricultural purposes, need not be looked for. It is very different, however, with the *Festuca duriuscula*, which is the most variable of grasses in its size, habit, form, and colour. And while a little has already been done in selecting and cultivating superior hay and pasture varieties of it, yet nothing has been accomplished in doing the same with those that are best adapted for short grass, although some of these hold out much encouragement to growers, by their pleasant as well as permanent greenness, combined with the other mentioned requisite essentials for short grass, which all its varieties possess, as is further shewn by their abundant presence in the turf of all the best cricket and other play-greens; and their powers of resistance is particularly conspicuous in those which are subjected to much trampling. The so-called evergreen and fine-leaved ryegrasses, together with other varieties of *Lolium perenne*, generally included in short-grass seed mixtures, are less leafy and more seed-producing than most of those which appear in old pasture lands; and were some of our enterprising seed dealers to take the trouble of selecting and cultivating the best of these last to seed from, they would doubtlessly be well remun-

nerated by the increased demand for their improved lawn grass seed, as well as by the prestige which never fails to attach to the originators of any meritorious article. All the ryegrasses are, however, deficient in that firmness of foliage and persistency of root which are essential in grasses for much frequented play-greens; and they are, therefore, only admissible into such mixtures in consequence of the rapid growth of their young plants, which give an early appearance of finish to the surface, and by which the more enduring but slower-growing kinds are protected or nursed in their early stages—purposes for which the so-called annual ryegrass would be still better suited, could a variety of it be got with sufficient fineness of foliage. The thickly-spreading leaf-shoots of the *Poa trivialis* are well fitted for covering the ground surface under and between other plants, and the objection urged against it in scythe-cutting times, of these shoots becoming raised up by the after operations of sweeping and raking, no longer hold, now that the cut grass is gathered by the mowing machine. Yarrow, unlike the white clover, is neither a dew-attracting nor moisture-retaining plant, and a proper mixture of it adds much to the closeness and elasticity of the turf; and the suckling clover forms a closer surface, is smaller in leaves, slower in growth, as well as drier, than the white clover, to which it should therefore be invariably preferred.

Much of the ground in the vicinity of towns which has recently been converted into gardens, was previously overgrown for shorter or longer periods with noxious weeds, and the seeds of these are frequently blown to it from neighbouring places; even in more rural localities, ground which is intended to be sown down for short grass, is scarcely less foul and unsuitable. Hence, along with the young grass there comes up in greens and lawns a thick growth of coarse grasses, and other pernicious weeds also appear, for which the seedsman, from whom the mixed grass seeds were procured, is almost invariably blamed. Great powers of discrimination are not required to detect the identity of six kinds of seeds in a mixture, and purchasers should possess small samples, collected if possible by themselves, to compare their purchases with; while dealers would also do well by keeping correct samples separately of the different kinds, for examination and comparison by themselves and customers. Were this generally practised, with the grass as well as other seeds, much misunderstanding, as well as expensive litigation would be prevented; and customers would have themselves to blame, who submitted to be imposed upon by unfair dealers supplying them with kinds and proportions different from those ordered and invoiced.

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### PEAS AND THEIR PESTS.

**O**F pea-destroying pests belonging to the animal kingdom the worst are mice, slugs and snails, beetles or weevils, and birds. The mice are easily overcome by a little well-timed perseverance in trapping; and for outdoor use, no mouse-trap is so easily applied and effectual as that familiarly known to gardeners as the fourth-figure trap. Poisoning of mice is always objectionable from the liability of its being transferred to cats and dogs, as well as from their escaping into places where their decomposition becomes an in-

tolerable nuisance. Snails and slugs may either be overcome by trapping with cabbage or lettuce leaves, by allowing young ducks to have the occasional run of the garden in the evenings and mornings, and by frequently dusting the ground at those times with quicklime. Beetles seldom appear in very destructive numbers, although instances do sometimes occur in which their ravages are very disastrous to the young plants, more especially of dwarf or slow-growing varieties. Picking them off the leaves and shaking

them into gauze bags, are modes recommended for their destruction; but an easier and more effectual mode of prevention is to wash and dust the leaves with substances distasteful or hurtful to them, such as tobacco water, soap-suds, hellebore powder, flower of sulphur, quicklime, soot, &c. Of bird peadestroyers, house sparrows are by far the most troublesome, commencing their devastations immediately after sowing, continuing them with redoubled perseverance before and after brairding, and making occasional attacks as the plants progress through their after stages, till their works of mischief are consummated by the tearing up of the young pods, and the abstracting of the peas before, as well as when these become fit for the table. We are not among those who look upon sparrows as being "feathered friends" of either the gardener or the farmer, and consequently have no hesitation in recommending their destruction, or at least their reduction, wherever they are troublesomely abundant. Of traps they are however wary; keeping them off by netting or other appliances is too troublesome as well as expensive, and as the objections against destroying them with poison are not nearly so strong in their case as in that of the mice; one of the easiest modes to accomplish this end is to use phosphoric paste, spread about double butter-thickness, on quarter-inch slices of loaf bread, cutting the same afterwards into half inch dices, and spreading them in places where the impudence of sparrows will lead them to resort, although other birds will not dare to come. Another mode which we have not yet tested, but which, we are assured on good authority, is not less efficacious, consists in steeping crumbs of loaf bread in whisky or other spirits, to which the sparrows quickly manifest such an unmistakable liking, that they will eat till perfectly overpowered by intoxication, when they may be gathered up and converted into sparrow pies, or otherwise disposed of.

Mildew on peas, as well as on turnips and some other crops, only becomes very hurtful in lengthy tracts of scorching dry weather, by which the vital force of the plants becomes so impaired that they are easily acted upon by this most insidious of plant diseases. This

cause of mildew points to its cure; and if taken in time, or when the first appearance of its powdery whiteness comes upon the eaves, nothing so effectually prevents mildew in peas as copious watering—not mere surface sprinkling, but thorough drenching, which will penetrate to the deepest and most distant rootlets; and this application is the more effectual if the water be slightly mixed with liquid manure, such as dunghill drainings, guano, and the like.

The numerous kinds of garden peas now in cultivation, and an imperfect acquaintance with their relative periods of ripening, as well as weather influences, frequently lead to the production of overabundant supplies at certain times, and deficiencies of crop at others. Although a seemingly unsatisfactory state of matters, this is by no means so difficult to remedy as usually supposed—judicious stopping of the young shoots, and pinching of the flowers, being all that is required. The better to illustrate this, suppose that four rows of any kind of pea are all sown at the same time, and so circumstanced that all would ripen or reach maturity simultaneously, but that it was required that each should come into use successively as the gathering of the other was finished, the first row should remain untouched, so as to yield the earliest crop. Then, as soon as the others shew the first appearance of flower buds, pinch these all off and stop the shoots by picking out their extremities; each stem or shoot will then set out young branches, and when these have in turn shewn blossom-buds, leave row second to bloom, but pick the flowers and tops again off rows 3 and 4, and proceed in like manner with these in turn, so that No. 3 will be picked twice, and No. 4 thrice, taking care that no stray blossoms be allowed to remain on any row before the time for its general blooming. This pinching of the shoots and blooms will, if persevered in, not only retard the period of maturing very considerably, but also largely increase the size and bushy habit of the plants, so that a very thin planted row will become very thick when thus repeatedly operated upon, and it will generally be necessary to thin out the plants in those rows on which pinching is to be performed.



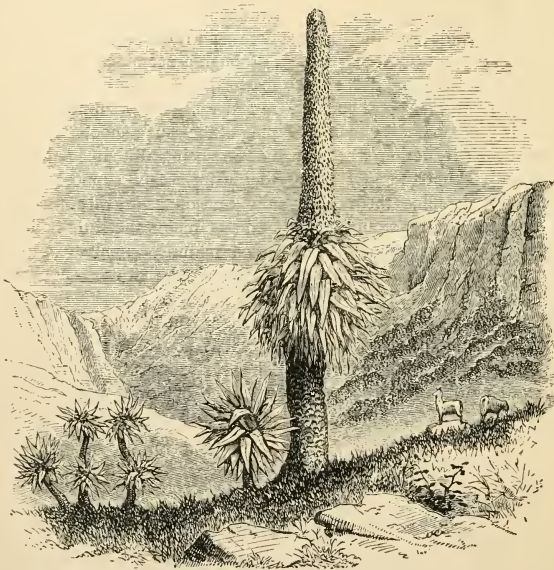
## NEW AND RARE PLANTS.

NO. I. THE ABYSSINIAN JIBARA (*Rynchopetalum montanum*).

IN the last number of the *Journal of Travel* there is a figure of the very remarkable Jibara, which we reproduce. The writer says:—

“There are a number of forms peculiar to Abyssinia itself, the most remarkable of which, perhaps, is the wonderful Jibara (*Rynchopetalum montanum*) the

Robert Brown formed a truer estimate of its affinities when he placed it in the neighbouring order, the Campanulaceæ. If it were blue (which it is not) it might be called the blue-bell of Abyssinia, rather a different looking Campanula from our humble little hare-bell. It is a tree 15 feet in height, with succulent leaves, and in some respects bearing a great similarity to the Agaves, with which it has the additional point of re-



The Jibara *Rynchopetalum montanum*.

zone of which begins at 11,000 feet, and continues, so far as the soil extends, up to the highest tops, at first mixed with *Erica* and *Hypericum*, then standing in thousands on the short grass of the meadows, blooming amongst the numerous small alpine plants.

“It has long been known as one of the most striking plants of the country. Jussieu and most botanists have ranked it among the *Lobeliaceæ*, but we think

semblance, that it lives until it flowers, and then dies. The flower-spike is yellowish-red in colour, and very handsome. Its other qualities, however, are not so pleasant, its fresh juice has the smell of bugs. It is very poisonous, so much so that even its shadow is said to be fatal to those who sleep under it. A more credible report is, that even its smoke occasions vomiting.”

## NO. 2. CATTLEYA DOWIANA.

This magnificent Orchid was received from Costa Rica, through G. U. Skinner, Esq. In its colouring and general effect it is entirely unlike anything yet seen in the genus, throughout with gold threads. The expanded flowers are nearly 7 inches across, and the fringed labellum not less than 4 inches long, the latter having protruded about an inch



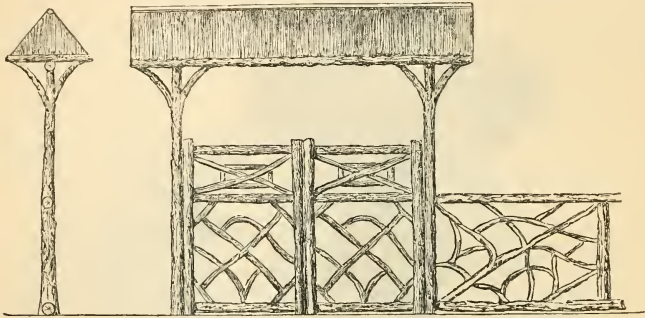
Cattleya Dowiana.

the sepals and petals being of a mellow straw-colour, while the lip is one uniform mass of the darkest purple velvet, streaked regularly beyond the point of the unexpanded buds. Its beauty entitles it to rank as the queen of all known Cattleyas.

## GARDEN ARCHITECTURE.

## I.—A RUSTIC FENCE AND GARDEN ENTRANCE GATE.

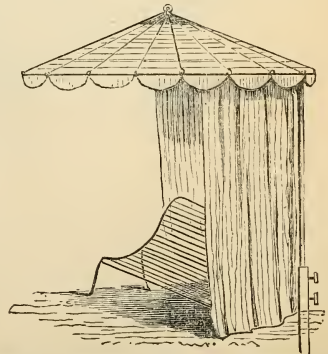
THIS very elegant design is copied from a fence which encloses the garden of a farm-house near Paris—forming a gate-cover is evidently a modification of that attached to the lych-gates of country



a very pretty farm house near Paris—forming, in fact, the entrance to the farm-yard. The church-yards in many parts of England. On the left of the cut is the end elevation. The

## II.—SHADES FOR GARDEN SEATS.

LADIES who, in the present sultry weather, resort to a cool spot out of an awning could be erected over their favourite seat in garden or hill-side. Now here is the



doors to read or work, have often felt what a boon it would be if some temporary shade or very thing they require. The invention is due to a Mr Scowan, who gained a premium

of £5 for his ingenuity from the International Horticultural Congress held last year.

The principle on which these shades are constructed is that of a lady's fan, or, as the inventor describes it, "the fin of a fish, or a pair of wings horizontally expanded, with the two front edges brought together." The framework is either of iron, cane, or whalebone, covered with blue or red striped canvas. The horizontal action enables the maker to give a round, square, oblong, or any other shape required, and to place the stem at any part from centre to edge, the latter being a very great advantage where required, as it leaves the whole of the centre of the canopy unobstructed. This canopy, with the addition of a curtain, forms a most complete sun-

shade, which can be erected or taken down in one minute.

In driving the canopy a tubular spike is first driven into the ground, and the stem inserted therein, which, acting telescopically, can be raised or lowered, by means of screw nuts, to any height required. The canopy is then placed on the stem and opened. The facility with which this canopy can be expanded, or collapsed and taken down, offers the opportunity of keeping it clean and free from insects.

These canopies may also be used, made in suitable material with proper fittings, upon open carriages, such as waggonettes, park phaetons, perambulators, &c.

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#### A NOTE.

LIKE many suburban flower growers, I was sadly annoyed by mischievous children, as well as by some of maturer age, plucking my flowers whenever they could reach them, till I fell upon the following mode of prevention, which I hope the most sensitive will not deem unnecessarily cruel. Recollecting the nettle-like stinging properties of the pretty harmless-looking annual and biennial *Loasads*, as well as of that once favourite flower-border annual, the Roman nettle *Urtica pilulifera*, I introduced them into the borders next to my entrance gate, and at other places where depredations had been most frequently made. No sooner had the former begun to display their beautiful yellow and orange-coloured flowers, than some of my tormentors laid hold of them, as they had been in the practice of doing, but they as quickly let them go; first looking in a bewildered-like manner at their smarting fingers, then at the pretty innocent-like nodding flowers, and ultimately moving away as if they had learned a lesson which they were not likely soon to

forget—forming resolutions at the same time to be content by admiring without touching in future, and which resolution I am glad to say has been well kept, for I frequently see some that were among the worst depredators now admiring my flower-beds through the way-side railing, without attempting to put forth a pilfering hand, and this, I am convinced, not so much from any fear of renewed punishment, as from a conviction that they had been taught good behaviour, through the circumstance of having had a smart, and upon the whole, a harmless practical joke played off upon them. The species which I have employed thus usefully, and, I trust, harmlessly, are the rambling and free-growing pretty yellow-flowered annuals, *Loasa Placai* and *L. nitida*, together with the showy reddish orange *L. lateritia*, which last does best when treated as a biennial, and accommodated with greenhouse protection in winter. As the seeds are not so easily got as formerly, it is of importance to know that they will retain their vegetative powers, for four five, or six years, probably longer.—*H. W.*



## Rambles by Road, River, and Rail.

### GALA WATER.

FROM Edinburgh to Tweedside is now a short and easy journey, very different from the time when the Selkirk carrier occupied a fortnight in the pilgrimage to the Scottish metropolis and back to his native Yarrow. Very different, also, from the year 1757, when Thomas Somerville, afterwards minister of Jedburgh, could hire a man with a couple of horses, and make the journey from Edinburgh to Hawick in two days at a total cost of 7s. 10d., disbursed as follows:—"To the horses, 2s.; to the servant, 1s.; to corn at Hougate, 8d.; to rolls, 1d.; to the turnpike, 2d.;—(all night at Traquair)—to corn, 1s.; to straw, 6d.; to eating, 1s. 5d.; to corn at Hawick, 1s." From Edinburgh to Traquair was then a long day's journey, but now the valley of the Tweed, from Peebles to Innerleithen, is a favourite summer residence for Edinburgh citizens, who can reach the city in time for business in the morning, and breathe again the pure air of the hills in the afternoon. Hawick, in 1757, could be reached with difficulty in two days by the young student, Mr Somerville, when summoned to his father's death-bed, and the road lay by Traquair, for there was no bridge over the Tweed from Peebles to Berwick. In our day any one may reach Hawick from Edinburgh in little more than a couple of hours. As we emerge through the long section at Tynehead into the valley of the Gala, we think of the Selkirk carrier plodding along, sometimes in the bed of the river, sometimes over the untrodden bent, and we are reminded of the lines—

"Had you seen this road before it was made,  
You would lift up your hands, and bless General Wade."

First the turnpike, and then the railroad has been made, and many great improvements besides. Even within living memory the extent of cultivated land has widely extended; and though the soil is cold and the hills steep and stony, the results of energy and enterprise are apparent in the waving grain, even to the lofty hill tops. Hardly any district of Scotland has progressed so rapidly in agriculture as the hills of Gala Water, and we may some day describe more

minutely the progressive stages toward the present high style of cultivation. Meanwhile, we "wind about and in and out," following pretty much the curves of the river, till we reach the busy little town of Galashiels.

For many excellences, including its braw lads, its grey cloth, and its checked plaidings, Galashiels has been celebrated, and it is now one of the thriving manufacturing towns of the Border. Long may its manufactories flourish, for agricultural prosperity is now conjoined with commerce, so that one cannot flourish while the other decays. But in agricultural annals Galashiels will ever be associated with the name of Dr Douglas, who was long the parish minister, and was in reality the founder of its prosperity. As a baronial residence, Galashiels is known to have existed early in the fourteenth century, and in 1416 Archibald, Earl of Douglas, issued from his tower of Gallowshiels to quell the turbulent Haigs of Bemersyde. It was not made a parish, however, till the year 1660, when it was formed by the junction of Boldside, in the county of Selkirk, and Lindean, in the county of Roxburgh. Robert Douglas was ordained pastor of the parish in the year 1770; and after a singularly useful career, during part of which he was the bosom friend of Sir Walter Scott, Dr Douglas died full of years and honours in 1820.

In the year 1770 Galashiels was a mere village, in which there was only one slated house, besides the manse, and the district was otherwise in a very backward condition. The whole population of the parish was then less than 800; it is now about as many thousands. It was a small colony of weavers, many of them were also "bonnet-lairds," but they had no money and no spirit of improvement. In 1775 only 722 stones of wool were manufactured, and it was all done with common cards and wheels, the cloth when finished costing 3s. a-yard. But the young minister gave a stimulus to industry, and even advanced money for the purchase of machinery, one result of which was, that in 1790 the consumption of wool had increased to 2916 stones, from which cloth at 5s. the yard was manufac-

tured, with the help of two spinning jennies. In 1796 the spinning jennies had multiplied to 18, there were four houses with machinery driven by water, and there were 4944 stones of wool consumed. £3000 sterling were obtained from the honourable Board of Trustees for Manufactures in Scotland, which were laid out in the purchase of machinery, and in spite of many difficulties the prosperity of the town rapidly increased. There are now about 20 large factories, and the money turned over for manufactured goods is estimated at £600,000 a year.

It may be worth while to gather into a focus the rays of light which we possess regarding the condition of Galashiels and its neighbourhood, when Dr Douglas began his ministry, and in doing so we may glance occasionally at the general condition of Selkirkshire, with which the town is naturally connected. Much of the high land is still in pasture, but then there was comparatively little cultivated. The higher hills were stocked with blackfaced sheep, and in some places 3 acres were required to sustain a sheep. The rent in such a case was about 1s. 4d. an acre, and the average rent for hill pasture was 2s. 9d. Arable land was let for 10s., and gardens for about 20s. For the sake of comparison we may quote some rentals in the cognate district of Peeblesshire, as they were in 1787, and as they are now. The rent of Easter Haprow, in 1787, was £131, it is now £600. Wester Haprow was £158 in 1787, it, also, is now £600. Lyne and Lyne Hall were £94, 4s. 2d. in 1787, they are now £1100; and Hamildean has risen from £71, 5s. to £540.

The dwelling-houses of farmers near Galashiels in 1770 were generally one storey, low in the roof, ill-built, ill-lighted, and covered with thatch. They were built low lest the tempests which then raged furiously, should make havoc of the roof. The farm offices were meanly constructed and very awkwardly placed, and some stables and cow-houses were so low in the roof that ordinary sized animals could hardly find admittance. All the houses received a fresh covering of rushes or sprett every year to repair the damage sustained by winter storms; and the accumulation year by year became so great that sometimes the walls were crushed beneath it to the great danger and damage of the inmates. When the desire for better houses arose, the tenants had to bear, in some cases, almost the whole expense. The landlord would furnish timber, slates, and lime, but the tenant conveyed them from the sea-port or kiln, and paid for all the work, though they had short

leases, and sometimes none at all. The cottages for shepherds and unmarried farm servants were wretched habitations, small, dark, smoky, and insufficient as defences against the wind and weather. Cot-houses for labourers or mechanics were still worse, and were usually built by the first inhabitant, who had it free for one year, and at a small rent afterwards. Each inhabitant had to keep his own house in repair. In the neighbourhood of Galashiels and Selkirk a more substantial class of houses was erected, on feus granted by the neighbouring proprietors. In the year 1794 Dr Douglas pointed with pride to the superior houses in Galashiels—the only village in the county—as a strong recommendation to all gentlemen who wish to see flourishing villages on their estates, to adopt that method, and give feus. With a degree of enlightenment in advance of his age, the worthy Doctor made a strong appeal to proprietors and tenants in favour of decent and comfortable dwellings for married servants, labourers, and mechanics. “Convenient and pleasant houses,” he says, “besides being favourable to health, may induce many, who now rove from place to place, and change their masters and their habitations at every term, to settle, to marry, and to exert themselves for the support of their families, and may encourage both husbands and wives to be cleanly and neat in their persons, their tables, and their furniture, and to keep their children, their dress, and their gardens in good order. In all these respects, what can we expect but discontent and disease, reluctant, careless, and slovenly exertions from those who dwell amidst smoke and dirt.”

The farmers of the district down to the close of the century were tenacious of ancient usages, and timid about innovations; but they have been described by Dr Douglas as frank, communicative, and hospitable. Their tables are much better provided than the appearance of their houses affords reason to expect; and there are, in their looks and manner, a cordial welcome, and an urgency to partake of their meat and drink, which strongly indicate a kind heart. A few of them live in elegance and plenty, have a plain dinner well dressed and served every day, and a bottle of wine, and a cheerful glass of punch for a friend. But none of them keep a chaise and a man-servant for any household purpose. Being all trained up from their infancy to ride, they themselves, their wives, and their children, can manage a horse with some dexterity, and can climb steep mountains, either on horseback or on foot, without

much inconvenience. And yet their cash must have been comparatively scant, for a precise calculation shews that a farm that could winter 2000 whitefaced sheep left a balance of only £109 to the tenant, while the same number of blackfaced yielded only about £66 a-year of profit. Part of the rent was then paid in gratuitous carriages of fuel, corn, hay, &c., and a certain number of *kain* fowls, also a *darg* or day's work, and sometimes a quantity of lint or tow had to be spun. Tenants in general were also restricted to certain mills, where they were obliged to have their corn ground. In 1792 a thrashing-machine was brought into Selkirkshire, but was never used; and the first actually employed was made in 1796 by a wheelwright in Galashiels. There was no regular rotation of crops, oats being the principal crop, and the rest of the arable land being occupied in about equal proportion with turnips, barley, and clover, after they were introduced. Thistles, collected and dried, were often used as winter food for cattle, and in the towns they were sold for so much per bundle. The oats were of the red, white, Angus, and Dutch sorts; and the barley was of the coarse kind called *bigg* or *bere*, which admitted of late sowing, and was less liable, on that account, to be choked with weeds. A sort named *battledore* or *sprat* barley, was brought from Yorkshire in the year 1790, by George Currie, who occupied the farm of Carterhaugh, three miles from Selkirk. It was small, plump, and remarkably thin in the skin, which made it give well both in meal and pot-barley, and it had the advantage of sending forth a great number of shoots from one stalk, but it required to be sown three weeks earlier than the other. Potatoes were not planted in the fields previous to 1772, and no kind was then known except the red and a few kidneys.

About this period whites were introduced, and a few years later red-nebs were brought from Langholm, and they were soon raised in sufficient quantities to form a staple article of food, and even to supply the contiguous parts of Mid-Lothian and Tweeddale with seed. When turnip culture began, idle and hungry people pulled and ate them to a great extent, even before they had attained any size; and swedish turnips especially were eaten "with prodigious avidity by every passenger, especially in spring." Shepherds were entitled to eight *soums* of grass—a *soum* being the quantity eaten by one cow or ten sheep, which in net money value was calculated at £22, 10s. The common wages, however, were sixty or sixty-four sheep, a cow kept throughout the year,

a house and garden, his master's horses to bring home his fuel, and a stone of oatmeal every week. Ewe-milking being considered the hardest of all female labour, was remunerated at the rate of 50s. to 60s. of wages for the summer half-year; but women in winter received only a guinea to 30s.

In 1707 there were no roads in the district. Peats and turf were conveyed on sledges or on the backs of horses, and the road to Edinburgh had not improved since the days of the first Selkirk carrier. In 1764, indeed, an Act of Parliament was obtained for constructing a road from Crosslee toll-bar, on the confines of Mid-Lothian, through Selkirk to Hairmoss toll-bar, on the Hawick road, with a branch of three miles to "the village of Galashiels." A road also led from Kelso to Peebles, the same route along which the monks of Kelso had many centuries before travelled habitually to and from Lesmahago, in Lanarkshire; and a bridge was constructed across the Tweed at Fairmile. About the same time, also, a good road was made from Selkirk five miles up the Yarrow, and over by Minchmoor to Peebles. But even to the close of last century there was nothing better than a track up the Etrick and Yarrow, utterly impracticable for wheeled conveyances, and neither safe nor easy even for travellers on horseback. Among the first experiments in road-making in the district was a piece on an inclined plane. "Roads made on this plan," says Dr Douglas, "may be very durable, and answer the purpose extremely well in mild weather; but during the severity of winter frost may render travelling upon them highly dangerous, especially in those places of this hilly and cold country which then feel not the influence of the sun." Even down to the close of the century the whole south of Scotland was almost without any good roads. The first Road Act in Scotland was obtained in 1760 to carry a turnpike through East-Lothian, thus improving the communication from Edinburgh to London, by way of Berwick. In 1764, as we have seen, an Act was obtained for a road part of the way between Edinburgh and Hawick, by way of Selkirk. Next came the road from Edinburgh to Kelso by way of Soutra Hill and Lauder. About 1790 a road was made from Kelso to St Boswells, which was afterwards prolonged to Selkirk, and years afterwards extended up the Yarrow and the Etrick to Moffat, and to Langholm and Hawick. From Jedburgh and Kelso roads were made to Wooler, to Morpeth, and to Newcastle, thus opening up a new and profitable market for

sheep, cattle, and wool. Toward Carlisle, also, transit was facilitated at the beginning of this century, for Duke Henry of Buccleuch and others carried roads from Canonbie up the Liddel to Jedburgh by Note-of-the-Gate, and to Hawick by Limekilnedge. With the construction of these roads the march of improvement in the district began in earnest, but we may conceive of the difficulties under which Dr Douglas and his contemporaries laboured when it is stated that till the beginning of this century Edinburgh letters for Galashiels, as well as Selkirk, Jedburgh, and Hawick, were carried round by Berwick. Thus it happened that letters from Edinburgh to Galashiels travelled 119 miles, while the actual distance between the two places was only 30 miles; and this is all the more strange when we consider that there was actually a "runner" from Edinburgh to Lauder, eight miles from Galashiels. In 1798 Dr Douglas proposed that Lauder should be a central point for the district, whence one runner should start for Kelso, 17 miles off, and another "by Melrose and Selkirk to Hawick, with a bye-bag from Melrose to Galashiels."

The system of open drains had been tried for some time, but with the construction of roads the use of lime and marl became more common. The first in the locality who used lime to any extent, as a manure, was a former minister of Galashiels, the Rev. Alexander Glen, who was, in 1769, translated to Dirleton, and he applied from six to eight carts, of three bolls each, to the acre. About the same period Lord Alenmore drained a morass, near Hairmoss toll bar, on the road from Selkirk to Hawick, and brought thence considerable quantities of marl, which was used as manure for the fields. In 1772 marl was exposed for sale at Whitmuirhall, three miles from Selkirk, and afterwards Mr Currie, at an expense of £1000, drained a loch at Greenhead, east of Selkirk, from which he marled his own fields, and sold the surplus to his neighbours at 1s. the cart load. The quantity applied to an acre was about 200 bushels. Dr Douglas was himself a practical improver of land, for in 1797 he purchased the estate of Clarty Hole, which he cultivated, improved, and laid out in fields; but in 1811 sold it to Sir Walter Scott, who changed its destiny, and gave it the name of Abbotsford. The difficulties of the situation may be further observed, when we say that sometimes Galashiels was flooded to such an extent, that boats came from the Boldside Ferry to convey the denizens out of their houses.

Previous to his death in 1820, Dr Douglas had to a great degree seen the fruit of his philanthropic labours. The annual consumption of wool had risen to about 20,000 stones, and the flannels had been pronounced by the Board of Trustees as surpassing in fineness any others made in Scotland. In the agriculture of the district, improvements had proceeded with equal rapidity. Leases of nineteen years had become almost universal. Drains 3 feet deep and filled with stones might be seen on most of the farms. The five-shift husbandry had been generally introduced, and artificial manures were coming into use. Farm houses and buildings had acquired a more respectable appearance, and fields were well enclosed with hedges or stone-walls. Teeswater cattle were taking the place of the old dwarfish hill breeds, and besides Cheviot sheep there were Leicester and half-breds.

But these were only the beginnings of real progress, for the past thirty years have seen more advancement in agriculture than any single century before. Even the sagacious Dr Douglas could hardly have conceived the changes that have taken place in his own immediate neighbourhood. A short distance from Galashiels, but in the parish of Melrose, is the little Elwand Water, a tributary of the Tweed. In the dale watered by this rivulet there are eight farms, having an aggregate extent of 5000 acres. Little more than thirty years ago, the whole district was a bleak and barren moorland, where inferior Cheviot sheep with difficulty subsisted on the stunted heather and rank rushes, which alone seemed to grow, and only the half of one farm with small patches on the others had come under regular cultivation. Mr Hogg had occupied Glendearg, one of these farms, for one lease, and having obtained a renewal two years before his lease expired, was the pioneer of improvement in the district. The task was not a promising one, for part of the farm was cold clay, deposited on a moorish subsoil, and it abounded in coarse blocks of greywacke conglomerates. The plough could do little more than remove the thick surface-matting of grass-roots which covered the stones, and these, to the depth of 10 inches, were all removed with handpicks and crowbars—four or five men being employed to remove the stones after one plough. These, however, were utilised without cartage to any distance, and furnished material for filling drains, besides building stone fences 5 feet high, around fields varying from 30 to 70 acres in extent. The process has been described as follows by Mr Sanderson, who had



good opportunities of knowing:—"Drainage and removing of the stones were therefore simultaneous operations, then followed ploughing and trenching; these completed, from 8 to 10 tons of lime were applied per acre, and several harrowings and a ploughing in autumn completed the preparatory operations necessary to put the land in proper condition to be seeded with oats the following spring. The fields were thus reclaimed, one after another, till all the farm, which contained upwards of 600 acres, was cultivated, with the exception of an upland inclosure. During Mr Hogg's occupancy of the farm, he put upon it 5000 tons of lime, and 50,000 roods of drains. The drains were cut 3 feet deep, and filled with 16 inches deep of broken stones, which were closely packed at the top. The cutting of the drains was at the expense of the proprietor, filling and covering in by the tenant. From the abundance of organic matter in the soil—the remains of rank though worthless herbage—the action of lime and drainage produced extraordinary results. The crops of turnips, oats, and barley, as well as grasses, which the farm produced for the first two rotations, have never, so far as bulk is concerned, been surpassed in the county of Roxburgh. On the neighbouring farm of Colmslie—famous in antient times as the dairy of the monks of Melrose—similar improvements have been, and are being carried out. Here, too, the presence of innumerable large stones renders the conversion of the land from a state of nature a very expensive and laborious

undertaking, and can only be accomplished by the union of such industry, perseverance, and energy as the present tenant of the farm has brought to bear on it. Happily this toil and industry are being rewarded in the abundant crops which the newly-reclaimed land is yielding. The difference between reclaimed and unreclaimed land was never more conspicuous than on this farm during the present season (1862). On one side of a lately built stone-dyke was a large lot of sheep depasturing on luxuriant white, red, and Alsike clovers, redolent with fragrance from their fully-expanded blossoms: on the other side sterile heaths and worthless spratt prevailed." The farm of Colmslie-hill, in the same way, has been transformed into an arable farm of more than 400 acres; and Langshaw, higher up the hills, has more recently undergone similar changes. On these four farms about 2000 acres of land have been reclaimed within little more than thirty years. First class half-Leicester sheep have now succeeded the poor and thin Cheviots; there are 28 pair of horses where formerly there were only 8, and the fruits are apparent in the bulky barnyards, steam-thrashing machines, comfortable steadings, and increase of an industrious population. Over into the vale of the Leader, and all up Gala Water, even to its source, these changes have spread during the course of a generation; and though some farms may be high and exposed to storms, even the climate will be improved under the influence of drainage and cultivation.

## The Stable.

### ON THE MANAGEMENT OF HORSES' FEET.

BY JOSEPH GAMGEE, SEN.

THAT the British Isles produce the best horses in the world, for all purposes, is a proposition which I shall not for a moment question. If we examine the causes upon which this pre-eminence depends, we shall find that, whilst it is due to a certain extent to the innate love of horses on the part of the people, which has ever led them to cultivate with care the breeds which we possess, it depends in the main upon the climate and soil of our country.

Notwithstanding these advantages to which this innate stamina is due, and the increasing interest with which the national wealth, spirit of commercial enterprise, and the popularity of field sports, has invested the subject of horse-breeding; we are compelled to acknowledge that, out of all proportion, more lame and feebly-footed horses are to be found in England than in any other country. This is assuredly an evil urgently calling for remedy, as it is due to preventable causes, and is, therefore, a discredit to the enlightenment of a great nation.

As the first step towards inquiry into the causes which lie at the root of the evil, I submit one, and which is the parent of other injurious influences: it is the notion, commonly entertained, that moisture is necessary to the condition of horses' feet. Let us see in what manner the feet of horses are affected by continued exposure to the influence of wet—to their being kept soaked in wet? The main question may with advantage be considered under the following three divisions:—1st, as it applies to the breeding and rearing of horses; 2d, in its bearings on the ordinary management of those employed for all kinds of work; and 3d, as to the wisdom or non-

advisability of the soaking process applied to horses' feet in the treatment of cases of lameness.

In considering the first section of my subject, some comparative observations may help to establish clear notions on the function of hoofs in general, and that of the horse in particular. Why nature has endowed some quadrupeds with hoofs and others not, and why the horse is gifted with the most elaborate and powerful, are questions pertinent to this subject.

All animals inhabiting the land are endowed with feet, furnished with nails, claws, or hoofs; and however different they may at first sight appear, these are merely modifications of a common structure, so as to suit it to the performance of functions adapted to the conditions and requirements of each species of animal. Strength, hardness, toughness, or want of brittleness, are the properties which are required by all the modifications of the one structure under consideration, and are accordingly equally characteristic of a hoof, a nail, and a claw. That great differences in form should exist between them can only appear natural when we remember that, whilst nearly all these nails, hoofs, and claws are in varying degrees essential for different offices: in the lion, eagle, &c., they constitute weapons of defence and aggression. Regarding now, the undivided hoof of the horse, and the cloven foot of the ox and other tribes, as but modifications of nails and claws common to a large section of the animal kingdom, if we examine the special circumstances under which these different animals are placed, we shall arrive at the conclusion that all quadrupeds endowed with hoofs are destined to in-

habit and render service on firm dry surfaces of the earth; each species having its structures suited to the circumstances under which it is placed. Thus we find the goat and the chamois gathering the spare herbage on the high mountain-ridges, the sheep feeding and enjoying health on the evergreen slopes of a lower level, whilst the fertile hill and dale—the selected abodes of people—affords the most suitable conditions for the subsistence of the horse, and the display of his unrivalled qualities for rendering service to man. The ox we find distributed over even a larger space of the earth's surface than the horse; it descends to the low swampy grounds, and feeds on the luxuriant grasses which abound there, ranges over among plains, and is found occupying mountainous districts among the stunted brushwood and fir-trees. The camel affords an instance of infinite wisdom in the adaptation of the foot to special requirements, the cushion with which its foot is provided, makes that animal superior to every other for travelling over the drifting sands of the desert. All these various species of animals endowed with hoofs, possess one characteristic feature in common—their cannon bones—corresponding to the analogous bones of the hand and foot of man, and which in these quadrupeds extend from the knee and hock to the pastern, are very lengthy; and another characteristic is the small size of their feet compared to the weight of these animals respectively. Examining a little further, we see that these characteristics are most marked in the speedy races, and in individuals of the same species whose general formation adapts them for great feats of velocity; notably in the Arabian and English blood-horse, in the deer, in the mountain goat, &c. The foot proper in each of these consists of the last phalanx or segment of the limb, and is so constituted as to have more strength concentrated into a small compass than is the case with the long and more extended foot of other orders. Comparing the ostrich with the swan, we find a small energetic foot associated with length of leverage in the swift, whilst short legs and flat broad feet are the characteristic features of

those animals designed either for swimming, or walking on soft muddy ground. It is the length of the levers of the metacarpal and metatarsal regions in the horse, deer, &c., acting on the admirably-adapted foot, which gives speed, power, and the means for sustained exertion. The foot, besides its strong bony internal framework, has additionally, as its outer encasement, the hoof; and in connexion with these—the foot's inner and outer supports (the bony and the horny)—every yielding structure acts; and from this most perfect organisation results indescribable strength, unvarying precision, and freedom from concussion.

Inquiring now into the conditions requisite for the proper action of these parts, we shall find that, in order to fulfil its function the hoof must be firm, tough, and free from weakness through any cause. Custom has, however, changed these conditions, and has caused horses to be kept with their feet wet, as if this were favourable to growth and efficiency, all sight being lost of the fact, that under such conditions horses are produced with weak feet, becoming unsound when slight disturbing causes come into operation, such as work, shoeing, &c., supplies.

The customs which doom the horse to exposure to wet and filth over his hoofs from foalhood, and during his working career to soft and thin soles, render the hoof altogether incapable of performing its office; and instead of being endowed with that complete stability which it requires, it yields to every force.

In the oldest treatise which has been transmitted to us on the horse and his management, we are told that “the first part to be attended to is the foot. The same attention which is given to supply a horse with food, and to let him have due exercise, that he may be healthy and strong, is also requisite to be observed in order to keep his feet in proper condition. Moist, *smooth* or *flat* floors will injure even those hoofs which are by nature good and sound” (Xenophon).

These maxims with all that composes the treatise of the Athenian philosopher were the horseman's guide for ages; but where we find them set at nought, unsound, unsafe, and

worthless horses are the result. Earl Pembroke points out in unmistakable language, in his work on "Military Equitation," 1761, the consequences which happen through the opposite modes of managing horses' feet to that above directed. The noble author says, "that the common practice of stopping horses' feet with dung is a very bad one, for the dung contains a rotting quality in it. They totally pare away and lay bare the inside of the animal's foot, which must cause narrow heels, because the hard outside of the foot will of course press in when it finds no resistance, the inside (sole) being cut away."

It is still regrettable that the aphorisms of so great an authority as the noble writer were not attended to, when forty years afterwards, attempts were made to improve the whole state of things by the establishment of our Veterinary College.

As a necessary consequence of exposure to wet, there results a nearly total loss of the natural elasticity of the horn, with bulging of the sole, absorption and flattening of the coffin-bone, and a variety of other changes, until the horse becomes a victim to continued pain, and a source of loss, instead of profit, to the proprietor. Feet which have been exposed to the influence of a wet soft soil, and of which not merely the hoof, but the bones also, become flat, soft, and spongy, may by proper management be re-

stored to a state of freedom from pain and lameness; although it is to be remarked that perfect structure and action cannot be restored where deterioration has long prevailed and deformity been protracted. The soft weak hoof, with its depressed sole and lateral distortions, only exhibits the counterpart of a flattened and distorted coffin-bone. We can afford relief and redeem properly in part, but prevention is the better plan.

A standard may be rationally laid down for the management of horses' feet, not taking account of shoeing, which is too important, and vast a subject to be treated in an incidental or subordinate way. Horses should be bred on land drained and variable in extent and surface, that ample space be secured, with firm resisting foothold, for developing the form and strength of feet; and thus, feeding being conformably attended to, the best horses are obtained; for though we sometimes see a horse bred with quality, it is rare to find other parts of the system good when the feet are bad.

Colts and young horses, of any age, unshod, should have feet so perfect in form, and firm in texture, that they should be able to make a show and display their best action on a hard level road, without the requirement of artificial protection to their feet. Nor will horses in such case stumble or require knee-caps for protection.

[The conclusion in our next Number.]



## The Dairy and Poultry Yard,

### CAN POULTRY BE MADE TO PAY?

IN looking for new sources and for the further development of the old means of animal food, I cannot but think that poultry claims our attention before many others, as having once formed an important part of our meat supply, as being simple and inexpensive in culture, and everywhere ready to hand. Of late years, however, poultry has fallen into neglect; and this kind of meat can now be procured at such prices only as to render it an expensive luxury rather than a reasonable portion of daily food. The farm-yard seems to be the proper home of the Rasorial order of birds; yet it is here that the neglect is most evident, whilst farmers for the most part deny the usefulness of this portion of stock, and tolerate it only from habit. It is not only the farmer, however, who raises objections to this kind of food. The consumer has certain prejudices. On the part of the farmer it is said:—

1. That poultry does not pay.
2. That even if it did pay, it is too unimportant to engage his attention.
3. That it damages the stack-yard.
4. That it is injurious to the crops.

On the part of the consumer it is urged—

1. That the retail price of poultry is such as to place it out of the list of daily foods.
2. That, even if it can be produced at reasonable prices, it is a poor substitute for butchers' meat, and does not contain sufficient animal nourishment.

If poultry keeping does not pay, and under existing circumstances, in the majority of cases, it probably does not, the reasons are to be found in the following facts:—

1. That no attention is paid to the choice and management of stock.
2. That food is irregularly and wastefully administered to it.
3. That no regard is had to the roosting, and particularly to the laying places of hens.
4. That the demand is restricted by the market system.
5. That farmers' wives have ceased to be hen-wives.

With regard to the choice and management of stock in poultry, we find on farms, generally, mongrel bred birds, which, from continued in-breeding, have deteriorated in size and stamina. The barn-door fowl of the olden time has changed, particularly within the last few years, becoming continually less useful for food. It is true that the barn-door fowl was always a mongrel; but when farm-yards were the nurseries of fighting cocks, where landlords, by covenant inserted in the leases, required the tenants to "walk" a game cock, or number of cockerels, and tenant farmers bred birds for the pit on their own account, there was a continued infusion of new and vigorous blood into the progeny of the hens that stocked the yard. That custom has happily nearly passed away. The deterioration, however, begun by the loss of these high-bred cock birds, was completed shortly after by the Cochinchina mania, when, by the introduction of cock birds of this variety (valuable as the hen birds are for certain purposes), a race of spare-breasted, leggy birds has been the result, wanting the chief merits of a table fowl. Again, when the flail and a careless system of farming made the barn-door a golden feeding-ground, chickens had opportunities of growth which they now have not, and which must be supplied to them more economically and judiciously by hand if rearing poultry is to be profitable. This plan, however, has been neglected, for poultry, unlike other farm stock, has not only not advanced, but has gone back in value, and consequently in estimation. The average weight of barn-door fowls sold from farm-yards is 3½ lb. From this must be deducted 3 oz. for feathers and 12 oz. for offal before they become food. The game-cock, as bred for the pit, rarely exceeded 4½ lb.; but by crossing with the Malay they may be brought to 6 lb. or 7 lb. in weight. Dorkings, when not in-bred, but well and carefully fed as chickens, will reach to 7½ lb. as pullets, and to 9 lb. as cockerels; higher weights, such as 10 lb. for hens, and 12 lb. for cocks, can be obtained, but these are exceptional. Dorkings, however, are not suited for cold clays and damp soils. Of food birds, besides Dorkings, the game and the large Surrey and Sussex fowls (which last always command a high price), there are the Brahmappootra fowl and the Houdan, or French Dorking, well adapted for use.

\* This article is a condensation of the evidence of Mr George Manning, delivered before the Food Committee of the Society of Arts.

Of these the Dorking and Surrey fowls are beyond all question the best for the table, in delicacy and weight of flesh ; the game the most savoury, although deficient in size ; the Brahmapootra not so delicate in flavour as the others, but hardy, weighty, and easily fattened ; the Houdan having the good without the bad qualities of the Dorking—precocious and small-boned, being non-sitters, and almost uninterrupted layers of large eggs. The Brahmapootra seems to be a useful stock on which to build other varieties. Of these, the cross with the Dorking is most strongly recommended ; and a cross with the Houdan produces table chickens of a fine size. At the last Chelmsford and Essex Poultry Show, the birds which took the first and second prizes for dead poultry, trussed as by poulterers, but not drawn, were, the one 13 lb. 12 oz., the other, 13 lb. 10 oz., the pair at five months old. They were the direct offspring of a Brahmapootra cock bird and Dorking hens. For stock it would be a better plan to put a Dorking cock with Brahmapootra hens, and the pullets of this union with Dorking cocks in no way related to the ancestors of the pullets. Very hardy and weighty table birds may thus be produced. By answers to inquiries, and by reference to the books of a farm, including the last six years, I find that the average price paid by higglers for barn-door fowls of the average weights first mentioned is 2s. for coop-fed, and 1s. 8d. for yard-fed birds. The cost of feeding and rearing the prize birds at Chelmsford was probably very little, if at all, more than that of raising the others. With regard to feeding, our system of leaving chickens to shift for themselves until such time as they are ready or wanted for the coop is all wrong. No attempt at after-fattening will increase frame if the feeding of infancy has been disregarded. Again, the indiscriminate emptying of apronfuls or sievelfuls of grain in a heap on the ground, whilst it serves to gorge the powerful, leaves chickens and weaker birds to starve, picking up here and there a grain, whilst sparrows and small birds have a large share in the feast. I see that Mr Mechi published last month the results of an experiment in the cost of feeding a single hen, shut up and without access to any food but that which was given by hand. The result shews that 5 lb. of barley, at the average of 1d. per lb (or 40s. the quarter) will make 1 lb. live weight of poultry food, worth 9d. per lb. I say it is quite practicable to feed poultry more cheaply, and consequently to sell them cheaper than shewn by this method—that is, supposing them to be at large ; but I am sure Mr Mechi will pardon me for saying that I think this statement of feeding in confinement is rather low, a circumstance which may arise from the fact that the bird pined at first. I have tried the same experiment with two pens of birds, consisting of a cock and two hens, confined for a long time to separate but very small wired pens. I tried it in March last year, and in the month just ended, and I found that my birds consumed about 3½ pints to his 2½ pints in the week ; but then I dare say the barley I used was of

foreign growth, and of much lighter bulk. Birds having a free run would cost very considerably less. I must not occupy your valuable time with the details of what is necessary for the housing of birds, and for their places of laying and incubation. It will be enough to say that they should be, what they are seldom in farm-yards—namely, cleanly, convenient, and attractive. A hen's nest should be on the ground, if there is no danger from rats, for laying and also for hatching ; and the roost should be low, particularly when they are heavy birds. I believe the sore and injured feet which are not unusual in large poultry are often caused by their jumping down almost perpendicularly from a high roost. Fowls will always choose the highest perch, probably because it is the warmest, and when this is in a large open shed, as a cart-lodge, they have room for some length of flight before reaching the ground, but in a small poultry-house they come down very heavily. If the perches are arranged in steps one above the other they will jump them one at a time until they reach the highest, but they will not come down that way. I do not approve of artificially warming the fowl-house ; it should be well built, and brick is better than wood, being warmer, and more easily cleaned ; but I think if the introduction of hot-air pipes is allowed it must produce such a warmth that on going out into the cold air the fowls are apt to get chilled, and to have an attack of the roup.

On the point that the demand for poultry is restricted by the market system, I would call attention to the fact that poultry produce stands at a costly rate to the consumer, and at a poorly remunerative one to the producer, by reason of the irresponsible middle men through whose hands it passes before it reaches the retail-seller. Again, in its perishable nature the producer is liable to much loss in a dull or a glutted market. In this matter I would venture to suggest the establishment in London, and the great towns of the United Kingdom, of wholesale markets, either apart from or in connexion with the meat markets, subject to police and other regulations, to have sales by auction, so that no part of the consignment need be returned to the producer, or destroyed as unfit for food ; to extend the same principles of markets and sales to other towns in the kingdom on their market days. One of the reasons already given for the neglect of poultry stock was, that farmers' wives have ceased to be hen-wives. Perhaps in the altered state of society it is unavoidable. It is, however, to be regretted. But poultry-growing, as a part of farm stock, and an item of our daily food, will need hen-masters rather than hen-wives. I mean that if it were carried on by the husband as a regular part of his business, he would feed his poultry the same as he does his horses and his stock, but when it is left to the wife there is often a complaint of the quantity of food required for the poultry, and a little sly barn robbery the result of waste. I have tried bran or buck-wheat, which is very good, and so is Indian corn. Cheapen a necessary of life, and a demand follows in-

stantly: this is a maxim illustrated every day. Simplify the market system and improve the means of production; you will then remove the consumer's first objection, viz., price. The second objection as to nutriment is answered by the fact that, as a flesh-forming food, poultry is more nutritious than beef. It is only inferior to beef as being less fattening, for it contains a little less water, a fraction per cent. less albuminous matter, and a greater portion of salts. To the remaining objections urged by the farmers, that poultry damage the stack-yard, I have little hesitation in saying that this is a mistake where stacks are set upon frames, and birds regularly and judiciously fed. The other, namely, that poultry damage the crops, will, I think, receive a conclusive and practical answer from Mr Mechi. Mr Mechi keeps 300 head of poultry, which have free access to the fields near the homestead, and he finds that they do more good than harm. With regard to the system of sales by auction, this plan has already been adopted by Messrs Broome & Co., meat and poultry salesmen in Newgate Market. Their manager, Mr Brooke, has been in Normandy and the other poultry districts of France, to ascertain the French methods of feeding, and of poultry management generally, which appear to be more systematic and economical than our own. Messrs Broome have kindly consented that their manager should attend before you, if desired, to give any information that may be of value. Taken in connexion with the statements of the weight and the cost of rearing barn-door fowls, it may be useful to place side by side the prices quoted in Newgate, and Leadenhall markets at two periods of the year which will represent plenty and scarcity of produce:—

Sept. 21, 1867. Mar. 27, 1867.

Surrey fowls, per couple	10s. to 12s.	...	10s. to 12s.
„ chickens „	5s. 6d. to 7s.	...	6s. to 8s.
Barn-door fowls „	4s. 6d. to 6s.	...	5s. to 7s.

Mr Mechi is now getting 7s. 6d. a pair wholesale for chickens. It is impossible at present to procure any reliable information with regard to the home produce, and the consumption of birds and eggs in this country. It has been variously and vaguely estimated. The story of our imports, however, tells a startling tale:—

In 1849 we imported	98,000,000 of eggs.
In 1866 „	438,878,880 „
In 1867 „	397,934,520 „

The cause of this reduction in last year's imports I am not prepared to give. The price of English eggs per hundred in Newgate and Leadenhall markets varies from 6s. 6d. to 13s. ordinarily in the seasons; the difference between the prices of English and French eggs being, for the most part, 1s. per hundred. The custom-house return of eggs and poultry imported in 1866 (the totals, except in the case of eggs, not being

yet made for 1866) gives the following details:—

EGGS.	
Imported from	Great hundred.
Hamburgh.....	16,630
Belgium.....	151,733
France.....	3,359,302
Spain.....	80,055
Channel Islands.....	31,840
Other parts.....	17,764
	<hr/>
	3,657,324 hundreds.
Long hundred	120
	<hr/>
	438,878,880 eggs.

POULTRY.	
Imported from	Value.
Holland.....	£16,815
Belgium.....	97,082
France.....	56,210
Other parts.....	4,864
	<hr/>
	£174,971

Value of eggs (at 6s. 6d. per 120), £1,188,630; total value of eggs and poultry imported in 1866, £1,263,601. If the foreigner can undersell us in our own markets in eggs, and can send a very large amount in value of poultry into this country; if our own eggs, in spite of this competition, maintain invariably a higher price, it is beyond question that there is—at all events, in our own production—a demand unsatisfied, and a profitable source of food neglected. I have made several inquiries into the matter of artificial hatching, and I am not satisfied with the results. The great difficulty is in rearing the chickens when they are hatched. We have no evidence to shew whether the cultivation of poultry is increasing; there are no returns of the quantity sent into the market, and it is impossible to get accurate information from the farmers to a sufficient extent to form an opinion. If you took the railway returns you would probably be unable to separate the home-bred from the foreign poultry.

I have not tried the experiment, which I believe has been tried in France, of having a movable poultry house, which can be taken from field to field, but I should think it would be very successful. The only objection is that the poultry are left unprotected. My attention has been principally directed to poultry kept in small places, and I don't think it can be carried on profitably in that way, because all the food must be purchased; you must then sell at fancy prices. If a considerable number are kept in a confined place, there must be some arrangement for changing the soil, which in most cases would occasion a difficulty. I kept three Cochinchina fowls for about three months in a small space about 4 ft. by 4 ft., with a little hut behind for roosting; but then I had the droppings continually removed and the soil constantly dug up. The prices paid to the producer by the higgler are 2s. for a

coop-fed, or 1s. 8d. for a running fowl, weighing on an average  $3\frac{1}{2}$  lb. I see no reason why poultry should not be sold by weight; I think it would be a very great improvement if all provisions were required by law to be sold by weight. The size and weight of the eggs from a Spanish and a Hambro' fowl, are very different, but they are all sold at so many for a shilling; and a retail dealer told me that he allowed a good customer to pick out which he liked. I have used Indian corn for fowls, and it answers very well, but just at present it is very dear. You cannot always keep to the same kind of food, whatever it is. In Sussex they may use a good deal of bruised oats; I have used a mixture of bruised oats, rice, and toppings, with success. I doubt the advantage of feeding fowls with meat; the kind of flesh which a fowl picks up naturally, is very different to anything we could give them. I have seen the reports of the large poultry farm in France, and I know them to be wholly untrue. I am certain that no experiments have been made on a large scale in this country to feed poultry on horseflesh mixed with farinaceous food, but I cannot say what has been done abroad. Greaves and other animal food have been given to force the laying of hens, but I believe the tendency is to wear out the hen very quickly. I keep breeding fowls about three years, then I sell or eat them. The eggs are not so good for breeding from the first year as the second and third; in the fourth year they begin to fail again, according to the constitution of the bird. The best breed for cold clay soils is Brahmapootra or the French sort, the Houdan. I think a cross between the Brahmapootra and the Dorking gives the most useful bird for farm-yard purposes. The Brahma has a good deal of the Cochin China in it; it lacks breast a little, but not so much as the Cochin; and when crossed with the Dorking it produces a very fine bird, with all the hardihood of the Brahmopootra and the meat properties of the Dorking. If the soil is good, no bird would answer better for a cottage than the Dorking. Lime must be supplied, of course, if it is not naturally present in the soil where birds are in confinement. I have had no experience with ducks, geese, or turkeys. I think poultry keeping would be carried on more successfully on a large scale than by individual cottagers. On a light soil I should prefer a pure Dorking, taking care not to be in-bred; if it were not a light soil I would have a cross between the Brahmopootra and the Dorking; in all cases I would have the Dorking, either pure or crossed. If you require only eggs, you may dispense with a cock-bird altogether; for breeding you should not have more than eight hens to a cock, and if breeding for exhibition or fancy purposes the number should be still further reduced. I

don't think the eggs are quite so palatable where the hens run alone. I think it would be well if in poultry exhibitions there were more classes for farm-yard poultry, and if, as has been done at Chelmsford, dead poultry were included. The Hamburgh, Spanish, and French varieties produce most eggs, but they never sit. I believe the most delicate-flavoured bird of any for the table is the Dorking. I can quite imagine that there may be an impression in France that the Houdan is superior, but I should attribute that to a national feeling. The Houdan produces very early chickens; but the earliest are the Cochins; they are very hardy, and can be reared even in the snow. I cannot say exactly why cheap poultry are always bad, but a fowl that has been fattened will keep longer than one that has not. I have not experimented on artificial hatching, and speak only from observation and information on that question. The difficulty is in rearing the chickens. I believe Mr Schroeder, at Rickmansworth, is trying it on a large scale. Colonel Stuart Wortley has invented a new incubator. The great difficulty is in rearing chickens from them fit for the market. This is the opinion of the salesmen.

The following letter bearing on the preceding subject has been sent to the secretary of the Society of Arts:—

“Tiptree Hall, near Kelyvedon, Essex,  
March 21, 1868.

“My Dear Mr Foster,—I am not often in town, but hope to be so in a week or ten days, and will endeavour to meet the committee. My experience teaches me—1st, that there is an abundant demand for poultry in our markets, even at the present extravagant prices; that while poultry sells at fully 9d. per lb. live weight, the best beef and mutton only sell at  $4\frac{1}{2}$ d. per lb. live weight (5s. per stone of 8 lb. net dead weight); that it costs no more to produce 1 lb. of poultry than 1 lb. of meat; that poultry are the farmers' best friends, consuming no end of insects, and utilizing and economizing all waste grain; that they should have free access to pasture and to our other fields near the homestead; that care should be taken as to their breeds, as in sheep, bullocks, and pigs; that first crosses, having regard to the demand in the market, are advantageous; that the manure from poultry is of first-rate quality. My poultry (about 300) have free access to my corn fields at almost every period of the year. Of course, poultry, like sheep, bullocks, or pigs, must be well and properly fed if they are to be well and properly developed in size and condition. I don't know that I could say more than this to the committee.—Yours faithfully,

J. J. MECHL.

“P. Le Neve Foster, Esq.”



## THE DORKING AND SPANISH BREEDS.

BESIDES being a clever artist, Harrison Weir is also a first-rate judge of poultry, which gives him a vast advantage over those who look at their subjects merely with an artist's eye. In the accompanying engraving he has given us groups of what may justly be called the two leading breeds of British poultry—the Dorking and the Spanish.

## I. DARK GREY DORKING.

*Cock*.—Neck-hackle and saddle—plentiful, light straw colour, or silvery grey. Primary quills—black or grizzled. Secondary quills and upper wing coverts—light grey. Lower coverts—a shade darker. Tail—ample, and black. Breast—black, or speckled with white. Thighs—black, or spotted with white. Legs and feet—pure white and featherless. Toes—five, and distinct from one another, the fifth well turned up, and one half longer than the fourth. Comb—erect, single, regular. Wattles—long and firm, and red like the comb. Earlobe—red, but often, in otherwise excellent fowls, red, broken with white.

*Hen*.—Neck-hackle—grey, often very dark. Back—ash, or grizzled grey. Primary quills—black, or black and brown. Secondary quills—dark brown, clouded. Upper and lower wing coverts—grey, and quite distinct. Breast—ruddy, but grey if matched with a cock having a spotted breast. Tail—dark mixed colour (grey, if defined at all). Thighs—brown and grey mixed. Legs, feet, wattles, and earlobe—the same as in the cock, spur excepted, which is nevertheless frequently seen on Dorking hens' legs, but a very unwelcome concomitant in hens of any breed. Comb—falling over on either side.

## II. SILVER GREY DORKING.

Large foul-feathered birds, erroneously called Silver-grey Dorkings, are plentiful, but useless as show birds.

*Cock*.—Breast and tail—stainless black. Hackle and saddle—stainless silver.

*Hen*.—Breast—bright robin, or clear red-

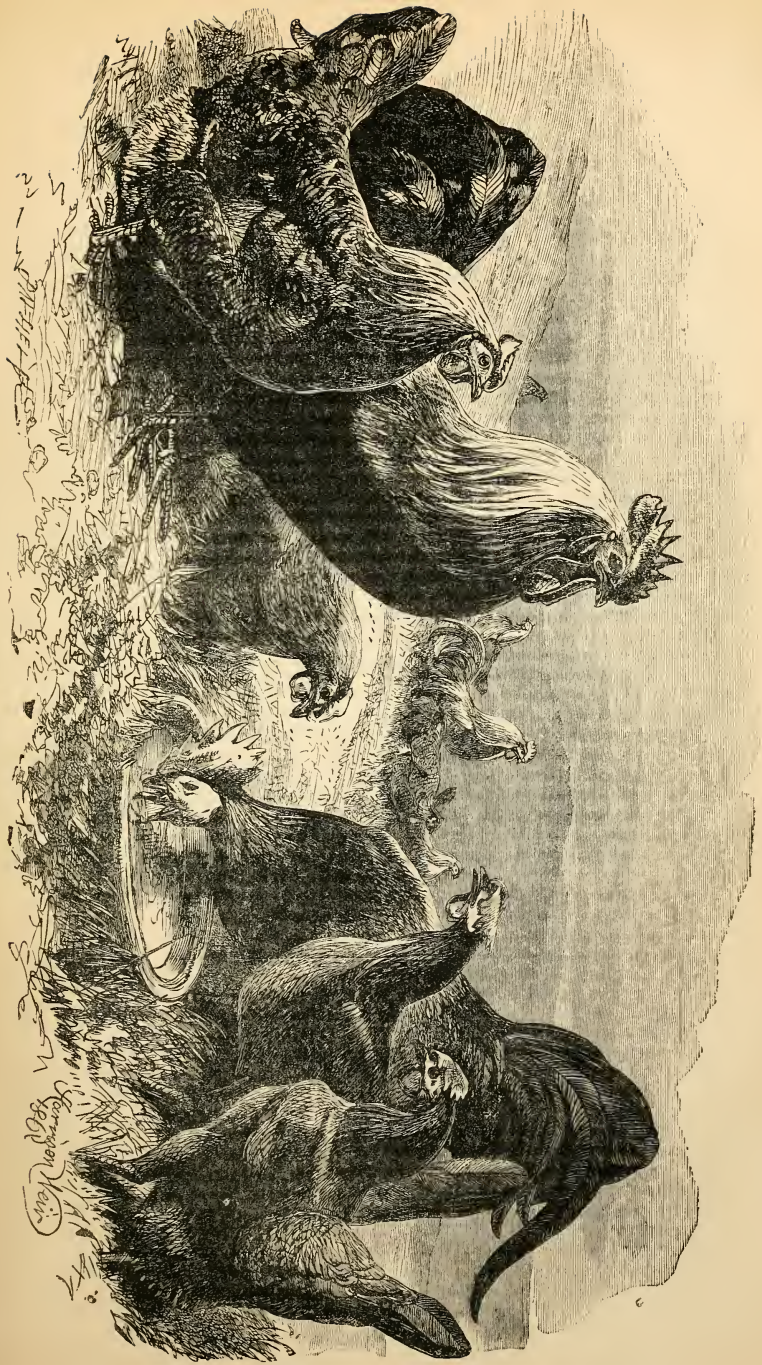
dish-brown colour. Body—light-grey, the shaft of each feather white, and very characteristic in good specimens. Hackle—spotless silver. Wing—perfectly free from red; but many birds, otherwise clean, shew this damaging impurity of feather.

## SPANISH.

*Cock*.—(1.) A pure white face, which begins from among the feathers close to the base of the comb, and terminates in the lower extremity of the lobe or white loose bag of skin which rises from the under part of the cheek, and extends back round the ear and forwards to the wattle on both sides of the face. The white face should be stainless, smooth, even, well-proportioned, and of wonderful extent. (2.) The comb should be erect, absolutely erect if possible, higher and longer than in any other bird, of a bright red colour, regularly serrated, and nicely balanced on the head. (3.) The body and legs are, in proportion to the weight, longer than in the other large kinds; and the neck should correspond. (4.) The carriage is upright and majestic. (5.) The plumage should be velvety black, or, more correctly, of a metallic green hue, and the legs of a slate colour up to a dark blue. (6.) The tail is ample, and long in the sickle feather, and the saddle feathers, like those of the hackle, are superfine and abundant. (7.) Large size, although by no means indispensable to success, is to be carefully sought for, as, other points being equal, it would unquestionably turn the balance against a pen not possessing it in favour of bigger antagonists. In the *Hen* the comb is very large, and hangs over one side of the face.

As for the Dorking, of whatever colour, and however cross-bred he may be, he is the grand British fowl, supplanting all over the country the old heterogeneous barn-door stock. For him, squire and farmer, yea, and city poultterer, stand up alike.

In the engraving the Dorkings are on the left hand and the Spanish on the right.



Dorking and Spanish Fowls. — Drawn by Harrison Ware.

Harrison Ware  
1869



## THE HENWIFE'S KALENDAR FOR JULY.

THE adult fowls which have not been engaged in the duties of maternity have, no doubt, been for many months contributing to the contents of the egg baskets, thus making eggs plentiful and cheap. In anticipation of a scarce and dear time arriving, the thrifty housekeeper may now adopt one or other of the *many ways of preserving them*. The simplest plan is to smear the shell slightly with good fresh butter, and place the eggs in a jar with the narrow end undermost; they will keep for months by this process, and retain at the end of that time the delicious milkiness peculiar to a new-laid egg. It ought to be done as soon as possible after the egg is laid. It is rather surprising that a plan so efficacious is not universally adopted. It need scarcely be added, that eggs after being buttered will not do for setting. Another way of preserving is by putting the eggs in ashes or sawdust; they must be entirely covered, so as to exclude the air; the narrow end, as in the previous plan, placed undermost. The following is an excellent recipe for preserving eggs in lime water, extracted from the popular and interesting work, the "Henwife:"—

"Select only perfectly formed eggs; the

slightest fracture or imperfection in the shell would cause the failure of the whole batch. Place the eggs carefully in a jar, and pour on them lime water, which is made by dissolving quicklime, in the proportion of two shells to four gallons of water; this must stand a day, at least, till the residue has settled at the bottom of the vessel; the clearer portion is then passed over the eggs, so as to cover them.

"Should the jar not be full, fresh eggs are added from time to time, and as the lime water rises it is poured into another jar ready to be filled in like manner.

"Be careful that the eggs are at least an inch below the surface of the water; place a plate or lid of wood over them to prevent them floating; tie up the jar and label it, stating the date and number of dozens."

The henwife must see that the eggs are removed at once from the nest, as they are apt to be addled by the hens sitting on them. Care must also be taken in bringing them from the henhouse to keep them dry, as a single drop of water may taint the egg. They should be disposed of as soon as collected, for they change rapidly during hot and moist weather.



## Hunting, Fishing, and Shooting.

### ELEPHANT HUNTING IN ABYSSINIA.

IN the very interesting volume recently published by Sir Samuel Baker,\* he gives a most graphic account of the hunting of wild elephants as practised by the "Sword Hunters of the Hamran Arabs." He says:—

"Before my arrival at Sofi, I heard of a particular tribe of Arabs, that inhabited the Basé country; these were the Hamrans, who were described as the most extraordinary Nimrods, who hunted and killed all wild animals, from the antelope to the elephant, with no other weapon than the sword; the lion and the rhinoceros fell alike before the invincible sabres of these mighty hunters.

When provided with horses these hunters boldly follow up the elephant in his stronghold. In describing one of these adventures, where the animal was brought to bay, Sir Samuel proceeds:—

"The elephant stood facing us like a statue; it did not move a muscle, beyond a quick and restless action of the eyes that were watching all sides. Taher Sherif and his youngest brother Ibrahim now separated, and each took opposite sides of the elephant, and then joined each other about twenty yards behind it; I accompanied them, until Taher advised me to keep about the same distance on the left flank. My trackers kept apart from the scene, as they were not required. In front of the elephant were two agageers, one of whom was the renowned Rodur Sherif, with the withered arm. All being ready for action, Rodur now rode slowly towards the head of the cunning old bull, who was quietly awaiting an opportunity to make certain of some one who might give him a good chance.

"Rodur Sherif rode a bay mare, that, having been thoroughly trained to these encounters, was perfect at her work. Slowly and coolly she advanced towards her wary antagonist, until within about eight or nine yards of the elephant's head. The creature never moved, and the *mise en scene* was beautiful, not a word was spoken, and we kept our places amidst utter stillness, which was at length broken by a snort from the

mare, who gazed intently at the elephant, as though watching for the moment of attack.

"One more pace forward, and Rodur sat coolly upon his mare with his eyes fixed upon those of the elephant. For an instant I saw the white of the eye nearest to me. 'Look out, Rodur, he's coming!' I exclaimed: with a shrill scream the elephant dashed upon him like an avalanche.

"Round about went the mare, as though upon a pivot, and away over rocks and stones, flying like a gazelle, with the monkey-like form of Rodur leaning forward and looking over his left shoulder as the elephant rushed after him.

"For a moment I thought he must be caught. Had the mare stumbled, all were lost, but she gained in the race after a few quick, bounding strides, and Rodur still looking behind him, kept close to the elephant that its outstretched trunk was within a few feet of the mare's tail.

"Taher Sherif and his brother Ibrahim swept down like falcons in the rear. In full speed they dexterously avoided the trees, until they arrived upon open ground when they dashed up close to the hind quarters of the furious elephant, who, maddened with the excitement, heeded nothing but Rodur and his mare, that were almost within its grasp. When close to the tail of the elephant, Taher Sherif's sword flashed from its sheath, as, grasping his trusty blade, he leapt nimbly to the ground while Ibrahim caught the reins of his horse. Two or three bounds on foot, with the sword clutched in both hands, and he was close behind the elephant. A bright glance shone like lightning, as the sun struck upon the descending steel. This was followed by a dull crack, as the sword cut through skin and sinews, and settled deep in the bone, about 12 inches above the foot. At the next stride the elephant halted dead short in its tremendous charge. Taher had jumped quickly on one side, and had vaulted into the saddle with his naked sword in hand. At the same moment, Rodur, who had led the chase, turned sharp round, and again faced the elephant as before. Stooping quickly from the saddle he picked up from the ground a handful of dirt which he threw into the face of the vicious looking animal, that once more attempted to rush upon him. It was impossible! the foot was dislocated, and turned up in front like an old shoe. In an instant Taher was once more on foot, and again the sharp sword slashed the remaining leg. The great bull elephant could not move! the first cut

\* The Nile Tributaries of Abyssinia, and the Sword Hunters of the Hamran Arabs. By Sir Samuel W. Baker, M.A., &c. 1 vol. London: M'Millan & Co. 1867.

with the sword had utterly disabled it; the second was its death blow; the arteries of the leg were divided, and the blood spouted in jets from the wounds. I wished to terminate its misery by a bullet behind the

ear, but Taher Sherif begged me not to fire, as the elephant would quickly bleed to death without pain, and an unnecessary shot might attract the Basé, who would steal the flesh and ivory during our absence."



Elephant Hunting in Abyssinia.—The Sword wins the Day.

And so they left the poor beast! It appears before their return, the whereabouts of that the Basé *did* steal the flesh and ivory quarry having been betrayed by the vultures.

## The Country Gentlewoman.

### *VALUE OF SYSTEM IN HOUSEHOLD WORK.*

AMONG the numerous advantages we enjoy in this favoured country, those relating to the education of our sons are not to be considered the least. We have excellent schools in abundance for elementary instruction, masters for the higher branches, and colleges and universities to prepare for the learned professions. Those who wish to follow mercantile pursuits can enter academies where education is conducted with a special view to this end. If agriculture be the object, the sciences connected with it can be studied both in the academy and the lecture room. In short, education is provided for our sons, with a view to their future profession, be it agricultural or literary, military or mercantile. But with our daughters, the case is widely different. Excellent seminaries, indeed, abound, where elementary education is admirably conducted, and fashionable accomplishments successfully taught. This is so far good, for it is well that our daughters be so educated as to become suitable companions for intelligent men. It is well that they are taught what will make them an ornament to the drawing-room, and enable them to enliven the leisure hours of the family circle with melody and song. But it is not enough. To amuse is not their sole, or even their chief object in life. They have duties awaiting them, less pretentious, it may be, than those devolving on our sons, and confined to a more limited sphere, yet not on that account less important or less difficult, and for the proper performance of which they ought to have some specific training—training that has a direct reference to their probable future, be it town, country, farm, or cottage. The position of a young girl placed at the head of a family, fresh from school and ignorant of the commonest details of domestic life, is truly pitiable. And could the experience of all such be written, with their varied difficulties and numerous mistakes, it would, we are persuaded, be the best argument we could use for the establishment of training-schools for our girls. Our boys are not placed in positions of trust until they have learned both the practice and the theory of their work. And why should our girls be expected to discharge the varied duties of the housewife while ignored theoretically as well as practically of all that concerns the economy of the household. The young farmer is taught to distinguish the different kinds of soil, to know the value of various manures, and the merits of the different farm implements. He is expected to understand much of chemical science and of vegetable life, and to be able to apply his chemical knowledge to the working out of his system of agriculture. And why should the farmer's daughter not have the same advantages? Much depends on her, everything in the interior of the house is entrusted to her, as outdoor concerns are to the stronger sex, and without her wise co-operation little progress can be made towards comfort or competency. In some parts of the Continent there are seminaries expressly for the purpose of teaching "Household Economy in all its branches," and to these, young ladies are introduced after going through the usual course of study. It would be well that we had, in this country, something of the kind; but, since we have not, the young housewife must be content to supply the deficiency as best she may, gathering from every available source the knowledge which her previous education has failed to give. And if their education, notwithstanding its defects, has had included in it moral training and intellectual culture, it will



not be without its use, even to the young housewife, for such an education is fitted to develop and strengthen all the qualities she requires—industry, perseverance, patience, and self-control. Armed with these, which we may term the tools for her future work, she cannot fail to acquit herself with credit. Although at first ignorant of household details, if she apply to these the same patient industry which she exercised in the study of history or science, the effect will soon be evident. In a very short time she will attain to a clear comprehension of her position, and experience will increase the usefulness and grace with which she fills it. By reading she can supply the lack of experience; but unhappily books suited to guide the young housewife are rare, at least compared with the flood of publications on almost every other subject. A French author says—“It is to be wished that a book were written in every country for the use of our housewives, quite a small book on kitchen economy, simple, clear, and easily understood.” He adds, “when this book is wanted it will be written.” That it is needed we are sure, and trusting that it is wanted we propose to carry out the plan. Short and simple we intend the work to be, but yet so comprehensive, that it may embrace everything connected with the housewife’s duties, with special reference to the farm and to the cottage; and introductory to the details hereafter to be given, we would offer to the young housewife a few general and scattered hints, to aid and encourage her in her untried career.

And, in the first place, we hesitate not to say yours is an important sphere—a noble work. Begin it, then, with cheerfulness, and continue it with hope. At first your duties are much lighter than they are likely to be in after years, you may even think too trivial to occupy your attention, that attention which you have been accustomed to give to what you consider more important objects. This is a great mistake. Your former studies should have been pursued with a view to fit you for this; your proper sphere of labour, and all the qualities then developed are now to be brought into exercise. The power of planning

and arranging once expended on lessons and studies must now be brought into play in your household arrangements, for be assured, that without systematic attention, your household, however small, will soon fall into disorder. I say systematic, because *system—method*, if you will—is the foundation of all domestic prosperity. Where that is wanting, confusion and misery must ensue. In the works of the Almighty we see order reign; safely, then, may we follow this high example. And we are assured that the housewife whose plans are formed wisely, and carried out perseveringly, though possessed but of moderate abilities, will be far more successful than one endowed with far superior talents, if she is at the same time destitute of this high qualification, and suffers herself to be guided by circumstances, or inclination, or caprice. At the outset of your career, then, consider the circumstances in which you are placed, the duties that devolve upon you, and, after mature deliberation, form your plans. This done, pursue them resolutely, and be no lightly moved from them; at the same time, when circumstances demand their temporary relinquishment or modification, consider the claim, and, if needful, yield to it; not to do so would, in many cases, be foolish, perhaps wicked. And, in planning out work for a specific time, see that you lay no more on yourself or your dependants than you can accomplish. The neglect of this will destroy the working of the best system ever formed. If a thing cannot be done, this being included in your plan will not make it possible; it must therefore be left undone. Numerous other things may share the same fate; thus the work of one hour will be continually treading on the heels of another (so to speak) and so order will speedily degenerate into confusion.

The thoughtful and considerate mistress portions out to her domestics the work for which she knows their strength and abilities to be equal, and leaves them undisturbed to carry out her wishes. Perhaps she has daughters who are naturally anxious to take their share in household matters. If they are allowed to do so, the probability is, they will



not be satisfied with the arrangements made; they will see a thousand things that must be done—they have no patience to wait and let each be done in its *own time*—all must be done immediately, and so the poor servants are hurried from one thing to another till their strength and patience are equally exhausted. Such a procedure is unjust to servants; their health and strength forms their sole fortunes, and the mistress has no right to rob them of it. Even though not carried to this excess, the overcrowding of work into one day, instead of spreading it more equally over a longer time, discourages them on the one hand, or stirs them up to rebellion and discontent on the other. Indeed, no thoroughly good servant, who knows her place and her power, will submit to such capricious management. And, however desirable may be the qualification of method in a servant, it is in vain for the mistress to expect it if she does not practise it herself. How, for example, can she expect her breakfast to be ready at a specified time if she herself is rarely, if ever, prepared at that time to partake of it?—how expect her dinner to be on the table at the hour, if, when it should be in process of cooking, the materials have to be procured and the markets made?—how expect her servants to get on with their work when, ever and anon, they are interrupted in it, to render trifling personal services, or to go on errands that a little thought and foresight would have rendered unnecessary? For method and management in the servant, when there is none in the mistress, it is in vain to look. Be, then, a pattern to your servants in this—fix the hour for every meal, and let it be kept to a minute. If your husband has been for hours at his desk or farm, he will return weary and faint, and in need of refreshment; do not keep him waiting for it. Remember the Scotch proverb, “A hungry man’s an angry man.” A popular Transatlantic writer says that the way to a man’s heart is through his stomach, and that a woman who cannot roast a turkey will never retain the affections of her husband. Without going to such a ridiculous length, we may safely affirm, that if you neglect your hus-

band’s wants, or even supply them irregularly, you will soon exhaust his patience and irritate his temper. And when there are children, method is even of more importance. Regularity in their hours of rising and retiring to rest, in their meals, in their recreations, will be found conducive both to their health and cheerfulness; and, above all, habits of order formed in youth will likely be permanent and prove invaluable in after life. And in the country and farm method is doubly necessary. Here the oversight of the mistress is not confined to the house, but extends to out-door arrangements. Here the Dairy, the Poultry-yard, the Piggery, claim her attention; and, without entering into details, hereafter to be mentioned, we may merely say that regularity in supplying food to the dumb creatures (quantity and quality being understood), with systematic attention to their different wants, will not be without its reward. The rich cream, the abundant milk, the full egg baskets, and the savoury hams, will amply repay the housewife for all the care and attention she may bestow.

A steady adherence to the procedure advocated above will doubtless involve a considerable amount of self-denial—duty will frequently call in one direction, inclination and sloth in another. Let duty ever prevail. When the time arrives for a specified work, do it punctually, however great your disinclination. Without self-denial nothing great or good can be accomplished, and the woman who cannot exercise it need never assume the position of mistress of a family. Here, pre-eminently, is room for self-renunciation, for in caring for the members of her household, she must necessarily lose sight of herself, and sink her interest in theirs. Still, it must be remembered that the executive is not generally the chief duty of a mistress; to her the administrative specially belongs. She it is that must assign to every part of the household machine its proper work, set it in motion, and watch over its working. And she must be absolute here—any interference is fatal. One hand moves the helm and directs the ship—so one mind must guide the house. And it is wonderful how much can be accomplished

by arrangement, even without the opportunity of active exertion. We could point to one lady, who was for years confined to her room, and yet during these long years continued to manage her large household in such a manner that it became a model to the neighbourhood, and a pattern to all who aimed at excelling in household management. In conclusion, we would adopt the plan of the famous orator of

old, who, when asked what was the first qualifications of an orator, answered, Delivery; when asked the second and the third, still answered, Delivery. So we, if asked the first qualification for a housewife, would answer, *method*; and what the second, *method*; and the third, also *method*. So powerful the effects, so wonderful the working of this simple but invaluable principle!

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### PET DOGS.

WE are desirous to bring "Magenta's" excellent little book on "The Treatment of our Domesticated Dogs" under the notice of our readers. It has been recently published by Messrs Blackwood & Sons, and no one who loves a canine pet should be without it. As the best way of recommending "Magenta's" book we take the following remarks from it:—

#### DIET FOR PET DOGS.

As to diet, the caution most necessary to give to lovers of these interesting animals is *not to overfeed them*. One meal in twenty-four hours is quite sufficient, and it is the practice now to limit the composition of that one meal to bread or rice and gravy for small house-pets that get little or no exercise.

Hot food or drinks are injurious to dogs. We formerly allowed such scraps of skin or fat as might be found on the plates at dinner, to be mixed up with potatoes or other vegetable and bread; the dogs' meal, no matter how many they were, was always prepared after our own dinner, and served to them in their respective corners of the room, while we waited to see that there was fair play amongst them.

Our pets never knew the charm of that cry of "Cat a meat," so deeply interesting to the distinguished foreigner who, on his return to his own country, daily lamented the absence of the useful individual who in England, for the small sum of threepence, used to provide him with a luxurious din-

ner, which even the dainty *cotelettes de cheval* could not replace. We have had our doggies eating two and two off the same plate, without a grumble, the cat sometimes admitted to a share with either party; but we were mostly honoured with her company when she happened to have remarked fish cooking.

The less animal food dogs get the better; its use has much to do with the foul breath and heavy smell so commonly complained of as accompanying the most petted of these creatures.

Dogs that are kept from meat are also less liable to distemper and fits.

They thrive remarkably well on rice and gravy, light unsweetened puddings, vegetables (not used exclusively), and in some cases fish; but the last, besides the danger from the bones, disagrees with some members of the race. So does milk occasionally, though supposed to suit all dogs.

One of ours, that came into our possession when of mature age, used to have most violent bilious attacks; and it was only after observation had fixed on milk as the unquestionable cause of them, and it had been withdrawn from use, that he ceased to be troubled with them.

These evidences of the delicacy of the animal's stomach, causing individuals among them to reject certain kinds of food or medicine that agree perfectly with others, demonstrate the necessity for the person who attempts to doctor a sick dog being as much

as possible acquainted with the peculiarities of his constitution.

Salt is not a necessity for the dog as for graminivorous animals, and in large quantities it is poison to him.

Salt meat is also unfit for dogs.

Small high-bred dogs, such as the toy terrier and Italian greyhound, that are always shivering, even in summer, would be the better of fat instead of lean meat, where any at all is given. The stomach must be either originally trained or gradually accustomed to it; but fat is known to generate heat.

For many reasons our pets ought to be fed upstairs. Independently of their recognising their master or mistress in the person who feeds them, it is a safeguard, not so much against starvation as against improper, or too great an abundance of food being given; moreover, strictness is necessary in denying the little fellows stray bits, even when their friends are at table upstairs.

The habit of begging or scratching at people when they are eating, is very troublesome, to strangers at all events; and as dogs have no company manners, they must be taught always to remain quietly under the table or chairs till their own dinner is ready. We regard it as a duty to abstain from making either ourselves or our friends slaves to our domestic pets, however valuable and dear they may be.

Where doggie is allowed to visit the kitchen at pleasure, the cook, if fond of him, will be sure, in spite of all directions to the contrary, to give him sly bits; and if, on the other hand, the servants dislike him, he will not only be starved, but teased, and his temper spoiled.

There is also greater risk of losing an animal that is left to roam about the house at pleasure, as nobody misses him. Where a dog is valuable, it is well to make some one servant responsible for him, with the understanding that the loss of the dog is the loss of place.

We would never keep a servant who was habitually unkind to a little dumb beast; the disposition is evil, and, to our mind, not to be trusted, if chance placed one's self in its power.

As to allowing bones to dogs, there are many conflicting opinions; some consider that they aid digestion, others that they lacerate the intestines. We do not care to let our pets have bones, as they reduce even large ones to splinters, and are then apt to give trouble by choking themselves, whilst upon us devolves the unpleasant duty of extracting the offending morsel, by forcing a finger and thumb down the throat to draw it out; the dog, too, not being quite aware of your friendly intentions, may bite; upon the whole, we prefer withholding an indulgence that can be well dispensed with.

Though large bones are said to be useful in fining down the sharp edges of puppies' teeth, it is obvious that for dogs more grown such an effect is not desirable. In any case, care should be taken, before giving a bone, that no smaller one or such loose gristle be attached as might choke the animal; and servants should be particularly cautioned to throw what is called the dog's bone of the leg of mutton, also fish bones, behind the fire. Accidents have frequently ensued from their sticking in a dog's swallow.

## COOKERY.

## THE ART OF COOKING POTATOES.

THERE is no vegetable more used and more abused than the potato. Unhappy esculent ! thy virtues were never duly appreciated, except only by a few of the potato-devouring tribes of the Emerald Isle. Thou art invariably spoiled in the cooking ; thy fine savour is lost, and thou art reduced to the indignity of serving as a mere accompaniment to so many mouthfuls of animal food —perhaps half raw, too, such as some of our cannibal countrymen like to glut upon. Be it now our task to indicate (with due humility, however) some of the various modes of dressing this tuberous root, whereby its various excellencies may be preserved. But, first, let us raise our voice against those vitiated palates which prefer the potato in a waxy or a spongy state to that farinaceous condition, the delight of all potato-eaters of refined taste. This excellent vegetable, so nutritious and so palatable, when cooked as it ought to be, is rank poison to the human stomach when, in any of the various modes of preparing it for the table, the farinaceous principle is lost sight of. In it alone consists the nourishment yielded by the potato ; every other form should be carefully avoided.

To boil a potato seems simple enough ; and yet we scarcely ever find it well done. At the tables of the great a good potato is never seen, because if not eaten the very moment it is boiled, the potato is worth nothing, and also because the refinement of peeling helps to destroy the savour. Another mistake is, to serve this vegetable in a covered dish, whereby the steam condensed by the cover falls upon the potato, and it becomes soddened and waxy.

Do not buy washed potatoes from the shops, or at Covent Gardens. Get them with the mould about them, and do not wash it off until just before you use them. If they are steeped in water long before they are boiled

they become stale and watery. Put them into plenty of cold water, with some salt. When they are about half boiled, throw away the water, and pour fresh boiling water upon the potatoes from a tea-kettle, adding to it some salt. Let it boil up briskly. When you have ascertained with a fork that the potatoes are very nearly done, throw in a cupful of cold water to check the boiling. The water will soon boil up again, and the potatoes will crack. Let the water then be drained off, and the potatoes served up immediately in an open dish with their skins on. The water upon them will evaporate the instant they are in the dish. They must be eaten at that moment ; in ten minutes their fine flavour would be gone.

The French calculate about sixty different modes of dressing potatoes, and as many of dressing eggs. But it will answer our purpose, and no doubt that of our readers, to give only a few of those modes in the present paper.

New potatoes, when they first appear, are considered a delicacy, though not half so good and wholesome as the old, unless they are perfectly ripe, and can be cooked without being made waxy. The following is an excellent way of dressing them :—

Choose the potatoes as nearly of a size as possible ; wash them, and rub off the outer rind ; then wipe them dry with a clean napkin. Put a quarter of a lb. of fresh butter into a stewpan ; set it on the fire, and when it boils throw in the potatoes. Let them boil in the butter till they are done, taking care to toss them every now and then, so that they may all go successively into the boiling butter. They must be carefully watched, because if done too much they shrivel up and become waxy. When the fork indicates that they are done, they must be taken out before they lose their



crispness; put into a dish, and some salt sprinkled over them. As soon as they are taken from the boiling butter a handful of parsley may be thrown into it, and, after it has had a boil or two, laid upon the potatoes as a garnish. They must be eaten immediately. This is a beautiful dish to serve up with fish, or it may be eaten alone. The butter in which the potatoes were dressed may be poured into a jar, and serve again for the same purpose. Old potatoes may be cut into round pieces about the size of a large walnut, and dressed in the same way.

Every Englishman who goes to the Continent eats potatoes *a la maitre d'hotel*. On his return, he is desirous of having them at his own table, a thing that can seldom be accomplished, though the process of preparing them is very simple. It is as follows:—

Boil the potatoes and let them become cold. Then cut them into rather thick slices. Put a lump of fresh butter into a stewpan, and add a little flour—about a teaspoonful for a middling-sized dish. When the flour has boiled a little while in the butter, add, by degrees, a cupful of broth or water. When this has boiled up put in the potatoes, with chopped parsley, pepper, and salt. Let the potatoes stew a few minutes, then take them from the fire, and when quite off the boil, add the yoke of an egg beat up with a little lemon juice and a teaspoonful of cold water. As soon as the sauce has set, the potatoes may be dished up, and sent to table.

There are several ways of frying potatoes. The best is to half boil them first, then cut them up into slices, and fry them in butter, or in goose dripping, which is preferable. When the potatoes are brown, drain off the fat, strew a little salt over them, and let them be eaten while they are hot and crisp.

Potatoes may be fried without being par-boiled, and even when boiled and become

cold. In both cases the process followed must be the same we have just described.

Mashed potatoes form a very common dish at English tables. This dish is generally, however, a kind of substitute, for the vegetable is seldom mashed unless it be so bad, when boiled, as to be uneatable, as is often the case. The ordinary mode of mashing potatoes is very unwholesome. It forms a greasy and often rancid compound in the stomach, so tenacious of the adhesive principle that the most robust powers of digestion can scarcely act upon it; and yet it is eaten by the most delicate females, who find themselves indisposed after it, but never impute their ailment to the potatoes, “which,” as they say “never *can* do any harm.”

Potatoes for mashing should be as nicely boiled as if they were intended to be eaten without further preparation; only they should be dressed a little more, though care should be taken not to let the water get into them. The farinaceous part only should be used, and with it a small quantity of the freshest butter. It is customary in some families to brown with a salamander the top of a dish of mashed potatoes. This is by no means objectionable, though we are of opinion that, by adding a little cream, and putting the mashed potatoes into the oven to brown them a great improvement would be made. Mashed potatoes are also very nice, if made up into round balls, covered with yolk of egg, and fried a light brown. They might with great advantage be mixed with some cold fish finely shred, and a little chopped parsley, then dipped in yolk of egg, and fried. In many families the cold remains of fish are often thrown away, which would answer this purpose extremely well, and form a very savoury dish for the next day's dinner. These two latter preparations should be garnished with fried parsley.

## ENGLISH CHAMPAGNE.

THE facility with which the green fruit can be procured during spring and early summer affords the only excuse for the practice of imitating champagne wines by a fruit so dissimilar to the grapes as is the gooseberry. Were grapes more abundant, nothing else ought to be employed in the preparation of British champagne, for green grapes communicate no unpleasant flavour. "It is ascertained," says Dr M'Culloch, "in the wine countries, that, independently of those causes of briskness in wines which consist in the management, . . . this esteemed quality always results from the use of *unripe* fruit, and is readily produced by mixing unripe grapes with ripe ones; the case is the same with the gooseberry." But the ripe gooseberry always communicates a marked, and indeed disagreeable, flavour; nor is this to be esteemed surprising, if any faith be accorded to the chemical analysis of those berries detailed by Johnston. The results of his experiments are quoted in a note by Dr M'Culloch, at page 16 of his work—the proportions of the several ingredients remaining unascertained. They are—water, sugar, as the sweet principle not crystallizable, supercitrate of lime, supercitrate of potass, supermalate of lime and potass, resin, a modification of gum, fibrin, ammonia in an unknown state of combination, phosphate of lime, and of magnesia.

Hence, to say nothing of the components inimical to the pure quality of wine, we find a total absence of that essential ingredient, the *supertartrate* of potass, or cream of tartar. To avoid, therefore, the bad flavour which *must* be produced by ripe gooseberries "the fruit," as Dr M'Culloch says, "can scarcely be taken in a state too crude, as at this period the flavouring substance has not been developed. At the same time, the expressed juice alone should be used; care being taken to exclude the skins from the fermentation, as being the part in which the flavour principally resides."

Having thus generalised, we also refer the reader to the authority of Mr Roberts, in

order to place before our readers the leading principles of the manufacture of genuine *foreign* champagne in France, as furnishing the surest basis for those operations which can by any means conduce to satisfactory results. It may be proper to observe, that the description of Mr Roberts is derived from a work by Dr Shannon: it differs very little from that of Dr M'Culloch, as the latter is more simply and perspicuously written, we give it the preference.

"In making *champagne*, the pattern of all our brisk wines, the grapes are first squeezed by a gentle pressure, and poured into the vat, where they remain for one night only. The next morning the liquor is transferred into casks. If the wine is intended to be red (pink champagne) the fermentation is allowed to continue some little time longer in the husks, till the red colour has been extracted; but the seeds are carefully separated, as they communicate a harsh taste. The first fermentation in the casks is violent, and the discharge of the yeast is encouraged for ten or twelve days, by keeping them full to the bung-hole. It then becomes more moderate, when the bung is put down, and a gimlet-hole, fitted with a spile, is made by the side of it. When the cask is thus closed, the vent-hole is thus opened every day or two, according to the state of the fermentation, for a space of eight or ten days, to allow the carbonic acid gas to escape. When this state is passed, fresh wine, reserved for the purpose, is poured in at the vent-hole about once a week, for the first three or four weeks, according to its waste, so as to fill the cask.

"This operation is then performed at longer intervals, of a month or more, till the end of December, when the wine usually becomes clear. It is afterwards decanted from the lees into a fresh cask, where it is fined with isinglass, in the proportion of half an ounce to a pipe; and this process of decanting is carefully executed in dry, clear, frosty weather. A new fermentation is now excited, by which the wine loses a portion of its sweetness, and becomes still further

meliorated. If it should prove too sweet, this first operation of decanting is not performed until the fermentation in the first cask has been rendered more vigorous, which is done by stirring up the lees, or rolling the pipe; and by this the sweetness is overcome, and the wine strengthened and improved. To ensure the fineness of this wine, which is one of its essential properties, and to render it at the same time durable, it is, at the end of six weeks, decanted a second time into a fresh pipe, and once more fined with half the quantity of isinglass. It is then completed, and is put into bottles in March; clear, dry weather being also chosen for this purpose."

It should be added, on the testimony of Dr Shannon, that the French employ a vault, as well as a wine cellar; and, "as the vaults are cool in the summer and warm in the winter, as soon as it begins to be hot, the wines must be carried down, whether they be in pipes or bottles, into the vault; and when it begins to be cold, they must be carried up into the cellar."

We are now arrived at the point where the directions for the manufacture of our factitious champagne must be compared with that of the genuine foreign wine. But we earnestly wish to impress upon the reader's attention, the self-evident facts that a much better imitation of champagne can be effected by substitution of green, unripe *grapes*, for crude gooseberries; and that such grapes can be procured anywhere, if people will merely be at the trouble to plant a vine against every vacant wall or fence. A wall 3 feet high may be covered with bunches of unripe fruit, as Mr Hoare has clearly proved; and if the grapes be taken, just at the period when the process of "stoning" (that is, of developing their seeds) commences, the tree may be safely permitted to carry every cluster which it shews; for it is by the *maturation* of the seed that a tree becomes distressed, and not by the number of crude berries which are left on it, till they appear to be at a stand-still, a period of torpidity that indicates the commencement of the seeding process.

Let grapes be grown everywhere in suffi-

cient abundance, and no one will require any other fruit for wine, unless there be a desire to retain a certain flavour, as that of raspberry, or of the peel of the orange and lemon.

The quantities of materials referred to by Dr M'Culloch for the preparation of a ten-gallon cask of green gooseberry wine, are the following:—

Of cold water, 4 gallons,

Of green gooseberries, 40 lb.,

Of loaf sugar (not moist sugar, by any means), 30 lb.;

and if these fail to procure ten and half-gallons of *must*, a further addition of water should be poured upon the husks of the pressed berries, which, when strained, will make up the deficiency.

The heat of the apartment wherein the fermentation is to be conducted, is stated to be fifty-five degrees, varying to sixty degrees.

The reader should now be at no loss to apply, practically, the rules observed by the French manufacturers, detailed above. But we shall now refer to Mr Roberts, who, though he accords closely with the directions which we find in the work of M'Culloch, at pp. 235, 240, is more definite and precise; he also has taken advantage of improved science, and places his readers in a situation to arrive at more certain results. Our limited space will, however, constrain us to abbreviate in a degree.

Mr Roberts's process is calculated to make 15 gallons of *gooseberry champagne*; it is founded upon the annexed leading facts.

1. A gallon of green berries, imperial measure, when heaped, weighs 10 lb.; and yields, to pressure, little more than one-third of juice.

2. This expressed juice, strained through a sieve, is of a gravity when compared with water, as 103 is to 1000, calculated by the decimal process; or by the saccharometer of 36, or thereabout.

3. It is to be diluted with an equal measure of pure water, the gravity will then be reduced to about 18. Now, as 1 lb. of sugar, when dissolved in a gallon of water, is found to

bring up the gravity to 36; therefore, 2 $\frac{5}{8}$  lb. —i.e., 2 lb. 10 oz., or, in lieu of the odd ounces, *two pounds and a half* of loaf sugar, and 4 oz. of pure honey—will be required to prepare a gallon of gooseberry *must*, equal to the strength of that grape juice, or *must*, which is used by the makers of champagne.

4. If one gallon of berries yield a third of juice, 22 $\frac{1}{2}$  gallons will be required for 15 gallons of wine; that is, to produce 7 $\frac{1}{2}$  gallons of juice. The proportion of other materials will then be, 7 $\frac{1}{2}$  gallons of water, 37 $\frac{1}{2}$  lb. of loaf sugar, 3 $\frac{3}{4}$  lb. of honey, and the gravity of 'must' will be about 106 or as 1109, is to 1000.

The items of the process may thus be concisely stated:—

To make a 15-gallon cask, take the above quantities of materials; but it is deemed always advisable to make a 2-gallon cask more, and additional quantities of ingredients will therefore be required. It must not, however, be overlooked, that the *sugar* will add considerably to the bulk; and therefore one gallon of berries, and the proportionate *extra* quantities of water and sugar, will suffice to produce 19 gallons, which, Mr R. says, are required for 17 gallons of fermented wine.

The water and the berries are not all to be mixed up at once; three tubs are to be employed, one for the berries a second, to bruise them in, and a third to receive them when they are bruised. One gallon is to be bruised at a time in order that every berry may be broken. To those bruised, one-third of a gallon of water to be added; and so on, until the 22 $\frac{1}{2}$  gallons are bruised, and are put into the third tub, and the 7 $\frac{1}{2}$  gallons of water are added; this refers to the 15 gallons only; the quantity required for the extra 2 gallons must be superadded. The mixture being completed, the gravity of the liquor will probably be about seventeen or eighteen by the instrument. The tub is then to be covered up, and the next morning the mass is again to be well agitated, or stirred up, and examined.

"The gravity will not appear to have

increased much, but *as long as it does increase* the liquor must remain on the husks, because ermentation will not have yet commenced, for which no certain time can be assigned, as sometimes it may be within ten hours, and sometimes not until three days. The instrument is the only sure guide in this event, for as soon as a decrease in gravity is perceived, fermentation has assuredly commenced. The husks must then be removed, after having been well pressed with the hand, and the liquor strained. But as they will contain some good, 2 or 3 gallons of water are to be poured on them; they may again be squeezed and strained, and this second liquor added to the former, which could not be less than 16 gallons, if the 15- and the 2-gallon casks are to be filled." We differ from Mr R. in this estimate, as the sugar will make up the required quantity without so much more water; however, he estimates the gravity of the liquor, as thus reduced, to be fifteen, and requiring one hundred and ten as the standard, he proceeds to adjust the quantity of sugar accordingly. "I have," he adds, "been in the habit of using, instead of 2 $\frac{5}{8}$  lb. of sugar to each gallon, 2 $\frac{1}{2}$  lb. of sugar, and a  $\frac{1}{4}$  lb. of virgin honey to each gallon. The honey must be boiled with the same weight of water, for fifteen minutes, and well skimmed during that period."

We have given the above extract correctly; though with some curtailment of the periods. What remains may be stated in a few words. The tub, with the liquor and sugar, is to be first thoroughly agitated or stirred up, then covered with a blanket: the agitation is to be repeated every alternate hour during the first day; after the last stirring up, the gravity is to be investigated and recorded. This examination is to be repeated morning and evening till the gravity be reduced to ninety, or rather to eighty. The liquor is then to be strained through a fine sieve, and put into the casks (fifteen gallons and two gallons), and the remainder is to be kept to fill up the casks; and this filling should be done every three hours, for the first three days, placing a dish to receive the scum which will be thrown off by the force of fermentation. The fine



liquor which will be caught by the dishes should also be preserved for filling up.

Dr M'Culloch's temperature, 55° to 60°, ought to be attended to; the fermentation will thereby be regulated: it ought to proceed quietly, but uninterruptedly, and the gravity be taken every two or three days. If that be reduced very rapidly, the wine must be racked off from its lees, the cask washed, drained, and slightly sulphured, and the clear returned. If the fermentation be torpid, the cask must be agitated. The French rules now apply; and the subsidence of the fermentation, leaving a little pleasant sweetness in the wine with a gravity not under thirty-six to forty, with a decided tendency to settle and become bright, furnish decisive criterions of a perfectly successful process.

The wine in the two-gallon cask is presumed to run in the same course, and to be bunged down till the period of racking and fining; then the space in the large cask, occasioned by the removal of the lees, is to be filled with the clear wine from the small cask, and any surplus quantity can be put into bottles and preserved for use.

The indispensable characters of excellence to be aimed at, are, *first*, a degree of sweetness, not subdued by the leaven during the first fermentation, but which process is still

going on; so as, *second*, to produce a gentle creaming, or mantling, in the glass; with a corresponding briskness on the palate, and a clear delicate flavour. *Third*, perfect brightness and transparency.

A few concluding remarks are required. The quantity of sugar, &c., is not great, and therefore the *leaven* from the gooseberries is sufficient to subdue it ultimately; hence the wine is intended to be used at an early age. The mantling of the wine proves that the fermentation is still proceeding; and the liquor will either become a dry wine, or become sour. This furnishes another argument for the substitution of green grapes, because the green gooseberries, being a fruit of the spring, leave the operator subject to the risk and difficulties which the heat of the first summer will subject him to. Green grapes can be had after the subsidence of the heat, and yet admit of the full meliorating influence of the autumnal months, leaving the wine equally perfect in the succeeding March or April.

Finally—Grapes contain the *tartarous acid*; and if the operator determine to employ *gooseberries*, it will be an improvement to add an ounce or two of *crude tartar* (which is a crystallized salt from the foreign wine-casks) to every 6 or 7 gallons of his *must*.

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## BEE KEEPING.

### SWARMING.

**I**N introducing the subject of Api-culture, or Bee-keeping, let it be understood that I have no intention of holding out any high prospects to your readers of making money by their culture; neither have I any exalted ideas of my own knowledge of their natural habits and instincts. At the same time, I am willing to impart all I know about them, hoping that others may be induced to do the same, and give their experience, and assist all who are in any way engaged in bee-keeping. I am certain all who take an interest in the subject will find it one of the most pleasant studies, as well as one of the most interesting and innocent pastimes, they can engage in.

Perhaps there is no other subject in natural history which has occupied the attention of mankind so much as bees, and many are the treatises which have been sent forth on the subject, from Aristotle down to the present time; and though many facts have been verified about them, still there is yet much to learn, which can only be done by close experimenting attention.

I have been engaged among bees, less or more, as long as I can remember, and the greater part of the time I, like a great many others, knew little about them; could put them into a hive when they swarmed, and kill them with burning sulphur when I wanted to

take the honey. If they got on well by themselves, so much the better for them and me; I could then do little to assist them.

But having paid somewhat more attention to them for a few years back, and corresponded with bee-keepers both in this country and England concerning their natural habits, I hope to be able to give some hints which may be useful to others.

At this season the attentive bee-keeper will have in readiness all his hives (of whatever kind he uses) for swarming. Though the last has been an unpropitious winter and spring for bees, the warm weather of late has caused them to advance rapidly.

My first swarm came off on the 25th May, the earliest I have had in the same place for twenty-three years. She was a "Ligurian queen," which I got from Mr G. Woodbury, Exeter, last spring, sent to me by rail in a small box along with a piece of comb and a few bees.

Not expecting her to come off so soon, I was not there until she had hived on a gooseberry bush. I put a hive on the top of the bush, and then proceeded to brush them gently up with the branch and leaves of a currant bush. Having got them nearly all into the hive, I lifted it off the bush, when I put it on the board, and shook the remainder of them off the bush, when they ran into the hive. I had then to leave them for about five minutes; when I returned, they were all rushing out and flying back to their former quarters. Here, then, was a case in which the queen was not where the bees had swarmed. I went

at once to the hive she left to see if she would return, but after waiting till nearly all the bees had returned, I could not see her, and from the unsettled state in which they appeared to be in, I was sure the queen had not gone back. Had I then lost my fine queen, was the thought that arose in my mind; and I at once set about to look, and found her on a strawberry plant about 6 feet from the hive, surrounded by a small number of bees. I lifted her up and put her into the empty hive along with a few bees, but she would not remain, or rather the bees would not allow her, as one of them pulled her out by the leg. Seeing this, I lifted her on to the landing-board of the hive she came from, which she again entered, and the bees then began to enter also, and so became quiet. Here then was a case in which I nearly lost a valuable queen, and of course a swarm, by not being on the watch. Had I been there when she came off, I would have caught her (which is easily done, being a breeding queen) and kept her till I saw where most of the bees were settling, when I would have put her among them, and all would have been right. She was so far advanced in maternity, that she was unable to fly further, and so the bees lost her. While she was in my hand she laid two eggs. I merely mention this, as it is only a few weeks since a very old bee-keeper asked me if I knew really which laid the eggs, the working bee, drone, or queen. Such a question being put by a very intelligent person is one of the inducements I have for taking up the subject of bee-keeping.

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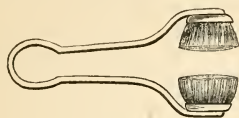
### USEFUL INVENTIONS.

#### I. APHIS BRUSH.

WHAT lady has not had to deplore the destruction of her pet plants by that annoying little insect, the green-fly. Tobacco-smoking although an effectual cure if well done, is not a nice operation for a lady, particularly if her greenhouse be small and abuts on her drawing-room. Washing with a sponge is, therefore, often had recourse to, if

the plants be few. But *here* is a very effective little implement, which she may wield with deadly effect. It consists of two circular brushes, one inch in diameter, formed of very soft bristles, about three-quarters of an inch long. The handle is made of steel, and is elastic. Each leaf or shoot is brought between the two brushes, which are gently but firmly pressed together and drawn over the

surface of the leaf, by which operation the aphides are removed without injury to the plant. It will be found very useful to those who keep plants in living rooms, or possess a small conservatory, but have no convenient

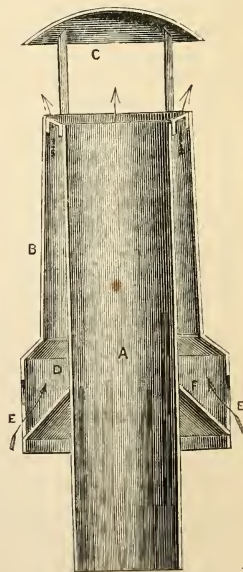
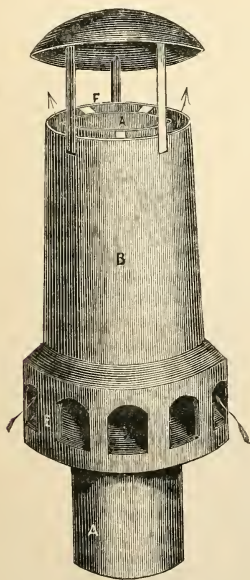


Aphis Brush.

means of subjecting their flowers and plants to fumigation with tobacco. The tediousness of the operation will, of course, prevent the use of the Aphis Brush on the large scale.

this chimney-cap asserts that it is a complete cure for smoky chimneys, and highly desirable where a great draught is needed. It is claimed that on sea-going or other steamers, the funnel may be made much shorter on this plan, and that for sailing vessels it is also desirable, making the fire in the galley burn freely in baffling winds when other arrangements fail. It has been used in some of the hotels and factories in San Francisco, and found to be advantageous.

“In construction, it is simply a pipe (*a*), with a jacket (*b*) and a hood (*c*), as shewn in the cuts. The lower part of the jacket is enlarged, as at *d*, and has openings (*e*) through which the wind enters. It issues at



## 2. SMOKY CHIMNEYS.

Those who are subjected to the great annoyance caused by smoky chimneys are likely to derive advantage from an invention which we copy from the *Scientific American*. That journal says:—“The inventor of

the top, as shewn. The jacket is supported by braces (*f*) at the top and bottom. The air circulating through this appurtenance creates a current within the main pipe (*a*), which causes the fire to burn briskly. It seem to be a useful invention.”

## DOMESTIC LABOUR-SAVING MACHINES.

THE application of mechanical contrivances to the saving of labour, the rapid and economical production of the thousand and one things which minister to our wants or our luxuries, is one of the most striking features of the times we live in. It is merely a grandiloquent piece of fudge, or is it the expression of a simple truth, conveying much that is eminently practical, when we say that the mechanical and scientific men of our day have not been sufficiently zealous in improving the appliances of domestic life; and that while perfecting to a marvellous degree the more gigantic products of the mechanical mind, they seem to act in reference to such minute but important matters as if it was beneath the dignity of the inventive mind to stoop to interfere in what they seem to think are but trifling details? We are prompted so to write on consideration of what we have witnessed of the labour-saving contrivances used in the households of American ladies. There labour is dear, and labour therefore must be economised. Hence the use of a perfect army, so to say, of appliances, by which either the intervention of human work is altogether dispensed with, or its amount reduced to the minimum. Machines and contrivances do for the housewives of America what they do here for the manufacturers of this country; and apt as one of the old country is to smile at what he or she may call the trifling knick-knacks we have above alluded to as existent in large numbers in American households, after one sees what they can do to save labour and economise time—and shall we be ungallant enough to say, save the temper of the “angels of the house”—the smile is apt to be changed into something more serious. In many of the departments of household economy there are numberless things which, when done in a wrong way, are provocative of much trouble of mind and loss of time, but which, by the aid of a little contrivance, can

be readily changed into things easily done. We purpose from time to time to devote a brief paper to illustrate and describe some simple mechanical appliance, which will serve to fulfil the condition to which we have just now alluded. Some of these will be ambitious enough, and take some labour to realize; the majority of the “notions” will be simple, applicable to every-day purposes, and the making of them will be within the scope of even the humblest of country mechanics.

## A SIMPLE KNIFE-CLEANER.

A clean knife is more than a luxury, it is a necessary, and should be at every well-appointed table, whether that be laid in the “lordly hall” or the “lowly cottage.” Some of the contrivances recently brought out, however effective, are costly; and some act wrongly, as, for instance, in ultimately giving a back as sharp as the front—a consummation by no means to be wished. For those who do not aspire to the use of the costly knife-cleaning machines, the following knife-cleaning appliance (fig. 1.) will be useful and

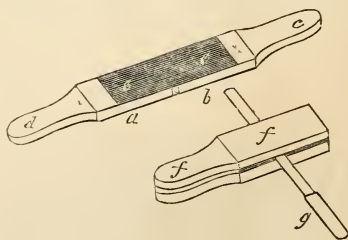


FIG. 1.

very easily made. It is formed of two pieces of wood *a b*, with handles *c d*. On the top surface of these, and joining them as with a flexible hinge, is laid a piece of thickish leather, and firmly secured to the blocks *a b*. The upper surface of this is provided with a rough surface of emery, put on by a method known to almost every mechanic. In using this appliance, the two pieces are folded together, as shewn at *f f*, and the knife *g* in-



serted between them, and worked to and fro. A polishing material of emery and oil may be kept in a pot, and applied from time to time, to expedite the cleaning. This appliance will be found very effective. Any degree of pressure can be given to the knife by pressing on the handle *c d*. Try it.

#### AN ECONOMIC ROASTING-JACK.

We have known cases where the expensive "bottle-jacks" have been superseded for the simple appliance shewn in fig. 2; at all events, it will be useful in cottages where the more costly article is beyond the reach of the housewife, and any mechanic can make it in that singular division of time not seldom alluded to in the kitchen, "a jiffey." It consists of a hooked piece of iron, made to em-

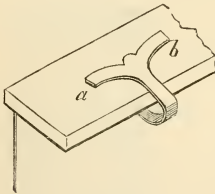


Fig. 2.

brace the edge of the projecting chimney shelf, the upper part resting on the upper surface of the shelf, and being provided with

wings *a b*, to enable it to lie steadily. The lower part, *c* (fig. 3), projects under the lower side of the shelf, and over this a leather band *d* is slipped, to which is suspended a cord *e*,

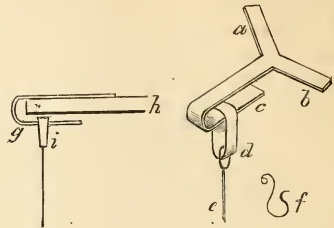


Fig. 3.

terminated by a hook *f*, to which the meat is connected. The cord *e* is made of three or four strands of worsted twisted together; and such is what we may call the torsional qualities of the cord, that in its twisting and untwisting it keeps the meat in a continual state of alternate rotation for a much longer space of time than one would be inclined to think so simple a contrivance could effect. In making this, care should be taken to have the sweep or curve *g* (fig. 3) so great as to leave a space between the lower limb and the mantel-shelf *h* sufficient to allow of the leather strap *i* to be freely slipped over.

### FASHIONS FOR JULY.

WE take the following from the "Englishwoman's Domestic Magazine," a periodical which, we believe, is now recognised as the best authority on all details of dress:—

"All the world," to translate a French phrase, is thinking of sea-bathing just now, and quite a new series of bathing costumes are being prepared for the season. Some of these will appear a little extraordinary, perhaps, to some of our English readers. Here they are, such as we have seen them:—

The Parisian costume—a *pantalon*, very wide and gathered round the ankle; a full jacket, with a round basquine, fitted to the waist with a belt, and short sleeves; a Parisian

cap, trimmed with a ruching of red braid, with a large rosette on one side.

The Swiss costume—double skirt, very short, and low square bodice, trimmed with red braid; waistband, fastened with a rosette; Swiss hat of black oil-cloth, with a red rosette on one side, and a net of red soutache to fasten up the hair.

The Marin costume—a straight loose pantalon and tight jacket, grey, with blue facings; marin hat and blue net.

And the Russian costume—wide pantalon and blouse, fastened slantwise, trimmed with braid and large buttons; Russian cap, edged with a thick ruche, and finished off by a tassel.

All these costumes are completed by high boots of soft leather, lined with cork, bound and laced with braid of the colour of the trimming: they are with or without heels.

For the toilets of the casino or the beach there are two styles of dress—the short costume and the train-shaped robe, with panniers, or a looped-up Louis XV. puff.

Shot silks of two colours make up charming dresses. The following is the list of the ten different combinations of colours most fashionable for these beautiful glacé silks shot of two different tints:—

1. Dawn of day (azure blue and maize).
2. Sunset (crimson and maize).
3. Lapis-blue and white.
4. Dove colour (blue and gold).
5. Amadis-green and gold.
6. Dove-grey and white.
7. Steel-grey and white (half-mourning).
8. Lilac and maize.
9. Light-brown and white.
10. Pale-green and rose-colour.

The shot silk dress is frequently worn with an underskirt of striped silk of the same colours, when the whole toilet is not of the same material. The trimming is of one colour only.

Let us glance at some of the prettiest toilets of the month. In foulard glacé, a marquise dress, shot light green and straw colour. First skirt, just touching the ground, trimmed round with a deeply scalloped and pinked-out flounce, gathered and without any heading. Second skirt, trimmed with a similar flounce, and with narrow cross-strips of green silk. This second skirt is looped up on either side with large bows of wide plain green ribbon. Plain bodice, open in front, and crossed like a shawl, edged with a ruche of green ribbon. Tight sleeves with a similar ruche round the wrists.

A young lady's dress for a *fete champêtre* is of plain white muslin over blue glacé silk. The toilet is completed by a pretty Bachlik of blue silk, pinked out all round the edges. At the back there is a pretty round hood, and the lappets, which are very wide, and rounded at the bottom, are tied at the waist so as to form a sash.

A walking toilet is composed of a dress of lilac and maize shot glacé silk, trimmed with a narrow gathered flounce, headed with a cross-strip of maize silk; the skirt is looped up in the middle of the back by a series of pointed lappets placed one above the other, from the waist downwards. The under-skirt is striped lilac and maize. Plain bodice and tight sleeves, with maize cross-strips; short circular cape, with lappets fastened upon the left shoulder, and hanging down at the back. Toquet of grey-plaited straw, trimmed with yellow roses. The cape is trimmed all round with a fluted quilling headed with a maize cross-strip.

A pretty walking toilet for a young lady is a plain high dress with narrow sleeves, and a double skirt of blue and white glacé mohair. The upper-skirt is cut out in very small scallops round the bottom, bound with grey silk and trimmed with gimp tassels and buttons of the same shade. Plain under-skirt; scarf mantle of black silk, scalloped out and bordered with a cross-strip; the lappets are loosely tied at the side, and trimmed with silk tassels, forming a fringe. Italian straw hat, bound with black velvet and ornamented with a pearl brooch and bunch of blue feathers at the side.

An elegant Watteau costume of blue silk, shot with white, consists of a round skirt without any train, just covering the ankle, and of a half-fitting casaque. The latter is very full at the back, and cut out into three large scallops edged with a narrow gathered flounce. Five similar flounces are placed round the bottom [of the skirt. There are three seams at the back of the bodice of the casaque; each seam is covered with blue gimp cord and finished off with a tassel. There are also gimp ornaments round the neck and tight sleeves.

In some costumes of the same style, for summer *fetes*, the casaque is of white tarlatan or grenadine, and trimmed with bows of coloured ribbon, over a dress of shot glacé silk or foulard. The dress is ornamented with gathered flounces or with bouillons of the same material.

Watteau paletots of black lama lace are

also frequently worn over long silk dresses, and thus complete a very elegant toilet.

Printed cambric or muslin may also be used instead of gaze de Chambéry for dresses, with fichus or mantelets to match

But the most useful of all materials for summer wear is black grenadine, and as that is also very fashionable this year, we strongly recommend it to those ladies who wish to study economy as well as elegance.

An old black silk dress will make a capital lining, or rather under-slip, for a black grenadine dress. The silk skirt should be trimmed round the bottom with a deep box-plaited flounce of grenadine. It is very much the fashion to trim a black grenadine dress with pipings of coloured silk—gold, yellow, and Sultan red are favourite tints.

For instance, a dress of black grenadine, to wear over an under-skirt such as that above described, has a rather short skirt, rounded off, and slit open at the back, piped with gold-yellow silk and edged with black silk fringe. The bodice has a pretty pelerine, open in the middle of the back, and pointed in front, wide demi-long sleeves, and basques in front. Pelerine, sleeves, and basques are trimmed with yellow silk pipings and black fringe. A sash of grenadine, piped with yellow silk, is tied round the waist: the lappets fall in the open space at the back of the skirt. The dress-skirt is slightly looped up at the sides, with short bows of grenadine piped with silk. The lappets of the sash are finished off with a fringe.

With the Louis XV. costumes the pannier jupon is indispensable. Under-skirts are things not to be overlooked in the toilet. Crinolines are transformed, not given up. The modern jupon is fully puffed out at the back and sides; this fashion is not becoming to all figures—but what fashion ever was? It gives a very graceful tournure to tall, slight ladies, and, at any rate, it suits a far greater number of figures than did the Empire dress, which rendered them all, without exception, stiff and ungainly.

Of all articles of the female toilet the bonnet is that which still leaves the most scope to fancy. Small and coquettish as they are

now, they are sometimes quite artistic in style and shape.

The following are some of the prettiest among the latest models:—

A diadem bonnet, all of white blonde, with a bandeau and aigrette of cut garnets, and a white curled ostrich feather.

Another, of straw-coloured Spanish blonde, with a garland of yellow rosebuds over a bouillon of tulle in front. On one side a bunch of rosebuds, with trailing sprays of brown metallic foliage, and a bow of straw-coloured ribbon at the back.

A baby bonnet of black crinoline, ornamented with a ruche of black lace, with a diadem of white heather blossom. Black blonde lappets are fastened with a spray of the same flowers.

A white chip bonnet, with a maize-coloured tulle scarf. A bunch of black grapes and vine-leaves is placed upon the crown of the bonnet, and continued in trailing sprays at the back. In front there is a diadem of black grapes and maize tulle.

A Watteau hat of silvery white fancy straw, trimmed with a scarf of light blue tulle and a bunch of field-flowers.

And a Louis XV. hat of black straw, with a coronet of black feathers fastened round the crown with stars of cut jet, and a bunch of roses of all colours on one side.

Several round hats are made of black lace, with jet ornaments and a bunch of green leaves or of feathers.

Black tulle and blond bonnets are also very fashionable to wear with any dress, with flowers to correspond in colour with the trimming. The shape is generally the diadem, rising high above the forehead.

A black bonnet or hat is very useful in these days, when, if *not* black or white, either hat or bonnet must be of the same colour as the dress.

The same may be said of every detail of the toilet—the boots, gloves, and parasol.

For the country or seaside, foulard parasols lined with red or blue, and cut out round the edge in rose-leaf scallops or tulip petals, or else with pinked-out ruches, are very fashionable.

THE  
COUNTRY GENTLEMAN'S MAGAZINE

AUGUST 1868.

*AMATEUR FARMING A HUNDRED YEARS AGO.*

[Concluded from our last.]



UNLESS a gentleman reduces his business to very great simplicity he will find too great a fatigue, and too constant an assiduity, requisite to render farming of considerable profit. Keeping all the people employed strictly to their bargains; overlooking the servants as to their hours of ploughing and other work; and likewise the manner everything is done in, with a variety of other articles, require an unceasing attendance. No gentleman that keeps any company, or, indeed, that amuses himself with anything besides his business, can perform it: he must employ a bailiff or land-steward, whatever be his opinion.

Respecting his management of that bailiff, a little consideration and experience will shew that business, of ever such an extent, may be thoroughly overlooked and known by a master through such first servant. It is not requisite to observe and watch him as much as he does the rest of the people; a much less degree of attention will effectually do. The gentleman should have a minute-book of work laid before him every evening, that he may know distinctly every thing his teams and men have that day been employed about. As he knows the measure of his fields, he can at any time tell if the proper quantity of work of all sorts be executed or not, and reprove his bailiff for omissions. As to the manner in which the work is performed,

it is very easy, when he rides out, to come unawares upon ploughs, to see if they go their proper depth; or upon carts, to see that they load fair; or into the hay or harvest field, to see what hours the people work, and how they perform their business. When a bailiff finds the business under him observed in this irregular manner, for which neither he or the men can be prepared, he must necessarily be spirited and alive in his attention, and keep every part of the business in good order. In case of absence, when he returns, he has recourse to the minute-book for every day's work of all kinds: a method so exact will not allow him to be deceived. When corn is thrashed, carried out, or sowed, or bought for any purpose, all is entered, so that neither mistakes nor foul play can ensue without confusion, and consequently discovery.

All money matters should go through the hands of the bailiff, who must keep an open book in the most regular manner, to which the master can have recourse at any time—a room, for instance, with each a key. This book should be balanced every Saturday night; and whenever much money is in hand, which the master must always know by the minute-book of transactions, he should order the bailiff to bring him such sums as he thinks proper, to be charged to his own account, that no temptation of consequence should



ever exist to induce the man to swerve from his fidelity. But when I say all money dealings, I except the most important. A considerable balance in the hands of a corn merchant, or a salesman, may be drawn for by the master; but it should be entered by the bailiff in the account of receipts, and immediately written off in his master's account. The reason of this is, that the bailiff may himself be convinced of the annual profit or loss, that, in case the latter happens, he may receive a proper reprimand for general conduct; and, on the contrary, in case of considerable profit, the gentleman should make him a gratuity, by way of encouragement.

This mention of accounts reminds me of the vast importance of regular accounts to a gentleman farmer. This is one of the advantages he has over the common farmer, and, I think, one of the greatest. The latter knows whether his business is, upon the whole, profitable or not, but only guesses the particulars; some articles may even be unsuccessful, without his knowing anything of the matter; and as to the aggregate of annual profit, he never knows the real amount of that.

But I have heard some people ask, What is the good of accounts? Will accounts turn a bad farm into a good one? Or will they recover losses that ignorance have occasioned? Nothing can be more mistaken than such ideas. If a farmer knows not the degree and amount of his profit or loss on every article, and by every field, it is impossible he should possess a due experience of the past, or ever be able to make it a guide to the future. Every common farmer guesses at all these particulars, and acts accordingly, which shews their ideas of the utility of the knowledge. What is experience, but knowing that certain causes have been attended with such and such effects? But what is the knowledge of effects, where a thousand are all jumbled into one account, with nothing but random guesses to form distinctions?

Various fields of wheat are managed in a very different manner. Is it not of consequence to the farmer to know exactly the product, the expenses, and the nett profit of each?

Is he not thereby a better judge of the merit of each method he uses? And will he not be able to manage future crops with more experience than if he had gained none of this knowledge? From keeping such an account of each field he knows the proportions of rent, feed, labour, wear and tear, &c., and the crop, and sees in what manner the latter answers to the former; and, by a comparison between different fields and modes of culture, is enabled to judge which is most probable, in future, to pay him best. Two fields of the same soil are cultivated exactly in the same manner, save, that one is manured at a large expense, the other not. To what degree does this manuring answer? Is the answer to this question of no importance? Where is it to be gained without exact accounts? This instance might be multiplied to ten thousand, in not one of which would experience be clear and valuable without a regular account.

It is the same with grass lands; their products of all kinds, with every sort of cattle. Twenty beasts are annually fattened that are kept the year through, and twenty milch cows are also kept: which pays the farmer the best? This is a point of no slight importance, for the difference may be very great; but is it to be known from that general account which every man carries in his head, which is nothing more than an idea? What accuracy can there be in accounts so kept?

The farmer stocks himself with two sorts of sheep, ewes, and wethers; they are both fed alike: which answers best, and to what degree? Even this plain case can be resolved with no degree of certainty, without a regular account being kept of each.

When a man turns over his books, and finds a regular balance of profit and loss on every article, he is enabled to review his business, to consider what have probably been his errors, and wherein he has been most successful. The result of such reflections is true experience, not the random notions that are carried in the memory. After some years farming, upon looking over his accounts, he finds that wheat has in general paid him very indifferently; and that, upon an ave-

rage of all sorts of treatment and seasons, barley, on the contrary, has been attended in the like variety with a considerable profit. Upon such a review he finds that his dairy of cows pay him far better than his fattening beasts; that his ewes and lambs are much more profitable than his wethers. He finds by the quantity of work performed by his horse and ox teams, and the expense of each, that the latter are more advantageous, as five to three. This knowledge is beyond all doubt the most valuable part of experience, and can no ways be gained but by regular accounts; for in what manner can such a review of one's business be otherwise made? Will any one be so absurd as to assert all, or any part accurately, can be carried from year to year—for four, five, six, or seven—in the head, and founded originally in nought but conjecture? Nor should fugitive notes and memorandums be called accounts; nothing can effect this great end but a ledger regularly kept.

In this light surely accounts may be said to be the foundation of good husbandry, and highly possible to convert a bad farmer into a good one. It is by means of them that gentlemen, in one instance, have so great an advantage over common farmers, as to balance in a good measure all the superiorities of the latter. It is by these means that gentlemen may, if they please, gain more experience in five years than a common farmer can in twenty. Many of them give into unnecessary expenses, prosecute more experiments than their fortunes will admit, and bring themselves, by degrees, and unknowingly of the amount, into a want of money. A man that keeps regular accounts may certainly do the same, but he must infallibly know how much he so expends, and be warned regularly of the danger; which are points of no slight importance.

It is, at present, a common thing to hear disputes in conversation about gentlemen's profits by farming. Some, with great earnestness, assert they make money by it; and others are as strenuous in contradicting the possibility of it. Where I hear these disputes I conclude, of course, that neither party know

anything at all of the matter, as twenty to one whether accounts are regularly kept by any of them.

It may be said that regular accounts would be too much trouble; but, on the contrary, nothing is so troublesome as irregular accounts, and, as to none at all, I never yet met with anybody that did not pretend to keep some. A very little thought would make any man perfectly acquainted with all the accounts a farmer can want. The subject is of importance enough to demand a little further consideration.

The first book to be mentioned that a gentleman farmer should open, is a Minute-Book. This should be a regular journal of all the transactions of the farm. The bailiff should keep this. The following is the form which I use:—

JUNE 21.

“Three ploughs in six acres.

\_\_\_\_\_

“A pair of harrows, ditto, covering the turnip seed.

\_\_\_\_\_

“The frosty cow calved.

\_\_\_\_\_

“The waggon to London for ashes.

JUNE 22.

“Four ploughs, half a journey in eight acres; the horses then went to—, for dung.

\_\_\_\_\_

“The black sow pigged 9.

\_\_\_\_\_

“Begun to hand-hoe the carrots in the three acres the second time.

\_\_\_\_\_

“Sold five fat beasts to the butcher the price £43.”

This will explain my meaning; there can be no transaction of any sort but what should be thus registered. I recommend the short lines between each article, to keep the bailiff from crowding his writing close together. Those kind of people will be so sparing of paper that it is difficult to read what they write.

Next comes the Cash Book, to be balanced every Saturday night. This is only for a check upon the person who keeps it, and that the disbursements and receipts may be regularly

known. If a gentleman keeps his own books it is not necessary.

The Ledger comes next, in which an account, debtor and creditor, is opened for every field, by name, in the farm; also for every article of live stock; one for wear and tear, &c., so as no money can be paid or received, no exchange of commodity made on the farm, without an account there being open for it. Two of them should be kept; one the bailiff should post the cash book into—that is, enter each article of cash expended or received in its proper account; and also to substitute for a Journal, the use of which book is too complex for a bailiff to keep.

What I mean by this, is the carrying transactions that have an amount in value, without any money being paid or received to their regular account. For instance, an account is opened in the Ledger for the six acre grass field. On one side all the expenses, and on the other the receipts for hay sold; but, instead of selling this hay, suppose it delivered from the stack to the horses, how is this to be carried to account? In regular book-keeping a merchant would enter this in his Journal, horses debtor to six acres grass for so much hay delivered, and then post the sum to both accounts in the Ledger. But the gentleman farmer turns at once to the account of horses in his Ledger, and writes on the debtor side, to six acres grass, so and so; and then, in the field account, on the creditor side, by horses, so and so.

In a word, he skips the Journal, and, at the same time that he simplifies his account, keeps them perfectly regular.

All this I suppose to be done by the bailiff; and all this is so very plain, that any ingenious fellow would form a clear idea of it in half an hour. But the master should keep the fair Ledger, in which he enters everything in the same manner as in the other; but reduces them to distinct heads. In the five Ledger they stand in confusion; many small sums of cash, and parcels of hay, corn, &c., delivered at different times; his business, therefore, is to throw them, at the end of the year, into one view, under distinct heads.

For instance, he finds a corn field account, with a great number of sums of cash, and corn sold, and some delivered at home for cattle. He consolidates all the expenses into a few totals, thus:—

		SIX ACRES.					
Debtor.	£	s.	d.	Creditor.	£	s.	d.
To cash for ex-	8	6	0	By hogs for 30			
pense of tillage				qrs. of barley			
Ditto seed . . .	3	0	0	delivered	24	0	0
Ditto rent . . .	6	0	0				
Ditto labour . .	4	0	0	Loss . . . . .	7	7	6
<i>(Exclusive of</i>							
<i>tillage)</i>							
Ditto manure . .	8	0	0				
Ditto sundry							
small articles	2	1	6				
	£31	7	6		£31	7	6

Now, the advantage of having such a view as this of every crop is immense. By looking over the particulars of the expenses he sees which run the heaviest, and knows from thence the proper channel, in the like cases for the future, for the chief expense to flow in.

At the end of every year an account must be taken of all the stock, the implements of all kinds valued and carried to the new year's account accordingly; and, as the article of wear and tear includes everything relative to implements, the annual valuation will throw into that account the decrease of value, as well as articles of new expenditure. The same observation is applicable to the accounts of horses and draught oxen, which, being valued in that manner, give the expense of horses, &c., declining in worth; an article that is never dreamed of in common; and yet the sinking of a horse's value is as much a part of the expense of tillage as the reparation of the plough. By these general methods a gentleman every year knows to a shilling the year's profit or loss, and the sum of money he has employed in agriculture.

And these numerous and very beneficial consequences are reaped at so small an expense of time and trouble, that it is amazing we do not oftener see the practice. The bailiff's share, which is much the most considerable, can never amount to half an hour in the day, if he writes a tolerable hand, and

is the least ready at accounts, and a bailiff that is not these is nothing: they are requisite to his office as the knowing wheat from barley. The master's part of the business comes but once a year, and may be a week's easy employment; but the bailiff may also do three-fourths of that—viz., the division of the expenses into distinct heads, but it must be under the gentleman's direction. Now, can any one raise a doubt of the benefit resulting from this practice not answering far more than such an expense? I think it is impossible, and that many do at present practise it, and that more will hereafter do it. . . .

I shall, in the next place, take the liberty of offering a few remarks on the employment of servants and labourers, as far as it particularly concerns a gentleman farmer, which is a point of very great importance in the general economy of a farm.

If a gentleman keeps a bailiff, servants are more profitable for all sorts of team work, except filling a cart and taking care of cattle, than labourers, because such articles require a constant number of men to be absolutely depended on; but I am in doubt about this point if no bailiff is kept to see regularly to the hours and work of these servants. I am confident they will not obey the master even tolerably, unless for a month or two, perhaps when they first enter into his service. A farmer who lives with his men, and perhaps works with them, will always be much better obeyed. This point I must own has troubled me more than once; nor could I ever manage to be totally at ease respecting it. There is no part of farming so irksome and provoking to a gentleman; he cannot take a walk or a ride without having proofs that every farmer around him has more work for his money than he has, and how to remedy it without a spirited active bailiff I know not.

Scolding and threats, and high words, either produce such impudence as no gentleman will bear—a revenge that will much injure him in cattle, crops, or some other point, or a deceitful conduct—that is, pretending to do better in the thing in question, but acting ten times worse in some other respect. For instance, you are troubled to

get your fellows to plough as much in a day as they ought; after many words you think you have gotten the day, but examine how it is ploughed, perhaps not better than scratched over.

If, on the contrary, you try what a mild, easy behaviour will do, and take no notice of trifles, you will infallibly be imposed upon in every particular, and your servants will soon learn to be impudent and despise your authority; and I have had such experience of numerous dispositions among farming men, that I will venture to assert (miracles excepted) the impossibility of this not being the case.

I have often reflected on the different methods of a gentleman's managing his farming servants when his farm is too small to afford a bailiff; and I must own I could never fix on any conduct that was exempt from great objections. One management is to give the head man so much per annum wages above the price of the country, and above what he agrees to take, that he may be under some fear of losing his place; while a gentleman pays no more wages than a common farmer he has not a sufficient tie upon his men. But such extra wages he must not be suffered to consider in the style of making him anything verging towards a bailiff, in slackening his work; he must, on the contrary, be told, on hiring, that his extra wages are given him for absolute and implicit obedience.

Let us suppose a dialogue between the master and man upon this point of hiring. My readers will excuse me dwelling on these minutiae of a gentleman's management; those who experience them will either not call them trifles or allow that trifles are of very great importance.

*Master*—You say you can plough, sow, mow, make a stack, and understand cattle?

*Man*—Yes: I won't turn my back on any man for that work.

*Master*—And that ten guineas are the lowest wages you will take?

*Man*—I can take no less. I can have it anywhere.



*Master*—Very well; you shall have ten guineas; but if you consent to obey me in the most exact manner, without ever talking about customs, or what not, you shall have twelve guineas a-year.

*Man*—Oh, yes, sir, I'll obey you; certainly will, sir.

*Master*—Suppose I order you to plough your land by moonlight?

*Man* (*hums and haws*)—Can't say, sir. I ne'er did work of that sort.

*Master*—Nor should I choose to have my land ploughed in that manner; but if I give an order for my men, horses, and ploughs to go immediately to work, at twelve o'clock of a night, as dark as pitch, I would be obeyed without the least pause or hesitation. You understand me; all I mean is this, whatever I order must be done without any reply, no talking of customs. What quantity of land do you generally plough a day?

*Man*—An acre.

*Master*—But my horses oftener plough me five roods. At feed time always an acre and a-half. But if I give the order for two acres you must execute it well and without hesitation.

*Man*—But how am I to take care of my horses after ploughing two acres?

*Master*—No matter if the horses are not taken care of at all; that is my concern, not yours. You see the conditions of my service. I would not have you engage with me unless you are absolutely certain you can submit to unlimited orders.

Not a man perhaps in five would venture to engage; and of those who do, many would think of the two guineas more than the equivalent they were to give for it. But I do not mean that the gentleman should ever order double the custom of the country. He should fix his eye on one acre for instance, but frighten the fellows by talking of much more; but they should every now and then receive orders as a test of their obedience, an acre and a half a day, an acre and a quarter, &c., and a sharp eye kept on the manner in which it is performed. Something beneficial I believe might be done upon this principle; but, undoubtedly, the extra

wages would be, with some servants, in a good measure wasted. The loss, however, is too trifling not to be worth some years of trial; for two or three guineas a year is no consideration compared with the difference of five or six horses performing a fair year's work, or but an indifferent one. If ploughing, for instance, be calculated at four shillings per acre, the difference of a rood a day is two shillings in two ploughs, or thirty-six pounds a year, besides the profit upon it, and the chances in favour of catching seasons; and although the team is not employed always about ploughing or harrowing, yet in all works the difference is the same, and very great the amount. If forty shillings or three pounds can be spent, so as to gain fifty pounds, it certainly is sufficient inducement to try—or even five-and-twenty.

Another method I have thought of, is to employ none but labourers, and have no kind of work but what is done by the piece. In Suffolk there is scarcely a species of employment that is not reduced to a common price. In this way the gentleman should draw up a list of every kind of work, and the prices he will give for each article, which should be, if anything, a little above the standard. This paper should be pasted up in the room where the labourers victual, or in some other common place, where it may be at any time seen. These prices should be accurate, and, in case of work not common, well considered, for they should be never varied on any pretence whatever. All work that employed the teams should have this proviso, that the oxen should be fed, and the horses fed and cleaned into the bargain.

If any work occurred in which it was found that a price could not be fixed, in proportion to the manner in which it should be performed, the gentleman, if he did not approve the offers of the men, should hire others occasionally to do such work.

This method has many very great advantages, and some disadvantages: of the latter, the principal would be the necessity of watching all their operations with a very strict eye, to see that *well* doing was never sacrificed to quick doing. Among the benefits may be

reckoned the certainty of the teams paying well for the expense of keeping them; and I must remark that this is a principal object in husbandry; for as matters are commonly managed by servants, the horses of a farm eat up three-fourths of the produce. In the way which I now propose there would be no fear of having them idle; they would be always employed, and every day's work would be a good one; a rood at least, and half an acre many times, they would regularly plough more than any gentleman's horses in the country. But in this management they should in reason have a greater allowance of oats than common.

In dubious seasons, particularly seed times, the advantages of this conduct would be immense, for every kind of work would be carried on as fast as the master himself could wish, which is never the case, by many—many degrees in other systems. It is impossible, upon the whole, to determine which method would be most suitable in all places, for in some the first would be preferable, and in others the latter. The greatest difficulty with the labourers would be in places where very few parts of country business are reduced by common practice to a price by the piece.

But whatever method of conducting the labour of a gentleman's farm was pursued, there are several means of smoothing difficulties, and introducing order and regularity into employments of all sorts: and these are applicable to both large and small farms, though more so to the former.

Among other particulars of this sort I should advise a gentleman to have all his working hands rung out and home by a bell. A large bell should be fixed on the top of one of the buildings, which should ring up the men of a morning, and out a second time with their horses harnessed, themselves mounted (the sacks of seeds, if sowing time, ready), for the call to march forth to work. Whenever a field was finished ploughing, all ploughs, harrows, &c., should be brought home; and when a new one was began, the ploughs, &c., should also be on the sledges ready with the men and horses to follow,

wherever the bailiff leads them. If tillage is not the work, or only part of it, the other teams should always be under the same management; they should be in the waggons, carts, &c., ready to start with the rest. All that were not in order for the call should be reprimanded, and a minute made of it in the bailiff's pocket-book (one kept for that purpose).

At a proper time, for instance, after eight or nine hours' work, the bell should be regularly rung again, to call them home from the fields; and no team suffered to come home on any pretence whatever till the bell be rung, nor for any weather, because if that required them to come home, the bell should be rung accordingly. Some works will admit of a variation in this respect, in which case a boy should be sent to such teams; but none ever suffered to leave work without a direct order, either by bell or otherwise. In case of any failing in this part of their duty, a minute, as before, to be made of it. About half-an-hour after, the bell should ring again for dinner, and in an exact hour it should ring them out *from* dinner.

In a considerable business it would much favour the general design of this regularity if each team had a separate set of implements assigned to it. For instance, each stable to hold four or six horses, and each to have a shed adjoining for a waggon, two or three carts, three ploughs, and two pair of harrows. This would occasion no extra expense of implements, for they ought undoubtedly to be in such plenty, that all the teams may at any time be thrown to one sort of work: if this is not the case, business will suffer often.

Once every quarter of a year the day's work should be half abridged, to have a general review; but none of the men should know of this day before the ringing of the bell which called them home so much before their time. As soon as arrived, an order should be given to bring forth each set—his implements, their horses harnessed, their oxen yoked, their spades, shovels, forks, &c., all numbered to the number of the team. All of them called for by a catalogue, and examined; deficiencies noted in the *black* book: the

same with every thing out of order, or that carried any marks of carelessness. The cattle attentively examined, to see that none were lame, that they were in good health, and that they looked well fed and cleaned, and, in all respects, as they ought. In the whole examination, everything good and bad should be minuted, and carried to each man's account, in the same manner as before mentioned, respecting the work. When the whole was finished, the gentleman should come out on horseback, with some little parade (and attended by any company that he might have with him), to make the occasion something solemn in the eyes of the people.

He should draw up in front of the line of the teams, and call on the bailiff to read over the account, beginning with *Team, No. 1*. As soon as every account was finished, he should give a little harrangue (with much solemnity in accent and manner) of praise or condemnation, according to the merits of the case; and, if the former, order them a proper reward. For which purpose certain things should be ready—suppose a parcel of new clothes of all sorts, to be divided with a small sum of money to each man.

If, on the contrary, a man has been found faulty, he should be reprimanded; and the great difference pointed out between a faithful servant who meets with his master's praise and rewards, and an idle or a careless one that receives his displeasure.

In case the account of any of them has been very *black*, and that for more reviews than one, he should order him to be discharged on the spot, with marks of disgrace.

To the first man of that *number*, which upon the last four annual reviews has most merit upon the whole, the most valuable reward should be given, with some durable testimony, with his name engraven on it, and the occasion. Some piece of household furniture, or anything better that could be contrived; and wherever particular merit was found an advance of wages should commence.

Some may think this a system of trifling; but from observations I have in every respect

made on the temper of these people, I have reason to be confident the effect would be very great. It would be absurd to practise it in a small business: but when from fifteen and twenty to a hundred servants are kept, it would give such an air of novelty and liveliness to the business that the fellows (some few excepted) would themselves like it not a little. And the assigning implements to each team, and making the men answerable for their being always in good order, and the harness, &c., the same, would keep all these matters in thorough repair; whereas, in the common course of business, work of importance frequently stands still, that something or other may be mended; a defect not discovered till just the moment the thing is wanted.

With respect to the horses, the benefit of it would be of very great consequence; for the men would have a great inducement to use them well, to be careful of laming them, to keep clean and free from all distempers that arise from neglect. A master that thinks such a point not of importance knows but little of business.

This conduct would have a vastly greater effect than all the hard words and scolding that could be given from one seven years' end to another. Country fellows are so accustomed to this sort of correction that they are absolutely hardened to it. To be obeyed, some method must always be pursued that is new to them. Even the conduct I propose would presently grow a matter of custom, and be unheeded, were it not for the rewards and punishments, the variety and substance of which would ever keep up the attention of the men; for a handsome present, and a rise of wages, are such striking affairs in their eyes that they would never be brought to disrelish the institution.

Suppose a gentleman, who carries on a very considerable business, expended in this manner twenty, or thirty pounds a year. A single man costs him above twenty pounds, and can he suppose that the difference between the ready obedience, the uncommon regularity thrown into every thing, the great quantity of extraordinary work performed, the



unusual order all his implements, harness, &c., are kept in, the security of his draught cattle from abuse, and in being thoroughly taken care of; can he think that the difference between these and many other articles and common management, are not of more importance than the work of one man? May I not say (in a considerable business) than that of five?

Another economical point in a gentleman's management, which I take to be of much consequence, is to convert the product of his farm into as few articles of sale as he can, consistent with his profit.

A bailiff has a greater opportunity of being a knave in buying and selling than in any other part of the business, for which reason that part of his employment should be contracted as much as possible. And if no bailiff is employed, a gentleman will find it a disagreeable part of his business; and, consequently, the same reason for reducing it to as small a compass as possible.

Wheat cannot be consumed upon the farm, nor converted into anything else; for this reason it must be sold as other farmers do: not, however, in dribs of twenty sacks at a time, to have twenty or thirty markets to go to, and as many bargains to make; but all laid up in a granary, and as soon as the whole crop is thrashed, sold by *one* sample and in *one* parcel, which conduct would reduce the trouble of a gentleman's feeling it himself, whether he had or had not a bailiff, to a mere trifle. It would likewise be of some consequence in the price; for wheat sells, in general, better during the summer than the winter. One cannot move one's length in matters of farming without finding something or other that requires money in plenty. The conduct now in question is, undoubtedly, very beneficial; but, if the gentleman did not at first appropriate a sufficient sum of money to the purpose of husbandry, he will find himself too much cramped for want of it, to be able even to sell his corn when most suitable. Nothing can go on as it ought if a farmer is ever for a single hour in want of a hundred pounds.

Of oats no more should be sown than wanted for the horses.

Barley, peas, and beans should all be

appropriated to fattening hogs, which (manure considered) will pay better than selling them at market, all expenses of carriage, &c., taken into the account, besides the circumstances of trouble, and taking the sale out of the bailiff's hands.

Potatoes should be applied to the same use.

Carrots may either be given to the hogs, or to any other sort of cattle.

Natural and artificial grasses, green and in hay, cabbages, turnips, &c., are all convertible into beef and mutton. A dairy is much more complex; but if it proves more profitable than other cattle, convenience must in that, and other circumstances, give way to profit.

There are two methods of selling cattle; both are attended with little trouble, nor is the bailiff trusted in either. One is by sending them up to London for sale by the salesman; the other, by advertising an auction twice a year; one about the middle or the latter end of April, for all sorts of beasts that have been fattened in the winter, hogs included. The other in autumn for such as have been summer-fatted.

There are many situations in which it is not profitable to send to London, and others in which it is particularly so; one of these methods will suit every part of the kingdom. In case of the latter, in a few years many butchers, &c., would depend on the auction, and regularly account on purchasing at it. But, at all events, a gentleman should absolutely reject the low dirty way of making twenty or thirty different bargains with country butchers: an odious work for himself, and the greatest source of villany, when in the hands of a servant, that can be invented. The advantages of selling by auction are so many, that they will more than balance a lower price than separate bargains would gain, for that leaves no bad debts, the money is all paid at once: there are no expenses of driving, nor falling off in flesh by it; and all sorts of commodities are sold, good, bad, and indifferent.

If cows are not kept for a dairy, all the products of a farm may be reduced to—1, wheat; and 2, cattle: all the first sold in one



bargain, and the second carried all to two accounts—a salesman for hogs, and another for sheep and beasts, or sold at two auctions; by which method the gentleman's trouble is reduced almost to nothing, whether he has or has not a bailiff. A simplicity in business is valuable of itself: for when products are of such a great variety that they cannot be united in sale, some trifling matter is for ever calling for that attention which should be employed on matters of importance.

Another point of some consequence in a gentleman's economical management is *house-keeping*, so far as it concerns the farm. Except in the greatest houses, where different tables are spread for different ranks of servants, all live in the same manner; and no gentleman should imagine that farming will answer while the people that carry it on are fed in the same manner as family servants. This is another of those points which, at first sight, may by some be thought trivial, but is really of importance. When only one or two men are kept, the grievance is not worth noting (although the loss, it should ever be remembered, in most points is proportioned to the farm), but when many are employed the case is very different.

In large farms, that employ from four or five servants, and upwards, it is certainly advisable to have a house kept separately for them; any distinct office for a kitchen, with chambers of rooms annexed, in which they may all be lodged and fed, under the directions of the bailiff, with no intercourse of any kind allowed between the family and them. Whoever keeps many men will find something of this management highly requisite. There is no slight satisfaction in knowing exactly what everything costs one, and particularly so in farming, in which it is absolutely requisite, for the sake of clear and exact accounts; but such cannot be effected if a family and farming men are mixed together: for in what manner can their board be calculated with tolerable accuracy?

I shall conclude this sketch with a few remarks on the necessity of gentlemen conducting their agriculture with spirit, if they would have it profitable, or if they would

even have it truly amusing. Let them manage in what manner they please, yet common farmers, who are not above working themselves, will, in numerous cases, have the advantage; it should, therefore, be the gentleman's business to balance that advantage by others, which it is not probable the farmer should command.

He ought, above all other points, so to proportion his land to his money, that he may never be disabled from practising, in all cases, what he has reason to think is right.

He should adopt the culture of such profitable vegetables as are not common in husbandry, if his soil is proper for them, which can scarcely be doubted.

Respecting all tillage crops, he ought to lay it down as a universal rule, that none should ever be sown or planted if the soil is not in *excellent* order to receive them, that he may ensure, as far as it is possible, good crops. He ought, at all events, to determine to keep constantly a great stock of cattle, in proportion to his farm, as a sure fund of profit both in themselves and in the article of manuring. He should adopt some particular system of conduct relative to labour and a bailiff, that may obviate the great evils commonly resulting from gentlemen's management in that point. He should, on many accounts, reduce the products of his farm to as few articles of sale as possible.

These points, it should be observed, are very applicable even to gentlemen who farm chiefly for amusement; for if a farm be merely an experimental one, yet it is highly expedient to banish all confusion, for I know of no diversion that arises merely from a want of order. And let a man's fortune be ever so considerable, a certain degree of economy is necessary, even in pleasure. If a gentleman, without any attention of this sort, can try a hundred experiments annually, by means of a certain sum he appropriates to agriculture, *with* proper management, that hundred may be doubled or trebled, and no extraordinary expense incurred; and these, I think, are matters well worth the attention of those who practise husbandry, whatever be their motive.

## The Country House.

### HOW TO BUILD DRY HOUSES.

CHRISTOPHER NORTH, in one of his admirable essays, proposes to give any one a complete set of his works if he can satisfactorily answer the question of "What is damp?" He evidently considers it a poser, and is clearly driven to think it so, not only from the queer vagaries it displays when it attacks houses, and from the difficulties which he so graphically describes of ever getting rid of it when once it gets possession of any part of one. There can be no doubt of this, that damp houses are met with in such numbers now-a-days as to suggest an inquiry as to how this should be; and, further, if there is any means by which houses can be built not to be damp; for although it is now the fashion with some to dispute the truth of a sanitary proposition—namely, that the emanations of drains, cesspools, and the like, or to use for these the more forcible if not so elegant a term, "stinks," are not unhealthy—about which much, by the way, might be said—there is certainly no attempts made to maintain that dampness in a house exercises an indifferent or no unhealthy influence on the health of its inhabitants. The truth is indeed indisputable that damp is a fertile source of disease, not the less dangerous because it is insidious and secret in its operations, often causing diseases which too frequently baffle the best skill of the physician. For our part, we have had evidence abundant enough that dampness in a house is about as bad a thing as can well be connected with it, and not a whit behind the active evils of more obvious if not less potent causes of disease. A few notes then will be of service in connexion with the subject of prevention of damp in houses, for with the best practical authorities we hold that there is no cure—no effectual cure—for it when once it gains possession of a house.

To know how to prevent an evil we must first know what are the causes which bring about that evil. In answer, then, to the question, What are the causes of dampness in the walls of a house? Of all these, we have no hesitation in giving the first rank in potency of evil to the undrained—in too many cases super-saturated—soil upon which the house is built. In heavy retentive clays we hold it an essential thing to be done, then, to thoroughly drain the site of the house, and the more extended the area of this drainage around the house the better. This drainage, it is needless to say, is conducted upon the same principle as that upon which the farm drainage of fields is carried out, only that the distance between the drains is less and their depth greater than in field drainage. The depth is greater, because the foundations have to be cleared from damp, and these, especially in the case of cellars being provided to the houses, are a considerable distance below the ordinary level. Site drainage is, therefore, expensive, yet not so much after all, as may be seen from the following statements—that (1) to drain an acre of light soil, the cost is equivalent to a rent or annual charge of 18s. 3d., this rate extending only, however, over twenty years; (2) of an acre in medium soil, a rent or drainage rate of 21s. is added, and this, as before, extending over twenty years; (3) for heavy soils, the rent for an acre over twenty years is 26s. These estimates are for a single house on an acre of land, a large extent of land, for an ordinary residence. If farm-houses are built upon one acre, the annual rate is correspondingly lessened, as thus—(see above)—class of soil marked (1), 10s. 8d.; (2), 12s. 3d.; (3), 14s. 11½d.

It is not, however, sufficient to drain the site of a house; it is necessary that other

expedients be adopted to prevent damp from attacking walls. The modes in which it does attack them are two. First, rising from the ground and proceeding up the walls in a vertical direction; second, proceeding through the thickness of the wall in a horizontal direction, this arising from the action of long-continued battering rainy winds on the outside of walls. To prevent the operation of the first cause a good foundation is primarily essential. Where any doubt exists on the subject, we would by

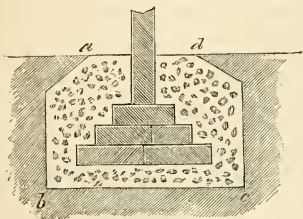


Fig. 1.

all means advise the use of concrete—the thicker the layer the better—in the trenches. Where efficiency, not economy, is thought of—the distinction between these terms is too often lost sight of in building—the more completely the “footings,” as the lower courses of walls are termed, are surrounded by and rest upon concrete the better; as thus, in which *a d* (fig. 1) represents the trench filled

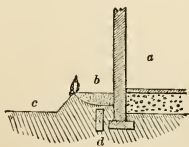


Fig. 2.

with concrete. A word here, by the way, may be permitted upon the use of concrete in foundations, especially in unstable soils. Do not make the lower layer too thin. We have known walls made to rest upon a 6-inch layer of concrete, with what result as adding to the stability of a wall may be guessed. The expense such as it was, might almost as well have been saved, and no concrete used. The thickness will of course depend upon the

height of the walls and condition of the soil, yet in ordinary cases it may be said that 12 inches are much more like the thing than 6 inches. In fig. 2 we give an illustration of a mode of making foundations of cottages, recommended by an eminent authority: Where *a* is the pavement of the floor of the room, resting upon broken stones or concrete; *b*, the broad gravelled walk before the door along the front of wall; *c*, the surface of the road; and *d*, the drain to carry off the water which may fall upon and percolate through the soil of the walk. This plan we think good; but one objection which it possesses we must point out as being one which is too often a characteristic of ordinary plans—that is, the nearness of the floor-level to the ground-level. We maintain—and no small observation has in all cases tended to quicken our belief in the fact—that no house-floor on the ground-floor can be thoroughly dry unless it is

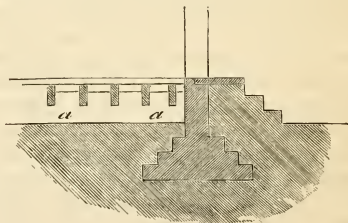


Fig. 3.

raised some inches above the ground-level, and a space left, as *a a*, fig. 3, between the flooring-boards and the ground or soil. Every ground-floor should therefore be approached by a flight of three or four steps. We have no hesitation whatever in saying that a most prolific source of damp in houses in the practice of making the floor on a level, or nearly on a level, with the ground level, or what is worse, below it—a monstrosity in house-building which it is scarcely possible to conceive of, were it not that it has its exemplars in not a few districts of our country.

Another of the expedients in use to prevent damp rising vertically up walls, is to have just above or at the ground-level a course of “slate,” or “sheet lead,” or “gas tar and sand mixed,” the object of all of them being

to arrest the upward course of damp, but which object these contrivances do not seem always to effect, judging from the failures we see around us. Of this class of preventives we know of none equal in thorough efficacy to the "damp-preventing bricks" of Mr Taylor of London. These are illustrated in

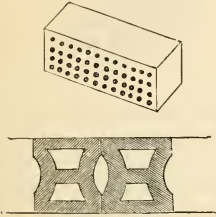


Fig. 4.

fig. 4, and being placed at or near the ground-level, the upper courses rest upon them, and are almost completely isolated from the lower courses; so much so, that daylight may be seen through them. One great advantage of this method is, that a thorough ventilation of the timbers of the floor is secured.

We now glance for a brief space at the means adopted to prevent the rain which may be dashed upon the outside of a wall from penetrating to the inside through the thickness of a wall. The most generally adopted method is to cover the wall thus exposed to a weather course of slates, or to paint it with

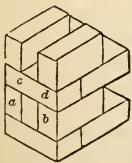


Fig. 4a.

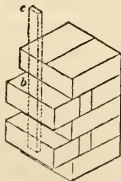


Fig. 5.

a composition of gas-tar and sand. Both of these are unsightly, and the first is costly. Other means have of late been introduced, and first amongst these is the plan of building *hollow walls*. The walls may be made hollow either by, first, so disposing of the bricks themselves as to form a hollow space or interval in its thickness; or, secondly, by having the bricks themselves hollow. Of the

first of these two classes we give illustrations in fig. 4a of a 9-inch wall, in fig. 5 of an 11-inch, and in fig. 6 of a 14-inch wall. In fig. 5 the reader will notice that by the simple plan of inserting studs or wood bricks here and there, and nailing vertical battens to these, the advantage of a double hollow wall may be obtained. Of the second class—*i.e.*, bricks hollow in themselves—we give in figs.

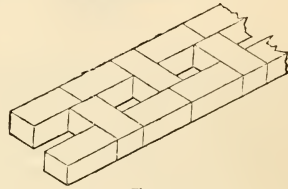
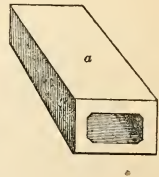


Fig. 6.

7, 8, 9, 10, and 11, illustrations of various forms. The forms in figs. 7 and 11 are "par-



Fig. 7.



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titution" bricks. Walls may be lined inside with hollow bricks to prevent the passing of damp through to the room; for this purpose the form in fig. 11 has been used.

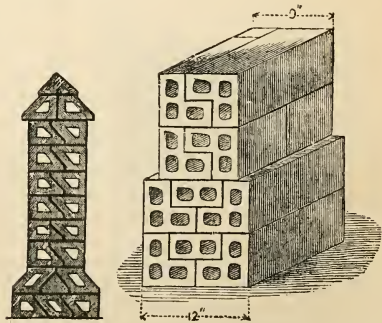


Fig. 8.

Another, and a recently introduced mode to secure a perfectly dry wall, is to build it in a way quite different from any of the modes



hitherto used. The best of these which have been introduced is Taylor's patent faced concrete walls, illustrated in fig. 12, in which *aa* is the body of the wall in concrete, and *bb* the facing bricks or tiles; fig. 13 is a view of a single brick. We may here remark that we

the mortar, so as to keep it from freezing, and enable them to go on with the building. This should be carefully looked after. We know of one house, in every other respect admirably built, but which is hopelessly ruined by the dampness of the walls, brought

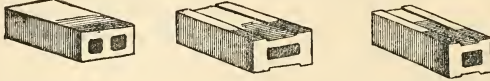


Fig. 9.

believe a good many of the difficulties attendant upon the building of cottages of the labouring classes, arising chiefly from the cost of the ordinary modes of erecting them, will be got rid of by the adoption of new plans of construction, of which this of Taylor's may be taken as a type. Under the title of "How

about by the bricklayers having used salt in the way above referred to. We consider the practice so disgracefully reprehensible that it should almost be treated as a criminal offence. Another cause of damp walls is the use of sand in mortar taken from the sea-shore, from the banks of tidal rivers, or from localities which have been at one time sea-margins.

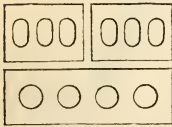


Fig. 10.

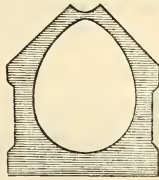


Fig. 11.

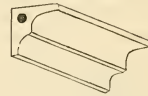


Fig. 13.

to Build Cheap Cottages," we propose giving a *resumé* of what has already been, and is yet likely to be done, in this direction.

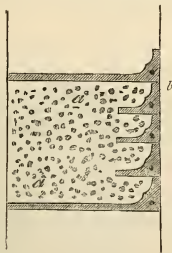


Fig. 12.

In concluding our Note, as to how to prevent damp in walls, we must draw special attention to the danger arising from the use of salt in building. Many are not aware of the pernicious extent to which this practice is carried in practice. During hard frosts the bricklayers are in the habit of putting salt in

The use of such sand should in all cases be strictly prohibited, and a clause inserted in the specification to this effect. Some architects, indeed, are so careful in this respect, that even where clear, sharp river or inland sand is used, they specify that it shall be washed, to free it from any saline substances with which it may be mixed. Again, in the localities immediately bordering upon the sea, builders are sorely tempted to use sea-shore stones. This should never be done, as a house in which they are used will always be more or less damp. Indeed, wherever salt is present, either in the mortar or in the stones, the walls will form excellent hygrometers, for the approach of wet weather will always be heralded by the damp exuding from their surface. We have now, we believe, drawn attention to the chief, if not the whole of the causes of damp walls in houses; and have endeavoured to point out how these causes may be avoided.

## The Farm.

### HARVESTING OF GRAIN CROPS.

SHOULD the warm sunny days we have for so long a period enjoyed, and the rainless nights continue till the time when the crops are ready to be harvested, that harvesting will be a comparatively easy task. And, as has pretty often been said during the hay-making season of the present year, in view of the little labour demanded of the husbandman in making the hay, that "it has almost made itself;" so, under such circumstances as supposed above, will it be said of the corn crops, they will almost harvest themselves. But it is well to remember that "there is many a slip between the cup and the lip," a proverb peculiarly applicable to our climate, which in its normal condition—if we may use the term—is characterised much more by its tendency to change than its tendency to maintain for a great length of time the same peculiarities. Pleasant, then, as the weather has been of late, with its sunny skies and its warm breezes, we may see it changed, and so completely changed that we may have cloudy skies and blustering blasts, and the pelting of a pitiless rain. All this may not happen, but it may; and it is the province of the wise man to consider the chances of loss and risk, as it is his prudence to prepare and provide for them. A few notes, therefore, on harvesting, having special reference to the difficulties cast in the way of quickly and economically performing it in bad weather, will not, may not be out of place. We can easily go back in memory to the difficulties of harvesting in the year 1860, and the lessons of the disasters of one season are not thrown away upon us, if they urge us to prepare for those of another, which *may* be in store for us. Who can say but that much of the harvesting time of this year may be characterised by precisely the

same features which made the year named above so miserably memorable. The very fact, indeed, of the weather having been for so long a period fine, makes it just the more probable that a change will be coming upon us in the contrary fashion.

The cutting of corn—whether done by machine or by hand—in fine weather, which has not been previously battered down by heavy rains and winds, is an easy matter—literally the labourer *goes in and wins*, a true statement, although a bad pun. But the case is altogether different in a thoroughly bad season, as our readers well know who have had practical experience as to what a field of corn then is. Twisted and torn, lying in all directions from which the wind can blow—some portions standing erect, some prostrated completely, some partially so, some lying at one angle, some at another, some parts as flat as if rolled, and all preserving a position or condition the very antipodes of what a fine standing field of corn really is, or as the farmer wishes it to be. It is not easy to go in to cut it, and cut it so that the standard in the art of cutting to perfection may be easily reached; this standard pointing to a condition in which the cut corn lies in regular swathes, with heads all lying in one direction, and with the straw unbroken. Indeed, in such a field as we have described above, it is difficult at first for the farmer to know how and where to begin; he must, at least, give up all hope of having his corn cut so as to be in regular swathe, and must content himself with having to cut as best he can, finding, as he will find upon him, the necessity to allow his men to cut according to circumstances, these circumstances being such that they will not be able

to follow out any regular swathe, but will be compelled to change the direction of the swathe as the direction of the lying corn changes. Hence, a field, in the condition above described when cut, will present the appearance of having been laid out in patches, each patch or many of the patches lying in a different direction from another or that of others. If with such a condition of the field a straightforward cutting is attempted, the ground may be got over quickly, but the corn will be laid in such a variety of directions, and in consequence in such a tangled state that all the subsequent operations will be greatly retarded. In the laid or lodged condition of corn, which is met with after and during wet and windy weather, the straw is very apt to be broken, and if not actually so by the wind, very liable to be so by the operation of cutting, especially if this be done when the straw is wet. Now, this breaking of the straw is carefully to be avoided—if it can be by care avoided, for it may be broken by natural causes, and then no blame can be attached to any one—for broken straw can never be well put straight on the sheaf, or stand up well in the field. The breaking of the straw may be greatly avoided by cutting short and narrow swathes, sweeping the corn cut, rather towards the mower than in the usual direction of a full and broad swathe.

Slow as this narrow and short swathing may appear to be, it is in reality the quickest way to cut a field in the condition we have named above; the quickest way because it best helps forward the putting up of the corn into sheaf, which is the ultimate result in view, so far as the field operations are concerned. A badly laid field of corn can never be cut so quickly, or in the same proportion as quickly, as a fair standing field, because, as named above, the direction of the cutting has to be changed so frequently, and it is only by going "in and out, and round about," that the mower can succeed in cutting the corn so as to lay it as much as it may be possible to lay it in the straight condition necessary to enable the sheaf to be properly made. All this careful work on the part of the mower requires careful supervision on the part of the master. In this case a master's eyes are worth a hundred pairs of hands. In bad weather, if he wishes his corn well got in, he must not grudge the personal care and attendance necessary to ensure its being so got in. The *well directed* efforts of men go infinitely further in the prosecution of any work than when they are allowed to go on at their own will and guided by their own notions, which are not always, indeed, we might say rarely, well founded as to what is to be done, and how it is to be done.

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### MEADOWS AND HAYMAKING.

(Concluded from page 38.)

ON the supposition that the hay is well and quickly made, and got up into great cocks in excellent condition—a state of matters which we hope all our readers will realize in their practice this season—the next point to be considered is the storing of it, as to which a few remarks may here be offered.

As soon as any farm produce is ready for storing the sooner it is stored the better. This is a plain way of putting a common-sense rule of practice. Judged by this rule,

the methods adopted in England generally will be found to be the best, that in Scotland the worst; for in the latter country, too frequently is it the case that in place of being at once carted away from the field, as soon as it is in good condition to be stored, it is allowed to stand in large cocks for weeks exposed to all the atmospheric influences which so rapidly deteriorate it. Multiply the outside surface of the hay exposed in each cock, not only to the action of the sun and rain, but to that of the damp ground upon

which each cock rests, by the number of cocks in the field, and some notion will be obtained of the loss sustained by this bad mode of procedure. Let it then be accepted as an axiom in haymaking, as in other departments of farming it is accepted, that the moment when the produce is ready for storing, that that is the time when the storing should be proceeded with. Hay is differently stored from corn, and may either be put up in the barn completely under cover, and enclosed on all sides, or put up into stack in the rick-yard. But in either case the operation of putting up hay requires to be done with great care. If it is to be stacked, the site of the stack must be prepared specially with a view to prevent damp getting into the body of the hay. The mode usually adopted to prevent damp is by placing on the ground a number of pieces of wood, poles of trees, &c., filling up the interstices with brushwood, &c. Stones may enclose the space upon which the stack is to stand, and the space within the stone enclosure filled up with smaller stones—or the usual form of corn stack stathels may be used. In the case of either of the two first-named methods being adopted, it will be advisable to cut a trench all round the space of the stack, so as to prevent the water from the surrounding soil draining to the stack; hence also comes this other recommendation, that the site of the stack should be raised so as to be considerably higher than the surrounding soil, so as to drain from rather than to it—although this will in some measure be effected by the raised bottom of timber or stones.

The best shape for a hay stack is that of the parallelogram, in which the length is greater than the breadth; its contents can be thus easily measured, and the less breadth which it possesses as compared with its length prevents the chance of the contents getting over-heated.

In depositing the hay in one stack, care should be taken to have each layer, so to say, placed as lightly and evenly as possible. As each portion is taken from the cart, an attendant should be ready to receive, take it up, and shake it loose so as to get rid of all knots and lumps, dispersing it

lightly over the surface, taking care to keep the middle higher than the sides and ends; and to keep these latter well bound, so as to have the mass well secured together. As the storing progresses, the hay projecting from the sides should be carefully pulled out so as to make the outside faces neat and trim. Much of the fine form of the hay-rick, which one meets with on a well-conducted farm, depends upon the care with which this external trimming is done. Little need here be said as to the thatching of the stack save this, that the same care which is given to the formation of the stack in other parts should be given in this. Nothing looks worse in a rick-yard than stacks finished in a careless, slovenly manner. When the hay is stored up in a stack in the open air, the operation of stacking will be much facilitated by using the rick cover, a cloth extended between two poles, or by having—as is often the case in England—a permanent roof supported by four standards at the corners, up and down which the roof slides, so that it can be adjusted at any desired height. With the use of either one or other of these contrivances the operation of stacking is much facilitated; and the uniform condition in which it is stacked, secured by the facility given to store the hay, as it gets ready for the stack, by avoiding the necessity of keeping that which is first ready in the field till the last cut is ready also.

To prevent the contents of the stack over-heating and getting scorched, special contrivances are often adopted by which a supply of air is carried to the centre of the stacks, and the heated air withdrawn from the same place, thus securing a certain degree of ventilation throughout the whole mass. Some do not approve of these appliances, inasmuch as they conceive that while carrying off the heated air from the interior of the stack, they also carry *into it* the damp condition of the exterior atmosphere, so that they believe it the better way not to stack till the hay is in that good condition in which it will not get overheated. But this, in our uncertain climate, cannot be always—shall we say is only now and then secured—so that, after all,



there remains so much to be said in favour of special arrangements for ventilating hay-stacks. These may consist of the ordinary form of corn-stack bosses, or of some special contrivance, such as the ventilating tube of Marshall, as made by Garrett & Co. of Saxandham, Suffolk.

It is here worthy of note, however, when on the subject of the heating of hay in stack, that the slight degree of heating, which arises from the sap or moisture contained or left naturally in the hay, is not to be feared; it is, indeed, on the contrary, perhaps, to be desired, as bringing about that chemical action in parts of the fibre which will make it more nutritious—at all events, more “tasty,” to use a common but expressive term—to the animals which partake of it. It often happens that in adverse seasons the hay is got—and can even with the greatest care only be got—in that unsound condition, that if not to restore it to that sound condition so much to be desired, at all events to bring back or give to it some of the palatable conditions of sound hay, salt is strewed over the hay as it is placed in layers in the stack. The salting is not approved of by some, but if not overdone we believe that it is beneficial; certainly all farm stock are particularly fond of salt in their food, which, indeed, in our opinion, should always contain it. On the other

hand, the fact should not be overlooked, that salt is remarkably liable to atmospheric influences, and takes up moisture very rapidly, so that if salt, at all events too much of it, is placed in the stack, and especially if ventilating appliances be used, the moisture which the salt, so to say, attracts will bring about the very condition of the hay which it is so desirous to avoid, and to amend which, in some measure, the salt is primarily added. Hence, in the practice of some, it is considered the soundest way to put up the hay in the stack in the best condition possible, leaving such condimental additions to be made to it as may be desired at the time when it is given to the animals. But the question of what should be those condimental substances, and what are their effects upon the animals partaking of them, is by far too important a matter to be discussed at the end of a paper like the present, which after all is only indirectly connected with it, and which, therefore, for the present we put aside, to be taken up and discussed in a more appropriate paper, and at a more convenient period. There is much to be said on the subject, and, as the result of some little practical observation, we may perhaps be able to say something which has not been said before, or, if already said, worthy of being said again.

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#### *RAPE AS A SUBSTITUTE FOR THE TURNIP CROP.*

**I**T is now absolutely certain that even should we have soon a sufficient fall of rain to moisten the parched ground thoroughly, the turnip seed, which is as yet lying dormant, will do little towards producing a crop equal to the demands made upon it. At present, the appearance of the turnip fields is extremely irregular. In some cases the plants look wonderfully well; in others the seed has not started equally, and the plants have come up in patches; while in what we fear is the majority of instances, the fields present the same appearance which they did when the

seed was sown, scarcely the vestige of a turnip plant being discernible. Even those fields which have hitherto been the most promising, must speedily suffer should drought continue, as the plants will become mildewed, and stop in their growth from lack of moisture. With many it has become, therefore, a serious question, what is to be done to provide keep during winter and early spring for the stock which must be retained on their farms. No one, under present circumstances, will venture to increase the number of their stock by purchasing, unless they have unusual resources for

keep; but there is always a certain proportion which must be retained if possible, and the number of which may even be increased in some instances by the difficulty experienced in getting surplus stock disposed of.

Turnips are so essentially the sheet-anchor of the British farmer, that any detrimental causes operating upon that crop is felt throughout every department of the farm; and it is, therefore, a matter of importance to consider what crop is best suited to act as a substitute for it, and to supply, in some degree at least, a failure of it, of which there is reason to complain in all parts of the kingdom.

A Lancashire correspondent, who had spent his last Easter holidays near Brighton, writes, stating that he saw several fields in that neighbourhood with magnificent crops of rape ready for cutting. Feeling assured that as the present drought will cause our turnip crops to be very light, and that food, in consequence, will be correspondingly scarce next spring, he considers that a crop of rape ready at that time will be of great value, and he therefore asks us to give him some information as to the cultivation of rape, so as to come in for use in spring.

Our correspondent has formed a correct estimate of the value of rape, and it is to it we must look in providing a substitute for the turnip crop where the latter shall prove a failure this season.

Although rape is extensively grown in some districts, chiefly as food for sheep, there are many parts of the country where it is comparatively unknown, and, certainly, where its value is not sufficiently appreciated. Rape may be sown from this time until the end of August or the middle of September, and we have had a very fair spring crop of it even when the seed was not sown until the beginning of October, but that is too late to be calculated on as a general rule. If sown now, or until the middle of August, it will be ready, in most cases, by November; and when sown in August and September, it will be fit for use in spring.

Rape may be grown on all kinds of arable

land, provided the soil is in good condition, or fairly manured; the manures most suitable for it being precisely the same as those used in growing turnips. It may be grown either in drills or ridges, as drills are styled in some parts, or it may be sown broadcast. We prefer drills 26 to 28 inches apart, as we are thereby enabled to horse-hoe and clean the crop, which cannot be done under the broadcast system. Two or three pounds of seed will be sufficient to sow an imperial acre when the crop is grown in drills, but 10 lb. will be required if the seed is sown broadcast. When the plants are too thick they grow up without producing that luxuriance of leaf and stem which is desirable in a forage crop, and it is needful, therefore, to thin them out to 6 or 8 inches when they are too thick. The after-cultivation, so far as regards horse-hoeing, is precisely the same as in the case of drilled turnips.

As it is with the view of being substituted for turnips where the latter have failed, we consider that the best plan to follow would be to apply a light dose of guano, superphosphate, or Phospho-guano, run the plough between the drills where turnips have been sown but not germinated, so as to raise fresh earth, and then sow the seed, which will be done by the ordinary turnip-sowing machine. This application of manure will start the seed, and that which is already in the ground, as applied when the turnip seed was sown, will bring the plants on to maturity.

The crop is consumed by sheep in the same manner as in the case of sheep folded on turnip. It is necessary, however, to bear in mind—as we learned to our cost—that as sheep are apt to become blown on rape, they should not be put on the crop for the first time at least, when their stomachs are comparatively empty. It is advisable to accustom them to it by degrees, and during the time the sheep are consuming the crop they should have hay or straw and salt supplied to them by way of change, and as a condiment. Some scatter salt on the crop before allowing the sheep a fresh break. This can do no harm, but the salt is just as easily supplied in covered troughs.

A good crop of rape will yield as much food as an ordinary crop of turnips. The crop may also be cut and given to cattle fed in the yards, and, altogether, the poor prospects we have of a crop of turnips renders the value of rape as a substitute, a matter deserving serious and immediate consideration, for unless steps are taken to

grow a crop of this kind it will be a very difficult matter to provide spring keep. We take it for granted, of course, that by-and-by we shall have sufficient rain to moisten the ground, for unless such is the case, rape seed will not start any more than the turnip seed which is lying dormant, and, we fear, something like kiln-dried in the soil.

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### WARNING WORDS ON WEEDS.

“ONE year's seeding,” says the proverb, “is seven years' weeding.” Those, therefore, if this is true, know what they have to expect if this year they allow the seeding—the labour of the weeding, which their worst wishers may well wish them to have, so difficult is it to perform. There is nothing perhaps so unmistakeably suggestive than the fact too well known to farmers, that while crops will be poor with all the pains that patient care bestows upon them, weeds will revel in abundance despite all attempts to get rid of them. In view of this it has been said, and there is something very suggestive in the statement, that weeds have been sent as a beneficent arrangement in order to make men industrious; and to exercise a reflex influence of a positively beneficial kind, inasmuch that the more the weeds are eradicated the finer will be the crops, which otherwise they would destroy. For it is worthy of note, that the mere getting rid of weeds exercises a most healthy influence upon the plants near which they grow, as the soil is stirred about them, and the atmospheric influences are allowed to act upon the crops. As the present period is that at which the weeds are most rampant, and at which the preventive measures against their increase may be in a great measure carried out, a few remarks on the subject may be useful now. We have spoken of the evils arising from one year's seeding; but there are some weeds which propagate chiefly by their roots, others again by their seeds. We shall consider the latter kind first. The seeds of weeds are distributed generally in one of

three ways; *first*, by the seeds being naturally distributed, either dropping from the plants, or being scattered abroad by the winds; *secondly*, by being mixed up with the seeds of crops; and, *thirdly*, by the plants with ripe seeds having been put into the manure-heap, and spread on the land with the manure in autumn or spring. As to the first of these, some notion may be had as to the rapidity with which weeds may be propagated if we state briefly here the number of seeds which each plant of our best known weeds bear. Thus the corn cockle (*agrostemma githago*) bears on an average 7 flowers, and each flower 370 seeds, or 2599 seeds in all. The chickweed (*stellaria media*) has 50 flowers, each flower 10 seeds, or 500 seeds in all. The charlock (*sinapis arvensis*) has 400 flowers, and each flower 10 seeds, or 4000 seeds in each plant. The groundsel (*senecio vulgaris*) has 130 flowers, and 50 seeds in each plant, or 6500 seeds in all. But there are weeds which bear more largely than even those named, bad as they are. Thus the corn sow thistle (*sonchus arvensis*) has 190 flowers, and each 190 seeds, or giving a product of 19,000 seeds for each plant. But this is far exceeded by the red poppy (the “rose-a-ruby” of our forefathers), that scourge of many a field, so abundant indeed in some that the flowers far exceed apparently the plants, and give a fiery red to the whole surface. Each plant of this terrible weed (*papaver rhæus*) bears 100 flowers, and each flower 500 seeds, or in the whole 50,000 seeds. Enough has been given to shew the

paramount importance of preventing weeds from seeding. Bad farming, indeed, is it that will allow of the weeds to grow so long without disturbance as to approach even remotely the seeding stage; but if, by neglect, they have been allowed to approach it, we would strongly counsel the farmer to spare no trouble nor expense to have the weeds pulled up; and when pulled up and collected, let him be by no means satisfied with an attempt to kill them by placing them in the dung heap. Some may have seeded, and the process of pulling up may have been so retarded that all or the majority of them may have seeded, and vain indeed is the hope that the seeds, by being mixed up with the manure, will have been killed. Even when apparently well rotted—often indeed, when lime is mixed in the heap—the vitality of the seeds remain unimpaired; and hence, when the manure is spread over the land in the autumn or spring, the seeds germinate, and of that field in which it is placed it may be said that the latter end is worse than the beginning. We remember once having bought a lot of well-rotted dung, so well rotted that all in it of vegetable growth was apparently dead; yet the growth of that same pest, the poppy, which we have alluded to, was in the following spring what the Yankees call a “caution” to see. If before this we had had any doubts as to the policy of burning all weeds so as to get their value in the form of ashes, we certainly had none ever after. We should therefore unhesitatingly counsel all weeds to be burnt: that is the only true way to deal with them: every other mode is but a compromise with principle, and, like all compromises of this kind, will only be a source of annoyance to him who adopts it. By collecting and burning weeds we turn the curse—which Scripture declares them to be—into a blessing. It is, indeed, a very singular circumstance, in connexion with weeds, the amazing vitality of their seeds. Corn and other seeds may, as they do, fail; rarely do the seeds of weeds fail to come up. A lesson of some value may be learned from this.

We have thus glanced at the first and the third of the ways in which weed seeds are

disseminated; we have as briefly to point out the second of these, namely, the mixing of these seeds with the seeds of crops. Shame it is to say that in some cases this mixing is purposely and systematically done by fraudulent seedsmen. The only way, therefore, to meet this dastardly evil is to deal with first-class men; and, further, if seed purchased from others than of this stamp is doubtful in value, to have it examined by an expert, and if weed-seeds in quantity are detected, to expose the seller. But in many cases the seeds of weeds get mixed up with those of the crop, not with design, but through carelessness. The only way to prevent this is carefully—in harvesting—to keep back all weeds, and not to allow them to be mixed up with the crop. This, of course, may be, as it has often been, objected to as involving labour. All that need to be said in reply to this is, that if labour is grudged to gain a good end, the business—nay, any business—had better never be entered into; nevertheless, there is another way of looking at it—the cost of carefully keeping out seeds of weeds from crop seeds may be set against the loss sustained in after seasons by the number of weeds: we know pretty well how the balance will be in some cases. On the other hand, however, it may be said that farmers generally purchase their seed, and do not save it. It must be saved, however, somewhere; and where saved it is worth while to save *it* only, and not the seeds of weeds in addition. But where seed is purchased for crops, it is no less true that purchased along with it are the seeds of weeds; and very careless indeed are many farmers as to the condition of the seed they purchase—so careless that they act as premium-givers to those criminally disposed, by their carelessness actually inducing fraudulent seedsmen to mix seeds of a bad kind with them. All seed should be examined if possible. The following is the result of one or two examinations of this kind, from a paper by Professor Buckman, who has devoted much time to the subject of weeds:—In a pint of clover seed the Professor discovered 7600 weed seeds: in a pint of cow-grass seed, 12,000; in a pint of brand clover



39,440; and 2 pints of Dutch clover yielded severally 25,560 and 70,400 weed-seeds.

Here, then, are three sources of the spread of those weeds which are propagated by their seeds, all of them more or less directly within the control of the farmer. He can prevent, if he likes, the seeds of weeds being scattered abroad by the winds, by simply cutting the weeds down before they seed; he can keep the seeds of weeds out of his dung-heap by burning them; and he can in large measure prevent his crop seeds being mixed with the seeds of weeds. But there is another class of weeds which are mainly propagated by roots. The majority of farmers farming heavy wheat land are but too well acquainted with the "couch grass" (*triticum repens*), which so overruns some fields, which is propagated so easily, and which is eradicated with such difficulty. The root of this pest is jointed, and each joint sends out a fresh rootlet, so that by cutting up the weed merely, as some implements do—that is, dividing it into parts—we only add to the mischief by giving existence to new plants. Salt given in liberal doses is said to be an excellent mode of getting rid of such grass. Docks are another pest to the farmer: they are best got rid of by extracting the roots in wet weather, or when the ground is damp, by means of what is called a "dock spade." This or any other implement which may be used will require to be used with care, so that the roots are extracted wholly: for if any part of the root is left in the ground it is the parent of a vigorous plant. The more direct the pull in the direction of its length, the more likely is the root to be wholly extracted; any lateral strain thrown upon it is almost sure to result in the root being broken short off. Such a mode of getting rid of root-propagated weeds is, however, too slow and tedious, and not always so certain a process, that other means have been looked for, for the purpose of getting rid of them. In pasture land and in meadow land—in the latter at certain periods of the year only—the best plan is to keep mowing the leaves down: let them, in fact, never be allowed to develop their leaves to any extent, never so far as to exceed 2 or 3 inches above the ground. Pro-

fessor Buckman says:—"As the leaves are the lungs of a plant," bear in mind never to allow in such "cases the lungs to develop themselves." This mode of meeting the enemy is of course not available in lands under arable crops, nor indeed, as we have pointed out, in meadow land, at all seasons of the year. In the land under crops, if the crop is a green one, many an opportunity will be afforded the vigilant farmer to get rid of weeds which shew themselves above ground; and, generally speaking, the previous cultivation has so made the soil in that pulverized state that the weeds are pulled up with comparative ease. It is a fortunate circumstance that the very act of getting rid of weeds in fallow crops helps to ensure heavier crops. As soon as other crops are off the field, the weeds should be taken in hand, either by forking the patches covered with weeds, or by the use of the plough, the grubber, or the cultivator. In the case of meadow land, and in pasture, the effect of certain artificial manures has not yet been fairly and fully tried. We have reason to believe that there is much to be done in this direction. We had occasion once to take occupation of a large meadow a short time previous to the hay crop being ready; but such was the condition of one part of it, as regards weeds, that it was difficult to say which was the best crop, the grass or the weeds. This part of the field was literally red with the seeds of the dock, which was the prevalent seed. In making the hay, we had all the weeds carefully separated from the hay, and the whole burnt; and as soon as the hay was housed and the field cleared, we top-dressed the whole of the field with a mixture of nitrate of soda and salt in about equal proportions, and at the rate of  $2\frac{1}{2}$  cwts. to the acre, taking care to give to the weed-infested part a much heavier dressing. In his locality, and with his soil (a pretty heavy one), he has had such a success in the treatment of perennial or root-propagating weeds with nitrate of soda and salt, that he has a good deal of confidence in the belief that if not a preventive, it is at least in great measure a cure.

*SMALL MATTERS.*

THE world is made up of atoms, and hourly experience shews the folly of despising small things. A feather indicates how the wind blows, and we are frequently led to form an estimate of a man's character from little peculiarities, although such may not perhaps force themselves broadly on our notice.

The same principle is equally applicable to farming pursuits. When we see an old cart shoved into a gap in a fence, or a pair of disabled harrows along with some dead thorns, doing duty as a field-gate, we do not feel particularly desirous to go any further in order to examine the management pursued on that farm more closely. We feel assured that such evidences of slovenliness sufficiently indicate what remains behind—dirty fields, imperfect tillage, and all the results which follow adherence to a system based on the principle of "it will do well enough."

We own to a partiality for order and neatness in farm management; and we feel that the absence of such features is sadly damaging to any place, although it may be tolerably well conducted in other respects. We like to see the right thing in the right place. An old hat or a pair of ruined unmentionables are quite in keeping when we find them used in constructing a scarecrow, but they are grievous blots when stuck in a broken window. A ragged hedge is, no doubt, a very picturesque feature in a landscape painting, but it is neither profitable nor pleasant when it is part of the belongings of a farm.

We are aware there are some who despise, or affect to despise, in their own case at least, those smaller matters which, however, give a character to a place, according as they are attended to or not. Yet we often find those very persons, unconsciously, perhaps, awarding their tribute of praise when any instance of more than ordinary neatness comes under their notice, forgetful, apparently, how contradictory are their expressions

of praise to their own actual practice. It is, however, one of the results of neatness in connexion with farm management, that it elicits expressions of approval, even from those who are strangers to the details of agricultural practice; and although, perhaps, such people cannot define precisely what it is which pleases them, still they feel there is something in the scene peculiarly gratifying to their perceptions.

Such things may, indeed, be regarded as small matters, but if we take them in the aggregate, or if we take the principle in its different bearings, we shall find that it is really of far greater importance than might at first be acknowledged. Thus, the same principle which produces tidiness in one matter, produces also thoroughly effective and systematic management in another. It is, in fact, the principle of doing every thing in the best possible manner, and of keeping every thing in the best possible order, so that the greatest results may be obtained at comparatively the least expense. The same principle which induces a man to thoroughly drain a field, work it well, manure it highly, and clean it perfectly, will, if extended to other matters, induce him to see that his fences are neat and efficient, that his implements are always cleanly kept, preserved in good order, and protected from unnecessary damage; that his farm-roads are in proper repair and kept free from weeds as well as the crop-growing parts of his farm, and that his farm buildings are maintained in as good condition as circumstances will admit. These, as well as other matters of a similar kind, arise merely from the extension of the same governing principle; and, although the practice in some districts would lead us to think otherwise, it is the greatest possible fallacy to imagine that slovenliness is in any way an inherent feature in the business of the farmer.

We wish, therefore, to press upon our

readers the importance of making it an essential point to attend minutely to those small matters which so often impart a marked character to their farms, whether favourable or the reverse, according as these are attended to or neglected, for the more closely the minute details of their business are looked after, so much the more satisfactory will the broader features become.

If we look, for instance, at the filthy condition in which the stables on many farms are kept, we shall find an illustration of what we have stated. It may have been a quarter or even half a century since the stables were built, but ever since the last stroke of the carpenter's hammer, not a hand has been raised to sweep down the accumulated masses of cobwebs, dust, and dirt of all kinds, which hang from every rafter, and has lain unmolested in every corner. To the white-wash brush the place has been a perfect stranger, and from the want of proper ventilation the entire building reeks with the most pungent odours. Is it to be wondered at that disease has frequently prostrated the unfortunate animals condemned to pass a considerable part of their existence in such holes, or that many of their number have been swept away in what has doubtless appeared a very unaccountable manner? Yet, how little might have prevented such a catastrophe. A little more fresh air, with the frequent and regular use of the stable-broom and white-wash brush, would have preserved the lives of many animals, or kept them in health, instead of labouring, as we often find them in such cases, under certain forms of disease, which, although not perhaps immediately fatal, are of such a nature as to lessen their value very materially.

Then, again, look at the state of the implements on some farms. As in the case of the stud, those indispensable requisites in farm manage-

ment cost a deal of money, although from the usage they get we should sometimes be inclined to imagine that such was not the case. We find them lying about in all directions, rotting and rusting; instead of being put carefully aside under cover when not immediately required for use. Paint is cheap, but year after year passes without anything of the kind being applied to them. We strongly recommend that every implement of the farm requiring paint should be painted once a year, after being put in proper repair, and that no tool, not even a dung-fork, should be allowed to lie knocking about after the occasion for using it had passed, without being put aside into its proper place. And here we may remark, that sufficient shed accommodation for the implements of the farm, large and small, is frequently wanting, even in some farmsteads of considerable pretensions. When such is the case, it is of course difficult to keep things in proper condition; but whether such accommodation exists or not, every effort should be made to do the best for the preservation of the implements that circumstances will admit of. We might give other illustrations of the fact that what some evidently consider trivial points of management, are in reality matters which deeply affect the interests of the owner; and if we look at the consequences which arise from them, it will easily be seen that in farming there are really no small matters. Some may, indeed, object that the close attention to such matters which we recommend involves expense; but is the expense remunerative? If so, then the objection vanishes; and we should not forget that homely illustration of the wisdom which saves pennies while it sacrifices pounds—"for want of a nail the shoe was lost, and for want of the shoe the mare was lost."

## FOOD OF THE TOWN-FED COW.\*

HAVING got your cows well purchased, the point of next importance is to feed them properly. Their invariable food in London cow-sheds is grains (brewers' or distillers' grains, the spent barley or other grain after being well washed or "worked out" in the process of brewing and distilling), with mangolds and hay in winter, and grass in summer. When first the cow is received into the shed it is important that she be gradually accustoming to her new food. She should therefore receive during the first week little but green food, grass, or clover, or vetches in the summer, and mangolds and hay in winter, with bran mashes, into which grains may be gradually introduced, until, as she takes to them, she may at length be treated as the others are. What this management generally is, I take from the statements of two men, neither of them very large dairymen, but both of them successful managers. Mr Sumpton, of Little Warner Street, Clerkenwell, who usually milks about thirty cows, describes his day's work as follows:—The cowmen enter the shed at 4 A.M., and proceed to milk. In the case of the wholesale milk trade, when the dealers who buy the milk do the milking, one good man suffices for thirty cows. The cowman then only helps if necessary at milking-time, and sees that the work is thoroughly done, his main business being to feed and tend the cows. If he has any reason to suspect that a cow is not milked out, it is his duty to his master to "strip" her, for nothing injures a cow more than imperfect milking; and if he succeeds in getting another half pint from her his master will give him 6d. or 1s. for it, and fine the dealer that amount for his servant's default. When not only milking, but serving the customers at shops and houses has to be done, three men are required for 30 cows. They begin milking at 4 A.M., and finish between 5 and 6. About a bushel and a half of grains is then given between each pair of cows, and they are partly cleaned out, and when the grains are done, a truss of hay ( $\frac{1}{2}$  cwt.) is divided amongst 12. In the meanwhile the men have been serving the milk; after which they have their breakfast (about 8 A.M.). After breakfast time a bushel of chopped mangolds, weighing 50 or 60 lb., is given to each two cows, and the cows receive another truss of hay amongst 12. The cowshed is then cleaned out, and the cows are bedded and left. At 1 P.M. milking recommences, and very much the same feeding as before is given. At 2.30 grains are given as before, followed by the same quantity of hay, and then (and only then during the 24 hours) the

cows are freely watered. They again receive a truss of hay amongst 12, and are left for the night. The grains are either brewers' or distillers' grains; the former are as much inferior to the latter in value as they are in price—the one at present costing 3d. to 4d. a bushel, and the other 8d. and 9d. In the case of cows in heavy milk—also in the case of those rapidly losing their milk, which must be sent to market as quickly as possible—it is common to give 2 or 3 quarts of pea-meal mixed up with the grains morning and evening; each cow thus receiving that quantity daily. And when the milking is coming to an end, for three or four weeks before the cow is sold, she may receive 2 or 3 lb. of oilcake in addition. A full bushel of grains, half a bushel of mangolds, one-third of a truss of hay, and 5 or 6 lb. of pea-meal in the case of the fattening cow, are thus the daily ration in a London cowhouse. The grains at 2s. a quarter, the hay at £5 a ton, and the mangolds at 20s. a ton, cost 1s. 3d. a day, and with meal or cake the daily allowance may cost from 1s. 6d. to 1s. 9d. per cow—10s. to 12s. a week.

In summer time the food is grass with grains, and meal if necessary. Most cowkeepers, except the very smallest men, either have a small suburban farm, or buy a few acres of vetches, clover, or grass, and cart it in themselves. When it is bought daily at the cowhouse it costs from 1s. to 1s. 3d. a cwt. during the summer, and the cows receive about that quantity daily, given to them as fast as they can eat it, morning and evening, with their grains.

Of course the proper feeding of the cow after she has been well bought is the very essence of the business of the cow-keeper. It is a proof of good management when she is so treated that no kind of food which she receives shall pall upon her taste. The maxim is—never "overdo" a cow with any kind of food. Some cows are exceedingly greedy for distillers' grains, and they yield a very large quantity of milk upon them. But it is easy to "overdo" a cow with grains; and she should be always stinted of her favourite food, or she will get sick of it, as I have seen often enough in the case of this very article—distillers' grains.

The suburban cow-keeper, though more favourably situated than the London dairymen as regards the bulk of the food he consumes—the grass, the mangolds, and the hay—is less favourably situated as regards grains; and this disadvantage combined with the other, of distance from the consumer, is such as at least to balance, often to overbalance, any advantage he possesses over the town dairymen in respect of labour, rent, and cheaper farm produce. Going further afield, as for example, to Swindon, and beyond it, or to

\* An extract from Mr J. C. Morton's paper in the *Journal* of the Royal Agricultural Society.



distant stations on the south-western and north-western railways, you find that the farmer feeds his cows for London, just as he has hitherto done for cheese or butter dairying. Bring them to the pail at all months of the year, so as to have a regular produce to meet his contract with the London dealer, he milks his cows out at pasture during the summer, and feeds them on hay and mangolds in the winter. Receiving  $6\frac{1}{2}$ d. to 8d. per imperial gallon for the milk delivered at the nearest station, and getting 500 to 550 gallons from his cow per annum, he receives 15s. to 18s. per annum for her produce, which is more than he can generally make of it in the form of cheese or butter, at the same time that he avoids all the cost of labour in the dairy. He runs, however, especially during hot weather, the risk of the milk souring on its journey, in which case it is thrown away on its arrival at his expense.

Nearer London the management is almost exactly that of the London cowhouses. Mr Sumpton tells me that he feeds his cows at his farm in Hendon parish exactly as he does his cows in Little Warner Street, only beginning an hour earlier, so as to give time to bring the milk in. No attempt is made to cool it for transmission this short journey, but it arrives warm an hour after milking, sometimes, however, the worse in summer-time for even so short an interval.

Mr Panter, who manages Lord Granville's large dairy-farm at Golder's Green, upon the Finchley Road, thus described the management of his cows, in evidence before the Royal Commissioners on the cattle plague:—

“We give about a bushel and a quarter, or from that to a bushel and half of brewers' grains to each cow, and about 15 lb. of hay, and about 30 lb. of mangold wurtzel, with 4 lb. of meal (pea-meal principally), in addition to that feed in the winter. In the summer, grass is given instead of hay and mangold wurtzel. This mode of feeding, though it damages the constitution of a cow, is adopted in order to force the greatest quantity of milk which the dairymen can get. The gain more than covers all the loss; at least it is supposed to do so. In our suburban district we give them more air, and feed them more on grass in the fields. We do not feed them so heavily upon grains and artificial food as they do in London. We give them much more natural food. Some turn them out from about July to October; and some do not. The cows always lose condition by being turned out; that is invariably the case. They lose milk, too, to the extent of a quart a day, unless the pasture is very good indeed.”

It is plain that the London cow management for milk production is certain to be followed wherever it can, if cows lose both flesh and milk when turned out to grass. Mr Balls, who manages the dairy farm at Oakington, near Sudbury, in the occupation of Colonel the Hon. W. P. Talbot, has kept from 80 to 100 cows constantly in stalls. They are milked at 3 and 4 A.M., and again at 1 and 2 P.M., and are fed

exactly on the London plan, first on grains, a bushel between two, next with a little hay, then with a bushel of either cabbages or mangolds, and then again a little hay; in the afternoon grains and hay and water (they are only watered once a day), and again hay before night. The alteration in summer is a substitution of grass for hay and mangolds. A small quantity (3 or 4 lb. a day) of meal is given along with grains in the case of cows nearly dry; or rather this used to be given, for Mr Balls now declares that there is no profit in the attempt to put on extra flesh with extra feeding, so long as meal is so dear and meat so cheap. He contrives, however, by careful purchasing, to get cows which will put on flesh without extra feeding as they get dry.

At Lodge Farm, Barking, where several cowhouses holding 60 cows a piece have been built at intervals of 200 or 300 yards from one another, in the midst of 50 acres of land, which is being irrigated with North London sewage, and has been thus producing enormous crops of Italian ryegrass, the rule of London management has been till lately carefully followed. A bushel of grains between two cows has been given immediately after milking, and followed by a little hay (a truss amongst 10 or 12 cows). They were then watered freely, and afterwards 30 or 40 lb. of pulped mangolds mixed with hay chaff were given, and the cows were left. The treatment in the evening was exactly the same, except that a little hay was given when they were bedded up for the night. In this case distillers' grains were used; and whenever the supply failed us the milk ran short at once. The yield dropped one-fifth, sometimes one-fourth, at the very next milking after the missing meal of grains, and brewers' grains were a very inefficient substitute for them. The quantity of milk would, however, gradually increase again under other feeding, as soon as the cows had taken cordially to the new ration, whatever it was, but in no case did it ever amount to the quantity which was quoted when they received their fill of distillers' grains. Latterly, partly owing to the cost and difficulty of obtaining these grains, and partly because it was desirable to test the value as cow food of sewage-grown Italian ryegrass given by itself, the mode of feeding has been altered. Several cowhouses were supplied with grass alone during the past summer, receiving nothing else whatever, and about  $1\frac{1}{2}$  cwt. a day was the average consumption per cow; and though the substitution of a bushel of grains for  $\frac{1}{2}$  cwt. of grass was at once followed by an increased yield of milk, yet the latter was so much the dearer food that the balance of profit was against it as long as grass was not valued at more than 18s. a ton upon the land. In winter we are giving mangolds, hay, and meal, without grains. In one shed at present twenty-five cows nearly dry are receiving 16 cwt. of mangolds, 7 trusses of hay, 100 lb. of barleymeal, and 80 lb. of cake; which is 70 lb. of mangolds, 8 lb. of hay (these are given as chaff and pulp), 4 lb. of barleymeal, and about 3 lb. cake per fattening cow.

In another shed, where fifty-eight are being fed, seventeen of which are freshly calved cows, and the rest are in about half milk, the consumption is 2 tons mangolds, 12 trusses of hay, 7 trusses of straw (all chafed and pulped and mixed), 56 lb. of meal, and 36 lb. of cake. This amounts to about 80 lb. of mangolds, and 16 lb. of mixed hay and straw (with 3 or 4 lb. of meal and cake to a few of those most nearly dry or in heaviest milk). The seventeen cows in full milk get 13 lb. of hay, 76 lb. of mangolds, 2 lb. of meal, and 2 lb. of cake a-piece, costing at current prices rather under 2s. a-piece. They gave at first on the average 2 barn gallons (= 16 quarts) a-piece, which are worth, delivered in London, 3s. 4d.

I believe that, though productive of a great quantity of poor milk, distillery wash is not by any means a common article of food in London dairies. Its reputation as a washy food may, however, have hindered my being told of its use. There is nothing, I believe, that more excites the milk secretion, and when given fresh along with other substantial food, no objection can be made to its use. It is, however, objected to the use of distillery wash, and in a less degree to that of grains, that the milk derived from their use as a food needs to be consumed at once, as it will "turn" more rapidly than the milk of grass-fed cows. I know of no direct experiment on this point, and can only refer to the impression which some milk dealers have that this is so.

In so far as the feeding of the cow belongs to this part of the general subject of town dairies—and of course it is the most important part of it—the only remark that need be made after what has been already said, is that the food must be always good of its kind, and regularly and punctually given. Faulty food soon shows itself in the quality of the milk; and irregularity in feeding or any other disturbance of so sensitive a creature as a milch cow is sure to be followed by a diminished yield of milk. Swedes and common turnips taint the milk; and if given at all should be used either in small quantity with other food, or, what is better, cooked in a hot mash. Here, too, attempts are made, by using saltpetre in the water with which the cans are washed, and by putting a little in with the milk itself when they are filled, to get rid of any taint which it may possess. I have given cabbages for months together to upwards of 100 cows without any particular care being taken to keep spoiled or rotten leaves out of the manger, but I have never found the milk tainted by them. To steam food which has any aroma belonging to it communicable to the milk is of course, as already said, the best way to make it harmless. But though I have been over sixty London and suburban cowhouses, I know of none where cow food is steamed or cooked, excepting only Mr Dancock's shed at Brompton, and there the steaming goes merely to the manufacture of a gruel to be thrown over an uncooked food, as hay, chaff, or grains. It is nevertheless certain that steaming food, wherever labour is not very costly, or where the exist-

ing hands have time to spare for the purpose without interfering with their efficiency elsewhere, improves its nutritiveness, and may be confidently recommended.

But the thing of all others, so far as my experience has gone, which is most important in order to the sweetness of the milk is, that the water given to the cows be clean and good.

One of the things which most strikes a stranger who first enters a London cowhouse during winter is the warmth in which the cows are kept. Experience has proved that this, too, has an important influence on their productiveness. They stand very thickly on the ground—one to every 30 to 36 square feet; the windows are closed and matted, and no thorough draught allowed; and thus the shed is warmed. There is generally room enough overhead, and perhaps a tiled roof, which allows ample ventilation; and thus, where the shed is kept tolerably clean, the air is sweet enough, as well as warm.

Very little litter or other bedding is used. I have been over large suburban cowsheds where none whatever is used. The cows stand so close to each other that they cannot get across, and thus the dung and urine fall from them into the gutter behind them, from which it is cleared twice or thrice a day, and the lair—an earthen floor—is thus kept dry. At the Lodge Farm we have used sawdust. At present 8 cwt. is the daily allowance in two sheds containing eighty-five cows, and there were exactly 21 tons of dung removed from these two sheds last week, being 3 tons daily. Most of the urine runs into a tank, only a portion of it being retained in the litter that is used. Two or three bushels of sawdust are, in the first place, put under every cow, and thereafter one bushel daily is sufficient, as much being daily taken as fast it gets soiled. The quantities amount to about 11 lb. per cow added, and 80 lb. of dung per cow taken; so that we collect about 70 lb. per diem of the actual *feces* of the animal. I may on this refer to a letter received twelve years ago from Mr Telfer, of the Canning Park Farm, near Ayr, who kept 48 of the small Ayrshire cows for a butter dairy. He found that these cows yielded 60 lb. of dung and 18 lb. of urine every twenty-four hours. Taking their smaller size into account, this agrees very fairly with our experience at Lodge Farm. He adds that the cows yielding most milk, at the same time yielded the most dung and urine, which is not surprising, seeing that these are, in fact, the *débris* of a manufacture, and must be greater or less according to the quantity of raw material which passes through the machine. Mr Telfer's cows lay on a cocoa-nut matting, their dung and urine falling into an accurately-made gutter, which was cleaned out perfectly by a single draw of a drag made to fit the groove. In London cow-houses the rough causewayed floors are cleaned out with besom and spade into a dung-pit, which the sanitary inspector requires to be emptied at intervals; and the gutters in well-managed houses are washed down from the pail.

## Farm Engineering.

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UNDER the above title we purpose taking up that important department to which may be given the general title of the "Mechanics of Agriculture," which comprises all the subjects concerned not only with the implements and machines of the field, but the structures of the fold and the steading. These will be discussed from time to time in a series of papers, in the matter of which we aim at two things—brevity and practicality. We do not design to give them in the regular order of a glossary or a dictionary, of which although much can be said in favour, would preclude "Notes" on subjects which may at the time be more than usually interesting and suggestive, and to which, on many accounts, it might be desirable to draw immediate attention. Thus far is it necessary to go in our introductory remarks: what further is connected with the principles upon which the series is commenced will best be developed in the course of the articles of which that series will be made up. One point only we notice here, and that is, that we shall, as far as may be competent for us to do, give an equal amount of attention to each department of the "Mechanics of Agriculture," to that of the "implements and machines," and that of the "buildings of the farm;" so that by the time we arrive at the conclusion of the series these branches of the art will both be pretty equally discussed.

We have said that we shall aim at brevity and practicality in these Notes, but it is obvious that the two terms must be used conjointly, inasmuch as if we only aim at securing brevity, we shall likely lose the important element of practicality. That both will be secured in the majority of instances

we believe; at all events, our best efforts will be given to secure them.

### I.

#### WATER AS A SOURCE OF POWER TO THE FARMER.

At a meeting of the British Association, Sir William Armstrong pointed out the fact that throughout this country there existed in almost all, but very markedly in some districts, a source of power which costs nothing in its primary or normal condition, and of which the practical adaptation to useful purposes costs comparatively little; this source of power being the numerous rivulets and water-courses of our rural districts. It is our purpose here to consider a few of the means by which water as it flows—in many cases quite uselessly—past our farm-steadings, can be made to render service to the farmer who occupies it. In using water as a source of power, the first point we have to decide is the way in which the supply can be maintained, so as to be at all times available. In many localities the source of supply is so admirably situated with reference to the building, that nothing remains to be done but to apply the machine by which the power is, so to speak, created, and so lead off this power by the usual simple means to work the machines of the steading. In some localities, however, the supply is either so far from the building, or its amount so small, that it has either to be led up to the place where the machine is to work, or to be stored up in the intervals of labour, and afterwards used for working the machine.

#### 1. THE HYDRAULIC RAM.

Of all modes in use for the raising of water from a low to a high level, we know of none

so thoroughly economical and, at the same time, so efficient as the Hydraulic Ram. It costs little, requires little, we might almost say no supervision after being once set in work, and altogether is such an admirable contrivance, that we are surprised to find that it is not adopted in numerous districts where the lack of water is complained of, and where it could be so easily applied. We have met with it in our rural districts now and then, but not so frequently as we should like to have seen it. It is more used abroad than with us, and especially in America, the go-ahead people of that country being keenly alive to all modes of saving or rather dispensing with human labour. The following diagram will explain to our readers the mode of

the ordinary condition of the ram at first starting, the valve *dd*, which is supplied to the upper part of the chamber *bb*, is open; through the opening then of this valve the water which fills or nearly fills *bb* flows and passes into the bed of the stream in which the foundation *a* of the ram is. As the water flows through this, it increases in velocity till it gains so much momentum as to close the valve *dd*; the water, therefore, flows on towards the end *b*, but is there arrested, and the recoil, so to speak, while it tends still further to close the valve *dd*, opens the valve *e*, and admits the water into the air vessel *ff*, from which it is led to any required distance or height by the pipe *gg*. The passing of a portion of the water into the vessel *ff*, ex-

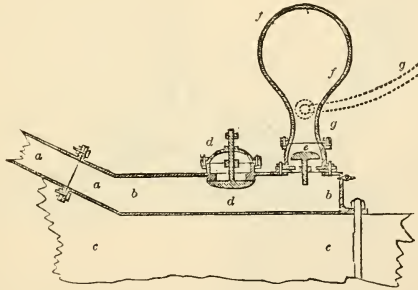


Fig. 1.

operation of this admirably economical and efficient apparatus. It is necessary to premise that it is essential that the stream upon which it is placed must have a few feet of fall. If the fall is natural the ram must be placed at a low, if not the lowest, part that is within the range of the stream. If there is no natural fall, one can be easily made by forming a simple weir, damming the stream across at some convenient point of its length; and starting from the edge of this weir, forming an incline in the bed of the stream below it, gradually leading down to the point at which the ram is placed, or the water from the weir may be led to the ram by an inclined pipe. Fig. 1 will illustrate one form of the ram. The water is led into the ram by the pipe *aa*, and from thence delivered to the chamber *bb*. In

hausting, as it does, the momentum of the stream, the valve *e* closes, and the valve *dd* opens, allowing the water again to pass from the ram, till it once more acquires such momentum as to close *d*, open *e*, and thus give a second supply to the vessel *ff*. We have thus a succession of openings and shuttings of the valve, and a constant supply of water through the pipe *gg*—the great feature being that a portion of the water which works the ram is forced up, acting thus as its own lifter. Any one will easily understand the force and precision with which the valves are worked if he will allow the tap in a water-pipe supplied at pressure to remain open for some time so as to allow the water to flow freely, and then suddenly shut the tap; in the shock which will be felt, given not only to the tap but to



the pipe connected with it, he will readily understand the power which works the valves of the hydraulic ram.

The supply of water thus gained at a point below the steading should be stored up in a tank or large cistern, which should be placed either on the roof of the steading or upon columns; the object in either case being to have a source of supply at *pressure*, which is necessary where a machine is to be worked by which to get power. It is obviously exceedingly useful for many other purposes, as, for instance, supplying the cattle courts, feeding byres, cooking apparatus, steam-boiler, or for washing the floors and windows, or for extinguishing fires. On the construction of pressure supply tanks and their appliances we may have a "Note" hereafter to give.

2. THE TURBINE.

The supply of water being obtained either by pressure from a tank or by a natural fall in the stream, the next point to consider is the best means by which power can be obtained from this supply. Now, on this point there can be no hesitation in awarding to the Turbine, of all the forms of water-power mechanism, the great merit of efficiency in action, inexpensiveness of original cost, and ease in maintaining in working order. The principle of operation of the modern turbine is exemplified in the well-known Barker's

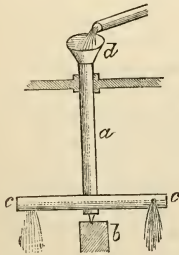


Fig 2.

Centrifugal Mill, an illustration of which finds a place in all elementary books of Natural Philosophy, and which, in fact may be called the original type of the turbine. A simple diagram and a word or two of description will make its operation and that of the turbine easily understood. Let *a*, fig. 2, be a vertical

tube, running on and supported by a pivot on the step *b*, and supplied at its lower end with a horizontal pipe *a*, forming equal lengths or arms on each side; the ends of these are closed, but a hole is cut in the sides of the pipe near the ends, but in opposite sides of the arm, so that while the water supplied by

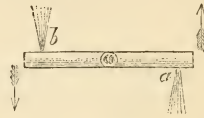


Fig. 3.

the pipe *d* to the vertical pipe *a* is projected with force from one side *a*, fig. 3, it is projected from the other side *b* in an opposite direction, as shewn by the arrows. The result of this is that the arms revolve rapidly, and with a force in proportion to the height of the column of water of supply, and to the area of the apertures *a b* in the arms in fig. 3. A modern modification of this, which may be called a re-action wheel, was introduced with great success by Mr Whitelaw in 1845, and is still used. In this the arms were curved,

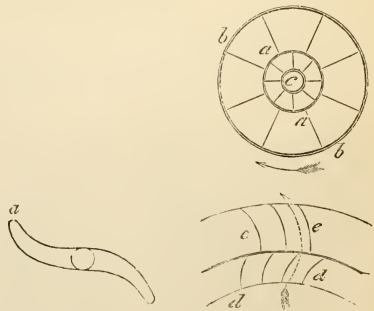


Fig. 4.

Fig. 5.

as in fig. 4, a simple arrangement of valves actuated by springs regulating the flow of water through the nozzles *a* and *b*, and, by consequence, the velocity and power given out by the machine. In the turbine the mere arms disappear, or rather they are multiplied, and appear as chambers in a flat or disc wheel, as simply illustrated by the diagram in fig. 5. Let *a a* in this represent a circular

chamber, in which there is a series of partitions leading the water, which is supplied to the central part of the chamber, to orifices corresponding in number to the spaces between the partitions. This chamber *aa* is fixed, but revolving round it concentrically is the outer wheel *bb*, also provided with a series of partitions. Into these the water is delivered from the central chamber *aa*, and passes from them through the apertures made in the outer periphery of disc. The water is thus passed in at the centre *c* of the turbine, and discharged at its circumference, giving motion in its passage to the outer disc wheel *bb*, to which the central driving-shaft is fixed, and which passes up through *c*. In another form

arms, as shewn in the section in fig. 6. In cases where a supply of water may be obtained at a low level to be raised to a high-level tank by means of a water ram, and then taken from the tank to work a small turbine, the power will be obtained at probably the very cheapest rate at which it can be obtained, for the ram works night and day, and the water from the tank can be put on the turbine at a moment's notice. We feel, indeed, that in recommending this mode of obtaining motive power we are doing a great practical service to those the circumstances of whose locality permit its adoption. In many instances steam power is obtained at large primary cost, which is expensive to be maintained, and in the main-

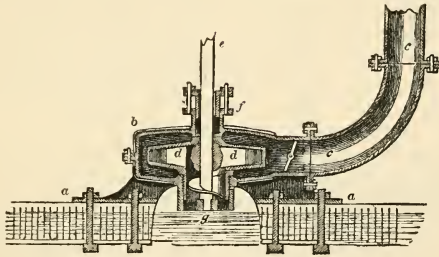


Fig. 6.

of turbine, as Schiele's, the water is delivered to the outer arms, and is passed out at the centre. In Fourneyron's turbine the partitions are made of curved plates, as *dd*, *ee*, fig. 5. In fig. 6 we give a vertical section of Gwynne's form of turbine: *aa* is the bed-plate by which it is bolted to the foundation; *bb* the wheel-case, supplied with water by the pipe *ac*; in the interior of the case the wheel *dd* revolves, of which the shaft—from which power is taken—revolves in the bearings *f* and *g*. The wheel is provided with arms straight near the centre, but curved near the extremities. As they approach the central shaft, they gradually sweep round like a screw, and terminate downwards into the pipe at right angles to the commencing portion of the

tenance of which risks of loss of no ordinary kind are run, and danger to life and property incurred—all of which could be avoided, and profitably avoided, by some such plan as we have in this Note recommended, and where the local circumstances are such as we have described. In many—we may safely say the majority of—farm-steadiings the working of the machines is not continuous, as in the case of manufactories. Working at intervals is their peculiarity, and it is just in view of this that we look upon the use of water power in the way we have above suggested as being the best adapted, both from its economy and the readiness with which it can be availed of, to the ordinary circumstances of farm-steading work.

## MANURE TANKS.

LIEBIG, in his "Familiar Letters," says that 1 lb. of urine contains the elements necessary to form 1 lb. of grain; for not only does it possess a compound rich in nitrogen—viz., *urca*—but also the sulphur of the tissues in the form of a sulphate, all the soluble salts of the blood and animal fluids, common salt, the phosphates, soda and potash. Well-authenticated experiments are not wanting to prove the soundness of the views of the great chemist.

There are few farmers who will not admit the value of the liquid manure of their stables and byres; but not one in a hundred takes proper means to preserve it, or to fix the ammonia even when they have gone to the expense of providing a suitable tank. Urine speedily undergoes putrefaction, thereby generating a large quantity of ammonia; and as this is a very volatile body, it flies off into the air unless some means are taken to fix it. Two most important practical conclusions follow, therefore, from a consideration of this property:—1st, That when urine is allowed to flow into a fermenting dunghill, the surest means are taken to waste the ammonia both of the urine and the solid excrements of the dunghill; and 2d, there is loss, although to a less amount, by allowing putrefaction to go on in a covered tank, unless some substance is put there to fix the ammonia as it is generated. In Flanders, where great attention is paid to this subject, the fresh urine is diluted with a large bulk of water, and thus a good deal of the ammonia is retained, although there is still a considerable loss. This method of dilution, moreover, increases the expense of applying it to the land, and is scarcely compatible with the methods of farming followed in this country. In the smaller Flemish farms a small tank is constructed below the floor of each byre, and the contents are diluted and applied direct to the land.

Mr Henry Stephens, the best authority on

all matters pertaining to the economy of farm management, does not consider that tanks are necessary on all farms. In his excellent work, "The Book of Farm Buildings,"\* he says that on carse lands where much straw and little green food is used, there can be no liquid manure; and on pastoral farms the stock confined in winter in the steading are too limited in number to afford much of that material. On dairy farms, on the other hand, where many cows are maintained, and much green food consumed by them in byres, tanks should be constructed for the advantage of the pasture land; and he recommends that on all small dairy farms the Flemish practice of constructing a small tank underground should be followed.

The *principles* to be observed in the construction of liquid manure tanks are thus set forth by Mr Stephens:—

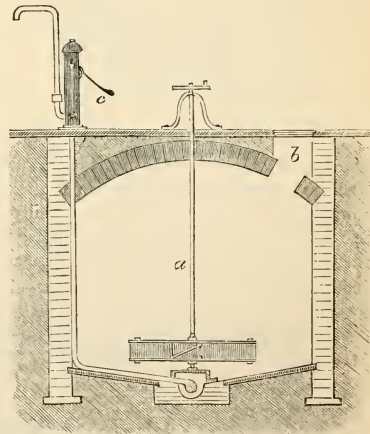
"The cistern for collecting liquid manure in the farmstead, though apparently simple in its construction, being merely a covered pond or a well, yet serious errors are frequently committed in its formation. The first and most important consideration for the formation of the cistern is the effect of hydrostatic pressure; inattention to this has caused the failure of many such cisterns. The liquid we have here to deal with, like all other fluids, acts on the bottom and sides of the vessel or body that contains it, with a pressure directly in proportion to the depth at which the fluid stands, without reference to either length or breadth; that is to say, suppose a cistern, whose bottom is 12 inches square, and its depth 10 feet, filled with water, every square inch in the bottom will suffer a pressure equal to the height of a column of water whose base is one inch square, and 10 feet or 120 inches, in height. The weight of such a column will

\* The Book of Farm Buildings: their Arrangement and Construction. By Henry Stephens, F.R.S.E., and Robert Scott Burn. W. Blackwood & Sons, Edinburgh and London.

be  $4\frac{1}{2}$  lb. nearly, and this would be exerted on every square inch on the bottom, or the whole pressure on the bottom would be 625 lb., the weight of 10 cubic feet of water. Keeping this in view, it will be seen that length and breadth produce no effect on the pressures that a fluid exerts against the vessel or body that retains it; and that in calculating the resistance to sustain such pressure, depth is the only element requiring to be taken into account. It is also to be kept in view that pressures on the bottom or sides is directly as the depth; thus, if our supposed cistern were reduced to 5 feet in depth, the pressure on the bottom would only be one-half, or  $2\frac{1}{4}$  lb. on each square inch." Keeping these principles in view, a tank, therefore, should not exceed six feet in depth. Its length being immaterial, so far as its construction is concerned must depend on the size of the farm, or rather on the number of cattle housed upon it. A convenient width is six feet, for this admits of an arch being carried over the tank at a moderate cost. As a rough guide to the size of tank required on a farm, an allowance of 1000 gallons for each cow, should be made; and this number of gallons occupies 162 cubic feet.

In fixing a site for a tank, the north side of the steading should be chosen; but where this is not practicable, a sheltered situation in any other part must be selected. No matter what the character of the soil, no tank can be properly constructed without puddling, by which means alone the ingress of drainage-water and the egress of the urine is prevented. The excavation should be carried at least 18 inches deeper than the proposed tank, and any water standing in the excavation must be drained off before laying in the prepared clay, which must be neither too wet nor too dry, but in a condition to combine with solidity. It should not be thrown in at once and beaten down; but one layer after another should be spread till the whole reaches 15 inches in thickness; and upon this the walls should be built with brick, not less than 9 inches thick, the back of the wall being firmly puddled as the work proceeds. The bottom of the tank may be either laid with pavement

or brick on edge, the level falling towards the centre, where a well-hole of about a foot in depth, should be provided to receive the end of the suction-pipe. The bricks should be laid with mortar, and when the tank is completely built, all the joints should be picked out and carefully pointed with Roman or Portland cement. A very useful addition to all manure tanks is an "agitator," to be used to stir the liquid when water is added, so as to bring the contents to a uniform state when being drawn off. This agitator, which is shewn in Fig. 1 (*a*), consists of an iron rod, with two or four arms or fans working in a socket fixed in the grating over the well-hole. The rod is brought through the cover of the tank about 3 feet, and terminates in two handles at right angles to the rod, by which the agitator is set in motion as required. Fig. 1 shews the section of a tank



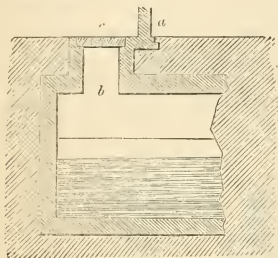
constructed in the manner thus described, *a* being the agitator; *b* man-hole; *c* pump, with moveable hose or fixed piping liquid for filling the manure cart.

The mode of constructing the Flemish manure-tanks, alluded to above, is thus described by Mr Stephens:—

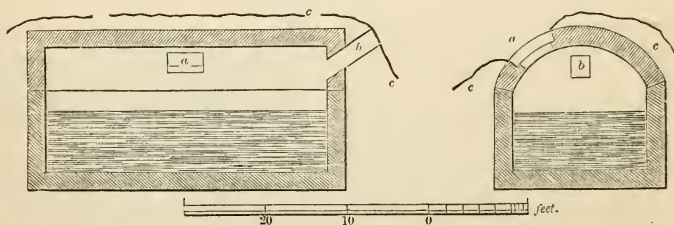
"The tank is frequently constructed underneath the stable and cattle-house, the liquid being led to it by open gutters running along



in front of the stalls. Part of it projects beyond the wall, as in fig. 2 at *a*, and is provided with a well-hole *b*, through which the liquid is taken when required for use by means of a pump, or long-handled ladle. The aperture is closed at other times by a wooden or stone cover *c*, as shewn. Brick is used in its construction, and the bottom and sides are well cemented, to make the whole water-proof. Sometimes the tank is divided into various compartments, these being designed to hold the liquid manure collected at different periods.



“But not only are tanks provided at the steadings: in many districts, as in the flax-growing district of Courtray, they are built at the roadside, at the edges of the fields, in order to facilitate its application. These are usually made to contain the *vidanges*—by



which term is meant human excretæ—which are collected from time to time in the towns, and carted out to the rural districts. In fig. 3 we give a transverse, and in fig. 4 a longitudinal section of a roadside tank. The manure is supplied to and taken out of the tank

through the man-hole door *a*, shewn in the transverse section to the left: this is usually kept close by means of a stone or wooden cover. But a second aperture *b*, is provided at the end of the tank, which is always kept open, to allow of the ingress of air and the egress of the foul emanations. The crown of the arch rises a considerable height above the level of the surrounding ground, and the whole is covered with earth or turf, *cc*, so that in process of time the structure is grown over with grass, presenting the appearance of a verdant semicircular mound with rounded ends.”

Before concluding, it is necessary to say a few words relative to the loss of the valuable properties of the urine in a tank by the escape of the ammonia. Various methods of fixing this have been proposed: thus, it has been recommended to strew powdered gypsum on the stables and byres, and to add it in large quantities to the tank. Gypsum answers very well in the dunghill, for when strewed in frequent layers on the porous mass it cannot fail to detain a great deal of ammonia, as it rises up along with watery vapour to the surface of the heap; but it is far from being so efficient a fixer for the ammonia of the urine tank, and for this reason it can fix ammonia only when in a state of solution; but gypsum dissolves in very small quantity in water, hence, when it is added to the tank, it sinks

to the bottom and gets enveloped in the thick viscid layer that lies there, fermentation goes on in the upper part of the tank, and ammonia escapes into the air just as if no gypsum were sent, unless, indeed, the contents of the tank are constantly stirred. Some farmers, especi-

ally those who are fond of doing things by halves, take another method of partially fixing the ammonia of urine. They dispense with a tank, in the proper sense of the term, and allow the excess of urine above what is required to saturate the dung in the court-yard, to run into an open trench, in which is placed a quantity of earth or peat. Earth can rarely do much besides taking up the urine in its pores, and permitting it to be removed and applied like ordinary compost. Peat is better, and can fix a portion of ammonia, but in both cases the solid matter speedily fall to the bottom, and urine floats and putrefies and wastes above it. On several well-managed farms we have seen a layer of rich peat earth evenly laid behind the cattle in the stalls, to absorb the urine as soon as voided. In the absence of well-laid and cleanly-kept gutters for conveying the urine speedily to the tank, this is perhaps as good and cheap a practice as can be had recourse to; but the saturated peat should be carried to a compost heap, in which the fermentation is low, or has been completed, and not be cast into the hot dunghill.

No method, however, can at all compare with sulphuric acid for fixing the ammonia of the tank. It is not, like gypsum, liable to fall to the bottom, but diffuses itself through the whole, so that there is no nook nor corner in which it is not ready to lay hold of the ammonia the moment it is produced.

Nothing can be more simple or easily managed, for there are no weighings or measurings

required to proportion the acid to the urine: the simple rule is, unless at the time when the tank is to be emptied, *an excess of sulphuric acid should always be kept in the tank*. But how is a plain unlettered grieve or bailiff to know when there is excess in the tank or not? Simply thus: let him purchase and keep beside him a book of *grey* litmus paper from any druggist or dealer in chemicals, and whenever he wishes to try the state of the tank, let him stir the contents a little, and then dip a slip of paper into the tank; if the paper becomes red, there is excess of acid present, if it becomes blue there is a deficiency, and he requires to pour in a fresh supply of sulphuric acid. At the time the neutralised urine is to be applied, it should neither change the paper to red nor blue, but leave it of the same colour as it would be left by pure water. The advantages of using sulphuric acid are manifold. Thus, the whole ammonia is retained, and that which retains it does not in any degree interfere with its formation. Again, no dilution is required, and this expense is saved in carting out. Further, the urine, after undergoing putrefaction, and having its ammonia fixed, may be pumped back upon the dunghill without causing or suffering loss, if the farmer knows no more effectual way of applying it to the land. Lastly, neutralised urine may be applied by the water-cart to any sort of growing crops without in the least scorching them, while unneutralised urine cannot be so applied unless very largely diluted with water.

## Summary of Agricultural Events for July.

### THE SEASON AND CROPS.

SINCE our last report was issued the weather has continued unprecedentedly hot and dry, and the amount of rain which has fallen has been very small. Water has, consequently, become exceedingly scarce in many parts of the country, and live stock have suffered much from this cause. Harvest operations have commenced unusually early, barley having been cut even in Banffshire on 11th of the month, while wheat was reaped in several parts of England on St Swithin's day, a circumstance which has not happened for many years. The wheat crop generally is good, but other crops are stunted in the growth. The hay crop has also been much lighter than was anticipated at an early period of its growth. Pastures are quite burned up. Many fields sown with turnips remain without the appearance of a single plant, but in some cases the appearance of the crop is much more favourable than could have been expected. A continuance of drought will, however, bring on mildew on the forward crops. Potatoes look tolerably well, but lately the plants are beginning in some parts to flag from want of moisture, and, for the same reason, the tubers are small.

### THE GRAIN TRADE.

The value of wheat has been slowly receding during the month, and it is expected that the downward movement will not be met by any reaction.

### THE LIVE STOCK TRADE.

The state of the pastures has compelled graziers, in many instances, to forward stock to market which are not in proper condition for slaughter; and the want of keep, combined with the poor prospects of the turnip crop, has told seriously on store markets, reducing the value of cattle and sheep considerably, and, in fact, extinguishing demand to a great extent. The top prices of beef and mutton have ranged as follows:—

At London, beef, from 3s. 10d. to 4s. 10d. and 5s. per 8 lb.; mutton, 4s. 4d. to 5s. per do. At Newcastle, beef, from 8s. to 8s. 9d. and 9s. per 14 lb.; mutton, 6½d. per lb. At Edinburgh, beef, 8s. 3d. to 9s. per 14 lb.; mutton, 6½d. to 7d. per lb. At Dublin, beef, 54s. to 63s. per cwt.; mutton, 6¼d. per lb.

### THE WOOL TRADE.

The latest reports state that there is a fair consumptive demand for English wool, and although less business than usual was done at Inverness, still there was an improvement in some qualities as compared with last year's market. Most of the north country clips are now sold at the Edinburgh, Leith, and Granton sales.

### THE HEALTH OF STOCK.

An Irish journal, the *Dublin Express*, notices an increase in the number of deaths among cattle from pleuro-pneumonia, and a suddenly fatal disease called apoplectic congestion, and also an increase in the mortality among sheep.

### AGRICULTURAL SOCIETIES.

Several important local shows were held during the month, among which were those of the Northamptonshire Agricultural Society at Oundle; the Ripon and Claro Agricultural Society; the United East Lothian Agricultural Society; the Peterborough Agricultural Society; the Morayshire Farmer's Club; the Angus Agricultural Association, at Forfar; the Northumberland Agricultural Society, at Cornhill; the South Durham and North Yorkshire Agricultural Society, at Darlington; the South Lincolnshire Agricultural Association, at Grantham; the Kincardineshire Society, &c. The great event of the month was of course the show of the Royal Agricultural Society at Leicester, which proved very successful. The Highland and Agricultural Society's Show at Aberdeen was not held until the close of the month, after this summary was written.

## The Garden.

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### *GRAPE GROWING FOR PROFIT.*

SEVERAL years since Mr James Lindsay, who has long held the first place among Scottish fruit merchants, purchased the beautiful small estate of Dryden Bank, about six miles from Edinburgh; and he immediately set about realizing the idea which he had long entertained, of growing grapes for supplying the market during the winter festive season, commencing with the Christmas holidays and ending with that period in spring when early forced grapes begin to appear in the principal fruit shops; a period of the year during which our supplies have hitherto mainly consisted of those ill-ripened, flavourless, thick-skinned, saw-dust packed, imported grapes, which do not even possess the recommendatory property of being ornamental, while they are almost invariably so very inferior in quality as to deserve the appellation of health-injuring, or the worse one of health-destroying.

The grounds of Dryden Bank have a rather steep-sloping surface, facing almost due south; and looking from their higher parts as well as from the elegant and commodious dwelling-house, up the narrow, steep, and romantic valley, where the North Esk tumbles over its rocky bed between high ascending wooded cliffs. "Classic Hawthornden," the antient residence of Drummond, the poet and historian, is seen perched upon its craggy summit, surrounded with fine old trees, conspicuous among which appears the great wide-spreading plane, under which he and Ben Jonson often sat holding kindred communings, when the latter travelled on foot from London in order to pass a few weeks with the Scottish poet; the whole

enviored by the fertile fields and woodlands of Mid-Lothian, and backed by the distant range of the Moorfoot Hills. Here, in the old garden, still exists a fruit-bearing but scanty remnant of the original Hawthornden apple tree. And among the caverned depths of unknown extent, with which the rock is penetrated, in which Pictish kings and their retainers are said to have found safe retreats, as did also Sir Alexander Ramsay and his patriotic associates in the days of Robert The Bruce, is "The Cypress Grove"—a solitary cave where Drummond is said to have composed many of his poems, and which still bears this, the name of one of his most celebrated prose productions.

The former garden of Dryden Bank, measuring about one acre, and situated on the more gently sloping lower part of the property, Mr Lindsay resolved on converting into a glass-covered vineyard, which he commenced in 1866 by the erection of two east and west lying, lean-to vineries, each 160 feet in length, the one being 15 and the other 18 feet in width, with a height at back of 15 feet and 16 feet respectively; both are heated with hot water; pipes of 4 inches in diameter being employed for that purpose in the former, and six in the latter, which have been found amply sufficient. The rafters are formed of the best red Baltic pine battens, and the glass used weighs 21 ounces per square foot, so that the essentials of stability and durability are secured in so far as practicable with wood and glass. Ventilation is provided for through low perpendicular sash openings in the fronts, and on the top of the back walls; their open-



ing and shutting being effected in a manner which combines ease with expedition. The pathways are formed of simple but substantial cast-iron grating 2 feet in width; and due care has been taken for securing and applying sewerage and other liquid manure, as well as clean water, when needed for the vines—a capacious tank capable of holding about 3000 gallons being provided for the former. The sloping nature of the ground allows of those two vineries being terraced, or the one placed at a considerable higher level than the other, so that the back wall of the lower acts as a retaining wall for the outside vine border of the upper, and injury from the overshadowing of the one by the other is consequently prevented. The soil used for the inside as well as outside vine borders was the turf from good old pasture land, of medium texture, well rotted or decomposed, and incorporated with crushed bones, lime rubbish, and a little superphosphate; this, as well as the other departments of the work having been done under the direction of Mr Wm. Thomson, and much after the manner recommended in his “*Practical Treatise on the Grape Vine.*” The kinds employed were chiefly the Black Alicante and Lady Downes, planted at 6 feet apart for permanent growth, with alternate supplementary vines about 4 feet further inward for being removed when the others fill their allotted spaces.

It was Mr Lindsay's intention to have planted his vines early in the spring of 1866, but like many others, when similarly circumstanced, he found himself unable to control the doings of his tradesmen, and had to content himself with getting one house planted in June and the other in July of that year; thus losing almost a season in the growth of his vines, as a first selection of these made in autumn and planted next winter, before they had commenced to grow, would have made almost as good plants in 1867. The appearance of the vines is now, however, everything that the most fastidious cultivators could desire, many of the rods having reached to the top of the rafters, and these are covered with most luxuriant foliage, interspersed on their lower parts with an abun-

dance of unusually large well-formed clusters, upon which the operation of thinning was being performed at the time of our visit. In the large house, which was the first planted, the supplementary vines, which are chiefly the Lady Downes variety, have from ten to twenty bunches on each, while the permanent Alicantes have on an average nearly half of that number, the whole carrying fully 600 clusters, which may be expected to weigh, when ripe, over half a ton. On entering, the visitor is agreeably impressed with the view of fruit and foliage hanging throughout a length of 160 feet, and in another couple of years, when these will cover all the rafters over a base surface of 18 feet in width, the appearance will certainly be grand in the extreme. That eminent horticultural author, the late Dr Patrick Neill, remarked in reference to the overcropping of vines, that “*avarice not unfrequently cheats itself in this matter; and it generally happens in the vinery, as elsewhere, that not he who desires most obtains most,*” and some while admiring the splendid crops with which many of the young vines at Dryden Bank are now loaded, may feel inclined to suspect that their owner has exposed himself to the Dr.'s imputation, by cropping too heavily, but Mr Lindsay has such strong faith in the plant-feeding properties of his well-prepared borders and liquid manure applications, that he fears no bad results from taking a first paying crop off at least his subsidiary vines. The inside wall surfaces have all been whitewashed with hot lime as a precaution against insect lodgment, which imparts throughout an appearance of cleanness. But, in our opinion, the general effect would be greatly enhanced, and an increased supply of fruit obtained, were the presently bare back walls thinly covered with trellis-trained vines.

The proper thinning of the grapes will, of course, annually entail a considerable amount of scissor labour in such an extensive vineyard as that at Dryden Bank will be. Mr Lindsay contemplates employing girls to perform this all-important operation. And we hope, for the sake of the girls, that he will use a portable outside awning to shade them

from the sun when at work. Grape-thinning in bright sunny weather is a species of professional martyrdom, that young gardeners may put up with for short periods, and enjoy if they choose; but even in a well ventilated vinery, the work—light although it is—cannot be long continued without hurtful and even dangerous effects upon the health of the operatives, which should never be risked when an inexpensive outside temporary shading will ensure safe protection.

Having erected his vineries, formed the borders, and planted the vines, as before detailed, Mr Lindsay, well knowing that after success will depend entirely on proper management, secured the services of Mr Alexander Anderson, who, when gardener at Torwoodlee, distinguished himself as a prizetaker for grapes at the Edinburgh Great International Exhibition of fruits in September 1866. As an inducement to faithful and permanent service, Mr Anderson is allowed more liberal remuneration than that which falls to the lot

of most gardeners. And so highly satisfied is his employer with the present appearance and prospects of his grand commercial grape-growing experiment, that he has resolved on erecting another vinery of iron, instead of wood, and of equal length with the existing two, but about 30 feet wide, or twice the width of the smaller, he having carefully studied the late controversy which originated in *The Farmer* on the "restrictive" and "extension" systems of vine-growing, and became convinced that the latter is that from which the most remunerative results are to be obtained.

In what may be termed the private range of hot-houses in the vicinity of the mansion, and devoted chiefly to the growing of peaches, grapes, and flowers for home supplies, we observed a large stock of well grown young vines, chiefly intended for sale. And in the pleasure-grounds are an unusually numerous assortment of good-sized hardy trees and shrubs, which we intend to notice more fully at another time.

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### WATERING OUT-DOOR PLANTS.

THE general prevalence of excessive drought during the last two months has called forth an amount of out-door plant watering, throughout the length and breadth of Britain, which may with safety be termed unprecedented; for even admitting that the summer of 1826, and others which have been noted for their warmth and dryness, may have surpassed the present in these respects, yet in those days plant-growing was comparatively limited, for the modern bedding-out system had not been introduced, and suburban amateur gardening was a luxury only enjoyed by the leading city magnates who could afford to keep their own practical gardeners, or men of all-work, to do the then unfashionable gardening labours, which are now deemed agreeable as well as healthy recreations, and partaken in by most of our well-to-do citizens, including many of the more industrious, fortunate, or deserving of

"the working classes." Hence the largely increased amount of plant watering now done, and too often over-done, in dry weather by unskilled amateurs, who are the less blameable for its injudicious application, seeing that much ignorance exists, even among practical gardeners, as to how, when, and where plant watering should be performed.

Without entering into any dissertation regarding the constituents of water, or the modes of its action on plants, we may here remark that all water applied to their leaves should be perfectly clean; that rain water is the best, whether for the leaves or roots; river water is the next best; and spring or well water is the worst, but this last may be greatly improved by boiling, or by keeping it in an open tank or cistern for a day or two before using it. Watering should never be done unless actually required to keep up healthy vitality in plants; and when done, it

should be thorough, so as to reach fully further than the extremities of the roots. And water should never be applied when lower in temperature than that of the soil. Inattention to these essentials is the cause which produces the very common and but too well-founded complaint, that "I am quite tired of this ceaseless watering; yet I would not grudge the labour did I see it followed by any really beneficial results, but my plants are making no satisfactory progress, notwithstanding all that has been done for them."

How to apply water, so that it may thoroughly penetrate to beyond the extremities of the plant roots, is by no means easily done, but when actually effected, it does not require to be often repeated. The uninitiated are apt to suppose that when they have thoroughly wetted the surface till the water is seen running off, they have done all that is required. This is, however, a fatal mistake; for even when discharged from the finest watering-pan the water will soon so clag, fill up, or puddle the surface, that it will run more easily off than into the soil, although it may not have penetrated more than an inch or two beneath its surface, and will consequently be absorbed by evaporation in less than a single day. For all who can command a sufficient supply and pressure of water, no better appliance can be used for laying it on than a sufficiently lengthy flexible tube, with a fine rose or minutely perforated pipe attached, so that when placed the ground will absorb the water as fast as it is discharged; forming temporary basins by drawing aside the surface soil around the plants, and refilling these with water till the ground will scarcely take in more, is the best mode for general adoption; and as, when the soil is returned, the surface is comparatively dry; it has the advantage of not producing an excess of cold at night from evaporation. For raised flower-beds, from which the water is apt to run off when poured on, a good plan is to perforate the surface thickly from 6 to 12 inches deep, with an ordinary dibber, or sharp pointed stick, taking care in doing so not to injure the roots, and then water so as to fill the holes repeatedly till the

soil is perfectly saturated. For rhododendrons and other special plants, growing in grass lawns on steep banks or elsewhere, it has been recommended to water them by means of bottles or other vessels, wholly and permanently sunk into the earth, having each a small hole in the bottom, with an easily applied top cover; and these being filled with water it escapes gradually into the root-surrounding soil. Another and somewhat similar mode is to use earthenware or other pans likewise pierced in the bottom, but set on the surface, and consequently removable at pleasure. We may here remark that there is nothing so effectual in preventing and curing mildew in roses, peas, brassicæ, and other plants, as a thorough soaking of the ground when it has become too dry; but, as before mentioned, it should never be applied when lower in temperature than the soil, while, if possible, it is better that it should be from ten to twenty degrees higher, for let it be remembered that in dry summer weather  $60^{\circ}$  is an ordinary temperature for the soil, at about a foot below its surface, and rain-water is then often warmer, but seldom colder, whereas spring-water may be quoted at between  $46^{\circ}$  and  $50^{\circ}$ ; hence it follows that the direct application of the latter, whether to the roots or leaves, must impart to them a highly injurious, and, in the latter case, a long-continued chill.

When to apply water must be judged of by observing a cessation of growth in the plant, a flagging or withering of its foliage, combined or not with the appearance of mildew. The time of day at which it is best to water, is a subject regarding which there exists much difference of opinion. It is not advisable, if it can be avoided, without much inconvenience, to water either the foliage or surface of the ground during hot sunshine, as the former is apt to become spotted or discoloured, while the latter, and more especially if it is heavy in texture, is liable to become hardened or surface bound. When the water is applied to the roots in such a manner as to leave a minimum of wetted surface, it signifies little at what time of the day it is given; but when the air is dry and clear it is

as well to dispense with evening wide-surface watering, as by its brisk evaporation an injurious excess of cold is produced throughout the night. An exception to leaf-watering throughout the day may be made in the case of recently transplanted evergreens, which are the better of being syringed morning, noon, and afternoon, in sunny weather.

Liquid manure is always a good adjunct to ordinary water, when applied directly to the soil; but in very dry weather, it should be used with extreme caution, and only when very much diluted, or it may prove highly injurious instead of beneficial. Dung-hill drainage is the safest of all, but only as much should be added as will bring the water up to the colour of pale ale; and if the better class of guanos or other equally rich fertilisers are used, a dessert spoonful of these to the gallon of water will be sufficient, which should, if possible, be mixed with the water some hours before it is applied. Wherever slugs and snails are troublesomely abundant—except among rhododendrons or other ericeæ—dry weather should be taken advantage of to water the ground with clear lime water, and the best time to apply it is in the dusk, or just after nightfall, when these pests have left their retreats in search of food.

All who have abundant and unfailing supplies of water, which they can apply to their gardens *ad libitum*, when droughts prevail, may consider themselves highly favoured. Many cannot, however, deem themselves safe from that greatest of discomforts, the want of fresh water when extreme and prolonged tracts of dry weather have to be endured. "Waste not want not," should be the timely watchword of all so circumstanced, and for the sake of themselves and neighbours, to say nothing of the feelings and pockets of water company shareholders, they should use all house refuse water for garden purposes, such as wash-hand and bath-room slops, soap-suds and the like, instead of taking all they want from the usual clean water-supplying sources. Waste of water, as well as of labour in watering might also be greatly lessened by more frequently covering ground surfaces with stable or byre manure, straw, short cut grass, tanners' bark, partly decomposed sea weed; cheap rush, straw, or bark mats; stones, tiles, gravel, deals, &c. None of these may be universally applicable, and for ornamental grounds some are highly objectionable, but numerous instances will occur in which one or other may be largely as well as beneficially employed.

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## NEW AND RARE FLOWERS AND FRUITS.

### NO. 3.—ANCYLOGYNE LONGIFOLIA.

A MOST beautiful plant, introduced by James Veitch & Sons in 1866, with something of the inflorescence of the *Russelia juncea*, introduced by Mr Pearce, Messrs Veitch's collector, in Guayaquil.

It is undoubtedly one of the finest tropical Acanthaceæ ever introduced into this country, and cannot fail to be a most important accession to our stoves.—See page 170.

### NO. 4.—CASTLE KENNEDY FIG.

Considerable attention has of late been directed to this fig by notices in the horticultural periodicals, and especially by the highly commendatory report which was bestowed upon it by the Fruit Committee of the Horticultural Society on the 30th May 1865, and the no less flattering com-

mendation by the judges at the Show of the Glasgow and West of Scotland Horticultural Society on the 8th June 1865. Of the origin and early history of this fig nothing can be said to be known. The oldest tree at Castle-Kennedy is supposed to have been planted at least eighty years since; and it shared in





*Ancylogyne longifolia*. — See page 169.

the neglect and ruin to which the whole place was subjected prior to the accession, in 1840, of John-Hamilton, eighth Earl of Stair, and uncle of the present noble proprietor, who restored the gardens and pleasure grounds to even more than their original magnificence. The tree, growing against an old wall untrained and unpruned, attracted attention, even in that neglected state, by its ripening, in fine seasons, abundant crops of fruit early

We have received a letter from Mr Fowler, the gardener at Castle-Kennedy, in which he says :—

“The largest of the fruit (forced) is now past for the season, but I send you an average specimen. The last two seasons some of the fruit weighed nearly 7 oz., and measured close upon 11 inches round the thickest part. I measured one the other day in the presence of two neighbouring proprietors, which was fully 9 inches in circumference. Planted out in the same house, and in every respect treated in the same manner



The Castle-Kennedy Fig.

in August, remarkable for large size and excellence of quality. Young plants grown as standards have frequently ripened fruit at Castle-Kennedy; and it has there been found vastly superior to any other variety either for forcing or wall-training. Compared with the well-known Brunswick fig (which the Castle-Kennedy resembles in colour), it is larger and more thickened towards the apex; and the flesh, which is reddish brown throughout, has an exquisite flavour.

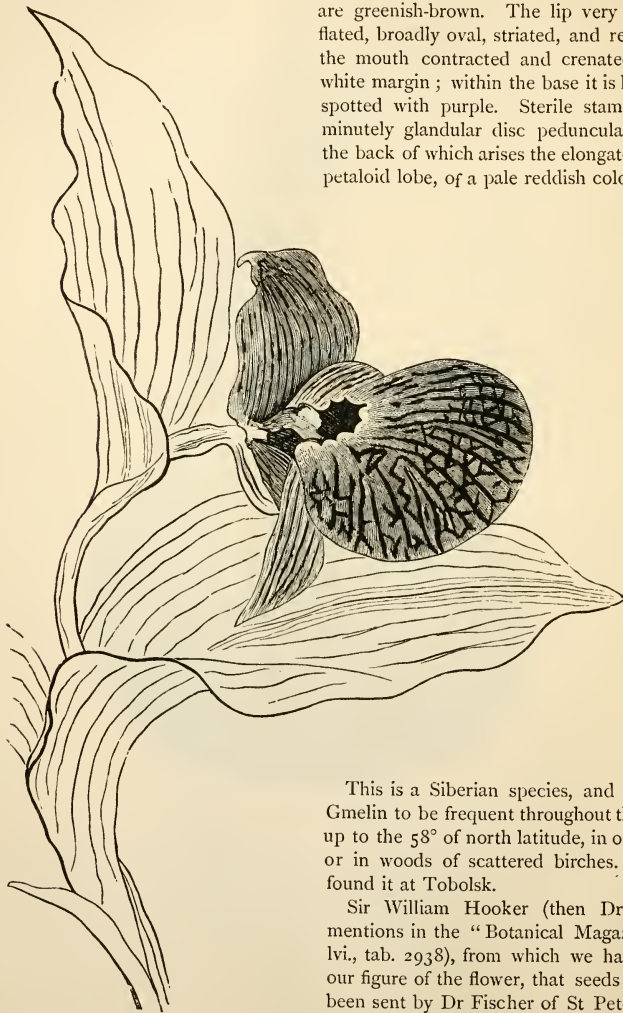
with the following sorts, it ripens a fortnight earlier than the White Marseilles, more than three weeks earlier than the Brown Turkey, and quite a month before the Brunswick, requiring little more than three months to mature its first crop. There is a peculiarity about it, which I have never observed in any other fig. When within a few days of being ripe it begins to exude a pure, honey-like substance from its eye, of most exquisite flavour, which, when the fruit is fully ripe, becomes viscid, and hangs down like a clear crystal pendant.”

Our engraving represents the specimen sent to us by Mr Fowler.

## NO. 5.—CYPRIPEDIUM MACRANTHON.

A species remarkable for the unusual inflation of the sac formed by the lip, and its uniform delicate pale mauve colour.

Flower solitary, of a uniform pale mauve or pinkish purple colour, with the exception of the inferior sepals (united into one), which are greenish-brown. The lip very large, inflated, broadly oval, striated, and reticulated, the mouth contracted and crenated, with a white margin; within the base it is hairy, and spotted with purple. Sterile stamen, a flat minutely glandular disc pedunculated, from the back of which arises the elongato-cordate, petaloid lobe, of a pale reddish colour.



A stemmed species, 8 or 10 inches high, with long ribbed leaves enclosing the stem.

This is a Siberian species, and is said by Gmelin to be frequent throughout the country up to the 58° of north latitude, in open places or in woods of scattered birches. Amman found it at Tobolsk.

Sir William Hooker (then Dr Hooker) mentions in the "Botanical Magazine" (vol. lvi., tab. 2938), from which we have copied our figure of the flower, that seeds had often been sent by Dr Fischer of St Petersburg to the Glasgow Botanic Garden, but that he never succeeded in cultivating the plant until roots were sent by him.

## NO. 6.—CYPRIPEDIUM CALCEOLUS.

The small European Venus' slipper (*C. calceolus*) may without disadvantage challenge comparison with any of the tropical species of this genus. Although the flower is smaller, its form is as remarkable,

It is a native of the Swiss Alps, and is found in spots with an eastern aspect, but sheltered from the winds.

It thrives best in loam and leaf mould, and may be grown in pots and forced. It is



*Cypripedium calceolus.*

and its colour more brilliant than that of most of them. The lip is a lively yellow, and the sepals deep purple, as are the petals, with the addition of being tipped with yellow.

usually propagated by fragments of the roots furnished with an eye.

There are two varieties, the one deeper in colour than the other. The variety figured is that of deepest colour.



## NO. 7.—CYPRIPEDIUM PURPURATUM.

Very nearly allied to *C. barbatum* and *C. venustum* (Wall). The chief distinction, according to Hooker, is the absence in this species of the warts on the upper edge of the darker stripes, and at the base spotted with deeper purple. Lower sepal (two coalesced) greenish. Lip greenish purple, obscurely veined. Sterile stamen, very large reniform.

*Cypripedium purpuratum.*

petals, and that the petals themselves are broader.

Dorsal sepal white, richly striped with purple; petals brownish purple, streaked with

Ovary long, club-shaped, furrowed, downy. Leaves radical, distichous mottled.

It is a native of the Malayan Archipelago, and flowers in a damp stove in November.

## Rambles by Road, River, and Rail.

### FARMING IN YORKSHIRE.

THIS county at a very early date was divided into three portions, called Ridings. The North Riding contains about 1,350,121 acres; it is bounded on the north by the river Tees, which separates it from Durham, and on the south by the East and West Ridings. Its population is estimated at 264,182 persons. The East Riding comprises the south-eastern portion of the county; it is bounded on the north and west by the rivers Harford, Ouse, and Derwent; and on the south by the river Humber. This Riding contains 771,139 acres, and has a population of 295,021 persons. The West Riding, which contains the remaining portion of the county, is bounded on the north by the rivers Ure and Ouse, on the east by the Ouse and Humber, on the south by Lincolnshire, Nottingham, and Derby, and on the west by Westmoreland, Lancashire, and Cheshire. It contains 1,709,307 acres, and a population of 1,623,530 persons.

The North Riding contains a great variety of soils. To the extreme west the mountain limestone prevails, forming a very picturesque country of hill and dale. The soils in the valleys amongst these hills are very fertile and highly valued. Eastward of this district there is a belt of poor soil, chiefly composed of the *aldris* of the millstone grit and decomposed shale. Still proceeding east we pass successively beds of new red sandstone, magnesian limestone, lias-clay, and oolite, the soils in each of these districts partaking more or less of the geological character of the stratum upon which they rest. To the east of the Riding lie the Yorkshire moors, comprising nearly 400,000 acres of land; many of these moors rise fully 1200 feet above the level of the sea. The greatest extent of valuable land is situated in the centre and northern portion of the Riding. The vale of Cleveland, comprising the low-lying land, which extends from the moors to the banks of the river Tees, contains a large area of land resting on the lias clay; it is cold, unproductive, and costly to work. The general rotation on the soils are 1 fallow, 2 wheat, 3 oats, or 1 fallow, 2 wheat, 3 beans or clover. Drainage is sadly needed in these districts, and the farm buildings are far from satisfactory. A large amount of capital might be profitably laid out on permanent improvement. The absence of leases, and compensation for unexhausted improvements, prevents the tenants carrying out the much

needed works of improvement. In some localities landowners have made the improvements, and charged the tenant a per-centage on the outlay. Though there are a good number who have acted thus, the greatest number appear to have no interest whatever in the condition of their properties. It is extraordinary that landlords, with so many examples of successful drainage around them, are not more alive to their own interests. The farms in this district are small; little stock is kept, the dairy being the chief object of small farmers. On the soils of the limestone and sandstone districts a different system of cultivation is adopted; on these soils turnips are largely grown, and a much larger number of cattle fed. The four-course rotation is the most common; some of the best farmers have extended this course into a six-course, by introducing beans instead of a portion of old clover, the clover not being found to succeed when sown on the same ground once in every four years. On these soils oats are sown on the clover leys, and barley and wheat after turnips. Turnips in these districts are generally consumed on the ground by sheep getting cake or corn. Last year 773,977 acres of land in this riding was under crops—222,189 acres corn crops, 77,916 acres green crops, 69,231 acres clover, and 365,383 acres permanent grass. About 30 per cent. of the corn crop consisted of wheat, about the same proportion of oats, about 25 per cent. of barley, about 5 per cent. beans, and the remainder rye, peas, &c. Of the 77,916 acres under green crops, 58,796 acres consisted of turnips, and 9169 acres of potatoes.

Many eminent breeders of cattle are resident in this Riding. Though the breeders on the north side of the Tees were formerly the most noted, their brethren on the southern banks have now far eclipsed them. The improved shorthorn breed of cattle is the most valued in all highly-cultivated districts. The old "Yorkshire cow" is fast losing caste. A considerable number of horses are bred in this part of Yorkshire; they are generally much heavier than those bred in the East and West Ridings. The celebrated Cleveland bays have not now the status they formerly had; they are much less in size than the animals bred twenty or thirty years ago. Animals nearer the racehorse have been employed for breeding purposes. The original coaching variety has nearly disappeared, and is replaced by a light, active animal, nearly thorough bred, possibly more

suit to modern wants, but possessing nothing of the strength of the old race.

Where flocks are kept, the improved Leicesters are generally preferred. Some farmers purchase Cheviot ewes at the northern fairs, cross them with Leicester rams, sell the lambs fat to the butcher, take the wool and dispose of the ewes in the autumn. A large variety of the pig is found in this part of the county; specimens of enormous size are sometimes shewn at the local and other shows; smaller sized varieties are, however, coming more into favour. Last year the live stock of this Riding consisted of the following animals:—45,885 milch cows, and 84,030 other cattle, 698,638 sheep, and 66,590 pigs.

The East Riding is generally divided into three divisions—1st, The Wold district, comprising the central high ground of the Riding; 2d, Howdenshire and the vale of York, extending from the west side of the Wolds to the rivers Ouse and Derwent; and 3d, Holderness, stretching from the sea coast to the eastern parts of the Wold. The chalk wolds of Yorkshire are much the same as the chalk hills in other parts of England. The country is much more picturesque than the downs of the south. The land is all enclosed, and generally by good well-kept fences. The wolds rise highest in the north, near Bishop Wilton Beacon, where they are fully 800 feet above the sea level. From this point southwards they gradually dip, until at Brantingham, the most southern brow of the wolds in Yorkshire, they are not above 500 feet in height. Upon these elevated plains the soil is about 2 feet in depth, it consists of a dark loam, not unfrequently containing a large amount of clay. The farms are large, varying from 500 to 1500 acres in extent. They are generally held by men possessed of the necessary amount of capital, and who have intelligence and judgment to turn it to good account. The land is easy to work, and under good management produces satisfactory returns. Corn, mutton, and wool are the chief products of this district. A very small proportion of the wolds require draining, the subsoil generally being so porous and open. Rents vary from 15s. to 25s. per acre. The employment of artificial manures—bones, guano, &c.—has vastly improved the agriculture of this district. A much wider area of land is now under root crops. On some of the best managed farms the following rotation is adopted—1 oats, 2 turnips, 3 wheat, 4 swedes, 5 barley, 6 seeds. The yield of grain is not large—wheat 26 bushels, barley 38 bushels, oats 50 bushels. The soil of the lower wolds consist of a light friable calcareous loam, not more than 9 or 10 inches in depth. Though, in many instances resting on a chalk rock, these soils do not contain much lime, frequently not more than 5 or 8 per cent. On these soils it is of the greatest importance to get the land thoroughly consolidated; for this purpose Crosskill's and Cambridge's rollers are in great request.

The usual custom is to consume on the ground, with sheep, as great a proportion of the crops as possible.

The holdings are smaller than those on the higher wolds, and command a little higher rent.

In Howdenshire and the Vale of York, a great variety of soils are met with—rich warp lands, heavy lias clay, sandy and gravel soils. The cold clays of this district are very unproductive. The rents vary from 12s. to 25s. per acre. The old system of these crops and a fallow is still the common rotation. Drainage is sadly required on the clay soils. On the sandy and gravel soils the agricultural practice is better, but still far behind that of some districts further north. Along the course of the Ouse, there is some rich warp land, which produces good crops of wheat, oats, beans, potatoes, and flax. The prevailing soils throughout this district consist of tenacious clays and blowing sands.

Holderness is a low-lying country, seldom rising higher than 50 feet above the level of the sea. Many thousand acres in this district have been formed by a deposit from the waters of the Humber. Until about a century ago this land was a profitless morass, under water at the turn of spring tides, affording capital duck shooting, but of no value for any other purpose. An embankment has been made to protect the land from the effect of spring tides; and, by working and drainage, the soil has been brought into a highly fertile condition. Great bulk of the land is under the plough; on these soils too much straw is generally obtained, and crops often suffer from being much lodged. On some of the best managed farms the following rotation are adopted—1, rape; 2, wheat; 3, beans; 4, wheat; or, 1, oats; 2, beans; 3, wheat; 4, beans. Some portions of the higher land of south Holderness are suited for the cultivation of turnips; but the greatest part is too heavy. On the heavier class of soils the following rotation is common:—1, fallow; 2, wheat; 3, seeds; 4, wheat; 5, oats; 6, beans. On the banks of the Humber warping has long been practised with most successful results. By attention during the warping process, it has been found possible to influence very materially the character of the deposit. When the tide is first admitted, the heaviest particles, composed of sand, are deposited; afterwards, on the motion of the water becoming less, the finer particles of sand and clay; and, finally, silt, composed of flocculent earthy matters. The first and second deposits are highly valued, and so also the third, but it is composed of such fine particles, the soil formed is heavy, retentive, and costly to work. On this account, therefore, the third deposit is seldom allowed to fall, the water being passed off as soon as the first two deposits are made. By warping a large area of worthless land has been rendered fertile and productive. The cost, including large drains and other works, varies from £10 to £15 per acre. In some instances the tenant did the work; but it is generally done by the landlord, and the tenant charged a percentage on the outlay. The process takes about three years for completion—one year for working, one year for drying, and the third year for consolidation. During

the third year a crop is frequently on the land. This crop generally consists of seeds. They are hoed in by hand, as the surface is too soft for horses to go over. After lying two or three years in seeds the land is drained, and is ready for ordinary cultivation. The seeds are generally grazed by sheep. After draining, the chief crops grown are wheat, beans, and flax. On some warp land heavy crops of potatoes are grown. Formerly large quantities were grown for the London market, but now the large manufacturing districts in the Midland counties take greatest part. Mr Herepath found a sample of suspended matter in the water used for warping, to consist in the anhydrous state of the following :—

	Per Cent.
Organic matter . . . . .	11.49
Soluble salts . . . . .	3.2
Carbonate of lime . . . . .	6.94
Carbonate of magnesia . . . . .	5.02
Alkalies from decomposed silicates	0.24
Lime . . . . .	0.75
Magnesia . . . . .	3.27
Oxide of iron and alumina . . . . .	12.82
Phosphate of iron . . . . .	1.22
Insoluble silicious matter . . . . .	55.02
	—
	99.97

Last year there was 626,799 acres of land in this Riding under cultivation, divided under the following crops :—Corn crops, 269,307 acres ; green crops, 99,930 acres ; clover, &c., 86,889 acres ; grass, 145,849 acres. Of the corn crops 43 per cent. consisted of wheat, 18 per cent. of barley, 30 per cent. of oats, and the remainder of beans, peas, and rye. Of the green crops, 69,159 acres were under swedes and turnips, 9447 acres under potatoes, 10,029 acres vetches, &c., 9379 acres cabbages, &c., and 1916 acres mangolds and carrots; while the live stock consisted of 19,890 milch cows, 39,622 other cattle, 549,780 sheep, and 60,020 pigs.

The West Riding is noted more for its manufactures than for its agriculture, an abundant supply of coal affording cheap fuel for the production of the motive power required in the manufacture of those products of industry for which this district is so celebrated. The Yorkshire coal-field embraces at the least one-third of this Riding. The surface of the soil is very undulating, rising into high hills in the west. The soils are very varied. In the vales amongst the mountain limestone hills, near the western boundaries, the soils are very fertile, and produce excellent pastures. As we approach the coal formations they are more inferior, but, being better farmed, are nearly as productive. In the manufacturing districts the land is generally under pasture, the demand for milk rendering the dairy a very remunerative branch of farm management. Here and there, however, near some of the large towns, we meet with arable farms very highly cultivated, indeed, more like market gardens than ordinary farms. On some of these farms,

a large quantity of potatoes are grown ; manure being plentiful and cheap in most of these districts. The farmers seldom adopt any regular system of rotation, but grow those crops that are the most remunerative. A good deal of land has for a long period been cropped with alternate crops of potatoes and wheat, while there are some instances where wheat has been grown on the same soil for a long series of years without any intervening green crop or fallow. Along the valley of the river Wharfe, past Ilkley, Otley, and on to Harewood, the land is very fertile ; a large proportion of it is in grass, stocked with shorthorns and Leicester sheep. At Harewood, where the land rises, the soil is not so tenacious, and is mostly under arable cultivation; it is well cultivated, and produces excellent crops. On the magnesian limestone, near Doncaster, Knaresborough, and Kipon, the land is lighter, a larger area of turnips are grown, and sheep farming more exclusively followed. Passing from Doncaster northward towards Huddlesey, past Hensall and Heck, the soil becomes very sandy. Continuing northward it becomes more and more firm and loamy in its character, and the district round Boroughbridge is noted for the superior pasture and arable land it contains. On the alluvial soils of the banks of the tidal rivers that flow into the Humber, in the south-east portion of this Riding, there is a large area of fertile land—on these soils, besides the usual corn and green crops, flax, teazles, woad, rape, mustard, &c., are grown. Near Selby and Goole a large area of the land is annually under the potato crop.

Last year 1,144,537 acres of land in this Riding was under cultivation—under corn crops, 255,783 acres ; green crops, 105,523 acres ; clover, 98,375 acres ; and permanent pasture, 656,716 acres. Of the corn crops 38 per cent. consisted of wheat, 28 per cent. barley, 25 per cent. oats, the remainder consisting of rye, beans, and peas ; and of the green crops, 22,830 acres consisted of potatoes, and 65,773 acres of Swedes and turnips.

In the districts round Doncaster some good horses are bred. The prevailing breed of cattle throughout this Riding is the improved shorthorn. In the dairy districts there are a good number of longhorns. There are some good flocks of pure bred Leicester sheep, but generally a cross with the Shropshire ram and Leicester ewe is preferred, the produce of which is much more valuable than the pure bred Leicester. In 1867 the live stock of this Riding consisted of the following animals :—91,610 milch cows, 119,565 other cattle, 815,041 sheep, and 93,017 pigs.

The rent of land varies greatly in this county, dependent on the quality of the soil, the proximity to good markets, &c. In the West Riding, in the district round Wharfedale, poor arable land lets as low as 10s. per acre, while the better land in grass on the banks of the river brings as much as 60s. per acre ; for land situated near the large towns, and for the alluvial flats, near Goole and Selby, much higher rents are obtained. In the East Riding, or Sunk Island, rents



vary from 35s. to 45s. per acre, on the lower wolds 20s. to 25s., on the higher wolds 15s. to 20s. ; and in the vale of York, on the cold tenacious clays, the rent varies from 12s. to 20s. per acre. In the North Riding, in the cold clay districts of Cleveland, rents are, in some cases, as low as 12s. per acre ; in other districts, as on the banks of the Tees, land is worth as much as 60s. per acre.

Over the greatest part of the county, yearly tenancies are the rule, and leases the exception. In the North and East Ridings the usual term is old Lady-day. The outgoing tenant is generally allowed an away-going crop from one-third of the arable land. This is usually valued to the incomer at, or immediately before, harvest ; the rent, rates, taxes, and expenses of harvesting being deducted. The straw and chaff belong to the farm. On some farms the manure belongs to the landlord, on others to the tenant. Unexhausted improvements are not generally paid for ; however, there is now a tendency amongst landlords to introduce some system of compensation on their properties. In the West Riding a Candlemas entry is more usual. In some parts of the Riding tenant right is recognised ; and valuations are sometimes as heavy as in the adjoining county of Lincoln. The custom, however, varies greatly. In some districts the cultivation, manures applied, rent, taxes, &c., on the land under green crop and bare fallow, is paid for by the incoming

tenant ; if the land has been under green crop an allowance is made for the value of the crop, the amount of this allowance depending on whether the crop has been consumed on or sold off the farm. A white crop generally extinguishes this claim for compensation. On the half-tillage land the out-going tenant is sometimes allowed half the rent, taxes, cultivation, and manures. The half-tillage land consists of clovers, beans, peas, and stubbles. In some districts an allowance is made for bone manure or guano used on the crop on the previous year, and also for the cake consumed by the fattening animals, but no regular custom is established. Even in districts where the principle of paying for unexhausted manures is recognised, there is much diversity in the practice of the valuers.

Labourers are well paid over the whole of this county ; near the large manufacturing towns as much as 20s. per week is sometimes paid in cash and perquisites. Over the greater part of the county good labourers are paid 14s. per week, and generally are able to obtain suitable cottages at reasonable rents. There is, however, still room for more cottages ; labourers have frequently too far to travel to and from their daily work. Formerly a large number of servant men were boarded in the houses of their employers, though from the absence of proper accommodation in some districts this plan is still adopted, yet the number so boarded is greatly reduced.

## Plantations and Hedges.

### INTRODUCTION.

THIRTY years ago a great work was finished. In the year 1838 Loudon's "Arboretum Britannicum" was published. It was the crowning work of many years of labour and perseverance, and, out of all Mr Loudon's voluminous publications, remains the most permanent memorial of his knowledge and ability. No greater praise can be given to it than to say that it is still the standard work on the subject of Arboriculture, notwithstanding that the seven and twenty years which have since passed have been more prolific in the discovery of new plants and trees than any similar period that could be pointed to in the past history of Botany. We never look at this work without paying involuntary homage to the amount of labour of many kinds which it discloses, and the indomitable spirit of work which enabled Mr Loudon to overcome the many difficulties against which he had to contend. Having lost one arm, and being to a great extent deprived of the use of the other, he supplied their place by an amanuensis, or rather we should say by two—one for each hand: for it is recorded of him that he sometimes had recourse to this extraordinary aid, and while walking up and down his study dictated to both, and that so clearly and continuously that their pens were never at rest.

Great as that work is, however; unspeakably valuable as a perfect quarry of materials, and in much as applicable to the present state of science as it was on the day of its publication, it is not all that the arboriculturist now requires. Time has gone on, and in its course new discoveries have been made which have left Mr Loudon's work in some respects behind: not only has its value been affected by discoveries of new plants, by discoveries in physiology, discoveries in syste-

matic botany, altering our old notions of affinity and arrangement, but even discoveries in the arts have affected it injuriously. The four last volumes of the "Arboretum" consist, as the reader knows, of copperplate illustrations of the different shrubs and trees treated of. These are, perhaps, the least satisfactory part of Mr Loudon's work. There is a wondrous family resemblance in them all. Not only are they all trees, but one is tempted to say that they are all the same trees. It would not be true, but there is sufficient resemblance to suggest the idea. The correct delineation of a tree is one of the most difficult tasks to which an artist can be put. Artists have got a sort of conventional scribble, which, by courtesy, is supposed to represent the foliage of a tree, and this is introduced on all occasions, and for all trees indifferently. The pains and trouble it takes to get them to make it botanically correct, and to seize its character, nobody who has not tried can well believe. That Loudon suffered from this difficulty is obvious, and his case was no solitary one. In the folio edition of Smith's magnificent "Sylva," the oaks are beautifully rendered, but that beauty is obtained at the sacrifice of verisimilitude in most of the rest. Scarcely anything escapes the infection: even the Fortingale yew looks like an oak. Selby's "Forest Trees" is an example of the same thing. It is illustrated by the most lovely woodcuts of trees that it is possible to conceive, charming little vignettes engraved by Williams, who for the minute beauty of his execution of woodcuts has, we think, never been surpassed; but lovely as they are, almost any one would do for any other. Is it a sycamore or an elm?—an oak or a chestnut? The coarse etchings in M'Grigor's "Eastern

Arboretum, or Trees of Norfolk," is another example. Where we *can* distinguish these, it is due to the general outline of the tree having been preserved; the character of the foliage is the same in all. The difficulty lies in the vast amount of labour which is required to make a faithful portrait, and the artist is only too ready to escape from this toil by dashing off the sketch with his conventional foliage. Determined on one occasion to superintend every step, and secure accuracy, we accompanied our artist into the green wood, and saw him take an unfinished, but as accurate and characteristic a sketch of a tree as man could wish. "I'll fill it in at home," says he. "Very good," said we; but it was not very good, it was very bad: for when we received the copy, we found, to our amazement and disgust, that the character of the tree was gone. The old conventionality had usurped its place, and it was only when we took the copy back to the artist, and got out the open-air sketch, and challenged him to point out where he got this and where he got that, that we at last extorted from him a reluctant admission that he had taken a few liberties to *improve the effect!* We have no doubt Loudon chafed under such contrarieties. In his days, they were more remarkable than in ours, for of late years artists have begun to recognise the fact that they cannot improve upon nature; that the more they attempt to do so, the further they go astray. The state of scientific art has greatly changed since Loudon's time, and, indeed, since our own experiences, to which we have referred. Photography has come in to guide art—to keep her within the strict limits of truth, and prevent exaggeration. To no branch of science will its services be more valuable than to Arboriculture. Growing trees are almost the only organic beings which cannot be submitted to the test of the rule and the line. By the micrometer, the most minute organisms, invisible not only to the naked eye, but unobservable by any but the highest magnifying powers of the microscope, can be accurately measured and figured without the aid of photography: so may every other animal or vegetable being;

but growing trees we cannot reach, we must trust to the eye of the artist; and characters which to the botanist seem impossible to be overlooked, are invisible to his uneducated eye. But he is never at a loss; in goes his conventional dash: like Shakspeare's barber's chair, it fits all comers—the tall pine, the squat yew, the brawny oak, any tree or every tree. Thanks to photography, we are no longer at his mercy. Every branch, every twig, every leaf is now lined down with an accuracy passing the skill of a trigonometrical surveyor; and we have now means by which engravings that may be depended on as exact representations of trees can be produced. What is now wanted, is a new work on trees, in which advantage shall be taken of this great medium of illustration—a work bringing Loudon's subject down to the state of the science at the present day, correcting any errors that are found in his book, and describing any new species that have been introduced or discovered since his time.

This is no easy task, and few there be who are qualified to undertake it. It is generally known that one eminent botanist, not less endowed with perseverance than Loudon, and much more distinguished as a man of science—Professor Koch, of Berlin—has been for some time engaged in the preparation of such a work. When it will be completed, or how far it will meet our *desiderata* when completed, we cannot tell. His occupations are numerous and engrossing, and he writes us that he is looking forward to the summer and autumn to make fresh observations and researches, and to the winter for time to bring his work towards completion.

Meanwhile, we think we may be doing good service to the reader, as well as to the science, if we attempt in these pages to supplement, to a certain extent, Mr Loudon's work in the directions we have indicated, where the progress of science has left it behind.

We propose, therefore, to devote a certain portion of this magazine to the subject of Dendrology, and of Arboriculture. Under the former head, an account of the hardy trees and shrubs which are of most importance

to the landed proprietor or cultivator in this country, will be given, illustrated, where practicable, by large woodcuts, taken from photographs of the actual trees. It is intended also that short scientific articles of a less restricted nature, and miscellaneous

information of all kinds relating to trees and timber, whether British or foreign, shall from time to time find a place.

Under the head of Arboriculture proper, articles on planting, pruning, felling, and utilizing trees will also appear.

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## ON PRUNING AND THINNING FOREST TREES.

### CHAP. I. GENERAL PRINCIPLES APPLICABLE TO PRUNING.

ENGLISHMEN have an instinctive liking for general principles. At any of our public meetings nothing seems to set our mind so much at rest as to get hold of some broad principle to which we can refer the subject under consideration. But the extraordinary thing is, that no sooner have we got our principle, than, instead of acting upon it, we immediately set about getting rid of it by encroaching upon it with exceptions on every side. A good illustration of this was given last summer, when Mr Gladstone unfolded his democratic charter of universal suffrage. All men were by right entitled to vote except those who were disqualified—the disqualifications excluding almost everybody but those who already had the privilege. So in the pardons offered by Philip the Second to his rebellious subjects in the Netherlands. Every one was pardoned except those designated under a few clauses, which practically included every man, woman, and child in the kingdom.

We find the same greediness for exceptions to general principles in one subject on which we have long wished to break a lance with the foresters of the present day—viz., Pruning and Thinning. We think very great mischief is being done all over the kingdom by the abuse of the pruning-knife and insufficient use of the axe, which has the more surprised us, that it is carried on wholly in opposition to and in defiance of principles which are recognised by every one.

It is long since Dr Lindley, in his "Theory and Practice of Horticulture," clearly laid it down that

"The quantity of timber that a tree forms, the amount and quality of its secretions, the brilliancy of its colours, the size of its flowers, and in short its whole beauty, depend upon the action of its branches and leaves, and their healthiness. The object of the pruner is to diminish the number of leaves and branches; whence it may be at once understood how delicate are the operations he has to practice, and how thorough a knowledge he ought to possess of all the laws which regulate the action of the organs of vegetation. If well directed, pruning is one of the most useful, and if ill directed, it is among the most mischievous operations that can take place upon a plant. The object of pruning is either to influence the production of flowers and fruit, or to augment the quantity of timber.

"Pruning is nothing less than the removal of leaves. To cut off a branch in summer is evidently so; and if the branch is naked, still its removal is the destruction of the part from which the leaves would have been produced had it been permitted to remain.

"Prune not at all should, therefore, be the maxim of the forester. Plant thickly, thin constantly, stop carefully, and leave the rest to nature."

No maxim can be sounder, and it may almost seem absurd to enlarge upon it. But if it be admitted, we may say with Rodrigo, "It hath not appeared." It has not been acted upon. Even Lindley immediately proceeds to quench the force of his observations by adding—"Unfortunately it does not happen that he who plants will always thin constantly; it is still more rare that stopping is thought of; and so a maxim, one of the



soundest in the whole system of forestry, cannot be observed. Hence pruning," says he, "may be regarded as a necessary evil, to which the wise must submit because of the ignorant; the careful to cure the evils inflicted by the careless."

Now, looking at pruning from the point of view which Dr Lindley had here in view—viz., the management of forest trees for the purpose of making timber, we dissent *in toto* from the exception or qualification by which he seeks to main his general principle. We hold the general principle as applied to forest trees to be absolute as regards the trees themselves, and to admit of no exceptions except such as are foreign to the welfare of the trees themselves. For example, we may cut off a branch that obstructs a path or excludes a view; but we do so not to benefit the tree—we know that it will injure it—but for the special purpose of using the path or enjoying the prospect. The way in which this qualification of Dr Lindley's may be and has been misread, will be seen by the practice recommended by Mr Brown, one of the chief authorities on forest management. In his "Forester" he says:—

"The proper manner of proceeding with the pruning of forest trees, as they are newly lifted from the nursery, and preparatory to planting them out, is to *shorten* all the *larger branches* that have the appearance of gaining strength upon the top or leading shoot of the young tree. This shortening of the larger branches ought to be done in such a manner as to leave only from one-half to one-third of their whole length remaining, with if possible a few small twigs upon it, in order the more readily to elaborate the sap as it rises in the spring; and in this state the young trees may be planted with the greatest assurance of success. The great advantage of this method of pruning young trees is that when the sap rises in them, the first summer after planting, there being a regular supply of small proportionable branches along the main stem, leaves are formed and sap is drawn up regularly to every part of the tree, consequently the tree maintains an equal vigour throughout. Were all the branches left upon the young trees,

the roots, from the effects of removal, would not be able to supply the whole with due nourishment; and the consequence would very likely be, that the plants would die down to the ground level, from which part of the trees numerous young shoots would issue, much in the same manner as they do from the cut part of those trees which have been over-pruned.

"It is now a well-ascertained truth among all practical foresters, that when a young tree is in a vigorous state of growth, and the wood full of sap, previous to its having made any heartwood, any branch may be taken off without doing the least injury to it. It is therefore just at this stage of the existence of a tree that it can with certainty be made to do well or otherwise according as it is attended to, to give the top the lead in the growth, to check the stronger branches, and to give the tree that shape it may be desired it should have when it attains full age."—*Brown's Forester*, 409.

It is difficult to imagine a greater accumulation of errors and mistaken notions than are crowded together into these sentences, and they are so confounded together that it is difficult to pull apart and point out separately the individual blunders. He begins by *shortening*, as he calls it, all the larger branches that have the appearance of gaining strength upon the leading shoot. Now, of course, it must depend upon the interpretation which he puts upon the words, "the appearance of gaining upon the leading shoot," how far this is justifiable. Were it only that when he sees a conifer with two leaders almost equal in length growing straight up close together, he should remove one, something might be said in its favour as an exception to the general principle. But that is not his meaning. His idea is on the principle of prevention being better than cure, to take a bond of fate, and remove all the strong branches near the top of the tree. It is a policy on a par with that of the Eastern kings, who no sooner were seated on the throne than they *shortened* all their brothers and sisters for fear of the possibility of their at some future time entering into competition for

the crown; and a policy equally destructive of the support which would otherwise have been received from them. He assumes that because the branches have the appearance of gaining on the leading shoot, they will therefore do so. Now, putting aside the single case of conifers with double leaders, we venture to say that the mere appearance of the top branches this year is a very slight indication of what they will be next year or the year after. We have often attempted, in our green and salad days, to form trees by pruning; but if absent for a year or two, we have invariably found that nature has taken it into her own hand and obliterated our feeble mouldings. It is a matter requiring constant watchfulness to keep a tree in trim, as all fruit-pruners well know. We, therefore, are satisfied, in the first place, that the forester is guessing entirely in the dark in *shortening* the strongest branches. He *may* be taking those which will prove competitors with the leader, but for one chance that they will prove so, there are thousands of chances that they will not. And what does this *shortening* mean—the taking off the half or two-thirds of the strongest branches of the tree. To hear such a cool proposal one can hardly believe, that the author had, only a few pages before, recognised the justice of Lindley's maxim, above quoted. It is clear that the discovery of the "well-ascertained truth," that "when a young tree is in a vigorous state of growth, any branch may be taken off without the least injury to it," has something to do with this. But how has this been ascertained so satisfactorily? Because we see no apparent damage, are we to infer that none has been done? It is not actual injury that must be our test; we should require to know how much finer and better the tree would have been, how much more wood it would have made, had it not been mutilated.

But more than that; even although it could be proved that, contrary to all reason, a plant *could* get on as well without its important organs as with them, does it follow that we should risk the experiment? Because a fine strong young fellow may escape

from a wound or two without permanent injury, is that any reason why we should, with malice prepense, inflict wounds upon all young fellows? Because it may do no mischief, is that any reason for doing it? It is to do good that the process is recommended, surely not because it may be done with impunity. But even here the author shews that he feels a weakness in his process, for he tells us that on "the poor remainder of the branch (the half or third left), a few small twigs should, if possible, be left, in order the more readily to *elaborate the sap* as it rises in the spring." What a droll phrase, and what a strange function for the leaves—to *elaborate the sap!*—to elaborate it as it rises! But let us pass the phraseology. He admits that he needs something to repair the mischief he has done by cutting off the supporters of the crown. What is that mischief?

The affinity between plants and animals may be a moot question, but the analogy between them none will deny; and whatever may be the opinion as to the affinity, the analogy, at all events, is sufficiently close to allow us to draw inferences safely from the one to the other.

Let us compare the growth of our own species with that of a tree. The young child is more tender and delicate than the grown man, therefore it is cherished and protected from the cold: so is the young plant more delicate, therefore it should be protected too. This is done by planting it out, not to stand alone, exposed on every side, but by planting a number close together, to impart mutual shelter. The child requires nourishment; its stomach must be sufficiently supplied. So must the plant; its roots, which we may call its stomach, must have a good and suitable soil from which to extract its nutriment. The child must have plenty of good air to breathe; if pent in cities, it must at times be sent off to the country or the sea-side, to recover from the effects of the insufficient supply of oxygen. If its parents are unable to do so, it becomes weak, rickety, and dies; or, if it survives through inherent strength of constitution developed by increasing age, it lives a short and fevered existence.

Plants in towns suffer in the same way, and horticultural societies and large nurserymen, who have Chiswick's or country gardens to send them too, can pack off their sickly plants to these sanitariums. But suppose that instead of the child suffering from the want of good air, it had the converse complaint of want of good lungs. What could be done then? This is the complaint of the trees in too thick a plantation, or which have undergone the process of having their branches shortened. The air above is pure, plentiful, and wholesome; but its own lungs (its leaves) are damaged, or half gone.

If the lungs are injured or defective, the plant cannot thrive, or at least it cannot thrive so well as if it had them sound. It stands to reason—and no appeal to the results of treatment can ever get over it. When a medical quack, on the faith of some anomalous results, challenges our assent to his system, we shrug our shoulders, and say we may be unable to account for them on other principles, but for all that we do not believe his: so, if the advocates of this system of pruning or *shortening* were to adduce results apparently favourable from the practice, we should treat it in the same way; but we deny that any such results can be shewn. The energy of youth may overcome the mischief, but it is health in spite of the treatment, not in consequence of it.

Mr Brown's rationale of the advantage of this shortening is as false in reasoning as the advantage is unfounded in fact:—"Were all the branches left upon the young trees, the roots, from the effects of removal, would not be able to supply the whole with due nourishment, and the consequence would very likely be that the plants would die down to the ground level." Supposing it to be that the roots could not supply the whole with nourishment, it would be better to leave it to nature to say how much it can and how much it cannot bear. If nature finds that there are more branches than she can support, they will die off, and she herself will remove them. It is the same principle as applies to decay in large branches, which are better left to slough off by themselves than pruned off.

The inferences to be drawn from the modern processes of orchard-pruning, too, entirely support our view. The object of the fruit-grower is not to get timber, but fruit; consequently, root-pruning and pinching off the leaf-buds is the process which *a priori* we should expect to militate against the growth of timber: they throw the tree back in its health, and give the plant that tendency to excessive production of fruit which is nature's instinctive effort to preserve the species from extinction. A multitude of instances might be given to the same effect: none more instructive than one mentioned by Mr Clutton, of an oak tree in a garden-hedge, which had been clipped and pruned incessantly, and although eighty years old, had never reached the thickness of a man's knee. Another example, of common occurrence, may be seen in village gardens, where a small tree, with a round head and bare stalk, like a mushroom or an orange tree, often occupies the centre of a plot: no one ever saw any such tree come to anything; they remain hideous examples of the result of pruning, and will remain so as long as they live.

An inevitable corollary to all this is, that pruning is injurious to the growth of timber, and ought not to be practised where that is what is wanted. For what object may we then prune? One, and almost the only allowable one, is to remove one of two leaders competing for the mastery; another is, where there is an unsightly or unsymmetrical branch which offends the eye, and disturbs, as we think, the beauty of the tree. Ten to one its removal will only make things worse, and it would be better to cut down the tree altogether than to touch the branch. But these (the only objects in whose behalf anything can be said in favour of pruning) are not the ordinary occasions in which pruning is perpetrated; they are rare, and seldom occur. The everyday mutilation has no such apology. Every forester goes about armed with a knife; and he has some foggy idea that by cutting off the little twigs which sprout from the trunk or branches, or taking off those which he imagines may by-and-bye interfere with others, he is in some way improving the



health and beauty of the plant. We suppose these gentlemen have some principle to guide them in their amputations; although we confess that the only thing of the kind which we could ever extract was a well-defined and fixed idea that nobody knew anything about pruning but themselves. Of such vague principles is this, which one may often hear applied to the Deodar—that by “cutting in” the lower branches, more strength will be thrown into the leader. According to our reading of nature, this is a vicious mistake. Every amputation must and does diminish the general vigour of the plant or animal. In truth, the occasions where pruning is advantageous are so rare, that it would be better that the forester should have to go home for his knife every time that it is to be used, than that he should be constantly exposed to the temptation of using it by carrying it handy in his pocket. There is not the same objection to the axe, provided it be distinctly understood that he lays it nowhere but at the root of the trees.

But suppose a branch to be injured or to decay, shall we not prune it away, then? No—a hundred times, no. If you do, you leave a decayed stump, which becomes a knot and blemish in the timber. If you leave it alone, nature herself throws it off gradually and imperceptibly, encroaching upon it by degrees, until, at last, a great branch will be squeezed out, reduced, at its junction with the trunk, to a diameter no thicker than a crow-quill; and the year after, the bark will be grown over, and you could not tell the place where the branch had been; and still less would you be able to detect it in the timber, were you to cut down the tree and split up the trunk to search for it.

The process by which this is done is exactly analagous to the dropping of a stag's horn. Everybody knows that when the horn is young and sprouting, it is a soft, vascular substance, covered with hair, like the rest of the body, only the hair is softer and finer. The vessels which supply it with nourishment course not only through its substance, but in great veins and arteries along its exterior, which leave their impress on the solid horn in the grooves which we see left

on the outside. As the internal substances hardens into horn, the vessels inside are choked off and obliterated, but the horn is still supplied with nourishment by the great external vessels, and would go on increasing in size and substance *ad infinitum*; or, if cut or torn off, the animal would bleed to death, but for a very beautiful resultant action from the stoppage of the smaller vessels. These being cut off from the interior, spread themselves to the right and left, and continue their mission of making a horny deposit, by producing it at the base of the horn, the horn so deposited forming the corrugated ring called the burr. This is at first deposited in the spaces unoccupied by the great vessels; but as these spaces are filled up, the deposit imperceptibly encroaches on the vessels, and gradually clasps them tighter and tighter, until they are wholly closed up, and the connexion between the horn and these vessels being entirely severed, and its supply of nourishment so wholly cut off, it naturally drops off by its own weight.

So the branch which is to be excised by nature has its connexion with the stem gradually cut off by the growth of the sound wood and bark around it. The pressure of the surrounding wood squeezes the base of the branch tighter and tighter, as the forceps of the burr does the vessels of the stag's horn in their bony band, until at last, when it has been thinned away almost to nothing, it squeezes it out with so much force that it starts forth like a pellet with a bound and a smart report.

It will thus be seen that the stag's horn branches of an old tree have more than the name in common with the real stag's horn of the denizen of the forest. We confess to being of those who have no objection to seeing an occasional white stag's horn branch projecting from the brow of an old tree. It is thoroughly picturesque; and the man who would prune it off has as little feeling for the beautiful as he has knowledge of forest management.

Pruning? we abhor the very name of it in reference to forest trees. There is a society



for the prevention of cruelty to animals. We wish we had one against the cutting and maiming of trees. There was an old forest law in Scotland (which, for aught we know, may still exist unrepealed, although fallen

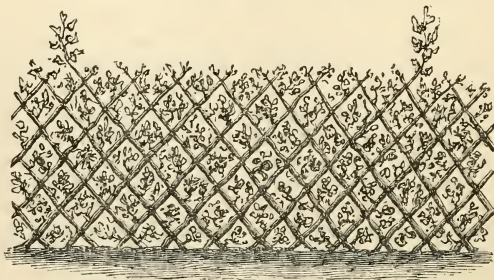
into desuetude), by which the man who cut down a young tree was doomed to lose his right hand. It was a well-intentioned, although ill-directed piece of legislation. Had it been for pruning, indeed!—

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### IMPROVEMENTS IN HEDGES.

THE plant generally employed for fences is the white thorn (*Cratægus oxyacantha*), and a useful plant it is for such purposes. The varieties of evergreen hollies ought to be tried, particularly when the hedges run through extensive and well-regulated grounds in sight of the mansion. In all peaty districts the spruce fir make an excellent evergreen fence. It will cover more ground than the holly; but in mossy situations this extra land will be found of less value. In sandy places, and particularly those near the

employed, giving one an inclination to the right and the other to the left. After being trod in firmly, commence to plait all together, taking one set of the plants the one way, and the other set contrary, interlacing them at an angle of 45°. It will be necessary to tie them at top with a piece of wire or rope yarn, and also at several points near the bottom, to keep them in position till they adhere to each other. To facilitate the union, although not absolutely necessary, it will be desirable to take a thin cutting off the bark of several, particu-



sea-shore, the sea buck-thorn (*Hippophae rhamnoides*) will be found an admirable substitute for thorns to form hedges. If it should ever be required to make at once an impenetrable live fence, the hornbeam (*Carpinus betulus*) will be found the most suitable, and for this purpose clean-grown sapling plants, 6 or 7 feet in length, ought to be procured. After the ground has been properly trenched and prepared, the plants should be put in, two together, at every 10 or 12 inches, according to the thickness or length of the saplings

particularly where they approximate. Shortly afterwards they will grow together, and form an impenetrable net-looking fence (fig. 1). From the pressure caused by the plaiting, they will throw out numerous shoots along the stems, which will continue to work in and fill up the interstices. In time the whole length will become an impenetrable mass, all engrafted together, and will bear cutting-in like any other hedge. Numerous other plants will be found in nursery establishments suitable for such purposes, as the hazel, elm, ash, beech,

laburnum, &c. Such hedges can be made of any height, depending entirely on the length of the saplings employed. When not in leaf they will be found extremely ornamental and agreeable to look on, and therefore worthy of encouragement, particularly when standing on a level with the rails.

If it should ever be wanted to plant such hedges so as to render them useful as well as ornamental, particularly on lands slightly elevated above a damp surface, in such places willows could be profitably employed, and the annual cuttings taken from them would yield a considerable revenue. Besides, when such plaited hedges are cut for profit, they are

more likely to be kept in order than thorn hedges, particularly when they run through lands which would be profitably employed for the growth of willows. When planting willows for such purposes, they could be inserted either as growing plants or cuttings—the latter will be preferable, provided the strip of ground has been properly prepared for them. They should be placed 12 inches apart, and during the first thinning the strongest shoots should be left for plaiting. After the plaiting has been successfully accomplished, all after-shoots could be removed for basket-making purposes.

## The Stable.

### THE BREEDING OF HUNTERS AND ROADSTERS.

THE present deteriorated condition of the breed of hunters and roadsters, and the scarcity of really first-rate animals of these two classes, is a subject of much speculation and uneasiness at the present day. Agricultural associations and kindred societies seem in vain to lend their aid "to improve the breed" in these departments of stud economy, and there is no denying the fact, that good animals of the right sort are yearly becoming scarcer. This scarcity arises not from any decrease in the demand; nor can we assign as a reason for the deficiency any falling off in the number of sportsmen at the present day. Although we do not now see the true fox-hunter of the olden time—the hard-riding, hard-drinking squire—the increased wealth of modern times, and the zest to a day's hunting which the engrossing occupations of this utilitarian, commercial age in which we live imparts, have kept up and recruited the ranks of sportsmen with a phalanx of followers not one whit behind the olden times in either pluck, mettle, or ability; and there are good old family names and representatives of noble blood who have become familiar as household words at the different "meets" in the various districts of our hunting counties. There need, therefore, be no insinuation that the falling off in the breed of hunters is owing to a lack of eager sportsmen and horsemen. In fact, many of these gentlemen, further to evince their love of the chase, and to combat with the extension of railway systems across the face of the country (which interferes so much with hunting and preserving of game), are yearly planting covers, rearing foxes, and doing all in their power to support and advance this harmless, healthful, and exciting pursuit.

The real falling off in the quality and enduring capability of the hunters and roadsters of the present day, as a class, is to be accounted for on very different grounds; and the principal blame seems to lie with the breeders themselves, in the apathy and utter want of system they evince in their mode of carrying on the enterprise. Every one now-a-days *will* try his hand at breeding horses; the belief is general, that it is an "interesting" amusement, and one not calling for special knowledge or attention to minute details, or regulated by general rules and laws. Usually some old favourite mare is retained for the purpose, regardless of whether she be at all qualified for the high and important function of raising stock adapted for the field; and without regard to the horse to which she is put, and the suitability of the cross—which, so far as the breeder seems to study, may or may not turn out a happy one—the union is formed. Very frequently the mare is during her pregnancy sent to work, and nature is expected, under such trying circumstances, to be able to nourish and mature a perfect fœtus! To add to the chances of the produce being "a *weed*"—the dam, being regarded rather as surplus or extra stock in the establishment, does not receive the most careful attention, or such additional nutriment as the double duty imposed upon her demands, or due regard to the breeder's own expectations and wishes for success, would lead one to expect. In this way, even before it is weaned, "a *weed*" is raised, and degeneracy perpetuated; and when we consider the miserable stinting of artificial diet and "keep" (because expensive!), to which many yearlings and two-year-old colts are subjected, need we wonder that the number of first-rate animals is few? For if, at the

best, breeding horses of other classes than for agricultural purposes be a difficult speculation, as we are ready to admit it is, it surely requires every attention and precaution which prudent and careful management can devise, to render the enterprize a profitable and successful one. In the manner just indicated, three-fourths of our young horses are reared, and the plethora of so-called brood mares, which are scattered over every rural and suburban district, has led to many a horse being employed as a stallion, which is utterly useless as a sire of hunting stock. If we look back for a series of years, and observe how few really first-class horses have been bred, and remember that the most famous "cracks" of their day are still eyincing their quality and virtues—transmitted in some cases through successive generations to the best horses of our own day—and that it is to these renowned ancestors that their powers are due, we may well regret the many names unknown to fame, and horses, whose good looks and appearances alone are their recommendation, which, are now-a-days admitted to the harems of even some well-regulated stud. This, then, is one of the greatest evils of the present day—viz., too little attention to the careful and thorough exclusion from the stud of any except faultless animals, as sires and dams. And so long as breeders persist in raising young stock from weedy sires or old worn-out dams, the race of hunters and roadsters in this country must go on deteriorating.

Another important evil is the low price of service of many stallions, which sometimes induces farmers to give the horse a trial; and the system of a graduated scale of charge—thorough-bred mares being generally made to pay double the sum asked from half-bred and agricultural dams—is a practice totally at variance with common sense, and ought simply to be reversed. If the owner of any good thorough-bred stallion will allow his horse to serve a heavy, course agricultural mare, he ought to be well paid for his condescension, and for allowing the pedigree of his horse to be allied with the obscure origin of the ancestry of the mare. Probably the best way, however, to secure well-bred stock

from the good stallion of a district is to prohibit his serving any but hunting mares, and only a limited number of these each season. This will tend to maintain longer unimpaired the vigour and action of the sire, and afford less chance of a sluggish progeny.

Too much blame cannot be attached to the custom of breeding from *old* mares. However good in looks the produce of such dams may be, it will invariably be found that they are at the best "*slugs*," and, as a rule, are not enduring. They may go a mile or two well enough, but cannot "*stay*," and at five or six years old their action fails, and they descend from high promise, so far as appearance goes, into slow, plain-going, third-rate animals. Indeed, too much importance cannot be attached to the brood mare. The part she plays in the reproduction of stock of the valuable sort is much higher than many people fancy, and, so far as our opinion is founded on personal experience, the dam exercises a far greater influence for good upon the progeny than the sire ever does. Breeders should therefore observe great care in the selection of the dam; and the best age to breed from is when the mare has arrived at the age of six or seven years, when her conformation is thoroughly matured and developed, and after vice, or inherent weakness, or hereditary disease, if latent, has had time to show itself: for it must be borne in mind that almost all diseases, and perhaps more certainly still all vices, are transmissible from the dam to the progeny. So much is this the case, that, not unfrequently, acquired bad habits, or malformations of the joints, the result of adventitious circumstances, and even vices which one generation has escaped, may be perpetuated and reproduced in young stock. Hence the necessity for a careful regard to "*pedigree*;" for as in human life we see diseases run in families, and sometimes passing over one generation, reappear in the next, so it is with horses; and in like manner, as we often see family likenesses and resemblances in character transmitted from sire to son, so in the brute creation we may observe conformation and points of similarity in temper and disposition equally truly re-



peated. Let, then, all vice exclude from the harem; also, all tendency to spavin, ring-bone, splint, curb, or navicular disease, whether the effect of hereditary predisposition or of fatigue or work; likewise, broken wind, bad hocks, and unsound or badly formed and contracted hoofs, although only the result of bad shoeing. Most certainly, by avoiding these blemishes, the breeder adds materially to his chances of ultimate success in an otherwise sufficiently difficult enterprize. These remarks are intended to apply equally to the case of sire or dam; although vice and temper is more usually perpetuated through the female line, and defective joints or hereditary disease commonly derived from the sire's agency.

The general contour, points, and conformation of good parents, for purposes of breeding, are so entirely matters of common sense, and so universally agreed upon and understood, that it would be quite out of the province of this paper to recommend good oblique quarters and shoulders, a small and light head, a clean, well-arched, and lengthy neck, small and well pricked ears, not wide set, deep ribs, and middle well coupled up, and with a wide barrel, allowing plenty of room for the lungs to play; and the back should not be too long in proportion to the height of the animal, although this is not objectionable, but otherwise, *in the dam*. The fore arm should be broad and muscular, and in like manner the thighs and hind hocks should be particularly good in this respect; for deficiency here is a sure index of want of leaping power, and ability to take a stiff fence without strain and subsequent distress. The bone below the fore knee must be flat, and there must be plenty of it; the pasterns should not be upright, nor too long and springy, for in the former case, in a year or two, the horse gets "*groggy*" and "*knuckled over*," and in the latter, severe work or a hard run produces a sprain, which may fall into inflammatory disease and permanent lameness. Well-made feet and sound hoofs are most essential requisites. These constitute the salient characteristics, so far as appearance goes, of a good sire or dam for

breeding hunters or first-class roadsters; and the mention of such a long array of essential qualifications calls up the remark of an old horse-dealer, who, when a customer once called upon him, and had stated what he wanted—an animal with this, that, and the other good point—naming in succession, as we have done, all the special components of a thoroughly good and perfect horse—coolly retorted: "That, sir, is the very beast I have myself been all my days trying to find!" Difficult, indeed, it is to find a first-rate brood mare, and one that will consecutively breed true to her type; but they are to be found; and if any of our readers may chance to have such a "picture," all the advice we would give is, simply not to part with her; and if she be one that repeats in her offspring her own stamp, it would be folly to desist breeding from her; and pains should be taken to procure the services of the best stallion possible. For, year by year, we have observed a mare of this sort will, if restricted to purely thorough-bred stallions, continue to breed finer and finer, and one year omitted may cost her owner much difficulty and trouble to induce nature to resume her functions.

Purity of blood on one side is, in our opinion, absolutely essential, to ensure a successful cross; for as the old adage that "like produces like" is decidedly true in horse-breeding, and as we wish our hunters and roadsters to shew style and quality, it can only be at the risk of lessening these two essentials in the young stock that we cover a three-parts-bred or half-bred mare with any other than a thorough-bred horse. Indeed, in all breeding, the *first-cross* frequently improves both breeds, but if continued further, and the male offspring of that union be allowed to cross again, coarseness, deficiency of courage, and impaired powers of endurance must be the result.

The necessity of having "action" in all horses required for the field or road is so universally known and admitted, that we have hitherto deemed it unnecessary even to mention it amongst the qualifications of all young stock of the two classes under con-

sideration. It will be found, that, as a rule, this virtue proceeds from the dam more than from the sire; and we should consider it perfectly imperative that every brood mare have good high-knee action. More especially is this requisite when the cross which we recommend is that between a thoroughbred stallion and a clean-boned, half-bred mare for producing roadsters, and between the same sire and a mare with higher quality and breeding for producing weight-carrying hunters.

The treatment of young stock from the time of foaling opens up too wide a field to be embraced within the limits of the present paper; and we shall conclude our remarks on the general question of breeding by referring to one point which is of much importance to the successful rearing of young horses. We allude to the nature of the soil upon which they are bred. There can be no doubt that, if due regard were given to this particular, we should seldom hear of bad hoofs and sand-cracks, as well as of other ills that horse-flesh is in its younger days so very prone to. Hard clay is particularly inimical to successful rearing of healthy stock. Where the paddocks, in dry weather, are of such a nature that the ground becomes hard and parched, the young stock may as well, under a scorching sun, be made to walk upon hot bricks, and the result would probably be no worse. Lameness must be the inevitable consequence, and that, too, at a critical period of the young animal's existence; whereas, if cool, moist, soft meadow-ground could with a little trouble be easily obtained for it, the salutary effect upon the poor creature's legs, and the difference in his ultimately enhanced value

to his owner, would amply repay the trouble of providing such a change. Nor is the mischief confined to the offspring alone, for the dam being made to go with her young upon such hard and hot soil, as is the case even in some large breeding establishments in England, must tend materially to inflame and injure her feet. This, as we have said, being one of those defects which, although in the first instance only acquired and not inherent, become hereditary, is surely sufficient reason for every one who contemplates breeding to consider first whether the soil of his locality be sufficiently adapted for the purpose. Otherwise, although in all other respects he may be both able and willing to give much care and attention to the task, and to place in his stud only such animals as are of a class and stamp to render success and profitable pursuit of the enterprize most probable, yet, from this cause alone, failure and disappointment may be the consequence, and all his other precautions be rendered utterly nugatory.

One mode of remedying the present deteriorated condition of the breed of hunters and roadsters throughout the country occurs to us as the easiest and most likely to be successful—namely, for country gentlemen in each district to take the initiative (for although not all hunters, all are interested in getting sound and useful horses, which at present can hardly be found), and purchase a good first-class stallion, put such a price upon his services as farmers will pay, and upon no account allow old worn-out and defective mares or cart-mares to be put to him, and look for remuneration, not from his services, but from the higher class of young stock which they would then be able to purchase.

## ON THE MANAGEMENT OF HORSES' FEET.

(Concluded from page 101.)

**F**OOT-ROT in sheep is a disease entirely due to causes, by which crippled useless horses are produced; and prevention and cure in one case is, on principle, nay, practically, the same as in the other.

The case of a race horse, which happened a few years ago, is worthy of record. The subject, a first favourite for the Doncaster St Leger, became, while under preparation for that race, a source of anxiety to his owner and trainer, owing to the state of his feet and hardness of the ground. Extraordinary attention was paid, his feet were kept constantly wet, and to such a point was it carried, that a boy, or several of them, were in attendance to go into the horse's box, from time to time during the night, to apply cold water to the horse's feet. The September day came, and the horse won the great stakes. Of course the feat was regarded as a great victory, due to cold water; while, in fact, the colt was so much superior to his competitors that for the time his chance had not been destroyed; besides, it is most probable that every horse that ran against the winner of that important race had been treated on the foot-weakening plan, the difference, therefore, between the quantity of wet applied to their feet respectively being only one of degree.

But weakening had so far done its work that by continuing the process, the coffin bones of both fore feet were undergoing rapid change. Absorption of their sharp margins was being effected in order to make a flat surface, which was productive of less pain than the deep strong forms, so effective to strength, speed, and all natural endowments of the limb, but productive of pain under the circumstances.

The St Leger was won, and the horse's racing career closed, and progressively his feet to the least initiated, gave evidence of confirmed disease. Meanwhile he became a favourite stallion, his early produce con-

firmed the favourable opinion of the public; and while the sons of this foot-ruined horse were winning the Derby and St Leger, he was doomed to perpetual suffering beyond the imagination of man to conceive.

With different management, that horse might have been in training and winning great prizes at seven or eight years old, and then have begun a career—as stallion—free from pain, in all his fine form and beauty, with years extended to his life, instead of being the most miserable picture of cruelty to behold.

The hoofs of horses and the nails of animals in general, are endowed with a quick and a dead part, and such an intimate blending of structure is there between the inner horn of the hoof, and the fibrous texture which underlays it, that one fails to discover any line of demarcation which can be assigned as that where sensibility terminates. One of the modes of connexion of the hoof with adjacent parts, is by interlaying plates—laminae—constituted of horn structure as belonging to the hoof, and of the reticular tissue, blood-vessels, nerves, &c., proceeding from the common sensitive envelope. Part of the adapting surfaces, the sole and frog, and around the coronet are apparently smooth; but by close examination it is found that the means of connexion at these parts is by filaments as fine as down, consisting also of blood-vessels and nerve matter, penetrating the horn substance; and so intimate and strong is the connexion that great force is required to detach any part of the hoof until after it has been subjected to decomposition. In the process of detaching, however, that which I am describing may be readily seen.

Throughout the connecting medium of the hoof a radius is established, which is endowed with most acute sensibility, and is amply supplied with the material for growth and repair over that medium. Blood is furnished, and a limpid, colourless fluid is passed on into the

substance of the hoof; but beyond the range to which red blood globules pass, that transparent secretion, is diffused through the entire substance of horn, and is ultimately passed off in the form of invisible vapour.

The foregoing proposition may be verified by the following test:—If a horse is made to stand on a flat stone floor after taking off his shoes and seeing that its feet be clean and dry, and the floor equally so, and be allowed to stand about a minute, it will be found on moving him that four imprints of his feet will be left on the floor, due to condensation of vapour exhaled from the surface of the foot.

The incident is analogous to that which occurs when we take hold of a piece of polished steel, or touch a mirror in cold weather, in which case the prints of our fingers are left on the steel or glass by similar vapour issuing from the surface of the skin. Therefore, the horse's hoof is not exceptional, but subject to common natural laws. Blood is required for the growth of new horn, which in successive order is moving on, outwards and forward, becoming firm in texture and fitted for its object.

Another way of observing these phenomena, less inviting than the example given, but one, I regret to state, for which constant opportunity is afforded, is as follows: In the first act of shoeing, after taking off the old shoe, the farrier proceeds to pare the foot, in doing which he is either following instructions or acting according to custom long in vogue. As slice after slice is pared from the sole, and the workman's injunctions in many cases are, that he should thin it until it yields under pressure of the thumb, the horn will be found moist; and as the thinning operation is continued, the transparent juice will be apparent on the surface of the hoof, issuing from its pores like sweat, and if the finger be passed over the newly cut surface, a damp streak will be visible, in which case any one may write his initials on the horse's hoof with the moisture drawn from it. By paring on still further, instead of colourless fluid, red blood will issue in all its integral parts, and then a name may be written on

the sole of the foot in blood. There is yet another stage, which, by courtesy, is called an operation, consisting of drawing blood by pints and quarts from the sole of the horse's foot, in which act all the paring thus far described being accomplished, the expert hand revolves his drawing knife on to its hooked point, and, with a thrust downwards and forwards in a semicircular direction, a shaft is sunk through the remainder of the sole, and blood flows—in the act a net-work of blood-vessels and nerves is divided. I am not adducing these examples of practice to remark on the monstrous cruelty or its tolerance, but to extract material as a lesson on the manner of the circulation of blood, and a secretion from it through the hoof.

Weakening of the hoof by any process whatever, especially by the prevalent ways of keeping it in constant contact with wet and by paring, is to be regarded as the primary cause of one of the greatest miseries of our age—lameness of horses. Not only does the procedure betray ignorance and indifference on the subject, and therefore is the more regrettable, and less hopeful of early recourse to remedy, but the weak-footed horse is thereafter affected by relatively slight additional causes.

Against my theory of horses' hoofs being destined for action on firm, and, if required, hard ground, and of their being only in a fit state to bear weight and exertion when free from moisture imbibed from without, it may be argued, that their condition of existence necessitates exposure to wet, and that even the dew on the grass keeps for the time the surface of the hoof moist; but let all conditions be taken into account, and then the theory I have advanced will be found consistent, and the doctrine sound according to all experience.

When men speak of natural conditions of horses, it is commonly found, if rightly viewed, that that which is indicated is diametrically the opposite of natural; they turn a horse into an open field, and seeing that there is grass and water, console themselves in the belief that the animal so confined is enjoying its natural freedom.

Men authorized to be the teachers of those



of future generations, adopt as their system the plan of placing horses, whether ill or well, and however differently they may have been previously managed, in sheds with nothing but the tiled roof for a covering, and one or more sides being left open. Nay, in some instances we have seen the roof supported on pillars, and the animals exposed to the winds from the four points of the compass; and by a strange perversion of sense — this, too, is called natural. The horse, in the only condition ever seen by us, that of domestication, is so completely subordinate to control, that the case of only a few other animals is comparable in the study of its instincts; yet comparisons help, and are necessary for instruction.

Wild animals have their feeding grounds and abodes more or less distant from each other, according to requirements, and the capability of the order to travel in search of food. The deer holds to its mountain or forest retreat, and goes forth to the valley for food; the hare also goes from her home, and even into the cottager's garden, to satisfy her appetite; but when the sportsman starts either the fox from its kennel or the hare from her form, they are cleaner and drier than know we should how to keep either under

artificial custody; and if their footsteps be tracked while they are running at full speed, the deep, sharp imprints of their toe nails will be obvious in every step; and to the firmness and strength of those nails their speed and lasting power is in great measure due.

Returning to the consideration of the horse, which is altogether dependent on the understanding and discretion of its master for tolerable existence, if turned on to a bleak bog at one season, and into a fold-yard, ankle deep with wet dung, during another, he is helpless: a five-barred gate, and posts and rails, mark the boundary of his confinement.

Wet and dryness are relative conditions. The question involved is one of degree. Horses' hoofs are not penetrated by wet until after some time of exposure to it, when they are weakened, and under exertion alterations ensue, which incapacitates the whole foot for its natural functions. Men can work for many hours together in the rain, and their hands not be affected, but very different is the case of washerwomen's hands, which, after many hours' immersion, become intolerant of water; the sense of touch for the time is impaired, and the nails fail to fulfil their office in giving support to the finger point.

## The Dairy and Poultry Yard.

### WHO WOULD KEEP POULTRY?

SUCH are the words of not a few persons who are either ignorant in poultry matters, or have some different fancy which runs counter to a love for fowls as domestic favourites. Such a sentiment, indeed, cannot be entertained by any intelligent amateur or experienced farmer's wife; and the farmer himself, his occasional condemnation of the destructive creatures notwithstanding, will not, when closely catechised, differ very widely from the fixed opinion of her who should know best. Unfortunately, however, many amateurs are not sufficiently informed in the management of their yards to enjoy the full pleasure which can be derived from their hobby; and not unfrequently the mistress of the steading, from want of proper training, or from a dislike to being considered "careful about many things," pays so little attention to the denizens of the barn-yard that we should not be at all disappointed at hearing such a lady declare that they are "just a pest—mair bother than a', thir worth—indeed, what wi' the maister's noise, and folks ain toil wi' the vermin, they're no worth the keepin'." Strong language this, very! yet, strange to say, even such a lady keeps firm by her hens, and still submits to the heavy toil and conjugal scolding which they bring upon her. Good-natured lady, how heartily we condole with you!

But why these complaints against the poor poultry? Are they really to blame for all the bad things charged against them? We don't believe it, and, as we shall try to prove, for very good reasons. What we mean to say is, of course, not required to secure the patronage of the wealthy gentleman who must have—is pleased to have—a large poultry-yard and his own poulterer, because he wants to see fowls served up to him about which he has

no doubts either as to age or feeding, not to mention his commendable desire for a fresh egg to breakfast, and as an ingredient in numerous dainty dishes. Far less do we presume to reason with those sensible people of all ranks who can take a better view of this lower world than the mere utilitarian. They know that the human mind must have some relaxation from severe duty and pressing care, as well as some innocent hobby. Accordingly, in leisure moments, they amuse themselves with some pet animal or other, and from the varied selection there presented to them, many, with good taste too, become owners of poultry-yards. Verily, rich is their reward! Interesting are the lessons they receive in natural history! Ay, and if parents, great is the boon they confer on their dear children! What more pleasing to a father or mother than to see a boy four years old (and we are proud to have known such), not only delighted with the habits and freaks of his own inestimable bantams, but able to distinguish each fowl in a yard of 40 by a name, which the tiny fancier has himself imposed, from some remark made in his hearing, or very often from some striking appearance in the individual bird—and this where all the birds were of the same colour. We rather think the advocates of "lessons on common things" should be earnest patrons of the poultry-yard after this. If they decline the honour, then, with all deference to such modern sages, we say, the sooner they lay aside the name of domestic educationists the better, for they have yet a great deal to learn. Nor is there anything remarkable in men, or (beg their pardon), ladies of taste and education, becoming *henwife*, since, by such a choice, they can every day see a beauty of symmetry and

colour, not seldom accompanied by a style and spirit which an artist may feebly imitate, but never equal, while, all the time, they are cherishing those feelings of sympathy and kindness which makes them no worse members of society.

We repeat, however, that such persons require no arguments to bring them over to support an innocent, pleasing, and instructive amusement. It is with harder natures we have now chiefly to do. Honourable and useful individuals, nevertheless, because cautious and practical, we must acknowledge them to be, who, while having no objections to keeping poultry, yet refuse to do so at a pecuniary loss, or at a profit too small to repay their trouble. They are no despisers of a good fowl, well prepared for the table, or of a rich, fresh egg, but it wounds their practical natures to pay cent. per cent. above the market value for the former, or twopence-halfpenny for the latter. To such weighty and even prudent scruples we dare not object, only we beg to question the accuracy, or at least the necessity, of the prices which have begat them.

Now, whether such poultry establishments as M. Sora's, near Paris, with its 100,000 fowls and handsome yearly return, do actually exist, or are mere myths, we do not much care; but generally we say that, if two different purchasers, the "cadger" and the city poulturer, coming between the first owner and the consumer, contrive to have each a fair profit, we cannot see why fowls and eggs should not, with judicious management, repay the expense and labour of the producer. This strong probability, moreover, is much strengthened by the vast and increasing demand on foreign supply. The number of eggs imported into this country in 1863, according to the Board of Trade Returns, was 266,929,680; in 1864 it was 335,298,240; while, so far as the Returns are published for the present year, the increase is in quite a great a ratio, being 10,000,000 for January and February over the return for the same months in 1864. No doubt a fowl or egg may be bought cheaper, and perhaps produced at less cost also, in many places on the

Continent than in most places in Britain. But against this put the increased value of the foreign article, caused by the profits of dealers and the risks of transit, before it comes into the hands of the British consumer, and we can hardly help concluding that the home producer should be able to sell with a profit as cheaply as the foreigner. It is not a question, nevertheless, that needs very much the help of general conclusions, for it has been settled by the testimony of experienced amateurs and practical breeders alike, that poultry may pay and *have paid*. On every hand you may collect proof of this statement. Ask the cottager or the hind's wife, who is allowed (now very seldom) to keep hens, if they pay, and she will compliment your ignorance by asking in return if ye "ken nae mair than that yet." The industrious farmer's wife will tell you, "I'm no sure if anything pays better." As for exhibitors, they hardly like to say what their profit or loss is, although we are generally answered by the somewhat significant words, "We can't say we lose by them." The "Henwife," of whom we poultry-fanciers are all so proud, who can boast of hatching in one year upwards of 1000 chickens, declares that "rearing for the market only would even give a profit;" and by a minutely constructed balance-sheet proves that her own splendid yard is far from being an unprofitable one. Such testimony is all the more valuable that the stock at Inchmartine is *very various*, and forms a fine combination of the useful and ornamental.

We can humbly add our own experience as regards a small yard where only *one kind* is kept, and sixty or seventy chickens are hatched, and that is, that without one advertisement or sale by auction we have, within the last six months, paid £4 for fresh blood, and drawn £21 for birds sold. This, after allowing £4 for keep, leaves a nice little balance on the right side, without taking into account a pretty liberal supply of eggs from thirteen hens for home consumption and hatching.

Unquestionably some people make nothing by their poultry, and just because they deserve nothing better. Laziness or greed is in such

cases almost always visible. One of the unlucky beings packs a pretty large stock into a small hole, where every passer by is offensively met by the strong fumes rising from the accumulated droppings of the unhealthy inmates. Another feeds on boiled potatoes tainted with disease, unmixed with sharps or fine barley dust, or ground maize, any slobber being good enough for hens! To advise such persons to give up keeping poultry would only be an act of humanity, for the most benevolent could hardly, we imagine, wish success to persons so cruel and greedy.

But there are respectable and good people who do not abuse their stock, and while realizing a very trifling profit, are not without reason dissatisfied with the remuneration of the poultry-yard as a whole. Now, these are mostly parties who rear for the market or depend on eggs for a profit, exhibitors being generally shrewd enough to manage better. With Mrs Blair, our advice is, *make the chickens larger* and prices *must* rise. Let some few plump old-fashioned Dorkings or good Dorking-crosses be kept, from which you may get kindly feeding spring chickens. Do not stop there, however, but keep a good many Spanish hens or Spanish crosses with some larger breed, such as Cochins, Brahas, or Dorkings, for a regular supply of large eggs. Dispose of all hens past their best at the moulting season. If not successful with early hatchings, buy young hens ready

to lay in autumn; and for a regular supply in winter, as well as early laying, Brahas are the best. See that the roosting-houses are not overcrowded, but well ventilated and cleaned frequently. Give such food as your stock seems to thrive on best, changing it occasionally, and never withholding sound grain as a portion of the daily fare; and as a general rule, let no meal be very soft, especially in the case of chickens. If these simple precautions be taken, you are then deserving of success, and you will assuredly meet with it. As for your account, showing your expenditure and income, do not forget to mark in the latter, at a fair price, the eggs or fowls which have been used at home; and at the end of the year the result will in all probability be very gratifying.

This encouraging promise, however, is thus confidently held out to those only whose yards are in a healthy state to begin with, and who are willing to exert themselves to banish disease and worthless specimens from their sight. If you have roup or asthma, the sufferers must be resolutely got rid off; and if you have hens of an unproductive class, make a clean sweep, and even at some preliminary expense put on a new stock of healthy young birds of such kinds and in such relative numbers as your market throughout the year demands. In a word, bestow the same care on your fowls as the successful cultivator of any larger live stock does, otherwise you cannot reasonably expect proportionate results.

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### POULTRY-HOUSES.

WHAT is the best sort of poultry-house? This question will be answered variously by different individuals. As hinted in our remarks on some palpable blunders in the treatment of poultry, some are satisfied with bestowing the very smallest amount of attention on the hen-house. Any odd corner, let it be ever so dilapidated, open, and from its space and structure unfit as a lodging for fowls, is too often assigned

for the purpose. The people who act thus are generally among the grumblers at the slender revenue from their fowls. You must patiently hear them value the expenditure on their stock at some such high figure as will make the cost of each egg twopence or threepence, while the poor, [hens, as innocent as they are truly unfortunate, get all the blame. Of course, the old-fashioned barn-door fowls or cottager's hens, hardened, but likewise stunted,



by the severe training of their chickenhood, may be comparatively much less hurt by sleeping in a hovel than the different varieties of more generous descent. Still, as the smaller classes of cattle and sheep are now much improved, even on their native uplands, by closer attention and more genial treatment than formerly, all sorts of poultry are much the better for comfortable roosts in roomy, well-roofed houses. Perhaps nothing is worse than a leaky roof and a penetrating draught. Indeed, a duck's fondness for water is fully equalled by a hen's aversion to it. As for draughts, geese and ducks are the only poultry little affected by them, while other classes pay the penalty of exposure to them in much the same way as man himself, by suffering from sore throats, weak eyes, swollen head, and general debility. This state of things is particularly true of such stocks as are confined within too limited runs during the day, and are too crowded on their roosts at night. Yet there must be abundant fresh air admitted. If the walls of the house be of stone or bricks, this can be done through openings in the roof formed by raising one or more tiles or slates high enough up to save the fowls from the direct current of colder air. If the house be of wood, and the roof of felt or other tarred cloth, the object will be best gained by slight crevices between the boards, or holes bored through the door, or by the door itself being a loose fit, always guarding against a cold current rushing through the heads of the fowls. In summer, when the atmosphere is not too damp, the slip admitting into the yards, when not placed opposite the door, may be left open at night, wholly or partially, as the temperature outside demands. In a house made of boards overlapping one another, the roof may be made perfectly tight, and a plentiful supply of fresh air be obtained from the effect of the sun's rays on the side-boarding and door. Hence most experienced poultry-fanciers prefer wooden houses to all others; and certainly in warm weather they merit the preference awarded to them; while in winter any too open part can be stopped up with straw or hay, and if necessary, the whole walls may

be made weather-proof by a screen canvas placed over them. Ventilation is also a very easy matter when the houses are not confined by their vicinity to other larger erections, as may be seen in the middle of a park devoted chiefly to the poultry of its wealthy owner. In such a situation, where room abounds, small moveable houses are decidedly the best.

All houses, of whatever material formed, should be high enough for a large-sized man to stand erect in them, except under the lowest part of the roof, where there is no occasion to enter unless in a stooping posture to gather the eggs. This implies that the roosting spars should be placed under the highest part of the roof, and the nest under the lowest part, as they should be. Where room is precious the nests should be covered in above, thus dispensing with all other assistance to the birds when flying to the roosting spars or descending from them. The spars may be made of any soft wood from 3 to 3½ inches wide, a little rounded on the upper side, and the sharp edges taken off. We do not find any necessity for retaining the bark, if the spar be made of sawn fir.

The height of the perch should not exceed 3 or 4 feet, and should never be very near the roof, otherwise the cocks' combs will run imminent risk of being frost-bitten by coming in contact with the roof. All poultry, for the sake of cleanliness, should have this spar or perch—Cochins not excepted, although theirs need not be more than 2 feet above the floor. Indeed, all lumpish poultry, including the strong-winged but tender-toed Dorking, should have low roosts; and when the more active breeds, as Game, Hamburgs, and Spanish, are allowed to mount 5 or 6 feet above the floor, the range of nests should be closed in above with a wide board to afford them a landing-place when they leave their perch. Earthen floors are the best, but to remove from the fowls all temptation to scrape them up, they should be beaten hard, well watered on the surface, and then smoothed down with a trowel.

When the houses are numerous it will be a great advantage to have them planned so as

to pass right through the entire range of them without interruption, for the purposes both of cleaning and feeding. In such cases, also, the moveable tressle-shaped perches should be used.

In smaller establishments a sheltered situation is often looked for, and the house leans against some good wall. Here the perches may be fixed, and within one outer door, under lock and key, may be formed several separate apartments, entering from the main passage running parallel with the supporting wall, each containing one cock and from four to six hens. Before this term we had a house answering this description, 16 feet long by 8 feet wide, including the main passage. The four inner apartments were fitted up with open spars to admit light from the door and windows, which latter should be in the sides of the house, as if placed in the roof there will be considerable inconvenience during a snow-storm. To adapt the house to the ground, one run entered at the end, and, looking northwards, had a broad fence opposite the gable of the house as a shelter from cold winds. The sub-divisions were necessarily small, yet with good airy runs and abundant ventilation through this wooden fabric, a stock of from sixteen to twenty hens and four cocks have thriven and maintained an honourable position in the show-yard. Removing to a new house, we find only a garden border,  $7\frac{1}{2}$  feet wide, but of great length, whereon to erect the future dwelling for our pets. Well, what is to be done? Why, against a wall 6 feet high we are placing a house, entering from the garden-walk, the passage inside being at right angles to the wall, the ridge of the roof being exactly in the middle of this passage

overhead, and two inner doors enter a separate apartment on either side. The door of each is in the middle, as being most convenient for cleaning, and in this case, to avoid contact with the outer door, which, in its turn, yielding to the principle of convenience, opens inwards. Runs of the same width as the house communicate with both apartments, having each a door from the garden walk close at the corner of the house, and the trap-door or slip for the fowls is at the same corner. One perch in each, 3 feet high, runs from end to end of each division, and two roofed-in nests are placed over against the door and the middle of the perch. A large pane of glass is placed in the side of each division for light. Except the garden wall gable the whole is of overlapping boards. The roof does not overlap, as it is covered with tarpaulin. The inmates are to number twelve hens and two cocks; and if further subdivision be rendered necessary, the house is so halved that it can with almost no change have three apartments, or even four at a push.

Every morning this house will be thoroughly cleaned, and the floor sprinkled with ashes (wood-ashes if possible) twice a-week. The inside of the roosting-divisions will be washed with lime every six months, or sometimes oftener, and the outer door will be kept open all day, unless in stormy weather. Of course this latter precaution cannot be taken in cases where the eggs are stolen, and then more ventilation will be required from other parts of the house. We have never, for nearly twenty years, had a single fowl stolen, nor perhaps even one egg, although the latter sort of theft has once or twice been attempted.

*THE PRODUCTION OF PASTURE IN DAIRY FARMING.\**

DAIRY farming is a combination of the two systems of arable and pasture, and a knowledge of both is necessary for its successful practice. A certain amount of dairy stock is kept on the pasture for the production of milk, and a portion comes under cultivation to produce winter food for them. This arable portion is varied according to the quality of the soil and the climate of the locality, but in the medium soils of Ayrshire fully more than a Scotch acre is required for fodder for each cow. The pasture fields are broken up in rotation, and after a system of cropping, which must also be varied according to circumstances, they are again sown down to pasture, and it is to this department of dairy farming that I have been requested to call your attention at this time. The production of rich pasture ought to be the first aim of every dairy farmer, as on the quality of the pasture greatly depends the amount of success he may attain in his calling. Cows fed on rich pasture attain a greater size than if fed on poor, and when sold, either as store stock or in the fat market, command a correspondingly higher price. The produce also partakes greatly of the character of the pasture on which cows are fed, and that best adapted for improving the carcase and laying on fat will give the richest produce, and that which yields the animal the greatest amount of food with the least trouble is that which enables it to yield the greatest quantity of milk. To have the fields well covered with luxuriant pasture not only improves the stock, increases the quantity and improves the quality of their produce, but it forms the best guarantee that we can have for an abundant crop of grain when they come under a rotation. Land covered with a rich and productive sward improves in condition more rapidly than that which is covered with a poor and scanty vegetation. Under a rich sward there is an accumulation of vegetable matter which undergoes decomposition when it is turned over, and yields a large supply of excellent food for the cereal plants, and will produce a heavier grain and better straw than an ordinary coating of farm-yard manure. To keep the fields well covered with a rich sward, then, is the best receipt for successful farming. Rich pasture consists in a close cover of those grasses which yield the greatest amount of nutrition to stock feeding on them, and for its production it is necessary that the land should be thoroughly drained if it is not naturally dry, for all the best sorts of grasses dislike a wet bottom when they are young, and will not root deep enough in it to bear the vicissitudes of the seasons, but will die out as soon as they have ripened their seeds.

The land should be gathered into ridges, with the drains between, the breadth of the ridges being regulated by the wideness at which the drains are necessary. It ought also to be deeply cultivated, so as to render it open and porous to make it penetrable to the atmosphere and the roots of the plants, and to allow the rain water to percolate freely through it. By this means it is less affected either by protracted wetness or by severe drought. The roots of the plants are struck deeper into the soil, and, having more scope, a greater number of feeders are sent out, and the plant being more copiously supplied with food, is enabled to produce a greater amount of herbage.

It is also necessary to maintain the land in good manurial condition. All grasses have their own individual propensities, and are indigenous to certain soils, conditions, and climates. In naturally dry and rich soils the better class of grasses grow spontaneously, while the poorer soils are clothed with those which contain a greater proportion of woody fibre, nature providing the land only with such a covering as it is able to support. The better grasses may be introduced into poor soil and struggle for a miserable existence for a season, but unless they find a ready supply of those elements which form their structure they must inevitably die out, while with good cultivation and a liberal manuring they may be retained and produce a rich and nutritious sward. We must, therefore, endeavour to bring our land into a condition similar to that to which the better class of grasses are indigenous.

The tendency of dairy farming, as generally practised, is to impoverish the soil of phosphates by their continued drainage both for the grass and the arable lands. Of the cereals raised the greatest portion is sold off the land, and only the straw retained to be converted into manure, and returned to the soil, and the produce of the dairy is also almost entirely removed. Unless the dairy stock receive a considerable amount of nutritious food during the winter months, as they are either producing milk, two-thirds of the inorganic constituents of which consists of phosphates, or they are nourishing the embryo of a future generation, of the bones of which phosphoric acid is a principal component, the manure produced is comparatively poor, and alone is incapable of maintaining the fertility of the soil. The quality of the manure, however, is considerably improved by the use of an extra amount of feeding. The fattening of cattle during winter produces a greatly superior manure, and fattening on the pastures has not such an exhaustive tendency as either the rearing of stock or the keeping of dairy cows. While cattle are fattening they assimilate an excess of the fatty matters of the food,

\* Paper read before the Ayrshire Farmers' Club, by Mr Robert White.

and excrete a proportion of the other alimentary substances corresponding to that excess, while milk cows assimilate the whole of these matters as well as the vegetable oils. The food which, when used by a feeding cow, is requisite to produce 1 lb. of beef, would, if used by a dairy cow, produce in milk nutritive qualities equivalent to more than 2 lb., and the matter excreted by the latter, being robbed of these ingredients, is correspondingly poorer. The liquid manure which contains the most of the phosphates and ammonia being generally allowed to run to waste, is another source of exhaustion to the land. The farm-yard manure is most economically used to raise the cereal and green crops, and should be ploughed deep into the soil to keep it open and porous. Its decomposition assists the disintegration of the soil, tending to render it more friable, and this action of the manure is entirely lost when it is allowed to lie and decompose on the top. Artificial manures are the best adapted for surface application, as they are more readily washed into the soil, and the pasture raised thereby will be more readily eaten and better relished by the cattle. To supply the deficiency of phosphates and supplement our manure heaps, then, it will be found profitable to top-dress our young pastures copiously with bones, mixed with a little ammoniacal manure, as the poverty of the soil is the greatest enemy with which they have to contend. If we keep the soil well-drained, deeply tilled, and in good manurial condition, nature would soon bring upon it a luxuriant vegetation, but if we go hand-in-hand with nature, and deposit the seeds of those plants we wish to cultivate, it will render us great assistance in covering the land with useful herbage.

#### INFLUENCE OF ROTATION ON PASTURE.

I may now make some allusion to the general systems of cropping, and their influence on the production of pasture. The most common system on the higher and more inland localities is to take two crops of oats and a crop of perennial ryegrass hay, and then allow the land to be depastured for three, four, five, or six years. This system has the recommendation of being the least expensive in management, and on heavy land when it is well manured it is the most profitable; but if the soil is allowed to remain poor, it encourages weeds and the poorer grasses. When this system is followed on clay soils, not naturally calcareous, a little lime may be very profitably applied. As there is an accumulation of organic matter in the soil when lying in grass, some of the manurial elements form insoluble compounds with the organic acids, and are thus lost to the plants, the lime tends to their decomposition, and makes available all the manurial matter the soil contains. Lime ameliorates the soil, assists in its disintegration, neutralises any acids, and decomposes any poisonous substances in it, in adaptation to the health and exigencies of the plants; it acts injuriously on most of the poorer grasses, and encourages all the better sorts. In some districts lime is applied to the sward during the summer before it is ploughed, a coating of

farm-yard manure put on the stubble and ploughed in for the second crop of oats, and by this means the land is sown out in good condition for pasture. Lime put in a powdery state on the ploughed land, and harrowed in along with the seed of the cereal crop, is a good preparative for the grass and clover seeds, and for the first year secures a luxuriant growth. The custom of allowing grasses to ripen their seeds (the first year) is unfavourable to the raising of first-class pasture. This practice, which is so prevalent in this county, weakens the roots of the plants, and deprives the soil of a quantity of phosphates. As no seed can be formed without the presence of phosphoric acid, it is therefore incongruous to a dairy district. The growth of beans, either on lea or in drills, is unfavourable to the production of pasture, the decaying roots of the beans proving poisonous to the grass plants, so that the pasture does not assume the same healthy appearance after them. Barley is the best cereal crop on which to sow the grass seeds; it is not an exhaustive crop on the land, and being early off, the grass plants are enabled to root deeper the first year. Under the foregoing system of cropping, the land undergoes so little tillage, and is so little exposed to the atmospheric action, that the vegetable matter is not altogether destroyed, and some of the good perennial grasses still retain hold of the soil, and appear again in the pasture when sown down. By this means the land is covered with a close sward sooner than after being green-cropped; but unless the land is kept in good condition, and full crops raised, the sward is likely to be composed of a considerable number of spurious grasses, and other weeds which yield comparatively little nutrition to the stock feeding on them. If the land through poverty or otherwise has got covered with a coarse and unprofitable sward, it ought to be subjected to a system of cropping, embracing a green crop. In green cropping the soil is freed from all roots of grass and other weeds; the organic matter is completely destroyed by the prolonged exposure of the soil to the influence of the sun and the atmosphere, thus rendering it comparatively poor. An opportunity, however, is afforded of deepening the soil by tillage, and improving its texture by reducing it to a fine state of comminution. Thus the green cropping of clay land, though an expensive operation, exercises a salutary influence on the soil, and by a kindred action renders the application of lime less necessary. The clay of the soil is decomposed by the atmospheric influence and the mechanical operations brought to bear on it. The alkaline earths and silicic acid in combination with it are rendered available for the plants, and give firmness and strength of straw to the following cereal crops. There is a very prevalent idea that the green cropping of heavy land is antagonistic to the raising of good pasture, but when the season is favourable and the land properly managed there is nothing in the system that militates against the growth of grass. A considerable amount of manure is applied



for the growth of green crop, but there is generally a ton of turnips removed from the land for every ton of manure applied. Five quarters wheat or eight of oats are next taken, and the third year a crop of hay with seed. It is not to be wondered that after so much has been taken from the land with only one manuring, the grass should refuse to grow luxuriantly. It is not so much the ordeal through which the soil has passed that hinders the growth of pasture as the absence of the food requisite for its maintenance. The land having been cleaned of all vegetating roots, we are dependant on the seeds introduced for a sward, and as it is generally ryegrass and clovers that are sown, unless the land receives a supply of manure, the ryegrass plants, having ripened their seeds, will thin out quicker than the clovers can cover their spaces, thus producing but a thin pasture. It generally comes a little earlier after the land has been green cropped; and by introducing a proper selection of grasses and judicious top-dressing, the finest pasture will be produced. However, as there has been for some time back considerable risk of injuring the land from the seasons proving unfavourable, I would only deem it expedient to green crop when the condition of the land demands it, to clear it of weeds and introduce a better class of grasses. When land has once been brought under a good sward, it may be retained without green cropping by raising good crops and sowing out with a proper selection of seeds. But as we cannot lay down one rule to suit all circumstances, my remarks are not applicable to either the light soils near the sea level, where green crops can be more profitably raised, or to the higher and more moorland districts, where the cereals are more hazardous.

#### GRASSES TO BE SOWN.

For the sowing down of pasture a considerable number of grasses ought to be sown, as it is a well authenticated fact that grasses of different kinds grow much closer together than those of the same species. If one species only be sown, no matter what species, or how thickly sown, or on what character or condition of soil, only a portion of the plants will prosper, and blank spaces will occur among them, inviting their occupation by thistles or any other weeds whose seeds may be ripening in the locality. But if a proper mixture in sufficient quantity be sown, the plants will grow more rapidly, and encouraging each other, will soon cover every portion of the surface, giving it the appearance and the properties of old pasture. As the grasses differ in composition, some abounding in fatty matter, some in saccharine juices, some in protein compounds, and others in extractive matter, so the food presented to the animals by a mixture of grasses is of a more varied character, is more conducive to their health, and enables them to yield a richer produce. The mixture of grasses sown must be selected according to the quality, the condition, and the situation of the land. I will mention a few which are easily grown and very nutritious, are adapted to a great proportion

of the county, and are coming every year into more general cultivation, while ryegrass and white clover continue to form the groundwork of the sward.

The first I would mention is Timothy. This grass adapts itself to all situations, but thrives best in strong, damp loams. It is a quick grower, produces a great amount of herbage, is as early in spring as ryegrass, is later in ripening its seeds, and contains nearly double the amount of nutritive matter. It is greatly relished by stock, either in the dried state or in pasture. Its seeds are very small, and require not to be deeply covered when sown.

Cocksfoot is also a hardy grass, and may be profitably introduced into pasture. It grows readily on all clay lands, and, when well cultivated, produces a great amount of herbage. It grows very rapidly after being cut, and when kept constantly low by grazing it is more profitable than ryegrass. Its habit of growth is tufty, and will thin out after four or five years. Its seeds require a deeper cover than Timothy, growing best with about 1½ inches of cover, but may be mixed and sown with perennial ryegrass. I would also recommend crested dogstail as a grass worthy of our attention. Although it is not such a strong grower as those already mentioned, yet it is nutritious, is readily eaten by cattle, and is an ingredient of all old pastures. It grows freely when sown, although its earliest stems shoot readily up to seed, and are then refused by cattle. Yet a great number of small fresh leaves grow out from its root, and give a healthy colour to the fields. For sheep particularly this is a valuable grass; but though some agricultural writers assign it but a minor place in cattle pasture, yet, in my own experience, I have found it conducive to the richness of the sward. Meadow foxtail may also be sown. It is a strong-growing grass, comes early in spring, is succulent and relished by the cattle, although not quite so nutritious as those already mentioned. Rough-stalked meadow grass is also valuable in mixture with those already named. It sends out trailing shoots along the ground, from the joints of which roots are sent into the soil, and thus occupies all the empty space. It is eaten closely by the cattle, and helps up the verdant freshness of the pasture at the end of the season. It is incapable of providing good pasture alone, but under shelter of those stronger growing grasses, it will flourish and thicken up the sward with nutritious food. I might also mention several other of the poas and some of the fescue grasses as useful in pasture, but, being creeping rooted, they are better adapted for permanent pasture than for alternate husbandry. Those that I have mentioned are well worthy of our attention, and being carefully sown along with perennial ryegrass and some clovers, will make a valuable contribution to our pastures. In order that the seeds may be got properly covered, the land should be well pulverized and made comparatively smooth on the surface previous to seeding, and 2 bushels perennial ryegrass, 4 lb. cocksfoot, 2 lb. meadow foxtail, and 2 lb. red clover, should be mixed and evenly strewn on a Scotch acre, and covered

with a turn of chain or light harrows. The other seed—6 lb. Timothy, 1 lb. crested dogstail, 2 lb. rough-stalked meadow grass, 3 lb. white clover, and 1 lb. alsike, may be mixed and sown either before the land is rolled or after the cereal crop cover the clod, when it will shelter the young plants from the drought and the scorching summer sun. These seeds being very small require very little cover; more of the seeds will grow without a cover than with half an inch of cover. When sown they readily fall into small crevices in the surface, and by the influence of rain and storm get sufficient covering and moisture to enable them to send their roots into the soil and grow. Should the grass seem thin on the removal of the cereal crop, more seed ought then to be applied; and should the clovers fail to grow, as is frequently the case after two crops of oats, unless lime has been recently applied to the soil, they should again be sown as soon as the winter's frost is over and before the land gets consolidated by the drying winds of spring. The young grass may be depastured in winter with sheep or young cattle, but ought not to be eaten very close. In spring the land should be frequently rolled, as the grasses thrive best on a firm condition of the soil, and the young plants are apt to be thrown out by the frosts and thaws. The grass is more encouraged by being depastured the second year and retaining the droppings of the cattle feeding on it, than by being cut when the whole produce is removed from the land. When the latter method is followed it should be top-dressed in the following spring with bones and sulphate of ammonia mixed in the proportion of two dissolved bones to one of sulphate. In the more arenaceous soils the bones may be applied either as half-inch bones or bone meal, and should be sown in winter or early in spring. If farm-yard manure is used, it

should be made into compost during the summer by mixing with dry earth in the proportion of two of manure to one of earth, it should be turned over, well mixed, and allowed to ferment. It should be applied immediately after the removal of the hay crop, and should be broken very small by the use of a chain or bush harrow and the roller. The stock should be put on the young grass early in spring to prevent it running to seed and being thereby lost, land impoverished, and the roots of the plants exhausted. All pastures should be regularly and evenly fed down, as there is waste in having them too closely eaten or left rough as to turn to seed. The amount of stock should be carefully proportioned to the pasture so as to avoid both extremities, but as overstocking is attended with the worst consequences, we ought to guard most against it. But as our county annually groans under an overstock of cattle at this season, instead of reducing our number to suit our pasture, let us rather by a better acquaintance with the nature, the habits, and the wants of the various plants which compose them, endeavour so to increase their produce as to supply the requirements of our stock. While famine is decimating the population of other countries, let us remember that it is to our pastures that our fellow-men look for a great proportion of their food, and let us not be wanting in either skill or application to keep this dire visitor from our land. Besides, how interesting must it be to every lover of his native country to acquaint himself with that tribe of plants which form the principal material in the green vesture which clothes its surface, which performs so important a part in the colouring of the picture which Nature spreads out before us so as to render our island home the admiration of foreigners when they approach our horses.

## Legal Notes.

### WHO IS RESPONSIBLE?

#### A SELKIRKSHIRE HORSE CASE.

A SOMEWHAT important case, one of considerable interest to owners of horses, was recently decided by Sheriff Milne—Sheriff-Substitute for Selkirkshire—in the Small Debt Court, Galashiels, to which we desire to call the attention of our readers. The facts of the case were reported as follows in several of the daily and local papers:—

“George Mark, carter, Galashiels, pursued Messrs Murray & Hepburn, blacksmiths, for £6, 4s., as damage and loss sustained through the pricking of a horse when being shod by the defenders. The case was heard at a previous diet, when an old Act of James III. of Scotland was founded on (10 James 3, cap. 79, 6th August 1447), intitled “*Schoeing of horses in the quick be smiths.*” The act sets forth that “*Beans ignorant smiths through ignorance or drunkenness spills or cruiks menis horse shoeing in the quick.* It is statute and ordained that quhenever a smith schoes a manis horse in the quick, that smith sall make and pay the coast of the horse quhill he be hail. And in the meantime find the man ane horse to rydle upon and do his labour quhill the said horse be hail, and gif the said horse cruiks thro the said schoeing and will not hail, the smith sall keep the said horse himselfe, and pay the price of the horse to the man that owed him.” Evidence was led by the pursuer to prove the facts of the injury, which the defenders did not deny, but brought forward witnesses to establish that “*pricking*” was a wholly accidental occurrence, which frequently happened with the best and most careful of tradesmen, and that blacksmiths did not hold themselves responsible for the effects of pricking, when due caution was exercised in the discharge of their work. In giving a decision, the Sheriff gave effect to the views of the defenders, that pricking was accidental and frequently occurred; and that blacksmiths, in the careful discharge of their work, were not responsible, seeing that the formation of the foot was so different in different animals, and that the pursuer was blamable in not taking the earliest opportunity to remove the shoe and apply remedies. Decree for defenders.”

With all respect for Sheriff Milne, we cannot

quite agree with him in the view which he took in deciding on this case. Pricking is, no doubt, a matter of every-day occurrence, but that does not detract from the fact that it is an injury inflicted by the smith, which depreciates the value of the animal for the time, and very frequently leads to serious disease in the foot. That horses are more frequently lamed, and permanently injured in the feet in consequence of the ignorance or carelessness of blacksmiths than from any other cause, is well known. Unfortunately, a large proportion of shoeing smiths know very little of the formation of the foot of the horse; and when employed in their calling, they hack away at the foot in much the same manner that a carpenter hacks at a block of wood in order to reduce it into shape.

Now, we do not mean to say that Messrs Murray & Hepburn are workmen of this stamp—they may be the most scientific shoeing smiths in existence for anything we know—but the fact was acknowledged that the pursuer’s horse was lamed in consequence of pricking when being shod by them. The defence that the pricking was accidental was accepted by the Sheriff, and George Mark was left to bear the loss. Suppose George Mark or any other man, Sheriff Milne, for instance, had that, or any other horse, on trial from a dealer, either for carting, or the saddle, or harness, and that, while on trial a shoe was cast, rendering it needful to take the horse to a smith, who pricked and lamed the animal in the act of shoeing, how would the case stand? The dealer very naturally would decline to take back a lame, and therefore unsound horse, when he had given out a sound one on trial, and the party

who had him on trial would have either to keep the horse at the price put upon him by the dealer, or pay what the dealer would consider an equivalent for the depreciation in value sustained by the animal. But would it be fair that the person who had the horse on trial should sustain this loss, seeing that the damage was actually caused by the act of another man? Grant that the lameness was the result of "accident," as alleged by the defenders in the Galashiels case, that does not lessen the responsibility of the person who caused the injury. If George Mark had sent his horse by railway, and the horse had been injured in course of transit, there is not a doubt but that he would have got damages from the railway company, although in that case, as well as in the case in question, "accident" might have been urged as a plea in defence.

George Mark deserves credit for having brought forward this case, although he suffered what he would call both "the skaithe and the scorn," inasmuch as that, in addition to the injury caused to his horse by the defenders, he appears to have been sharply reproved by the Sheriff for remissness in not taking steps to repair that injury. Seeing, however, that horses are so frequently injured, we may say ruined, by blacksmiths, it is important that attention should be drawn to the matter, so that it shall be clearly ascertained whether they are to be held responsible for any injury caused by them, or exempted from

such responsibility, and the grounds upon which exemption is to be extended to them. If blacksmiths are held responsible, it will have the effect of forcing them to acquire, what most of them do not possess at present, a thorough scientific knowledge of the formation of the foot of the horse, and the proper principles of horse-shoeing, before they venture to undertake a duty of that kind. The extract from the old Act of James III. of Scotland, quoted in the report given above, shews that that monarch held very sound views on the subject; and it certainly would be a pity if that Act has really become obsolete. We repeat the words of the Act, modernizing some of the terms used:— "Forasmuch as ignorant smiths, through ignorance or drunkenness, spoil or lame men's horses by shoeing in the quick, it is enacted and ordained that whenever a smith shoes a man's horse in the quick, that smith shall pay the cost of the horse until he be whole, and in the meantime find the man a horse to ride upon and do his labour until the said horse be whole; and if the said horse is lamed through the shoeing, and will not heal, the smith shall keep the said horse himself, and pay the price of the horse to the man that owed him." Should this Act be revived, there are some shoeing smiths, we fear, who will require rather extensive stable accommodation.



## The Naturalist.

### THE JARARACA.

THE Jararaca (*Bethrops Neuwiedii*, Spix.) is the substitute of the rattlesnake in Brazil. About Rio it is frequently met with in plantations, and in bushy and grassy places by the sides of woods, but is scarcely ever found in dense forests. The Rev. Hamlet Clark, in his "Letters Home," gives an account of his first introduction to it, which may serve for that of the reader too:—

"We were riding slowly along in single file, our guide leading, when, as we passed a broken horizontal limb of a tree, close to the side of the path, all at once he woke up into active life. He was off his mule in a trice, handed me (I was next in file) the rein and his whip, had cut down and whittled clean a cane sapling, and then with all his force whack came the cane on the broken branch! Now we knew what the man was after. At once there uncoiled itself and fell to the ground a splendid serpent (the man said 9 feet long, we thought not quite so much), the deadliest serpent known here. He was sleeping, twisted round the branch in the sunshine, black and bright yellow, very hideous in its beauty. A villainous flat broad head, made uglier by a thin neck, snapped at us in every direction as we stood round it, and a single snap that hit its mark would have been certain and speedy death to man or beast."

Deadly enough its bite certainly is, but not quite so invariably fatal as Mr Clark supposed. People are said to have died from it within the space of two or three minutes after having been bitten, but more generally they survive for ten or twelve hours, and many recover entirely or rather do not die, but their constitution is almost always broken, and they suffer much from ulcerated limbs.

Gardiner in his "Travels in the Interior of Brazil" mentions the case of a female slave, about thirty-two years of age, and the mother of four children, who, whilst weeding Indian corn on a plantation, about eight miles distant from the house, was bitten by a Jararaca on the right hand, between the bones of the forefinger and thumb. He describes both the

symptoms and the treatment. The accident took place about eight o'clock in the morning, and immediately after she left to return home, but only reached half way when she was obliged to lie down from excessive pain and exhaustion. At this time she said the feeling of thirst was very great. Some slaves belonging to the estate to which she belonged happened to be near, one of them rode off to inform the manager. When he arrived he found the arm much swollen up to the shoulder, beneath which he applied a ligature. From a cottage in the neighbourhood he got a little hartshorn, some of which he applied to the bite, and caused her to swallow about a teaspoonful in water. Being in a state of high fever, he took about 1 lb. of blood from her, after which she became faintish. She was then removed to the Fazenda, and had two grains of calomel administered to her, and about an hour after a large dose of castor oil. Gardiner saw her the following day, when she still complained of excruciating pain in the hand and arm, to relieve which a linseed meal poultice was applied; and the pulse being 130, and full, about another lb. of blood was taken from the other arm. Next day a number of little vesicles made their appearance on the back of the hand, and a little above the wrist, which, when opened, discharged a watery fluid. For the next two days she continued to suffer much pain, to relieve which poultices were constantly applied. More vesicles formed, and the cuticle began to peel off in the vicinity of the bite. On the fourth day after the accident, when the poultice was removed, she complained of no pain at all in her hand, and on careful examination it was found that gangrene had taken place, all below the wrist being dead, and from the state of the

arm there was every appearance of mortification extending. On making an incision into the living portion above the wrist, a considerable quantity of a very foetid whitish watery fluid discharged itself; and on pressing the arm between the finger and thumb a crepitation was felt from the air which had generated beneath the integuments. She was now very weak, the pulse 136, small and feeble, and she appeared to be fast sinking. Amputation being the only means that seemed to offer her a chance of recovery, Gardiner at once decided to take off the arm. He accordingly performed the operation, and in a fortnight after the stump had healed up, and she was walking about the room. He tells us that four years afterwards he again saw her, and her general health had not suffered in the least, but she had become irritable and ill-tempered.\*

This was an exceptionally favourable case. The reader will understand, therefore, that the reptile is looked on with no little dread and alarm, and that every one gives it as wide a berth as they can, although it is naturally timid, and never attacks unless in desperation, and when it imagines its retreat cut off.

Our friend Mr Alexander Fry, the well-known Entomologist, on one occasion had an encounter with them which may be interesting to the reader, and as we have his permission to repeat it, we shall endeavour to do so as nearly as possible in his own words:—

“One fine morning I left Rio for an entomological excursion up the mountain of Tejuca, and thence on to a neighbouring mountain called Pedra Bonita, which is situated between the Tejuca and the Gavia, and commands a most extensive and lovely prospect. Its top is nearly flat for a space of many acres, and is covered by small bushy shrubs a foot or a foot and a-half high, very like our bilberry bushes. The sun was high when I reached the top—at his highest and hottest—and the scene that opened upon my view as I breasted the crest of the hill, and gradually obtained a more and more extended

prospect, was magnificent beyond description. Even in that land of paradise I remember nothing more beautiful. Pushing on with my eyes fixed on the ravishing scene, I had reached the centre of the plateau without looking at the ground over which I passed. I had brushed through the bilberry bushes as one would through the heather on a Highland moor. Wrapt in the heavenly view, I had paid no heed to my steps, but when I reached the middle something distracted my attention for a moment, and my eye unconsciously caught sight of an object which instantly banished all thoughts of the view from my mind. There! within a yard of my knee, coiled up on the top of one of the bilberry bushes, lay a hideous Jararaca, with his head raised up in the middle of his coils, his eyes fixed upon me, and his mouth gaping wide open. It is the habit of these creatures to open their mouths, and gape ready to strike when disturbed or irritated. Hallo! thought I, here is a dangerous neighbour; discretion is the better part of valour—I'll get out of his way; and I turned a little to the left to slip gently out of his reach. As I did so I just glanced carelessly in the direction to which I was turning, when I involuntarily started back, for there, within a couple of yards of me, on another bush, lay another Jararaca, coiled up like the first, with his head erect, his mouth open, and his eyes upon me. Lucky I noticed you, my gentleman! thought I, and began to slide off to the right, when there, full in my face, lay another Jararaca, coiled up on the top of his bilberry bush—head erect, mouth open, and eyes intent on me. I stood still, and glanced hurriedly round—the recollection raises the hair on my head even yet. There, on every side, lay Jararacas upon Jararacas. Their black and yellow livery spotted the whole space. The hot sun had summoned them all out to bask in his rays. I had stumbled into a perfect nation of them. There they lay—every head erect, every mouth open, and every eye turned upon me. I thought the way by which I came must at least be free. I looked back. No! they appeared as numerous behind me as before. I must actually have brushed close by some

\* Gardiner's "Travels in the Interior of Brazil, 1846," p. 51.

of them as I pushed through the bushes. I was completely surrounded—the cynosure of all eyes—the object of universal attention. It was like a horrid nightmare. I had found my way into Pandemonium, and stood like Satan with all the evil spirits sitting around me in the shape of serpents. For an instant I felt chained to the spot; my heart stood still. But one thinks quick in such emergencies. I had escaped in my way in, and I thought my best chance of escape would be by following the same route out. Gently, gingerly, and slowly I backed my way out of the thick of them, until the bushes were more free from them, when I changed my tactics, took fairly to my heels, and in a series of bounds, more cervine than human, I found my self out of the conventicle.”

Our friend may thus say that he has been present at a public meeting or parliament of the Jararacas. From its constitution one

might rather describe them as members of the *lower house*, but the silence, decorum, attention to the business in hand (basking in the sun), and the look of quiet but dignified surprise with which they effectually repressed the intrusion of a stranger, must have more reminded him of our Upper House. The shortness of his stay, and the promptitude of his retreat, however, prevented him from obtaining information on some points which excited his curiosity. Where did they all come from, and where would they have all gone to when the meeting broke up and the sun went down? Although the creature is not unfrequently met with in the neighbourhood of Rio, it is generally solitary. It shews what multitudes there must be of them in some localities, and how until favourable circumstances call them forth and reveal their numbers, we may form most erroneous impressions as to the relative numbers of the animals composing a Fauna.

## Hunting, Fishing, and Shooting.

### DUCK SHOOTING IN CANADA.

FARMERS have by nature a dash of the sportsman in them. While they like to see their crops glowing with the harvest promise, and their turnip fields not altogether destroyed by the nibble of the hare, yet, we think, a true farmer would never like to walk his fields without hearing now and again the *whirr* of the partridge and the pheasant, or the *thud* of the hare, as she limps away, startled from her cosy seat. With a true sportsman heart pervading the British tenantry, there would be little danger of the game being exterminated, even though the game-laws were not nearly so rigorous; and I think that true-hearted landlords would not grudge a day now and again, across the stubbles, to tenants who could realize the difference between poaching and legitimate sport. When landlords and tenants come to have something of a friendly and common interest in their game, we may look for fewer evils flowing from misunderstandings in regard to game. With occasional opportunities for shouldering a gun, when my boyish strength could give effect to my instinctive love of sport, I fortunately or unfortunately contracted the habit of blazing away at crows and pigeons, rabbits and hares; and, I may as well confess it, when an unlucky partridge or pheasant would cross my path, could I be blamed for just wishing to see how I could fly at somewhat higher game?

Coming to Canada a few years ago, I found that these instincts thus awakened did not entirely die away, but rose into stronger power as I saw the track of the moose and deer, or heard the old gabble of the goose, or the well-known *sough* of the wild duck. For some kinds of sport Canada is unrivalled. The very stillness and majesty of her un-

tracked forests, in some fine autumn mornings or evenings, when the sky presents its almost unmatched deep blue, and the foliage glows in all its wondrous colours, give an impression which can be felt only once in a lifetime. And when along with this external beauty is combined the excitement of seeking such game as the caribou or moose, any one who joins in this sport for the first time must necessarily have new and strange sensations. Or let us suppose it to be winter, and a novice takes to his furs and snow-shoes, following the track across leagues of snow, with the thermometer  $30^{\circ}$  below zero, and a sharpish wind, I am sure that there would be a new experience of life gained by the true-born Britisher.

Perhaps more pleasant and not less novel would be found the wild-turkey shooting on the prairies. The wild turkey is one of the most beautiful and noble birds that can anywhere be seen; and any one who wishes to get a dash of new blood into his domestic broods, or restore something of the beautiful copper tinge, could easily secure one of the wild birds from Western Canadian prairies. I might allude also to the woodcock, snipe, and other kinds of game, which in certain parts of Canada are very plentiful; but, as might naturally be expected from her immense lakes and rivers, waterfowl is even more abundant at certain seasons than any other kind of game. The swan, goose, and duck are very abundant. For the most part, they breed further north, and winter further south, thus passing through Canada twice a year, and affording magnificent sport, especially in the months of October and November, when the weather is almost perfect. Duck shooting may, perhaps, be regarded as very much the same all the world over; yet



in Canada it has its own peculiarities. In some of her rivers there are immense flats or swamps, which are overgrown with reeds and rushes, and thus afford beautiful ground, much of which is covered with duck-weed. On some island or dry spot in the neighbourhood of this ground a small wooden hut or shanty is erected, in which the sportsman makes himself as much at home as the pests of a swamp will permit. Before daybreak he may find himself in some favourable position, in which he can command the birds in their passage, and may bag his twenty, thirty, or even fifty birds before breakfast. Or, desiring even a more pleasant kind of sport, he may get into a canoe and paddle quietly through the rushes, and mark his bird as he disturbs it at its morning repast, and turn it over beautifully as it rises in the air. In such swamps it is sometimes necessary for the canoe-man to get out and either pull or push the canoe over almost dry ground; but no shooting can be more pleasant than sitting quietly in your canoe, and every few minutes having your shot at duck, snipe, bittern, or some other Canadian bird. Very frequently a man well acquainted with the waters can mark to a nicety the spot where a flock—and sometimes a flock of thousands may be seen—alights; and paddling quietly and noiselessly through the reeds, a raking shot may be had, when half-a-dozen, in a not over-sportsman like manner, will be tumbled over with the first barrel, and one or two with the second. Duck stalking is very interesting. Towards the close of the year a very ingenious mode of getting within reach of ducks is sometimes adopted. A scow painted white is quietly paddled in their direction, and it so resembles a floating sheet of ice, that frequently they can be approached

within twenty or thirty yards. It is of course in the large swamps that the best duck shooting is to be had, and the numbers and variety are something almost inconceivable. The Common wild duck, or mallard, is of course very abundant; so also are the teal, pintail, canvas back, widgeon, shoveller, wood duck, and many others. I do not seek to allude just now to the characteristics or peculiarities of any other except those of the wood duck. This is one of the most beautiful birds that can anywhere be seen. It is called the wood duck from the peculiarity of its habits in lighting and building upon trees. When first seen darting through the air, almost like a hawk, and suddenly perching upon a tree, one unaccustomed to the bird can scarcely conceive what it is. When the young are hatched, the mother-duck carries them to the water, and they are at once in their element. Duck-shooting is one of the most difficult, but one of the most interesting kinds of sport. It is of course easy enough to blaze away at coveys, or aim somewhere in the direction of a single bird; but, to judge the distance, the angle of flight, the rapidity of motion, and almost instantaneously to cover the head, and not merely wound the bird, requires a nicety of mathematical calculation, giving a training both to eye and hand.

However interesting new scenes may thus be, I have a strong conviction that for real pleasure nothing can surpass the moor on the 12th, or the stubbles in September. And had I any hope of finding some enthusiastic sportsman willing to grant a few day's liberty on some good ground, I do confess that I would almost feel tempted to steal time enough to cross the Atlantic on such an errand, and enjoy again the autumn breezes of old Scotia!—*Leven*.

## The Country House.

### HOUSEHOLD CLEANING.

BY THE LATE MRS PARKES.

CLEANLINESS, whether household or personal, may be considered as one of the unalloyed advantages derived from civilization. If it may not be ranked as a virtue, it is at least the parent of virtues, and not unadvisedly, was the old saying first pronounced, "Cleanliness is next to godliness."

As a habit, it has moral as well as physical advantages, personal as well as domestic; hence its claims on our approbation and daily observance. It evinces an absence of slothfulness; for without activity and exertion, cleanliness cannot be practised: it is an emblem, if not a characteristic, of purity of thought and propriety of conduct. It seems as if it could not be associated with vicious pursuits; so rarely, in the habitually profligate character, are the active and wholesome habits of cleanliness perceptible. The squalid wretchedness, which sometimes engages the pity of the philanthropist, is oftener found, on investigation, to be the effect of vicious idleness rather than of unmerited misfortune; while cleanliness, if it cannot totally indemnify us from the evils of poverty and disease, can keep them far removed from utter wretchedness and misery.

Cleanliness is an unequivocal good; and accordingly we find that it confers a species of rank on all its votaries, to whatever class in the scale of society they may belong. The cleanly family, whether living in the cottage or the hall, is "respectable" "creditable"—a distinction which serves as capital or stock in trade to members of the industrious working class, and is not without its value in the higher walks of life, where honour and distinction are sought.

In the former class, the respectability of a

family (and we can scarcely allow respectability to be claimed where cleanliness does not prevail) is a sufficient recommendation to honest and creditable employments. An opposite term, given to an idle slovenly family, would be an equal impediment to the worldly advancement and welfare of its members. Doubt and suspicion must inevitably cloud the prospects of all whose domestic habits could not promise for them, that, in the world, when called upon to act, they would be diligent and energetic, not self-indulgent, or wanting in attention to any of the proprieties of life.

We shall first consider cleanliness in the house, together with the modes of cleaning everything within its walls.

Whatever may be the exciting causes of infectious diseases, cleanliness has in its keeping the specific by which their progress is checked. Under its influence infectious complaints are often confined to some solitary instance in a family, and do not spread, as formerly they would have done, with the fatal rapidity of a pestilence. This specific allays the scourge, as well as giving exemption from contagion to all who practise it. Many other effects of cleanliness on health might be stated, with considerations of much importance in other points, relative to family comfort and prosperity.

The economy of cleanliness is another recommendation to its observance; the uniform cleaning of house and furniture are amongst the best means of preserving both: we can neglect no wholesome practice in the whole cycle of domestic cleaning without inflicting an injury on some part of our property. We may even incur an entire loss, by neglecting

to clean in time some of the various articles of furniture which comfort and convenience require us to possess. So that to the other evils of uncleanness we may fairly add that of waste of property. Thus on domestic cleanliness how much depends! comfort, economy, health, and respectability.

It must be acknowledged that in this country, the taste for cleanliness, if the term be permitted, has long been cultivated, although there may be room still for improvement in it, as its universal prevalence depends upon the cultivation of more qualities than one.

Yet here we must observe that, indispensable as the practice of cleanliness is, like many other good inclinations and habits, it may be carried too far. It may encourage an inconvenient fastidiousness, a nicety that must often be offended, and a consequent tendency to irritation of temper. Such effects would, in some degree, counterbalance the advantages of cleanliness.

There are families and situations in life in which cleanliness can only be practised in generals, not in details: in such cases the love of it should be kept within the bounds of possibility, or it may become a daily cause of family uneasiness and discord. We delight to see the supremacy of cleanliness, its victory over dirt and smoke; but it can only yield such pleasure, when known to be the result of a practical, orderly, and regular system, and not of the severe, hard, daily duty which we imagine to be the characteristic of an enslaved existence. Cleanliness, like every other good quality, must have its prescribed limits. If these be overstepped, it may prove a torment and inconvenience, instead of one of the sources of domestic enjoyment.

We now proceed to such details respecting the practical part of our subject as may enable the mistress of a family or her housekeeper to form her system of household cleanliness, and to direct its daily course:—

#### I. CLEANING FLOORS.

Floors of a house may be of several kinds—of boards, of brick, and of stone.

Boarded floors are commonly either of oak or deal. The former, chiefly seen in country

houses, or in the residences of the opulent, forms an excellent substantial flooring, and is often only partially covered with carpet. Deal floors, on the contrary, are almost uniformly and entirely carpeted, except in the apartments assigned to children and servants: the mode of cleaning them is consequently of less moment and less laborious than that employed in cleaning floors of oak.

Scouring—for which the housemaid must be provided with a good-sized wooden pail for water, a wooden bowl for sand, a piece of flannel rather more than half a yard square, and a hard scrubbing brush—consists in scrubbing floors with the brush, some sand, and clean cold water, and afterwards in washing off the sand with the flannel. Soap is sometimes used with sand; but, instead of improving, it injures the colour of the boards when dry, giving them a blackish appearance.

In scouring, the housemaid first dips her brush in the water, then sprinkles it with sand, and scrubs, with force, such portions of the floor as her arms can reach at a time. From these she washes off the sand with the flannel, drying and completing each portion at once, so that she need not tread over the boards until they are dry. In bedrooms, it is desirable to scour first the boards beneath beds, chests of drawers, or wardrobes, that these parts, being less open to the air than others in the room, may have the more time to dry. When bedrooms and nurseries are scoured in the winter, and when the windows cannot be long open on account of the weather, it is very prudent to have fires in each room to accelerate the evaporation of the moisture on the floors. The damp arising from newly-scoured boards is as likely as any cause whatever to encourage the inflammatory diseases of childhood, or the coughs of individuals subject to them.

For scouring, when necessary to be done in winter, dry clear weather should be chosen. During very frosty weather it ought rarely to be done, the evaporation not being then rapid enough to carry off the moisture of the boards; or if it freezes on the boards, which is sometimes the case, it then requires two days, instead of one, to dry the room thoroughly.

Deal boards, if not carpeted, should look white and clean; they may be improved, if the colour be indifferent, by the use of fullers' earth or pearl ash dissolved in the water. In the use of clean water the housemaid should not be sparing; whenever it begins to look dark-coloured and becomes thick, she should instantly carry it away, and bring a pail of clean fresh water to her task. If she does not change the water frequently, she will smear and not clean the floor. Scouring, in most houses, is usually done at stated intervals; in nurseries and offices, generally every week; in bedrooms, every fortnight, or once a month, according to season and situation; in sitting and eating-rooms, which are carpeted, scouring is not done more than once or twice in the year, nor need dry rubbed oaken boards be scoured more than once in twelve months.

The effect of scouring oak boards with soap and water is to bring them to a dirty dull white colour. To prevent this, the boards, after being scoured, are washed over with water, coloured either with umber or yellow ochre. With old boards, the umber is most commonly used; with new oak floors, the ochre. After the scouring and the washing with the coloured water has been done, the most laborious part, that of polishing, called dry rubbing, the boards, remains to be accomplished. For this work, the housemaid must have a large, heavy, hard brush; in length, one foot or more; in width, about eight inches, affixed to a long stake or handle. With this brush and a little hot, dry sand, she must scrub the floor to and fro the way of the grain, until the polish, destroyed by scouring, be restored. Sometimes bees' wax is used to accelerate the reappearance of the bright surface; but bees' wax, in restoring the polish, at the same time renders the boards so slippery as to make walking on them scarcely less dangerous than on ice. Friction alone will, by frequent repetition, brighten the boards sufficiently without the inconvenience of making them slippery also. After the dry rubbing is over the sand is swept away, and for the next ten or twelve months, these boards will only require sweeping

every day, and a little dry rubbing once a week.

In France, where carpets are less commonly used than in England, oaken floors are seen in most of the great houses and in hotels. They are kept in a highly-polished state by men—the work being there considered as too laborious for women. The men perform this duty with their feet, to one of which they fasten the brush; and with great activity, and without much apparent fatigue, they soon bring a glass-like surface to the floors. They employ wax and other polishing substances to hasten their work.

For removing spots of grease from boards, take equal parts of fullers' earth and pearl ash—a quarter of a pound of each—and boil in a quart of soft water, and, while hot, lay it on the greased parts, allowing it to remain on them for ten or twelve hours, after which it may be scoured off with sand and water. A floor much spotted with grease should be completely washed over with this mixture the day before it is scoured. Fullers' earth and ox-gall boiled together form a very powerful cleansing mixture for floors or carpets. Spirits of turpentine, rubbed for a short time forcibly on grease spots, dissolve the grease in the floor, and make it readily unite with pearl ash or soap, with either of which the parts should be afterwards washed. Drops of tallow may be scraped off. Stains of ink, dried in on floors, are difficult to eradicate. Strong vinegar or salts of lemon will remove them. Red wine stains on boards may be removed by laying on them a strong solution of soda. If this be not sufficient, the chloride of lime or bleaching liquid, sold by chemists in half-pint bottles, will remove them.

## II. CLEANING THE SIDES OF APARTMENTS.

As oil paint is injured by too frequent scouring, it is necessary to use every means which may render the scouring of paint needless; first, by cleaning the walls, edges, and mouldings from all lodgments of dust, frequently sweeping and daily dusting them with the proper hair broom, called the Turk's head, over which a clean linen duster should



be tied. Every angle, the favourite nook of the house spider, should be cleared, as well as the panels and ledges of doors. In sweeping the mouldings of the ceiling cornices, great care must be taken not to break them, they being made of plaster, and consequently brittle.

Partial washing of spots and stains on oil paint may prevent the necessity of more frequent general scourings. Every week the housemaid should examine the paint, and remove with a flannel and soap and water any spots upon it, finger marks, &c., within her reach; having wiped them away with the flannel, taking care to wipe those parts dry, so as not to leave it visible where the cleaning has been done.

In washing or scouring paint little soap should be used, the alkali of the soap having a tendency to injure oil paint. But water alone is not sufficient. After scouring with the brush and soap, plenty of water should be used to wash off what remains of the soap; otherwise, if left on the paint, it will cause its decay.

Oak wainscot should, when necessary, be washed only with a sponge and warm water; after which it should be rubbed with a brush, like mahogany.

Stairs in towns are frequently painted in oil either white or of stone colour. The parts which are not covered with carpet should be washed weekly with warm water and two sponges; one to wash, the other to dry, the stairs with: by using sponges the edges of the stair carpet are not so likely to be injured, as by a brush or scouring flannel. Painted stairs look clean and neat while the paint remains on them; but the paint requires to be renewed almost every second year.

When walls are painted in distemper, they will not bear the application of water, and therefore admit of no cleaning except that of sweeping down gently from them all the dust that may adhere to them.

Paper-hangings of walls also admit of very little cleaning except that of sweeping them down with the hair broom, covered with a clean linen duster. Stains by smoke may sometimes be cleaned by rubbing them with

the crumb of a loaf. Grease can scarcely, by any means, be removed from paper hangings.

Whenever a room is fresh papered it is desirable to reserve small pieces of it, that repairs may be made in the case of any part being torn off or injured.

### III. CLEANING MARBLE AND STONE WORK.

Marble floors, chimney pieces, and hearths, are simply washed with a flannel or sponge and soap and water, and wiped dry with linen cloths. If stained either with oil, wine, or discoloured with smoke, other means must be employed to clean them.

Oil or other grease dropped on marble or stone may be removed by laying on the stains a mixture of strong soap lees with fullers' earth and pipe-clay well dried, and powdered. When laid thickly on, a flat iron, made tolerably warm, must be put on and suffered to remain until the mixture is dried. And if on washing the part the stain be not eradicated, the mixture and iron must be applied either once or twice more.

Stone floors and stone stairs are sometimes scrubbed with sand and water, sometimes with the hearth-stone, or with pipe-clay prepared after the following receipt.

Boil half a pint of size with the same quantity of whiting and pipe-clay in two quarts of water; the stones must be first washed clean with water, and this mixture afterwards laid smoothly on them with a flannel; when dry they must be rubbed with a dry cloth or flannel.

Stone floored kitchens and offices, stone hearths, stone steps, and balconies, are usually washed with a flannel and water, and, while wet, scrubbed with the hearth-stone.

Steps at the entrance of houses are washed and whitened every day in town, in the country scarcely more than once a week; stone kitchens twice a week, balconies only once.

In the areas of town houses, together with the offices opening into them, cleanliness is as requisite to the comfort, and perhaps health, of a family, as in the interior of a house.

The dust-hole, often opening into one of

the areas of two houses, and being thus in close vicinity to the windows, cannot be suffered to remain long unemptied without considerable inconvenience, especially in the warm seasons of the year, when the fermentation, both of the vegetable and animal substances, produce noxious exhalations. On this account, it should be a rule not to throw any animal or vegetable substances into the dust-hole, but to dispose of them otherwise.

In London, parochial arrangements are established for clearing away from every house all its refuse, at short intervals.

The men employed in this business are not entitled to any direct remuneration from the inhabitants, their services being paid for by the contractors who employ them. But they often refuse to remove any unusual degree of rubbish in the dust-hole without being paid for it. It is well to know that they have no right to this, and a redress may be had by applying to the contractor himself.

#### IV. CLEANING WINDOWS.

A correspondent of the "Builder" says:— In large towns it is usual to employ glaziers to clean the windows; and they being used to the business, do it most effectually and expeditiously: the mode is, first to dust them with putty-powder (sold at the oil shops under that name), enclosed in a linen bag, afterwards rubbing it off with two wash leathers, one a little damp and the other perfectly dry: a sponge and cold soap and water some employ; but the panes, if wetted, are seldom so

thoroughly and immediately dried as not to catch the dust again almost as soon as it has been cleaned off.

To clean windows expeditiously two persons should be employed, one within the room, the other on the outside the window, the latter standing securely on the glazier's machine, unless the sashes are double hung, in which case the upper windows may be cleaned while the outside person merely sits on the sill, his legs being within the room, and his back to the street; but this is a dangerous practice for any one to attempt except a professed glazier.

Uncleaned windows give a dismal and untidy appearance to a house.

When the cleaning of windows is to be paid for each time, there may be considerations of economy to be attended to, which may prevent its being done as frequently as would be otherwise agreeable and desirable. Where no such reasons determine the periods of cleaning windows, it should be done in most of the rooms once in a fortnight. Where men-servants are kept, and great attention to appearance paid, sitting rooms should have their windows cleaned once a week, and even more frequently in rainy weather. Those who have to pay a glazier each time, who generally charges 6d. each window, if he clean both inside and out, content themselves with having it done once in three months, trusting to their housemaid to keep them in tolerable condition, which she may easily do by frequently cleaning the inside of the pane.

## WHAT IS A RUMPSTEAK?

ASK for a "bifstek" in the Palais Royal, *par exemple*, and Francois or Pierre will bring you a little lump of beef of a pleasant savoury brown colour, a little crimsoned, embedded in crisp shavings of baked potatoes. You know that the white-capped chef has longed to anoint it with sauce Robert, Sorel, Sharp, or Tomato, to remove its barbarous simplicity. It eats well and tender, but a little tasteless, and it is without much natural fat of its own, the Norman beast being of the lean kine genus, and by no means a bull of Bashan; you eat, and as you eat patiently, you ruminates on the past life of the unknown animal, part of which you are devouring. But a London steak is a far different thing—it is thicker, fatter, juicier, and of a rarer merit; it has been beaten worse than any Christian galley slave by the Turks, and has been broiled with a learned and almost unerring instinct. It requires no effort of digestion, it melts in the mouth like a peach, passes at once into the blood, and goes straight to recruit the heart. It is a sort of meat fruit, and merely requires the soft pressure of the lips. Broiling, to tell the truth, however, requires no common mind. "To broil" is to perform an operation which is the result of centuries of experience acquired by a nation that relishes, always did relish, and probably always will relish, broils. It requires cleanliness, watchfulness, patience, profound knowledge of great chemical laws, a quick eye, and a swift hand. The Homeric heroes are supposed to have lived on broils,

and this branch of cooking is deserving of the utmost respect. A young cook should be always informed that it takes years to learn how to broil a rumpsteak; for a thousand impish difficulties surround the broiler, and do their worst to spoil the dainty morsel, and prevent its reaching the expectant jaws. If the gridiron be not bright as silver and clean between the bars, the meat will suffer. If the bars be not rubbed with suet they will print themselves on the steak. If the fire be not bright and clear there is no hope for the broiler. If the broil be hurried, it will be smoked or burnt. If the gridiron be over-heated before the steak is put on it, it will scorch the steak. If the gridiron be cold the part of the meat covered by the bars will be underdone. If the gridiron be not kept slanting, the constant flare and smoke, from the fat streaming into the fire, will spoil the steak. If no salt be sprinkled on the fire, the meat will very likely taste of brimstone, which the salt should exorcise. Few people seem to know that rumpsteaks are not at their best except from October to April. It is only in the colder months that they can be taken from meat hung at least four days to make it tender. When fresh they are mere fibrous masses of unconquerable gristly fibre. A good steak, often turned to prevent burning, and to keep the gravy at the centre, takes ten minutes to broil. It should be eaten with a tablespoonful of warm catsup, and a little finely minced shalot.—*Dickens' "All the Year Round."*

*DRIED FLOWERS FOR FASHIONABLE USE.*

**D**RIED flowers, in their natural colours, have for some time past appeared for sale in the shops. The mode in which the operation is effected is this:—A vessel with a moveable cover is provided, and, having removed the cover from it, a piece of metallic gauze of moderate fineness is fixed over it, and the cover replaced. A quantity of sand is then taken, sufficient to fill the vessel, and passed through a sieve into an iron pot, where it is heated, with the addition of a small quantity of stearine, carefully stirred, so as to thoroughly mix the ingredients. The quantity of stearine to be added is at the rate of half a pound to one hundred pounds of sand. Care must be taken not to add too much, as

it would sink to the bottom and injure the flowers. The vessel with its cover on, and the gauze beneath it, is then turned upside down, and the bottom being removed, the flowers to be operated upon are carefully placed on the gauze, and the sand gently poured in so as to cover the flowers entirely, the leaves being thus prevented from touching each other. The vessel is then put in a hot place, such, for instance, as the top of a baker's oven, where it is left for forty-eight hours. The flowers thus become dried, and they retain their natural colours. The vessel still remaining bottom upwards, the lid is taken off, and the sand runs away through the gauze, leaving the flowers uninjured.

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*BEE-KEEPING.*

## SWARMING AND SUPERING.

BY A LAMMERMOOR BEE-KEEPER.

**T**HE case of the bees losing their queen, as described at page 122, will be found by bee-keepers of not unfrequent occurrence. It generally happens in first or top swarms, from the queens being old and their wings worn, so that they are unable to support themselves in their flight. At the same time, the queen may be a first-rate breeder, as mine was, and therefore every attention should be paid to assist her. The swarm alluded to did not attempt to come off again until June 4, at eight o'clock A.M.—a very unusual time; on this occasion, she again fell in front of the hive along with about a dozen of bees. I got hold of her, and as many bees as I could along with her, and put her into a hive. Still enough of bees did not follow her, she being too near her own hive. When fairly in, and as many bees as could keep her in, I

removed her to the place where she was to remain. The hives being those called the "Woodbury" bar frame hive, which I now generally use, I was enabled to give her as many bees as I thought proper, by removing the cover off the one she came from, and taking out two bars containing young brood and bees, which I put along with her, and so made up the deficiency.

Had such a circumstance taken place with the common straw hive, where I could not have taken out the bees and comb, I would have changed the places of the hive, lifting the old hive about 20 yards from her own stance, and replacing it with the new swarm; and the bees which were out would, when they came back, have remained with the queen, and sufficient would have been left with the young brood in the old hive to hatch them and rear the young



queen; this I have done successfully on former occasions.

Those unacquainted with the economy of the bee, I observe, frequently make a mistake in putting the tops or super on the wrong hive, especially in the spring, by generally placing them upon the old stobs, or those that have thrown off swarms, imagining that having done so they must be strong and well able to collect honey, forgetting that it is the young queen which remains in the old hive. And after say the second swarm comes off, leaving but few young bees to hatch which had been laid by the old queen previous to her coming off, the third queen in the old hive may be still unhatched. A week or more may elapse, depending on the weather and other circumstances, allowing the young queen to get out and be impregnated with the male or drone. In three or four days after that event she begins egg laying, and it takes 21 to 25 days till these are hatched; consequently, from the time the first queen leaves the old hive, until the third queen's brood has begun to come out, a period of six weeks at the very soonest must elapse before any increase to the number of bees takes place in the old hive; so that the few bees kept in, after two swarms have come off, have labour enough to keep up the supply of honey for their existence and to rear the young brood.

It is therefore the first swarm which went off with the old queen, on which the top or super should be put, as the old queen begins to lay eggs immediately that the workers have made cells in the new hive; and that is very soon after they have settled. A good swarm will have a large piece of comb made the first night. Those eggs will be out in 21 days, and the bees will be gathering honey in a day or two after.

After swarming, should the weather become such as to prevent the bees getting out to collect food, they should be fed inside the hive, that they may go on with the comb-making, and allow the queens of the top swarms to go on laying eggs. Every good bee-keeper will make it his chief study and care to use every means to enable the queen to have space to lay all the eggs she is capable of doing (and I believe we have little conception of the number some queens can produce), as it must be evident to every one that the more bees, the more honey will be gathered, if it is to be had.

I would therefore urge strongly the necessity and the real good which will ultimately follow a liberal supply of honey or boiled sugar, especially to top swarms; the old hives or stobs do not require feeding in the summer-time.

The kind of food and manner of feeding will be noticed in a future article.

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### THE POOR MAN'S MEAT.

THE quantity of butcher's meat (says the *Daily News*) consumed by the poorer classes of London is considerably greater than is usually supposed. It must not, however, be hastily assumed that this meat is eaten in the shape of beef, pork, or mutton; on the contrary, large numbers of the poor have been flesh-eaters for years, without once enjoying, unless at rare intervals, the luxury of a bit of beef or mutton. The meat used by them is procured wholly from what is technically termed the "offal" of slaughtered animals, and which forms a most important feature in the metropolitan dead meat trade, its sale generally constituting the principal source from whence the profits of the wholesale butcher are derived. The offal consists of the head, tail,

kidneys, heart, tongue, liver, skirt, and similar portions of the animal; the feet generally going with the skin or hide. The estimated value of the offal per animal is about 50s. for a bullock, and from 10s. to 13s. for a sheep. The offal, when fresh, generally forms, in poor neighbourhoods, the most saleable portion of the animal. In Whitechapel a pair of milks can be purchased for a penny. As the two milks together weigh nearly a pound, this forms the cheapest kind of animal food within the reach of the poor, and as such is eagerly sought after. The oxtails are generally disposed of, at prices varying from 1s. 4d. to 2s., to hotel and dining-room proprietors, as are many of the kidneys, which bring about 1s. 4d. Sheep kidneys are sold with the portions of the animal to which they

are attached. The tripes of bullocks are purchased wholesale by the tripe-dressers, who, after properly preparing them, either retail the same themselves, or else dispose of them among the tripe shops in Clare Market and other poor neighbourhoods. The same class of dealers also purchase from the hide and sheep-skin tradesmen the feet of sheep and oxen, which, after being duly cleansed and dressed, are retailed under the designation of "trotters" and "cowheels," the latter being much in favour among the poor for making stew and soup. The feet of swine, similarly prepared, are sold principally by hawkers, who find their trade most brisk towards evening in the various public-houses—a pint of beer and a pig's foot or trotter often constituting the evening meal of many of the poorer class of labourers. The price of a sheep's foot or pig's foot thus dressed ranges from a half-penny to three half-pence, one penny being the medium charge. A considerable portion of the livers and skirts are purchased wholesale by retail dealers in low neighbourhoods. The general price of these is 1s. 8d. In Whitechapel some of the Petticoat Lane Jews are good customers, the liver being retailed by them in the same manner as fish—namely, in a cooked state direct from the frying-pan, the purchasers generally being the poorest of the poor, who seldom have the means of procuring a fire. The hearts of oxen and sheep, in the majority of instances, constitute the Sunday dinner of the purchasers, who are generally working people. Stuffer with a pennyworth of herbs, and baked with a few potatoes, they afford a cheap substitute for the rib of beef or shoulder of mutton which the poor so often find themselves, from want of means, unable to purchase. A bullock's heart sells for about 1s. 6d. Cer-

tain portions of the entrails of animals are also used as food. Calves' heads and sheep's heads are bought largely by a certain class of dealers, who retail the same readily in a baked state. They also find a quick sale among individual purchasers, especially among Scottish artisans, who are thus enabled to procure their favourite luxury at a lower rate than in Edinburgh or Glasgow, where the great demand exceeding the supply naturally leads to enhanced prices. The ox-heads are largely used in the making of soups, and form another staple article of food among the poor. They are bought wholesale by the tripe-dressers. An ox's tripe and head are valued at 11s. Sheep's brains are retailed almost solely to the dealers in baked sheep's heads. The tongue, both of the ox and the sheep, is generally sold by the tripe-dresser to the curer, and forms, with the ox tail, the dearest portions of the offal. Other parts of the offal, such as the tripes of sheep, are disposed of as food for cats and dogs. It is, however, a well-known fact that sheep's tripe is largely used as an article of food among the poor—necessity overcoming their natural distaste. No part of the animal is lost. Even the blood is valuable, being used first for calico-printing, and then for manure. Other portions of animal matter find their way into the hands of bone boilers, and people of a similar class. When it is remembered that in 1867 no less than 265,754 head of oxen, and 1,472,000 sheep, forming a total of 1,737,754 animals, exclusive of calves and swine, were disposed of in the metropolitan market, some adequate idea may be formed of the magnitude which the trade in animal offal has attained.

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### THE PLEASURES OF ARCHERY.

WE could trace the history of Archery very far back, even to the time of Ishmael, who, we are told, "dwelt in the wilderness and became an archer," but with him and such remote times we would at present dispense, and content ourselves with Archery as it has been and is now in Britain.

For several centuries after the conquest of England by the Normans, we find that the bow and "cloth-yard shaft" were considered the deadliest weapons of English warfare. The foes of England dreaded the English archers. They were by far the most formidable part of the army; our enemies not un-

frequently realizing that the tide of battle was turned by a well-directed flight of arrows, that carried death and confusion into their ranks. In times of peace the bow was not hung up in the hall as being of no further use; for, by many able writers, we are told that the bow was to our forefathers what the rifle and fowling piece is to our modern country gentleman. Unfortunate was the bird or dun stag whose bright plumage or towering antlers attracted the eye and became the butt of the sure-aimed English archer.

Many are the wonderful feats in archery related of those old times, but we fear we

are apt to smile incredulously at them, and attribute the origin of the well-known phrase of "drawing the long-bow" to their recorders.

We would not dare, however, to cast any imputation of this kind on the stories told of Robin Hood. Sherwood's robber chief fills a nich in England's history, and he is too firmly rooted in the affections of British people ever to be displaced. None of us can help admiring the bold outlaw, who, in defiance of his country's king and laws, held with his followers a court of his own in the sylvan glades of "Merrie Sherwood." The feats said to have been performed by him with his bow it would be uncourteous in us to doubt, to "cleave the willow wand" or

"Hit the mark a hundred rod,  
And cause the hart to die,"

was, we are told an everyday occurrence with Robin; and if it was, why should not some of our champions of the archery field emulate his deeds, and attain to a perfection still more extraordinary?

For about two centuries after the time of Robin Hood, the bow was still used as an implement in war, for at the battle of Flodden, which was fought in 1513 between the English and Scotch, we are told that the victory gained by the English was in a great measure owing to Sir Edward Stanley and his archers. After the date of this battle Archery seems to have become merely an amusement, being superseded as an implement in warfare by the cannon, the arquebus, and the hand-gun.

As an amusement it has since remained; for as the nations of Europe grew more and more powerful, the inventive talents of the British people were put to the task, and have produced weapons infinitely more destructive of human life than the fragile bow. We cannot say we regret the change, for the bow, in turning as it has done from being the emblem of war to that of peace, has given us one of the most sociable, rational, and enjoyable of pastimes.

The qualities which recommend Archery as an amusement are varied, and all of a character that appeal to our good sense and judgment.

It is a pastime that can suit itself to all. In the exercise of Archery we find that relaxation for mind and body which is needful for the preservation of both mind and body in a vigorous healthy condition. It lends to the mind a healthy excitement, it raises the spirits, it gives sufficient bodily exercise, it develops the muscles, it confirms and restores the health, and is moreover an innocent, harmless recreation.

The other popular pastimes, such as Cricket, Bowls, Golf, and Football, have all their own peculiar good qualities to boast of; but, to our thinking, Archery has fairer credentials to shew than any. One very closing argument in favour of Archery is, that it includes the ladies; indeed, Archery now-a-days would be nothing without ladies; those other sports that we have mentioned, from their essentially masculine character, naturally exclude them. Ladies have far too few outdoor amusements. It is not well that they should be shut up within doors any more than the lawyer, merchant, or student. To tread nature's carpet studded with gowans and buttercups, and to hear the carol of the lark overhead, might suggest a new effect to that tapestry, or a sweeter turn to that melody. These results might spring from the practice of Archery; but its main recommendations are its elegant, innocent, healthful, invigorating qualities, which no other pastime for ladies can give. Croquet, as compared with Archery is deficient in many respects. It can scarcely be disputed that Croquet is less elegant, less invigorating; and, when playing at it, not above a fourth part of one's time is engaged. In Archery, the attention is always occupied, the body continually exercised, and whoever has felt the delicious thrill of excitement through the whole frame when a close contest has come to the last few arrows, knows well that then there is no stagnant blood in one's veins.

Mr Ford, for so many years the champion of Archery in England, has lately published a book on the amusement. In a paragraph, in which he particularly addresses the ladies, whom he gallantly calls "Fair Marians," the following occurs: "How many consumptions,

contracted chests, and such like, think you, might have been spared, had the practice of Archery been more universal amongst you? It is an exercise admirably suited to your requirements—general and equal, without being violent—calling the faculties both of mind and body into gentle yet active play, yet oppressing none; bringing roses to your cheeks, and occupation to your mind—withal most elegant and graceful.”

We could wish the day not far distant, when the “Fair Marians” of Scotland, inferior in neither beauty, gracefulness, nor wit, to their fair sisters over the Border, would imitate them, and join their fathers and brothers on the Archery field. The enjoy-

ment of the gentlemen would thus be greatly enhanced, and the element of happiness that has been so long wanting in our Scottish Archery fields would then be complete.

One of the best characteristics that pertains to Archery is its refinement. Refined minds and characters alone can enjoy it. Archeresses must be ladies, and archers must be gentlemen. We conclude our remarks at this time by quoting the “Archer’s Motto,” as it is called. It was composed by one who was himself an archer, and who well knew the qualities and traits of character necessary to make a good one—

“Stout arm, strong bow, and steady eye,  
Union, true heart, and courtesie.”

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### FASHIONS FOR THE MONTH.

FANCY costumes are invariably cut with two skirts, that is to say, the jupe and jupon with the Lamballe mantlet, the Marie Antoinette fichu, or the small straight paletot as a necessary accompaniment.

All these are trimmed with cut ruches, or plaits *à la vieille* to match.

The woollen and silk serges are quite in vogue, in various shades. If in place of the jupon to match it is made in taffeta, you may have a very charming toilette.

For example, on a Baltic green poult-de-soir jupon, with a high Marie Antoinette volant, a skirt of silver grey mohair, ruched *à la vieille*, and the ruches edged only by a small cheval grey ribbon; the skirt relieved very high behind and on the sides, so as to form large round denticulations.

On this skirt a large sash of poult-de-soir of spring green, with short ends fringed to match. A fichu Marie Antoinette, ornamented with large ruches in the form of a cross in front.

Taffeta jupons offer the advantage of being able to be worn with different toilettes. All the shades of grey look well with green. Black cashmere, also very much in vogue this summer, is only supposed to be elegant with a jupon of silk.

Jupons of taffeta, with pekined stripes, are worn more than the plain skirts, and they may be worn without volants. Foulard costumes, above all, harmonise marvellously well with Pekin stripes.

I have seen several at Chantilly worn by the “queens of fashion,” and there is nothing very astonishing in this, as her Majesty the Empress has adopted foulard for the greatest part of her toilette for country and travelling dresses.

The Baltic green, Lémn blue, and English grey, are the shades mostly worn.

Round bonnets in straw have also made their appearance. The Louis XV. models with straight edge, very low form, are the most elegant. The white rice straw is worn



with light coloured robes, and grey and black straws remain in favour for the more simple toilettes. Many young ladies wear the puff-chapeau, that is a simple bow of tulle, the ends of which fall behind.

Robe of rose and white striped foulard, ornamented by a Marie Antoinette volant with a small bias-piece of rose taffeta, which fastens the top, and another at the bottom. Tunic of rose foulard, cut at the bottom in round denticulations, edged with rose taffeta. The tunic is attached on the sides by a large bow of taffeta with long waving ends. Bodice in striped foulard having above all a sort of half bodice, describing a flat bertha in rose foulard. This bertha is cut in round denticulations, attached on the shoulders by round bows with ends fringed to match. Bow of rose taffeta in the middle of the bodice. Collar of rose foulard laced at the top of the bodice. Large rose taffeta tied behind. Collar and sleeves of muslin, ornamented with valenciennes. Rose bow and ribbon in the hair. Dauphine shoes in rose satin.

Robe of changing glacé taffeta, ornamented in the bottom by a double galloon of silk. Trimming of taffeta cut in two shapes, ornamenting the second skirt. Dahlias of taffeta. Archduchess fichu of taffeta to match, encircled by a galloon and silk guipure of the same colour. Bow fastening the fichu on the sides. The fichu is opened behind, and the two sides are crossed in the form of braces. Bonnet of bouillonnée gauze, with small train of foliage and clusters of light flowers.

A bonnet is no longer a head-dress, it is only an ornament.

Straw has completely succeeded tulle and gauze, and the taste for black still remains in the ascendant.

Spanish and Chantilly laces are very much worn.

Amongst some of the newest I have seen a bonnet of Belgian straw with a large white band in the form of a fanchon. In front, small ruche in decoupé straw colour crape: this ruche is larger behind, and a band falls on the chignon, coming round on the front in the form of scarf strings.

In the middle of this ruche a smaller one in black lace. In front, diadem of wild flowers, with trains of foliage, with buds falling on the sides. Small bouquet to match to serve as an agrafe.

Bonnet of English straw edged with black velvet. Blue and black flowers with metallic leaves set *en aigrette*. Barbes of black lace with agrafe of blue flowers.

Bonnet of rice straw of the Louis XV., round form coquillé with black lace advancing to the front, and on the middle a large rose with a row of buds; behind coquillé of lace to match. The row of buds is set on a barbe of black lace, which falls on one side.

Bonnet of white straw with a small embroidery of black velvet. Garland of foliage. Green beetle and diadem of narcissus. Large knot of Metternich green ribbon behind, and a narcissus with foliage in the middle of the knot.

This last bonnet is of a charming design. Many birds of small size, butterflies, beetles, and flies of all kinds and colours, are employed for decorating bonnets.

A robe of velvet, mauve glacé with green, with a volant plaited rather high and embroidered with velvet, on which we set a small polonoise, closed in bias, embroidered with black velvet. Flat sleeves, ornamented with an embroidery, which joins a *fente*, which is at the bottom of the sleeves.

There are many dresses of this kind made in pekined and changing taffeta.

Toilettes for the country. Juppon of Alpine, mauve taffeta, with a high plaited volant; the plaits falling on the other skirt of mauve taffeta, cut in pointed denticulations, embroidered with satin. Three small rolls of satin ornament the bottom of the skirt. Tunic of black taffeta set above the skirt, forming four large denticulations: one in front, two on the sides, one behind. The one behind is open, and in the *fente* passes a knot of black taffeta tied at the bottom of the skirt, ornamented with small rolls of satin. The tunic is encircled by a laced bias of mauve and three rolls of satin.

The bodice is fastened to the tunic, and is black with mauve sleeves. Dauphine fichu

rounded behind, open in front, coming down to the sash. Fanchon bonnet of black lace with a cluster of iris, with long foliage, fixed on the side. Collar and cuffs of quilted linen.

Jupon of azure taffeta, ornamented by two bands of straw-coloured foulard. Mantle of straw foulard, ornamented with large biases of blue foulard on the sides, two large coques with pans, encircled with azure taffeta, ornamenting the robe; above the bows rises a blue braid. Azure sash round the waist with large rosettes of foulard, ornamented with light blue taffeta. Quite flat bodice, with epaulettes and ornaments of light blue taffeta. Blue lace collar. Straw bonnet.

Robe of faille or gauze of a Metternich green. Round skirt, ornamented by three rolls of satin behind and white blonde lace set at the bottom of the third roll. This blonde is fastened on the side, and the rolls form an edging to the breadths. In front they are reproduced, and ornament the robe, but without blonde. Square décolleté with the same blonde encircling the shoulders. Short sleeves, with *ballon Empire*. The bodice, cut square, shows a guimpe of tulle with very small bouillons, and has sleeves to match *buillonné* at the top. Round waist,

sash of white gros grain; behind, two bows in the form of a dahlia retain two white ribbons, descending on each side, and partly relieving a *buffante* tunic. A large dahlia bow is set at the end of each ribbon, and the ribbon which passes under simulates a scarf, which forms the puffing of the tunic, and is tied negligently in the middle of the skirt, with long ends. In front, the tunic falls squarely, and is ornamented by rolls, and the same blonde as the bottom. Head-dress formed of a double row of rolled crape. Knot of hair on the top of the head and chignon with falling curls behind.

Robe of pearl grey faille. Skirt without train, with volant with flat "organ pipe" plaits. Tunic edged with small rolls, relieved *en panier* behind. High bodice flat, buttoned in front. Round sash in aurora faille. On the sides cockade with one long end fringed. Tyrolian braces in faille, forming epaulette, and crossing the bodice squarely. Plain flat sleeves, with *Empire ballon* at the top. Simple head-dress, with boucles frisées on the front, bow at the top of the head, and long ends behind. Flat collar and cuffs of lawn.—*London and Paris Ladies' Magazine of Fashion.*

## Notes and Queries.

### NOTES.

#### THE PRESENT DROUGHT.

SIR,—It seems to be understood that the foliage of trees has its influence in so regulating meteorological phenomena, that to destroy the arborescent growth of a country is to subject it to drought and barrenness. Now, it would seem an important question at present—and is it not one to which statisticians might furnish an approximate answer—whether, through the destruction of foliage on the European continent, incidental to carrying on the warlike operations of the last few years (whether in making gunstocks or otherwise), the similar destruction, whether on the Continent or in England, incidental to railway operations, and the destruction of Hainault and the Epping forests, &c., we have not at length reached that limit, which, suffered to be exceeded, may subject us here in Great Britain to a chronic barrenness like that of the rock of Gibraltar.—*G. M., Holloway, July 1868.*

#### THE RAID UPON DOGS.

It would appear that the chimney-sweepers formerly performed the duties that have now devolved on the force of Sir Richard Mayne, the Court of Common Council being the directing power in the business. In a London newspaper of August 1760 we read:—“In the pursuance of the resolution of the Court of Common Council, held on Tuesday at Guildhall, all dogs that are found at large in this city after Wednesday are to be destroyed.”

And in September 1760 we, from another newspaper paragraph, learn how the resolution was carried out:—“Thursday three chimney-sweepers, having each killed a dog in the parish of St Paul’s, Covent Garden, went to receive the reward, which, being paid to one of them in a half-crown, shillings, and sixpences, a sharp contest arose amongst them concerning the dividing of it, one insisting it was two shillings and threepence, another but two shillings and twopence each. At length, after a great dispute, it was proposed by one of them to change the whole sum into halfpence, and lay it in a heap, and then stand round and take up a halfpenny a piece as long as they lasted, by which means they would all have an equal share, which proposal being readily agreed to, they immediately put it in practice, [and all went off very well satisfied.”

### QUERIES.

#### IRISH WOLF-HOUNDS.

Any reliable information regarding the existence of this rare breed, in its original form at the present time, will greatly oblige.

#### MERAC.

In Blakey’s *How to Angle, and Where to Go*, he affirms, on the authority of a Captain Guillaume, that *merac* is the best and most attractive bait for tench. Pray, what is *merac*, and who is Capt. Guillaume; is he a French writer on angling?

THE  
COUNTRY GENTLEMAN'S MAGAZINE

SEPTEMBER 1868

*A PRACTICAL VIEW OF THE IRISH LAND QUESTION.*

(By a Resident Landowner and Farmer.)

CHAP. I.

*The Collapse of 1845.*



HAVING for the last fifteen years devoted myself to the improvement and cultivation of my own estate, I have had numerous and varied opportunities of investigating the system of agriculture pursued in the south of Ireland, and of forming an opinion as to the causes that operate to connect the land question with that discontent and agitation which are now disturbing the public mind, and seriously impeding the development of our natural resources.

To know Ireland one must live in it. A casual ramble through the country may give the eye a superficial view, and a few notes jotted down from policemen, national schoolmasters, or mine host of the hotel, may lead a hasty traveller to believe he has learned something of her people. But one must go deeper to understand those national peculiarities which lie at the bottom of such a question as that of the land. The Englishman or Scotchman is naturally struck with everything he sees which differs from his own notions, of what is right and proper, and instead of making allowances for differences of soil, climate, custom, and tradition, varying with each district, he jumps to the conclusion that the peculiarities of Ireland

arises from ignorance, bad laws, or some other cause, which up to the present time has not been clearly ascertained.

The national peculiarities of Ireland are neither so unmeaning or stupid, as some of our detractors would wish the world to believe. The mud wall and the thatched roof present to the mind of a man who has seldom seen anything but substantial walls of masonry and brick, covered with good slate, nothing but a state of discomfort and wretchedness; but the Irish peasant, often with scant fire, will tell you, that there is a degree of warmth and coziness in his cabin not always to be found in a house of more pretensions. If we consider for a moment the cost, not to say the difficulty, until very recently, of procuring the materials for a superior structure, we must see that the existence of our cabins is due more to the absence of good slate and other appliances, than to either the bad taste or ignorance of any class. Again, our fences, earth-banks with furze on the top, look poor and slovenly to an eye familiar with the well-trimmed quickset hedges of England, but I should say that the breeze from the Atlantic has more effect in determining the fashion of hedges in Ireland than anything else. These and other peculiarities are, upon our first acquaintance with Ireland, apt to produce impressions in themselves unfounded; the



country must be measured by its own rule, and it is, I contend, on this account, that English opinions upon Ireland require time to season, that an intimate knowledge of the character and habits of the people, and the peculiarities of the country cannot be acquired without something more than a casual run by rail, and that larger and more profound experience is necessary before one can venture to speak positively on the vexed problem of the Irish Land Question.

It is impossible to understand the present without reference to the past, and it is on this account I propose to consider the subject from the time of the French war. At that period the price of all kinds of cereals was very high, and the system that was initiated then has not been without its effects up to the present time. The *artificial* price of corn raised the value of land much beyond its intrinsic worth; cultivation received an impetus before unknown; and a large population, living on the potato, with few wants, gave facilities for securing the crops at little cost, and with considerable certainty in so uncertain a climate. Home manufactures, too, were not without their effects in giving employment and promoting the general well-being. The landowners, alive to the prosperity around them, in many instances availed themselves of so favourable an opportunity to let their estates, and large tracts of country were leased away, often without any or few restrictive clauses; a sum of money not unusually being paid down by the lessee as a fine for the lease, or as a reduction upon the rent, the landlord wishing to forestall his interest by obtaining the immediate consideration.

The occupiers of these tracts, from the steady rise in produce and the cheapness of labour, rapidly created interests under their leases, and commenced a system of subletting, competition forcing up rents to almost fabulous prices; holders of land had no difficulty in picking up all the spare money in their neighbourhood, and were able to command almost any price for the acre. I know of land now let at 14s. per acre which then payed 50s. Even tracts of mountain and bog,

before almost worthless, were let to cottiers at high rents to grow potatoes, and such was the luxurious growth of this esculent that it was not uncommon to see heaps of it rotting by the ditches from sheer abundance. So long, then, as prices continued high, and the potato grew, "all went merry as a marriage bell." But this extraordinary prosperity fostered a spirit of recklessness and extravagance amongst the owners in fee, who, having transferred the responsibilities and control of their estates to others, neglected to perform the duties their position entailed—many became absenteees, and many encumbered their property by extravagance. The middlemen copied the example of their betters, and supported their dignity not so much by their industry as by screwing the uttermost farthing out of their dependents. There appears at this time to have been an utter disregard of all management of property, sub-division, rack-rents, and a rapidly increasing population, unskilled and only partially employed: no development of the inert portions of the land, but rather a steady deterioration from a vicious system of agriculture; in short, a combination of circumstances all tending to prepare the country for that terrible calamity which overtook it in 1846.

The failure of the potato crop unhinged the whole system of land-tenure. So long as the potato grew, and that almost spontaneously, it remained unchallenged as the staple of the country, it enabled the peasantry to eke out a miserable existence, because the yield of a very small proportion of inferior land produced a sufficiency of food, and they were satisfied with this, inasmuch as that with a little skill and appliances of the most inferior kind, they could rear their families and live in a state of indolence and freedom suited to their nature and training. The one pillar upon which the whole land system rested was knocked away by the potato disease, which destroyed the chief food of the people. Famine, with all its attendant horrors, dried up all minor resources, and put the payment of rent by the labourers and farmers to the middlemen out of the question; the latter were in turn unable to meet their engage-

ments with the owners in fee, and thus a catastrophe unforeseen and unparalleled in history, overtook a system which, when brought to trial, proved as rotten as the potato itself. The provisions of the law, public charity, and the grant of millions from England, were insufficient to meet so sweeping and universal a famine; property ceased to yield a rental, and was swamped by rates; owners in fee became pauperised, and the poor died by thousands from actual starvation. With such a state of things it was not to be wondered at that all was chaos and panic, and that much time was spent, and much suffering endured, before means could be devised to combat the pressing necessities of the poor, and institute such changes in the system of agriculture as the altered circumstances required.

The repeal of the Corn-laws at that time brought in a supply of food to our starving people, and helped in some degree to mitigate the magnitude of the evils under which we laboured, but whilst it created a temporary plenty, it produced a permanent reduction in the price of grain, the high rate of which, coupled with the cheapness of labour under the potato culture, was the source whence the rack-rents of former days had been derived. The farmer and the labourer from this period had to occupy a perfectly new position. The latter could no longer be paid in kind, the former, from the universal pauperism that prevailed, was saddled with heavy rates, and had largely increased expenses in his family and his labour account, whilst by the alteration in the law he suffered a considerable reduction in the price of his corn. Expenditure increased, receipts diminished—some change had to be made—class had to meet class and endeavour to patch up a system which had so signally failed. As sweeping as the disease so sweeping had the remedy to be; a population of 8,000,000 under the *new era* could no longer obtain food and employment; the cause which had produced famine and starvation amongst the lower classes had paralyzed the hands of the upper, and everything was at a dead lock—*land without capital* to cultivate it, and people

without food and employment. To remedy this state of things two means were adopted—the Encumbered Estates Court for our bankrupt proprietors, and emigration for our starving and unemployed poor. Small farmers could no longer pay rent for their little miserable patches of land, or even hold them had they been owners in fee. Still the remedies adopted were considered by many to savour of injustice, and to be the fruit born of the misrule of the country. The Encumbered Estates Court had the effect of placing men of capital upon the bankrupt estates, and removing many of the old families, who, either from extravagance, too great a reliance upon the potato culture, or the common ruin that surrounded them, had been drawn within the vortex. It is hardly to be wondered at that a system producing ease and plenty to the people, and extravagant rent rolls to the proprietors, should have been universally adopted, or that, while it lasted, its soundness should never have been challenged. The stoppage was as unforeseen as the cause of the disease—hidden in impenetrable mystery—as long as things went well all slumbered and slept, the failure of the potato came and the dream was ended. It now became apparent to the small farmers that they could no longer hold their own; America, fortunately, was open to them, and an exodus unparalleled in the world followed, a population of eight millions being rapidly reduced to about five millions. This reduction, like cutting the masts away from a sinking ship, has enabled us to right ourselves, and I believe we have every cause to be thankful that so great a number of our countrymen had such a haven to flee to. They left behind famine and poverty *directly* caused by an all-wise Providence, and a country so overwhelmed by the catastrophe, that it was impossible that anything short of lightening the cargo could save the sinking ship. Had these people to endure great hardship, had their exodus been carried out with great personal danger and loss of life, there might have been some regret at the movement; but when they, by a safe, easy, and cheap transit, severed themselves from poverty, starvation, and death, and at once

obtained employment, plenty, and independence, becoming occupiers and citizens of the finest country in the world, I am at a loss to see why there should not be general thankfulness at so happy a result, and a desire on the part of every honest man to wish them "God speed."

Let us now turn to the owners in fee. I may here remark that whilst great sympathy has always been expressed for our exiled countrymen, calumny and vituperation has been unsparingly poured upon the heads of our unfortunate landlords, who were, if possible, even greater sufferers than their dependents. Agitators, who were looking for the support and vote of the many, hesitated not in Parliament and elsewhere, by inuendo and overdrawn representation, to paint the character and conduct of the landlords in the blackest colours, laying to their charge all the difficulties under which the country laboured; and, strange as it may appear, few if any of the gross mis-statements were rebutted by the class against whom they were made, but were allowed tacitly to pass, and thus became accepted as facts by the English public. When we consider that about one-ninth of the whole country came to the hammer in the Encumbered Estates Court, and much of it at a time when all was panic; that a still larger proportion was without rental, encumbered with heavy rates and in the hands of paupers, who were unable even to cultivate, much less to meet their present engagements, we can readily understand that the position of the landlords was no light one, both as regards their own personal condition, and as regards the exercise of their duties to those upon their estates. The universality of the distress increased the difficulties of adjustment tenfold. Men who were tenants were not disposed to become labourers; many farms having been in possession of their families for generations, and the old feudal notion of an innate right to the soil having been engendered in their minds, they could not be induced to quit. Thus at every step the necessary changes of conversion and absorption of the small holdings was

stoutly resisted; and all this made the process both tedious and expensive, and often unnecessarily harsh. Other landlords were more fortunate, and had tenants who were able to tide over the almost universal deluge, whilst some found their estates literally left unto them desolate. The old system which had existed under the potato culture was now gone, and the hard experience already gained pointed to emigration, larger farming, and the introduction of improved agriculture, as the best method of resuscitating the country, all which at the present time are bringing forth good fruit in well paid rentals, in reduced pauperism and crime, and in steadily increasing national wealth.

The Encumbered Estates Court infused capital and life and vigour into the agricultural community. Purchasers, in the work of re-adjustment, were not trammelled by old family ties or traditions. In many instances large tracts of land were cultivated or reclaimed upon the modern notions of a regular system of horse and manual labour, combined with machinery. Many owners, too, who had capital turned their attention to the cultivation of their exhausted and undeveloped estates, whilst others unable to procure the necessary plant and stock, leased them at greatly reduced rents, converting the small farms into large ones, and their tenants either into labourers or emigrants. Large tracts, too, of mountain and very inferior land returned to their pristine condition, the cost of cultivation (in the absence of the potato) and the value of the produce putting profit out of the question. But the difficulties of re-adjustment did not stop here. To meet the requirements of the times the modern system of agriculture had to be introduced, small fields had to be converted into large ones, the spade had to give way to the plough, the sickle to the scythe, the flail to the thrashing-machine; labour had to be reduced to a system; and to transform the traditions and habits of a people almost necessarily involved much up-hill work on the part of capitalists, and no small heartburnings and misgivings upon the part of tenants and labourers.

## The Ganded Proprietors of Great Britain.

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### No. 1.—*THE DUKE OF ROXBURGHE.*

IN Scotland there is hardly any baronial residence that can surpass in beauty of situation and magnificence of architecture the Duke of Roxburghe's Castle of Floors, near Kelso. Situated on the banks of a noble and classic river, overlooking one of the most highly cultivated straths in Scotland, and within sight of the English border, its surroundings conjoin the rich fertility of England with the romantic beauty of the mountainous Caledonia. Apart from its agricultural importance, the district is attractive because of its old associations. It was the battle-field in the old Border wars; in its neighbourhood was situated one of the first four burghs of Scotland; it was the cherished possession of comfortable old abbots; and the castle of Roxburgh was a favourite royal residence. Last year our gracious Sovereign honoured the Duke and Duchess of Roxburghe with a visit, and a brief description of the noble edifice, which for three days gave hospitality to Queen Victoria, may not be unacceptable to our readers.

It was about the middle of the 17th century that Robert Ker, the first Earl of Roxburghe, transferred the family residence from Cessford Castle to the neighbourhood of Kelso, where the amenity was greater, and where the windows of his mansion could overlook the fertile lands acquired from the churchmen by successive royal gifts. The site for a residence was chosen with admirable taste, and the subsequent arrangements have been planned and executed so skilfully, that, as Sir Walter Scott says, "The modern mansion of Floors, with its terrace, its woods, and its extensive lawn, form altogether a kingdom for Oberon or Titania to dwell in, or any spirit

who, before their time, might love scenery, of which the majesty and even the beauty impress the mind with a sense of awe mingled with pleasure." In its present form the mansion was built in 1718 by John, the fifth earl, created the first Duke of Roxburghe in 1707, one of the most accomplished men of his time, a public-spirited nobleman, and a strong supporter of the union with England. The designs were furnished by Sir John Vanburgh, and the ideas of mediæval grandeur are finely blended with those of modern taste. Thirty years ago it was enlarged and improved under the direction of Mr Playfair of Edinburgh, and it now forms one of the most admired specimens of the Tudor style of architecture to be found anywhere in Scotland.

To the traveller approaching Kelso by railway, or viewed from a variety of points south of the Tweed, Floors Castle has all the appearance of a royal residence. On the north side of the Tweed is an expanse of rich natural grass, upward from which rise a succession of terraces, and on the apex of the highest, flanked with woods on either hand, as well as sheltered behind, is the castle, a thing of architectural beauty, skilfully adapted by art to fit in with the natural beauties of the situation. To the northward there is a gradual ascent, broken by undulating hills, one of which is capped by Hume Castle, and another by Smailholm Tower, and in the distant north the horizon is bounded by the blue ridge of the lofty Lammermuirs. From the castle itself, the prospect to the southward is unsurpassed for richness and beauty. In the lawn near the river-side an old tree marks the spot where King James II. was killed by the bursting of his own cannon; and across



the Tweed are the ruins of Roxburghe Castle, for centuries a royal residence. The river Tweed itself is a noble stream, and within the ducal policies are some of the best salmon casts on the river, where the Prince of Wales and the Duke of Edinburgh have at times successfully grappled with the monarch of the flood. The town of Kelso, with its ruined abbey, its elegant villas, its spacious five-arched bridge, nearly 500 feet in length, is a prominent object in the landscape; and beyond the circumjacent woods the eye wanders over many thousand acres of the ducal territory, including the rich alluvial lands of Sprouston, the fine garden farms west of Roxburgh Castle, the wooded heights of Caverton, and the green hills of the Cheviot range, which can be seen along their whole length from the eastern extremity near Wooler to the western apex of the Carter Fell on the borders of Liddesdale. It is a land every foot of which was familiar to the heroic barons of Cessford, whom the Duke of Roxburghe now represents; and from his renowned ancestors the Duke has inherited some of the richest lands on the Border. For its combination of beauty, romance, and fertility, the Duke of Roxburghe's estate cannot easily be surpassed, and in the centre of this noble country Floors Castle occupies a worthy place. The poet of Teviotdale has described the locality in the following lines:—

“Bosom'd in woods where mighty rivers run,  
Kelso's fair vale expands before the sun;  
Its rising downs in vernal beauty swell,  
And, fringed with hazel, winds each flowery dell;  
Green spangled plains to dimpling lawns succeed,  
And Tempe rises on the banks of Tweed.”

Like some other noble families, the Kers have not enjoyed their estates from a date of very great antiquity. The family is probably of Anglo-Norman lineage, but the name first appears in Border history about the middle of the 14th century, when it was spelt, on the English side Carr or Carre, but in Scotland Ker or Kerr. The first mentioned is John Ker, “of the forest of Selkirk,” who, in 1357 and 1358 obtained two charters, one of Auld-townburn, the other, along with his wife Maria, of “part of the lands of Auldtown-

burn and Molla in the regality of Sprouston.” These lands are all on the east side of the Bowmont valley, extending from the neighbourhood of Yetholm to the English border, at the summit of the Cheviots. Several of the hills are over 2000 feet high, and the character of the locality is expressed in the word molla or moll, which is the British word mole, and signifies a bare, bald, and naked hill. And yet the vales must have been fertile, for the monasteries of Kelso, Melrose, Jedburgh, and Paisley had possessions there; and at the time when John Ker appears on the scene, there were at Mow, a fortress, a church, and a vicar, which have all now passed away, leaving nothing but the antient cemetery, where priest, peasant, and warrior sleep peacefully together. From this period the Ker family seems to have taken root on the banks of the Bowmont, for, on the 20th of November 1430, Andrew Ker added the lands of Primside to those of Mow and Auld-townburn, and seven years later he had a grant of sundry lands in the regality of Sprouston from Archibald Douglas, who calls him “my beloved kinsman.” In 1466 he obtained the barony of Cessford, with which the Ker family has ever since been closely identified. In 1450 another Andrew Ker succeeded to the barony of Cessford, and in his time the fortunes of the family continuously prospered. On the 6th of February 1452 he had a charter of the King's lands of the barony of Auld Roxburgh, and married a daughter of William Douglas of Cavers, by whom he had a son, Walter Ker, who succeeded to the estates in 1480. Previous to his death in 1561, Walter Ker had obtained from James IV., for himself and his heirs, “the castle of Roxburgh, and the site thereof, called the castell-stede, with the site and capital message of Roxburgh, together with the right of patronage of the hospital called Le Masson Dew of Roxburgh, and whatever was annexed to the said hospital, castle, and message. Likewise, the right of patronage of the hospital called Le Masson Dew of Jedburgh, rendering, if demanded, one red rose on the feast of St John Baptist, in sum-

mer, at the castle, in name of blench-holding." By this time the family of Ker was widely extended in the county of Roxburgh. Mark Ker, ancestor of the Kers of Littledean, held the fortress of Dolphinstone, near the water of Oxnam; and Thomas Ker had, in 1410, built the strong baronial fortress of Ferniehirst, on the banks of the Jed, two miles above Jedburgh. Another of the family held Gatheshaw, on the banks of the Kale, and the gallant chieftain of the clan lived in Cessford Castle, whence he ruled the fair domains of Caverton, the whole east side of the Bowmont to the English border, the regality of Sprouston, and the fertile wedge of land between the Tweed and the Teviot, terminating in the "Ros" or promontory, which gave name and place to the town and royal castle of Roxburgh. To this extent had the name and influence of Ker risen within a century and a-half, from the time when John Ker first appears as laird of Auldtownburn and Mow, when probably his whole following was scarcely more than the twenty men who held the Cocklaw Tower against English aggression.

When Andrew Ker, in 1446, received from Archibald Douglas the barony of Cessford, the country was not in a state for the encouragement of agriculture; and all the arrangements were adapted to a condition of incessant warfare. From remaining ruins it appears that the central part of Cessford Castle has been 67 feet long, 60 feet broad, and 65 feet in height. The walls have been about 13 feet in thickness. In 1523 the Earl of Surrey pronounced the place to be impregnable, but, as every other fortress in the neighbourhood had been destroyed, Sir Andrew Ker, then warden of the marches, capitulated rather than sustain the horrors of a siege. Within a circuit of three miles were the fortresses of Ormiston, Eckford, Wooden, and the Moss Tower, the last of which was situated in a morass, now "the garden farm of Teviotdale," and owned by the Duke of Buccleuch. In the moss some antient occupants of the district have remained interred; for, several years ago, there were dug up the skull of a bison, a huge pair of deer's horns,

besides nuts, roots, and large trunks of oak and other trees. For two hundred troublous years, from 1446 to 1650, the successors of Andrew Ker ruled in Cessford, and its last noble occupant was Sir Robert, better known as Hobbie, or Habbie Ker, first Earl of Roxburghe, and celebrated as the most powerful man of his time. He was born in 1570, was raised to the peerage as Lord Roxburghe in 1606, was elevated to the rank of Earl of Roxburghe and Lord Ker of Cessford and Caverton in 1616, and died in the year 1650. His first public appearance was in 1585, when he joined the banished lords in their unsuccessful effort to expel Stewart, Earl of Arran, from the royal presence. Afterwards he became warden of the Scottish marches, and was considered a particularly brave and active young man. In 1597 he surrendered himself to Carey the English warden, in consequence of neglecting a mutual agreement for a delivery of prisoners, and he was delivered up to the Archbishop of York, who described him as wise and valiant, but somewhat haughty and resolute. He was speedily released, and obtained, with other estates and titles, a charter of Holydean in the parish of Bowden, and of the town of Kelso and the barony of Sprouston, all of which had formerly belonged to the Kelso Abbey. The Roxburghe estates were now both rich and widely distributed, extending into about fourteen parishes, and valued, in 1643, at upwards of £43,000. Some alterations have been made since then, but in the way of extending rather than curtailing the ducal possessions; and the annual value has, of course, largely increased. The lands of which we speak are all in the county of Roxburgh, where farming has reached a high state of development, and we propose to describe the Roxburghe estates—first, as they were toward the close of last century, and, next, as they are at the present day.

Of the upland portion of the estate, in the parishes of Hownam, Oxnam, and More battle, little need be said. Great changes were effected toward the close of last century, in the way of enlarging farms, which diminished the population, causing no little

discontent. The minister of Hownam, writing in Sir John Sinclair's "Statistical Account of Scotland," says:—"The great decrease of inhabitants, within the last forty years, is evidently occasioned by the too general practice of letting the lands in great farms; but may be, in some measure, owing to the mode of agriculture almost universally adopted in the parish (especially since sheep and wool brought so high a price), of converting the arable into pasture land. The lands, fifty or a hundred years ago, were parcelled out into at least four times the present number of farms. As late as the year 1750, five tenants, with large families, occupied a farm now rented by one tenant. There were, also, about these times, several small but proud lairds in the parish. Their lands are now lost in the large farms, their names extinguished, and their mansions totally destroyed." The inhabitants of the parish had been reduced in forty years from 632 to 365, and about half of the remnant were shepherds. There was a breed of sheep peculiar to the district, of moderate size, but good feeders, and producing excellent wool as well as good mutton. The same district is still noted for its fine sheep, and some of the best Cheviots in the south of Scotland are raised at Hyndhope, at the western extremity of the Roxburghe estate, among the Border hills.

Much more important, however, has been the transformation in the parishes of Bowden, Eckford, Roxburgh, Kelso, and Sprouston, where are situated the most fertile portions of the Roxburghe estates. The parish of Bowden, near Melrose, contains about 6700 English acres, of which more than half belongs to the Duke of Roxburghe. The family had possessions here at a very early date, and the old castle of Holydean or Halidean was once the family residence. It has been a place of great extent and considerable strength, but is now quite a ruin. On a stone preserved from the ruins, and now placed as a lintel to the door of Holydean farm-house, is a unicorn's head, and the words "Feer God, Flee from sin, mak to the lyfe Everlasting to the end. Dem Isbel Ker, 1530." There are also the remains of a

chapel and cemetery, and also the ruins of a stone wall without lime, which has been six or seven feet high, and which enclosed five hundred acres of land, called in an old tack "the great deer park of Halidean." In a vault below the church of Bowden rest the members of the Roxburghe family for over two centuries and a half. From the "Statistical Account" we can give, in brief compass, an accurate picture of the parish as it existed toward the close of last century. The whole extent was 6700 acres. The farms varied greatly in size, the rents ranging from £400, £200, £100, to £70, £60, and even £10 or £8 of sterling money, besides some services continued from the time when the monks of Kelso owned the district; and one-half of the schoolmaster's salary, which, however, was only £8, 6s. 8d. in all, besides a house and garden worth £2, and £3 for collecting poor-rates. The highest rents were paid by the villagers of Bowden and Middleham, which amounted to £1, 10s. per acre, but farmers paid 15s. to 5s., and for a tract of outfield land the rent was not over half-a-crown an acre. There were about fifty small feuars in Bowden and Middleham who paid, of teind and feu-duty, to the Duke of Roxburghe one-eighth of the yearly value of their subjects.

In the parish there were twenty-six ploughs, each drawn by two oxen, and three or, at least, two horses; and ten or twelve drawn by two horses only. Previous to 1795 oxen had been discarded, and there were forty-four ploughs, each drawn by two horses, and both driven and held by one man. The English plough, with broad or plate sock, had come into general use, though some preferred the old Scotch plough, especially in stony or stiff land. Shell marl was obtained at 6d. per cartload, if drawn by one horse, or 9d. if drawn by two; and forty-five single cartloads or thirty drawn by two horses, were laid on each acre. Lime was also brought from Mid-Lothian, at the rate of 12s. a cartload of three bolls, and it was used at the rate of six carts of lime to twenty-five of marl. Lime was considered best for grain, but marl was more suitable for grass. The kinds of grain



used were white oats, barley (not bere or bigg), early peas (locally called hot seed), and Kentish or Cleveland wheat. Little rye was grown, and no flax but for family use. The whole extent of turnips in the parish was then 140 acres, and there were 50 acres of potatoes. Land ploughed out of lea or pasture was always sown with oats, then turnips or potatoes or fallow, then barley or oats, and then grass. After maintaining the inhabitants, it was calculated that the annual exports from the parish would be about 350 bolls of oatmeal, at £1, 5s. per boll; 300 do. of barley, at 18s.; and 450 of wheat, at £1, 2s., amounting in all to £1202, 10s. per annum. In 1782 a great deal of corn was uncut at Martinmas, and oats yielded no more than three stones of meal per boll, so that great distress must have been a necessary result when so small a margin was left in ordinary years. There were four corn-mills in the parish, which had each a right of *multure*, and about 1795 one thrashing-machine had been newly erected, which, says the writer, "does a great deal of work; but when the prime cost and interest thereon, tear and wear of every kind, the number of hands, and the extraordinary waste of horses, are all taken into account, it may not be of great profit to the proprietor."

Of horses there were only 160 in the parish, one-fourth of them too young for labour; of black cattle there were 540, of which about 90 were reared yearly, and 50 stall-fed for the butcher, weighing on the average 45 to 50 stones of 16 lb. Dutch weight. About 80 swine were fed annually, chiefly by tradesmen. They were purchased from England in October or November, when three or four months old, and cost 10s. or 12s. each, after which they were fed four months on the refuse of potatoes, with a little bruised oats or barley, till they attained a weight of 10 or 12 stones, when they were killed for family use. Of sheep there were 2300, chiefly of the white-faced long-bodied kind, which attained a weight of 12 lb. to 14 lb. a quarter. Wool was 18s. a stone. The common diseases of sheep were "rot, a kind of consumption occasioned by overstocking the pastures, and

by rainy seasons, especially a rainy autumn; and the *sturdy*, or water in the head, which attacks them when about a year old, chiefly in the months of April, May, and June, and is of so corrosive a nature as to perforate the skull into holes large enough to admit a pea or a small bean."

The number of inhabitants in 1794 was 860, an increase of 188 since 1755. There were 217 families, and most of the inhabitants were feuars, farmers, or cottars employed by the farmers, besides the tradesmen who abounded then in rural districts. There were fourteen joiners, three coopers, thirteen tailors, eleven masons, twelve weavers, six grocers, three blacksmiths, four ale-house keepers. Coals were brought from Mid-Lothian, 28 or 30 miles, at the rate of 1s. per cwt. Feuars and small farmers, who had not work enough for their horses, were in the habit of driving coal, lime, and marl for hire; and the rate was 4s. a-day for a man, a cart, and two horses. The wages of a man-servant, boarded in the house, were £7 to £8 a-year; maid-servants got £2, 10s. or £2, 15s. for the summer, and £1, 5s. for the winter half-year. A married farm-servant had about £14 or £15 a-year in oats, barley, peas, flax, and potatoes, with the maintenance of a cow throughout the year. The harvest usually lasted a month, during which men obtained £1, 6s., and women £1, with victuals. At other times, men had 1s. 2d. a-day in summer, and 1s. in winter; women had 7d. or 8d. in summer, and commonly no work in winter. Masons had 1s. 8d. and carpenters 1s. 6d., without maintenance. A carpenter got, with victuals, 1s. a-day, and tailors got 8d. Within forty years previous to 1794 these wages had doubled. The parochial schoolmaster had not, in 1794, over £30 a-year, including everything; and another schoolmaster at Middleham had £3 a-year, and got his victuals during the teaching season from the different families, according to the number of children they had at school, which would not average more than thirty. His whole income would not be more than £7 or £8 a-year. In the Bowden school there were usually about seventy scholars, of



whom thirty were learning to read English, and paid 1s. a-quarter of fees; twenty-five were reading and writing, who paid 1s. 6d. a-quarter; and about fifteen were instructed in arithmetic, book-keeping, and mathematics, at such terms as could be agreed upon.

The parish of Eckford, in which Cessford Castle is situated, lies much lower than Bowden, but in 1793 it was not much further advanced, though cultivation had much improved from former times. The English plough had come into common use, and it was drawn by two horses instead of four oxen and two horses as formerly. Raising of turnips, with the preparation of land for the crop, had superseded fallowing. Barley and oats were largely grown, and potatoes were planted to an increasing extent. The growing of hemp had been given up, and lint was grown in less quantities than formerly. In the year 1776, a new kind of oats was introduced by Mr James Church, farmer, of Moss Tower, which formed an era in oat-growing all over Scotland. He raised them from sixty grains of Polish oats, which he had obtained from a friend, and which he planted in a corner of his field on the 14th of June of that year. Their produce turned out very considerable. Every year afterwards they were sown on the farm without any signs of degenerating, but they grew best on dry land in good heart. They were said to ripen a month earlier than the common oats, though sown at the same time, and on the same soil. They required to be cut down early, being more liable to shake than ordinary grain. They commonly weighed about 28 stones the boll of 6 bushels, and yielded 11 or 12 stones of meal. Their reputation speedily increased, and they were at length generally sown in the district, and then over Scotland, some parts of England, and even America. The enclosing of land had now become general, which was done at the expense of the landlord, the tenant paying interest on the money. Rents were from 10s. to 20s. an acre; and the usual tendency toward large farms was observable. One half of the land was usually in grain, one-fourth in turnips, and the rest in pasture. Oatmeal sold for 1s. 6d. a-stone; beef, 3½d. a lb.;

veal, mutton, and lamb, 3d.; pork, 4d.; geese, 1s. 6d. each, stripped of the feathers; ducks and hens, 8d.; and turkeys, 2s. 6d.

Wages paid to servants had risen with the progress of agriculture. The ordinary wage for a man was £7 a year, and for a woman £2, 10s., with maintenance. Day labourers had 8d., and women 6d.; masons had 1s. in summer and 10d. in winter; and tailors had 8d. a-day with victuals; turnip-hoers and hay-workers had 8d. A man for harvest work had 1s., and a woman 9d., with diet. Hinds, who provided their own diet, were allowed a free house, grass for their cow in summer, with fodder in winter and spring, eight bolls of oats for meal, two bolls of barley, one boll of peas for family bread, and one firlot of potatoes planted. Cottars usually paid the rent of their house by harvest labour, in return for which they had a small spot of ground adjoining the house for furnishing cabbage and pot-herbs, some potatoes planted in the field, a quantity of lint sown, and sometimes potatoes or barley, so far as the manure they had collected during the year would cover the surface. These cottars, with their families, were eagerly coveted by farmers, since they were ready for every emergency; and employment was given to their children from the age of eight or ten years and upwards, according to their respective abilities. The cottages were valued by the masters at one guinea per annum; and the family, besides the other perquisites mentioned, had turf for fuel brought home by the master. The schoolmaster's salary was £8, 6s. 8d. a-year, with a small piece of enclosed garden ground, 30s. for collecting poor-rates, school fees at the rate of 1s. per quarter for reading, 1s. 6d. for writing, and 2s. 6d. for these, along with arithmetic, 4d. for registering each baptism, 1s. for proclamation of a marriage, 4d. for an extract of a testimonial for a single person, or 6d. in the case of a family, and 10s. yearly for acting as session-clerk, besides some casual perquisites.

In the immediate neighbourhood of Kelso, land, about the same period, let considerably higher, none being under 15s. an acre, while it ascended in a gradual scale to £2, £3,

£4, and even £5 an acre. The soil is a deep rich loam, on a bottom of gravel, and grows very luxuriant crops. About 1770 it was common to divide the cultivated land into six equal parts, each of which in succession got a summer fallowing, and all the dung that the farm produced—lime being then little used in agriculture. The crop immediately after the fallow was always wheat, the second barley, the third oats, the fourth peas, the fifth oats or wheat, after which it was laid down in grass or fallowed again. The land was always foul, and the crops, except the first and sometimes the second, were invariably poor. The introduction of lime as a manure, about 1777, along with turnip husbandry, potatoes, and sown grasses, produced a change for the better. Land in tillage was then divided into four parts, one sown with turnips or planted with potatoes, for which the land was cleaned, pulverized, and manured; a second sown with barley or spring wheat; a third bearing a hay crop, and a fourth with oats or wheat, but in some cases pasture. Occasionally the third crop, was peas instead of hay. On some farms a considerable proportion was kept in pasture, on which sheep or black cattle were fed—a kind of stock that had become profitable about 1794 through the high price of wool, and the constant demand for beef and mutton at the Edinburgh and Morpeth markets. Wages for certain classes were somewhat higher than in the rural districts. Masons and carpenters had 16d. to 22d. a-day without victuals. Working men had 1s. to 16d., but in haytime and harvest they got 16d. to 20d. Male servants, maintained in the house, got six to eight guineas yearly, and female servants had £3 to £4, 10s. The gains of a hind were calculated at £18 a-year, and turnip-hoers had from 4d. to 8d. a-day.

At the present time the Duke of Roxburgh's estate in the county, from which his title is derived, are extensive and valuable. They are situated in twelve different parishes, and vary considerably in situation and culture. About the Bowden part of the estate there is nothing remarkable; and its interest is chiefly derived from its history, the remains of its

baronial residence, and the sepulchre of the ducal family in the vault below the church. In the parishes of Oxnam, Hownam, and Morebattle, some farms are a mixture of pasture and cultivation, while on some of them there is almost nothing except pasture. The pastoral range extends for many miles along the north side of the Cheviots, extending in some parts to the Border line. Near the centre of this pastoral region is the Duke's shooting-lodge, appropriately named Greenhill, for there is not a ploughed field in the neighbourhood—grass is growing green even to the boundary of the little garden on the east side of the two storey cottage; and on the steep acclivities which rise on every side are fed some of the healthiest Cheviot sheep on the Borders, while the whole district is one of the best shooting-grounds for grouse in the kingdom. At the western extremity of the estate in this direction is Hyndhope, the Cheviots from which, bred by the tenant, Mr Elliot, have carried off the prizes at many a competition; while, to the eastward, in the vales watered by the Kail and the Bowmont, are numerous fine farms, with rents in one case exceeding, and in others approximating to £1000 a year.

The farms in the parishes of Eckford, Roxburgh, and Sprouston, however, are worthy of special attention. In one of these parishes the Duke is almost sole proprietor, and in all of them he holds the largest stake. It is not customary for the Duke to advertise a farm when the lease expires; but should the tack not be renewed offers are invited, and from these offers one is selected, which may not necessarily be the highest. It is wise to exercise discretion in the selection of a tenant, so as to secure respectability, capital, and skill, and on the Roxburgh estates the method has worked remarkably well. For the tenants suitable houses are provided, and the farmers on this estate are generally men who can hold the position of gentlemen, but think it no degradation to manage their own business at home or in the market. We are not aware of any other estate which contains in a large proportion farmers of energy and enterprize, and well-earned reputation. For

Cheviot breeding we have only to name Mr Elliot, Hyndhope, and for Border Leicesters, Mr Stark, Mellendean, and Mr Simson, Courthill. The houses are elegant, the gardens well laid out and neatly kept, the hedge-rows are trim, the steadings are commodious and conveniently situated near the centre of the farms, the land is rich and well cultivated, and the whole country wears an aspect of elegance, comfort, and even opulence, not excelled in any part of Scotland. Rents are not quite so high as in some parts of the Lothians; but they average about 45s. an acre. The highest rent paid for any arm on the estate is £2800 for Redden in the parish of Sprouston. The next is Caver-ton in Eckford parish, £1800; then Ker-chesters, £1700; next Kersknowe, £1550; and Cessford, £1544.

The farm of Redden is on the south side of the Tweed, by which it is bounded on the north, and it extends on the east to the English border at Carham Burn. Some of the fields are about 60 acres in extent, perfectly square in form, quite level, and admirably fitted for working with a steam-plough, which we understand the enterprising tenant, Mr Dunn, intends to procure. It is good wheat soil, and the produce of one field is known to have paid the whole rent of the farm, when wheat was high-priced about 1815. The farm is at present worked by about twelve pair of horses, and, like others on the same estate and in the same district, it is worked on what is called the five-course rotation, which includes a combination of stock and crop husbandry. The ordinary arrangement is oats, then turnips or beans with a small portion of potatoes; next, wheat, barley, or oats, along with which grass is sown; then clover, and finally pasture. A portion of the young grass is saved for hay, but some of it is pastured the first year, and all of it the second. Even the portion that is kept for hay is pastured up till about the

close of May, so that when dry weather sets in, as it sometimes does at this season, the hay crop is comparatively light. During winter, however, oat and bean straw are used as fodder. The feeding of cattle prevails to a great extent, and steadings are so arranged as to feed sometimes over a hundred. At Redden there is a steam-thrashing machine; but there is also a water power of peculiar construction. The water supply is considerably lower than the steading, but a wheel is placed so as to receive its full force, and from this a shaft on an inclined plane drives the machinery about 200 yards distant.

As previously noticed, the tendency for many years has been to increase the size of farms; and we may say, also, there has been a constant demolition of surplus houses. One or two villages remain in a most dilapidated state, the only excuse for which is the merely nominal rent at which houses are held. Every farm has a number of houses, which are generally comfortable and commodious, and are inhabited by the steward, the shepherds, and ploughmen. The ploughmen are chiefly paid in kind, but in average seasons their "gains" will be equivalent to £38 to £40 a-year. The ordinary wage is a cow kept summer and winter, about 1800 lineal yards of potatoes planted, 10 bolls of oats, 4 bolls of barley, 1 boll of beans, a free house and garden, one month's food during harvest, and about five pounds in money. Formerly every hind was required to keep a woman or stout boy for farm work, called the "bond-ager," but with a great effort the hinds last year managed to get quit of this imposition to a great extent. It is still requisite that workers be kept, but by proper arrangement a farmer can manage to secure two or more workers in one house, so that others may go free. The payment for field-workers is at the rate of six to seven shillings a-week. There are no bothies in the district for either men or women.



## The Farm.

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### *THE SECURING AND THRASHING OF CORN.*

NOT often are the farmers of this country so happily circumstanced as they have been, and are still this year with regard to the weather, with which they have been and are favoured during the corn harvest: seldom have they been called upon during a long, long course of years to begin the happy labour of a harvest home so early in the season as they have been called upon in this; for which, and the concomitant blessings which attend upon it, let us be thankful to the Giver of all good. True, as man seems born to discontent, or at least seems to have great pleasure in keeping in hand a stock of it, and, however niggardly in other things, is extremely liberal in the dispensing of it, we need not be surprised at hearing the grumbles of those who think themselves aggrieved in that, while they have had good corn crops, they have no roots; and, while congratulated upon having such splendid weather for harvesting their corn, lift the eyes and shake the head as to the want of rain for their pastures or their meadows. It is a happy frame of mind for any one to be in, to look at the benefits they have received, not at the losses they may have sustained—to look at the bright side rather than at the dark one of the cloud. But be all this as it may—and the thoughts that it is calculated to raise are by no means valueless or lack suggestiveness—we turn to the more immediate purposes of our paper, and give a few remarks or notes upon the securing of corn. As our readers are aware, in some districts in this country there are two systems practised in securing corn: one in which the whole of it is taken to the immediate neighbourhood of the homestead or farm-steading, and stacked up in the rick or stack-yard; the other system, which, however, is not followed out in all its integrity—being, where adopted,

only in some cases partially adopted—is the having the corn stacked in or near the field in which it was grown; this being done chiefly by those who approve of thrashing out the grain in the field by means of a portable engine, or from motives of economy, or presumed economy of time at the period when the corn is ready for stacking—with the view of getting this quickly done—and, thereafter, at a more convenient time, carting it off to the farm-steading. Of the merits of these two systems comparatively little need be said here, as, in the opinion of by far the greater majority of practical men, with which we heartily concur, the merit—to put the matter paradoxically—of the field stacking and thrashing system is that it has little or no merit at all. One has only to examine, as we have often examined, the operation of thrashing out grain in the field by means of a portable steam-engine, to see that it is an eminently unsound one. The immediate and direct evils, or at all events evil contingencies, which are connected with it, are quite enough to condemn it; as, for example, the risk there is of being interrupted during the actual thrashing out of the grain by bad weather; the litter made in the fields by the blowing about in heavy winds of the broken straws, and the loss sustained by the same thing happening to the chaff and “cavings,” or from them being trodden under foot; and last, and probably not least, the danger arising from having so combustible a material as straw in the immediate neighbourhood of so capital a supplier of firing material as a steam-boiler furnace. We never saw a portable engine at work under such circumstances but we were struck with the wretched incongruity of the arrangement. Men are only considered prudent who keep the source of fire from combustible



materials; it is not, to say the least of it, prudent to bring the two as near as possible—it is somewhat like inviting a catastrophe. Some, indeed, seem to have as great a difficulty in such cases of tracing the relation between cause and effect, as had the Irishman who, in cutting down a branch of a tree, sat on the outside of the saw-cut he was busily making, and when, as a result, he fell to the ground with the branch under him, he was not so much concerned at the contusions which followed as at his difficulty to clear up what he called “the *inexplicable mystery* of the whole affair.” But, apart from the objections which we think are great ones to the system of field-stacking and thrashing of grain named above, there are others, of which little need be said here, as they will commend themselves to most of our readers—as, for example, the objection, that as you are to use the straw for the purposes of your stock in the stading, you thrash it out at a place at a distance from them, and that, as you have in any case to take the straw to the stading, it will be taken easier, and got there in better condition in its unthrashed state than after it is thrashed and broken up. Other objections might be named here, but the object of this paper not being the finding fault with a system which does not properly come under the term “securing,” as in our title, we proceed at once to give such remarks as we have bearing upon the subject directly.

In other countries the corn crops are nearly all placed under cover, huge barns being erected for the purpose, and by which the grain may be said to be secured in the fullest sense of the term. This system of “housing” corn crops—for it is nothing else—has never been adopted here, and for obvious reasons; but in view of the numerous advantages which do arise from having such a valuable material as corn under cover, a modification of the barn has been of late years proposed to be part of every well-regulated homestead, and proposed by thoroughly practical men. Some years ago we advocated the system of having a covered rick or stack-yard, and prepared and published plans by

which this could have been carried out; but this plan had its defects, more especially in the way by which we proposed to place the corn under the roof. We have since met on a very large scale with a covered corn shed, which is on a very much better principle than the one we prepared, and of which we now give the following very brief description: The principal feature in the arrangement of this corn shed—which has been carried out on the farm of G. Leigh, Esq., Luton, Beds., under the superintendence and from the designs of Mr Ross, the able manager of the estates—is, that the necessary amount of cover is obtained by adding to the length of the shed rather than by increasing the width, giving the maximum in the length, the minimum in the breadth. The breadth decided upon is 36 feet, and the length 450 feet. This long space is covered in with a timber roof, supported at pretty long intervals by pillars of home timber 18 feet in height, the spaces between the pillars and the ends being left open. The floor of the shed is of brick; and the base of the whole from which the pillars rise, and which is carried all round the shed so as thoroughly to enclose the floor space, is made in the shape of a low or dwarf brick wall. As we have said, the floor space is completely closed in by this dwarf wall, and to prevent rats and mice entering it, and burrowing amongst the grain, the upper part of the dwarf wall is capped with a two feet deep covering of zinc, up the smooth surface of which the vermin cannot climb. The corn, as it is led from the field is carefully built up within this space, beginning at one part and gradually filling it up; the ends or roots of the sheaves are, of course, left outwards, and so carefully and neatly had this been done, that when we visited the farm the vast shed looked as if its end and side walls were made of straw ends, so uniformly and evenly executed was the surface. The result of this arrangement is, that the cost of the shed is reduced to a minimum, the roof and base only, with supporting pillars, being required—the wall, so to say, being formed of the close and compactly built up sheaves.

*HARVESTING OF GRAIN CROPS.*

[Concluded from our last.]

SUPPOSING the corn to be cut after a fashion more or less complete and perfect, the cares of the farmer are next directed to the tying of it in sheaf, and the placing of it in stook on the field. As facilitating the placing of the cut corn in stook, it is difficult to overestimate the economical value of those self-acting reaping-machines, which not only cut the corn but lay it in regular and uniform bundles, ready to be tied up into sheaf. To see a reaping-machine of this class do its work, one cannot help being made strikingly aware that the labour of the field is reduced almost to a minimum. When to the present work of the reaping-machine is added that which will, we are assured, one day be added to it, in which the corn laid aside in regular bundles shall be tied together so as to be placed at once in stooks, the labour of the field will be still further reduced. Although the fact should not here be overlooked, that in certain seasons, and under certain conditions, the grain will be all the better if allowed to lie loosely, for a period more or less lengthy, on the ground, to be subjected to the drying influences of the sun or air, which advantages could not be secured, or at all events so well secured, if the corn was tied tightly up simultaneously with its being cut and laid aside by the self-acting rakes of the reaping-machine. At the same time, the advantages here noted will be much modified by the state of the weather at the time, or rather shortly after the corn has been laid in the field by the reaping-machine. For in certain states of the weather it should be the object of the farmer to get the corn set up in stook as quickly as possible in order to protect the corn from the action of the wet. Yet another view may be taken, and it is right to state that it is a view held possibly by the great majority of practical men, that if the corn is cut dry there is no necessity to let it lie for any time on the ground to be exposed to

the sun or wind; but, on the contrary, it is the best way at once to get the corn set up in stook, securing it from rain, should that come before it is taken to the rick-yard and safely housed in the stack. Hence, in this view, the importance of all modes by which the tying up of the cut corn in sheaf, and of placing it in stooks so arranged as to give the best possible protection from the weather, are quickly done. In tying up corn in sheaf the practice generally is to make the sheaves too large, by tying up too much at a time. The object here aimed at is, doubtless, the saving of time, as the time taken up in tying a large quantity of corn will not be much greater, if any, than that required to tie up a small quantity. And this is one of the advantages of the self-acting reaping-machine, for the corn given to each sheaf is not, as a rule, large in quantity. There can be no doubt of this, that if the great object is to have the corn exposed as fully as possible to the drying influences of wind and sun-heat, the more loosely it is put up the better. In very large sheaves the corn in the centre will be found scarcely at all open to drying influences. Thick and massive sheaves should therefore be avoided; and although more time will be expended in making light sheaves, still the good result required will be more readily obtained. And it should ever be remembered that in this, as in other departments of labour, it is not the saving of trouble which is the object in view, but the perfection of the work in hand. A close consideration, indeed, of the philosophy of the subject of the preservation of corn, would shew that the system of putting it up in the field in thick sheaves, and these put closely together in stooks to protect the sheaves, is simply brought into existence by the exigencies of our uncertain climate. If the plan were at all feasible in practice, the true way to treat the cut corn would be to

spread it out in layers as thin as possible, so as to permit the extension of exposed surfaces to be carried out to the maximum; but this cannot be done in our uncertain climate without involving large expenditure in securing a covering for the corn so spread out. We may yet see drying-houses and shelter-sheds for corn forming part of every well-ordered farm, but till this is carried out, the old fashioned ways must still be adhered to, and the fullest advantages of the system of exposing the cut corn to drying influences under the operation of the sheaf and stook system, is to make the sheaves as small as possible, and to make the stooks in such a way that the rain may not find access to the corn, while as much as possible the drying winds will. To judge from the careless, slovenly way in which we see the operations of stooking done in many fields, one would think the object was to expose the corn in the best possible way to be spoiled by dashing winds and rains. No care seems to be taken to place the sheaves well and firmly on the ground, and in such a way that each sheaf will be supported by its neighbour. Some are placed to lie over at one angle, others at another angle, so that the whole is so rickety and insecure that the first strong wind which blows, blows the whole over; and the odd thing is, that after this does happen, and the sheaves are thus exposed to rain, and often allowed to lie in pools of water, the farmer—if, indeed, he deserves the name—never seems to think that it would be worth his while to go in or send into the field to lift the hapless sheaves up, and place them in some fashion better calculated to shield them from the rain. Often have we been surprised to see the indifference of farmers in this respect. All stooks should be carefully built up, and invariably be covered with a cap sheaf or cap sheaves, with the ears downwards. This will serve as a kind of natural thatching to throw off the wet, and keep the corn underneath dry; and if fine weather comes the trouble is not great to take off the caps so as to expose the corn below, and to replace them should bad weather come on. All this doubtless involves trouble,

but surely the expenditure of trouble is better than the "securing of loss," which is inevitable if the trouble is not taken. In setting up the sheaves with caps they should not exceed six in number, although four is better if the sheaves be large, and the whole should be inclined inwards, so that the ears will be well together, and easily covered with the cap, which, as before said, is turned ears downwards, the ears being well opened up as the cap is put on, so as to cover the whole of the top of the under sheaves. In this mode of placing sheaves in stook the thickness is reduced to a minimum, so that the air finds free access to all the parts; but it is not so secure as the system which is known as wind-mowing, and which is placing the sheaves in the form of small stacks. To commence the building up of a stack in this system—each stack containing from half a load up to a whole one—four sheaves are placed butt or end down upon the ground, with the ears all sloping inwards, and the butts outwards as much as possible, without making the inclination too great, thus bringing the ears too close to the ground. Around these four sheaves others are placed, and row above row till a length of 8 or even 10 feet be obtained, and a point be reached at which the cap, with its ears downwards, may be put on, covering the whole. In placing these successive sheaves, care must be taken to have all the ears well in, so that when the whole is finished there will be a regular inclined surface formed of the stems or straw of the corn only, down which the wet will run so readily that windmows constructed on this fashion may be allowed to stand for months without receiving much injury. From what we have said the reader may be able to pick up some points, which we hope most earnestly they will *not* have to put in practice this season; and which hope seems, while we write, likely to be realized, for the heavens seem still to be sealed, and from deep blue skies the sun pours down his heat in a way which reminds us more of "lands of the sunny Ind," or the "shores of the far Cathay," than of our own island home, with its weeping skies and blustering blasts.



*WATER AND THE WANT OF IT.*

THERE is little reason to doubt that the most absorbing question of the day is water. In every corner of the land it is eagerly sought for, and the sight of a running stream is felt to be something worth looking at. Man and beast are suffering alike, and in many parts so scarce has this necessary of life become that a request for a cup of cold water by a thirsty traveller is much more likely to be met by an ungracious refusal than kindly compliance. Streams, which in bygone years have never failed to afford good sport to the disciples of Izaak Walton, are now only distinguishable by heaps of dry gravel or caked mud. What has become of the fish it is hard to say; roasted prematurely perhaps, without being eaten. Springs are dried up, pasture fields are mere arid tracts of withered, sapless herbage, over which cattle and sheep wander helplessly. In several instances mortality amongst live stock has been distinctly traced to the animals eating the dry stems without getting water in sufficient quantity to counteract the effects of food of that description. In some instances we have seen cattle fed in the fields on the dry straw of last year's crop, and when such a step is necessary it would be advisable to cut the straw by means of chaffing machines, and moisten it thoroughly with water poured over it in the troughs. By so doing it would be rendered more palatable, and the addition of some cake, mixed with the chaffed straw, would help the poor starved animals considerably. Sometime ago Mr Mechi recommended cutting green beans, when that crop is grown, and giving them to cattle, instead of retaining the crop until it became ripe for harvest. We have been reminded of Mr Mechi's hint more than once lately, when we have seen tolerably good crops of beans growing on farms where there was evidently great scarcity of food for the live stock, and we have no doubt that, if used as food for cattle in the green state, the crop, under

present circumstances, will be found to pay as well as it would do if allowed to ripen.

But with respect to water, if live stock which remain on the farm suffer so much from the want of it, what must be the state of those which are conveyed in railway trucks under a burning sun. When travelling by railway, we see passengers hastily leaving the carriages in search of water to allay their thirst; and if such is the case with human beings, surely the condition of the poor helpless animals which are imprisoned in the trucks must be infinitely worse. We do know that humane railway officials frequently endeavour to help the poor brutes so far as lies in their power; but they cannot meet every case, and it is with great difficulty they are able to do anything even under the most pressing circumstances. We would, therefore, take the opportunity when all are experiencing, more or less, the effects of extreme heat and drought, to plead once more for the dumb animals who cannot help themselves. Dumb they are no doubt, in so far as speech is concerned, but even the most obtuse cannot fail to read the unequivocal signs of suffering which they evince but too plainly. If a remedy could not be easily found there would be less room for censure, but when it is as easy to supply water to cattle conveyed by railway as it is to fill the boiler of the engine, surely no one can defend the culpable indifference which has been evinced regarding this matter. The treatment of live stock on railways is positively disgraceful to humanity, and there is no one to blame except those who have the power, but not the will, to alter matters. It is to the superior officials of the railway companies we look for redress, whether directors or head superintendents; and it is they, and they alone, who are to blame. We have the remedy, simple and easily applied, in the troughs attached to cattle trucks according to the plan devised by Mr Reid; and it is only downright perversity which has



prevented that plan from being carried out on every line of railway in the kingdom. We know that railway officials of all grades are exceedingly averse to anything which savours of coercion; but in such a pressing case as that to which our remarks have reference, public opinion must be brought to bear upon them, so that they shall be compelled to act in accordance with the dictates of humanity, and for the benefit of the public which suffers loss, more or less directly, from the manner in which live stock, conveyed by railway are treated. Surely the Lords of the Privy Council, who have the power to make regulations for conducting the cattle trade, would, if applied to in the proper manner, compel the railway companies to take steps for supplying live stock with water

at regular intervals along the different lines. Chambers of Agriculture and similar associations are, of course, the proper parties to move in the matter; but we consider that societies established for the prevention of cruelty to animals would be acting quite in accordance with their legitimate objects if they, too, asked the Privy Council to exercise its authority in order to compel railway companies to attend to this matter. It need not create any surprise if the great heat and drought of this summer should be followed by an unusual amount of mortality amongst live stock; and if so, the additional sufferings endured by railway-carried animals are certain to have an even more prejudicial effect on their health than usual. No time should be lost, and we strongly urge instant action in the matter.

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### WEEDS.

NOTWITHSTANDING the long-continued drought and intense heat, which has dried up our rivers and springs, stunted the growth of our cereals, burned up our pastures, and left our turnip fields without a plant to indicate the nature of the seed sown or the crop expected, we find abundant evidence of the truth of the old proverb, that "ill weeds thrive apace." In pasture fields, where not a vestige of vegetation denoting cultivation is to be seen except withered stems, thistles lift up their heads as defiantly as ever, and ragworts have lost nothing of their usual sturdy habit of growth. Turnip plants may not gladden the eye of the farmer, but coltsfoot spreads its broad leaves regardless of heat and drought. Oats, in many instances, may not be long enough in the stem to hide the clods, but there is no lack of charlock, skellock, kedlock, or by whatever other names that universal pest is known; and manifold forms of that particular kind of unprofitable vegetation, which we call weeds, are to be seen everywhere infesting fields and waysides.

There is nothing new in this: the evil is as

old as Adam, but the lapse of time has not rendered it less vexatious. With each succeeding year it is again and again brought under our notice in such a palpable form as to defy our overlooking it. It has been the theme of innumerable after-dinner agricultural orations; men of the highest scientific attainments have not considered it too humble a subject for investigation; practical writers on rural matters have over and over again described it as the standing reproach of their profession; but it still exists almost in primeval force, and the subject, looked at from an agricultural point of view, is as fresh as ever.

It does seem strange that men, who complain, and not without reason, of high rents and heavy taxes, should voluntarily add to those rents, and virtually increase those taxes, by cultivating—for it is cultivation in a certain sense—a species of vegetation which not only does not yield them any return, but actually injures those crops which are naturally looked to as the means whereby the farmer expects to be remunerated for his labour. If thistles, docks, or ragworts are to be allowed standing room, they ought to be

grown in rotation, and not mixed up with other crops. We don't recommend it, however, nor do we imagine that it would have a favourable influence on the balance sheet. Still they are grown, and they are even protected in the course of their growth, in order, apparently, that their powers of reproduction may not be impaired. Thus, when thistles are permitted to stand until the seed is perfected before they are cut down, we treat them with exactly the same consideration that we would bestow on rye-grass or on our corn crops. They get the benefit of costly manures, to the detriment, no doubt, of those plants for the special behoof of which those manures were intended; and, in fact, it frequently happens that we cannot do more for the profitable "plants of the farm" than we do for those which are without any claim to that title.

There are, no doubt, certain classes of weeds which are exceedingly difficult to eradicate. The seeds lie dormant in the soil for years, and spring into life under circumstances favourable to their vegetation. The charlock is an example of this; and there are others which even a long course of the highest cultivation fails to overcome, as, for instance, that pest of East Lothian farming—the wild oat. But, apart from these, there are many kinds of weeds which are disseminated and propagated through inattention or neglect. Dirty seed is a very common channel for conveying weeds to our fields. Professor Buckman discovered "in a pint of clover seed 7600 weed seeds; in a pint of cow-grass seed, 12,600; in broad clover, 39,440; and two pints of Dutch clover yielded severally 25,560 and 70,400 weed seeds. Supposing these samples to be sown, here were seeds enough to stock the land with weeds for many years. The farmer often goes to the cheapest market, and gets weeds for seed, and so pays exceedingly dear for what he considers a cheap bargain." It is well known that a large proportion of rye-grass seed is produced in districts where "dirty farming" is by no means the exception, and when such seed is sown without being thoroughly cleaned, the best farmed land in the kingdom will be speedily overrun with weeds of all descriptions.

In the case of thistles, and other plants having winged seeds, it becomes very difficult, in fact, impossible to keep clear of them, unless they are regularly cut down, or otherwise eradicated at an early stage of their growth, not merely on any particular farm, but on all the farms in the neighbourhood. "A dirty farmer" in this way is a nuisance to all around him; a mere "dog in the manger," who will neither keep his own land clear of weeds, nor allow his neighbours to do so with their farms. Dirty roadsides are also fertile nurseries for weeds, especially those which have winged seeds; and many who abhor the sight of a weed of any kind are subject to the nuisance from the neglected state of the public roads which run through their farms.

It would be desirable to know how far road trustees could be made responsible for allowing the roads to become nurseries for weeds, polluting all the land in their vicinity. For several years past the destruction of roadside weeds has assumed somewhat of an official character in Ireland, from the circumstance that Mr Donnelly, the Registrar-General for Ireland, has made it a subject of earnest appeal in his annual circulars issued respecting the collection of agricultural statistics; and several statements regarding the proportionate quantities of weeds on farms throughout that part of the kingdom have appeared in Mr Donnelly's official reports. That gentleman has shewn great and praiseworthy enthusiasm in his "crusade against weeds;" beseeching farmers and invoking the aid of grand juries to assist him in his efforts towards keeping at least the roadsides clean. Nor have his efforts been fruitless, as Irish grand juries generally insist on road contractors keeping the roadsides free from weeds, and in this way some good has been effected. The example thus set should be followed in other parts of the kingdom. Thistles should also be prevented from seeding in woods and plantations, which, like the roadsides, are frequently allowed to become nurseries of such plants; and by attending to those points, relief would be afforded to many farmers, who at present are compelled to see their land unprofitably occupied in consequence of the inattention or neglect of others.

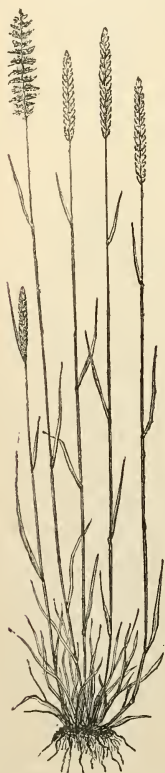
## GRASSES FOR PERMANENT PASTURE.

NO. III.—CYNOSURUS CRISTATUS\* (*Linnaeus*)—Crested Dog's-tail Grass.

SYNONYMS—*Gramen cristatum*, or Cockscomb grass of Gerard and other early English authors. Scotch—*Windlestrae Grass*; French—*Cretelle* or *Cretelle des pres*; German—*Das Kammgras*; Dutch—*Tingerpflum*; Danish—*Haukamsgræs*; Swedish—*Kammexing*.

## DESCRIPTION.

A VERY common fibrous-rooted grass, with a thick under growth of short flat leaves, from among which the stems rise rather



*Cynosurus cristatus*—Reduced in size, shewing habit of growth. rigidly upright to heights of from 12 to 18

\* From the Greek *κυνος*, a dog, and *ουρα*, a tail, in allusion to the form of its spike.

inches, and in some instances to 2 feet. These are surmounted by erect peculiarly-arranged crested spikes, in which the comb-like spikelets are set alternately in two rows, both rows inclining to one side of the rachis or centre rib, from whence they arise. These spikes or ears are openly spread when in flower, but contracted or narrowed at other times. The beginning of July is the usual period of flowering, and the seeds ripen in four or five weeks afterwards. When allowed to produce seed the stems become hard, withered, and innutritious, so that they are then avoided by all kinds of stock, and impart to the pasturage an unsightly "windlestraw" appearance.

## NATURAL DISTRIBUTION.

Common throughout Europe, except in its most northern latitudes, but has no place in the floras of North and South America, Australia, and New Zealand. In Britain it abounds in all grassy grounds under elevations of 2000 feet, but is most abundant in meadow pastures where the soil is stiffish in texture, somewhat moist, and not under medium quality.

## QUALITIES AND USES.

Stillingfleet, who was one of the earliest English writers who directed attention to the cultivation of the best native grasses, included the *C. cristatus* in his select list of deserving sorts, and cultivated it himself in 1761. The London Society for the Encouragement of Arts, Manufactures, and Commerce, awarded, in 1766, two prizes of £5 and £3, 3s. to E. Birch, Somerset, and Wm. Gosse, Hants, "for gathering its seeds by the hand." In vol. ii. of "The Bath Society's Letters and Paper," published in 1778, mention is made of seeds of the crested dog's-tail grass having been sent to that Society by G. Swayne of Pucklechurch,



*Cynosurus cristatus*. — Natural size.



Gloucestershire, to "complete a small collection of the grass seeds for which a premium has been offered by the Society for three years past," and his only recommendation of it was its being the "easiest of the whole group to collect a quantity of seed from." J. Anderson of Monkshill, Aberdeenshire, figured the *C. cristatus* in his *Essays relating to Agricultural and Rural Affairs*, published in 1784, and recommended it for cultivation; but Sinclair, in his *Woburn experiments*, found its weight of produce to be considerably under that of the perennial rye-grass, or only at the rate per acre of 6125 lb. at flowering, when



Back view of Spike.



Spikelet magnified.

grown on a brown loam with manure, 12,251 lb. at seed ripening, and 3403 lb. of lattermath. Yet he recommends it for forming a sward of the best quality, particularly under circumstances where sheep are a principal object, and adds, that in all the most celebrated pastures he had examined, it constituted a very considerable portion of the produce; and in some part of Windsor Park it constituted the principal part of the herbage on which the deer and Southdown sheep browsed. Doubtless the crested dog's-tail grass owes much of the recommendations bestowed upon it by early cultivators, to its natural association with much superior grasses in the best meadow and pasture land, and perhaps not a little to its abundant production of easily harvested seed

and its consequent cheapness; but agriculturists now look upon it as an unworthy occupant of good soils, which might be more profitably filled with much more valuable kinds. If they admit its presence as being essential in mixtures for good sound sheep pasturage, it is only so far as it is certain to be produced from the natural presence of its seeds in the soil. Hence it should only be sown in mixtures for ornamental short grass, for which it is one of the most suitable of the flat-leaved grasses, in consequence of the firm compact turf which it forms, and its non-liability to suffer from excessive droughts. Cobbett and other writers recommended the *C. cristatus* as one of the best grasses for manufacturing into straw plait, a purpose for which rye, and the small bearded wheat, called *Grano marzolino* by the Italians, are now almost exclusively employed. In case any of our lady readers should wish to try the preparation and plaiting of this native grass, we give the following directions for their guidance:—1st, Collect the stems about flowering time, and select that portion only of each between the upper joint and the base of the spike; place them in boiling water for ten minutes, and then spread them out to bleach for ten days. 2d, Gather and prepare them as in the last case, put them in boiling water for one hour, then spread out and keep regularly moistened for two days; after which place them in a close vessel, and apply the fumes of burning sulphur for two hours; or, 3d, They may be bleached in half-an-hour, by first placing them for ten minutes in a strong solution of acetic acid, and then subjecting them for twenty minutes to the vapours of sulphureous acid gas.

#### SEED AND SOWING.

The seeds of the crested dog's-tail are heavier than those of most other grasses, averaging about 26 lb. per bushel; and being small in size, they are easily separated or cleaned from others which may have been grown and harvested along with them. When ripened and secured in dry sunny weather the colour is brightish yellow, which, however, is easily tarnished and changed to a dull brown if subjected to unfavourable wet weather.

The former is termed "yellow seed," and is most highly esteemed; although the vegetative powers of the other are not necessarily impaired by the tarnishing. About 28,000 seeds are contained in 1 oz. The greatest number of these braird when covered with not more than a quarter of an inch of earth; about half as many when the covering is from three quarters to one inch; and none appear from under an earth covering of two inches. The diminutive produce of *C. cristatus*, and the unsightly appearance of its dry innutritious "windlestraws" in autumn, render its introduction, as before stated, into pastures unadvisable; but as it is the most suitable of flat-



Seed highly magnified.



Seed slightly magnified.

leaved grasses for lawns, play-grounds, and bleaching-greens, it should be used in mixture with other grass seeds at a rate of never less than 6 lb. of seed to the acre, while even twice that quantity may be allowed on stiff damp soils which are unfavourable to the permanent endurance of the finer fescue-grasses, rye-grass, and others.

## CHEMICAL ANALYSIS.

By the Woburn experiments the nutritive extract at the period of flowering was found to be at the rate of about 407 per acre, which was only increased to 478 lb. at seed ripening, although the green produce was then doubled; and that of the lattermath was only equal to about 133 lb. per acre. Professor Way's analyses of its plants, gathered in the meadows about Cirencester, at the period of flowering, shewed them to contain 62.73 of water, 4.13 of albuminous or flesh-producing principle, 1.32 of fatty matter, 19.64 of respiratory principles, starch, gum, and sugar, 9.80 of woody fibre, and 2.38 of mineral matter or ash; while the same in a dry state yielded 11.08 of albuminous or flesh-producing principle, 3.54 of fatty matter, 52.64 of respiratory principle, starch, gum, and sugar, 36.36 of woody fibre, and 6.38 of mineral matter or ash.

## VARIETIES.

There are no distinct varieties of this grass in cultivation, nor does it, when growing in a natural state, present any marked differences, either in size or appearance, unless a viviparous or grass-upon-grass form, which is occasionally to be met with in moist shady places. Unlike true viviparous grasses, this, however, is not perpetuated by the same plants in dry seasons or when grown on dry exposed places; hence it is not worthy of being reckoned a decided variety.

## PAPERS BY FARMER JOHN.

## NO. I.—“RUB UP YOUR GLASSES.”

WHAT some of my old friends and neighbours will say, when they hear that I, who have been more used to handling a pitchfork than a pen, am actually about to appear in print, I don't know; but, I'll be bound for it, there will be a great deal of gossiping and head-shaking over it. Well, they may shake their heads as long as they like, they won't shake me from my purpose. I don't at all see why these smart young gentlemen should have it all their own way in the papers, and fill them up with what I call chaff; so I am just going to try if I can't put in a grain or two of solid old English corn now and then to make weight. And seeing that I am peering and poking about all day long, like a fowl on a dungheap, 'tis odd if I don't light upon something worth picking up once in a way. I have nothing else to do with my time now, for I have retired from business altogether. Not that I mean to say I have made a fortune; oh no! farmers can't do that now-a-days. What with high rents, and high wages, and other things, if a man can manage to keep his head above water it's as much as he can expect. It's more than I expected at one time, and more than I am certain of now, between you and me. To tell the truth, though I am but a poor scholar, and can't be expected to judge of words as I should of sheep, so as to pick out the best, I begin to see that I made use of the wrong one just now, when I said that I had retired. The fact is, I did not retire at all, I was regularly shoved out of the way, and this is how it happened. You must know that I am getting on for an old man, and the only chick or child I have in the world is one headstrong boy, whose mother lies down in the churchyard, with a place kept by the side of her for me. That boy has been a trouble to me ever since his poor mother died, what with one megrim and another; but we managed to rub along pretty

well together till a few years ago, when he took it into his head to go slinking after a little pink chit of a girl belonging to farmer George Morris, down below here. After a bit nothing would do for the young puppy but that he must marry her, and he kept on harping so that I found that I should have no peace till I gave consent. So, like the foolish old father I am, I let him have his way at last, and a pretty recompense I got for my folly. As for peace, I had no more of that after than I had before. For no sooner were they married, than, as a matter of course, madam came home, and I will say this for her—she didn't come empty handed. There was a whole waggon-load of trunks and packages of one kind and another, and amongst the rest a bran new piano. I knew mischief would come of that thing as soon as I saw it brought into the house, and sure enough it did. It had not been set up in the room a day before madam found out that the plain old furniture and carpeting which had suited us very well for thirty years didn't match with it at all. And so it was all packed off to the lumber loft, and replaced by a lot of trumpery from a grand upholsterer's. She would have marched off my elbow chair, and me in it, I do believe, at that time, if she could have had her way. But I wasn't going to stand that, so I just took my seat in it and stuck firm, though she tried all she could to drive me away, by strumming at that piano morning, noon, and night. She, and her friends together, didn't give the poor instrument a single day's rest for a whole twelvemonth, I do believe. After that there came another kind of music into the house, and to tell you the truth I wasn't sorry, for though it sounded rather strange at first to the ears of an old man like me, yet there was something natural about it, and it shut up the piano completely. And when she found I wasn't above taking a hand at nursing now

and then, madam altered her tone towards me. There ! I won't say another word against her, for she has worked me a comfortable pair of slippers, and always manages to keep a clean pipe and a stock of tobacco in the house for me. She doesn't do much work, it's true, for she hasn't got the strength ; but she makes the girls do theirs, so that's as well. She's too proud to take the butter to market, as her mother used to do ; but she gets more for it by sending it to the grocer's than ever her mother could, though she tramped the whole town over, so that's better. Besides, she will have a nice little bit of money, I know, when her father dies ; so perhaps, after all, Master Jack might have gone further and fared worse. It is he himself that I complain of now, more than his wife. I never troubled my head much about being master in the house that I know of, but I always thought till lately that I had a claim to that title out of doors. But as soon as he was married Master Jack began to think otherwise. He rode about all over the farm, ordering the men this way and that way, just as though he were lord of all. There was no being up-sides with him. If I mounted my old grey cob, and rode up into a field to see whether it was fit to sow or not, ten to one but I found him there with the horses and tackle, and the field half sown. And so it went on, till I found everything taken out of my hands. And when I took him to task about it, he turned round upon me, and asked me what I meant by trying to make him look little before his family. Family, indeed ! two little babies that can't talk plain yet. Now, if you don't call this being shoved out of business I don't know what you would call it. I'm set aside to rust just like an old plough, and that by my own son, too. Whatever is coming over the youngsters I can't think. They're all alike. There's young Tom Steers, whose father was a plain, homely man, and as good

a neighbour as ever breathed ; he's ten times worse than my Jack. I haven't forgotten what he said to me the other morning, and shan't in a hurry. I was riding down the lane, going to see an old friend, when who should overtake me but Master Tom on a fine horse, and dressed up in a smart pair of yellow cord breeches, top-boots, and a velvet hunting-cap. He said it was a fine day for the time of year. "Yes," says I, "Master Tom, it is a fine day —just such a one as I should think you ought to be at home at work on. I can't see what you can want a hunting such weather as this." "Can't see!" says he ; "no, of course you can't. You haven't been able to see clear for a long time. I'll tell you what it is, Farmer John ; if I were you, before I went any further I would go home and rub up my glasses ;" and he spurred his horse, and was out of sight in no time. "Rub up my glasses, indeed." I couldn't get the young dog's words out of my head the whole day. I talked it over with my friend, and he agreed with me that it was a shameful thing for a boy like that to say to an old man like me. "Rub up my glasses, forsooth," I thought to myself, as I was riding home that evening. "What ! am I getting near-sighted or going blind, then, or what is it?" Rub up my glasses ! I've a very great mind to say I would rub them up when I get home, and go and look up Master Tom and some of the rest of these clever young upstarts, and try if I can find anything worth seeing amongst them. Yes, that's what I'll do ; for, thanks to Master Jack, I have nothing else to fill up my time now. So I have rubbed up my glasses, and am going on my search at once ; and you may depend upon it, as soon as I find anything worth speaking of, you shall hear again from

Yours, to command,

FARMER JOHN.

Barley Farm.



*SAWING OFF THE HORNS OF CATTLE.*

THE appendix to the last annual report of the Royal Society for the Prevention of Cruelty to Animals, in detailing a variety of cases in which convictions have been obtained, mentions one wherein a fine of £7, 12s. was imposed on the offender for "ill-treating and torturing eight heifers by sawing off their horns close to their heads." The defendant, a farmer near Leyburn, appears to find justification for his barbarity in what he alleges to be the fact—and he brings forward several witnesses to confirm his statement—that the custom is practised in Scotland. A similar case was tried in Dublin about three years ago, and a verdict obtained against the offender, after a lengthened debate, in the course of which testimony was borne by numerous witnesses to the cruelty of the practice. In the hope that it may stimulate to an investigation, we beg leave to cite a portion of the evidence given on that occasion by Professor Spooner, President of the Veterinary College, London. It is reported as follows :—

"I have said that I consider this to be a very gross act of cruelty, and for this reason : that the horns of oxen are unlike those of the deer species. They have a large proportion of bone growing out from the bone of the head, and that was surrounded by a heavy sensitive structure, so that, to cut the horns, they had to go below where it was simply horny, and the animal

had to suffer great pain. The nearer the operation was performed to the skull the greater the suffering. That bone was hollow—that is to say, it had not one single horned cavity—but it had several cells which extended into the head, though not to the brain, but close to it. These cavities were exposed by the removal of the horns to the air ; and as they were lined with a delicate sensitive membrane—there being besides a delicate sensitive covering outside—great suffering must be caused. The cavities were never intended by nature to be exposed to the air, which brought on an inflammatory condition. These cavities were very apt to be inflamed, and the inflammation was very likely to be extended to the membranes of the brain, causing madness, lockjaw, or other dangerous results. This operation is one of the most painful and unwarrantable that could possibly be performed on cattle."

Such is the evidence of a competent authority to the cruelty of the system ; but as it is one of trickery also—the object being to pass off the animals as polled cattle, and thereby to obtain a higher price for them—the operation is done by stealth. But the question ought not to be suffered to rest—the custom is not a new one, and it surely claims the attention of the Society for the Prevention of Cruelty to Animals, as well as of the friends of humanity throughout the country.

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*LANDLORDS AND TENANTS.*

THE following remarks on this subject were made by Lord Erskine in a speech at the recent annual dinner of the Clackmannanshire Union Agricultural Society. Speaking of the great value of such meetings as that which had been held on that day by the Society, his lordship said :—"They give an impulse to the energies of agriculturists by creating competition and promoting rivalry, which, if carried on in a friendly manner, is, in my opinion, advantageous. They also give members the opportunity of seeing the advance which has been made from year to year in the science of agriculture. On both these points, however, enough has been said in connexion with other toasts to-day, and I will not occupy your time by saying more about them. But I think there is another, and a still more important object to be gained by these meetings. I mean the opportunity they give to landlord and tenants, and all interested in country pursuits, becoming acquainted with each other, and of meeting

on common ground and comparing ideas on subjects of mutual interest. Gentlemen, I wish these opportunities were more taken advantage of. If they were, I am convinced there would be a much better feeling among us. There is at present a tendency amongst all parties in the country to form classes and to look at things from a narrow and selfish point of view, and I am sorry to see this feeling existing, and I am afraid spreading among the tenant farmers of Scotland. I do not, however, refer to this country in particular, because I am happy to say I believe there is less of that tendency here than in other parts of the country. Now, gentlemen, regretting as I do this state of things, I do not think the tenant farmers are to blame for it, at any rate not in the first instance. I believe we must look to another quarter for the origin of the mischief. I mean to a great number of landed proprietors who do not take a personal interest in their estates, who never go near their tenants, and who

ook upon land simply as an investment for money, and utterly ignore all the duties and responsibilities which the possession of estates entails. Now, when you see proprietors behaving in this way you cannot wonder that tenants follow the example set them, and look exclusively after their own interests as a class; and from this state of things questions in which the interests of the two classes seem to clash are constantly arising. I think it is of the greatest importance that these causes of contention, which disturb that good feeling which should exist between landlord and ten-

ant, should be removed in some way or other. On some of them legislation may be necessary, but I am convinced that if occasions like the present were more taken advantage of, and if all those interested in agriculture, or who from the possession of land ought to be so, would mix more together and exchange ideas, we should hear very little of such questions, both parties would come to see that their interests instead of being antagonistic are identical, and they would look at matters not from a narrow class point of view, but would work together for their common benefit.

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### THE SHEPHERD'S KALENDAR.\*

**JANUARY.**—The breeding ewes ought to have a plentiful supply of roots in order to give them full condition prior to lambing; for, although it is argued by many that with ewes in a fat state a greater loss is sustained from deaths, I am inclined to think quite the opposite, and that ewes when full of flesh, are much more equal to combat difficult cases of parturition than when emaciated, and lean, in which latter state they often sink. Fattening sheep and hogs are now fed on cut swedes, with more or less artificial food, as they are intended for early maturity or otherwise.

**February.**—Although it is highly advisable to have ewes full of condition when they lamb, it has been proved that if they are fed on roots exclusively up to that term, the offspring is weak and delicate; it is, therefore, prudent to remove them to grass, and gradually diminish the supply of roots, up to weaning, and substitute, say a little cake, corn, maltculms, &c., any of which appear equally to tend to develop the fetus, and therefore that which is cheapest may be selected.

**March.**—In a large flock a few cases of abortion generally precede the lambing season which is not much to be feared, as in the ewe, unlike the cow, this casualty is not at all contagious, although the same cause may be productive of several cases which are, such as fright from dogs, jaming, forcing through gateways, &c., all of which ought to be studiously avoided. Rare instances of *prolapsus uteri*, too, occur prior to lambing—these cannot be avoided, but a skilful and attentive shepherd in the majority of cases delivers the ewe with impunity. Erect shelters in different parts of the paddocks, fields, &c., into which young lambs have to be turned, by placing hurdles in the section of a V and fill them with straw or litter; these form a protection against the sharp winds which may prevail, and which are so productive of those fatal attacks of crook. About the third week in March is

the best time for ewes in this backward district to begin lambing. Having been marked in rotation as they took the ram, those which are due first should have close attention, and, if convenient, should be put during the nights in an airy house or yard with shelter, and be seen at intervals of an hour or so. In cases of difficult parturition let nature guide the shepherd, who should note the following, viz. :—Allow ample time before rendering assistance, and never attempt to extract a lamb without first having placed it in a natural position, which must be done patiently, cautiously, and dexterously. When much handling is resorted to use black oils to prevent gangrene. If the ewe appears debilitated give gruel with brandy or other stimulants with gentle purgatives. An efficient shepherd will not have triplets or pets, but will mother a third lamb or one which may have lost its mother upon a good nurse which has but one lamb. In cases of straining from after-pains give laudanum and castor oil. The stock of roots intended to be eaten on the land upon which they grew, should be so calculated that they are finished by the end of this month, so that their presence does not interfere with the operation of sowing the land with barley or other spring crops. Then arises the question, where can the remainder of the roots be most advantageously consumed? I have tried three experiments, viz. :—Firstly, on old sward, the result on which was that there was no marked improvement in the yield of grass, and unless folded and frequently changed the flock became almost simultaneously lame from inflammation, which ended in foot-rot. Secondly, on land intended for a root crop, with much more favourable issue than in the previous case, and when the breaks were littered with straw, a good crop of turnips followed, but they were much more unsound than others grown and manured in the ordinary way either in winter or at the time of sowing. Thirdly, on wheat, the results of which I have found to be more satisfactory, but which, by the way, should be grown studiously for this object†

\* A paper read before the Boroughbridge Agricultural Society by the Secretary, Mr Thomas Scott.

—viz., on light soil, and, if not, upon poor land after say oats or barley, the latter I prefer. In this case the fold should not be too large and the flock removed once a day.

*April.*—My notes for the foregoing month with respect to ewes apply also to this. In case of twins where one lamb is stronger than the other, muzzle it at short intervals, so that the weaker one may have its share of milk and consequently become a match for his fellow. In fine weather dock, castrate, and flock-mark the lambs at from three to six days old, house for a couple of nights, apply paint on the necks of the *twinn* lambs as a safeguard from foxes, and turn away the ewes with singles into an ordinary pasture, but those with pairs should have a good pasture, or in addition to a middling one be allowed mangolds, a little corn or cake mixed with chaff, maltculms, &c. During this month a great saving in wool is effected by keeping the ewes free from doddings, which the young grass necessarily occasions. Mangolds often form part of the food of the sheep during this month, and they may be given with impunity to ewes, but not so with males, for when given *ad libitum* they cause an accumulation of sandy matter in the region of the bladder, which, if not quickly remedied, soon terminates in death.

*May.*—Ewes with twins should have cake so that the lambs may acquire a taste for it, and when they begin to eat it freely, it should be given in an enclosure into which the lambs only have ingress. In this month summering or pasturing may be said to commence, and I will here urge the necessity of frequent change of pasturage, and where the flock or a portion of it occupies but one field of clover, &c., it ought to be divided so as to admit of change so natural and beneficial to animals of the sheep kind in which change appears to be an innate principle. Water, too, especially to ewes giving suck is indispensable. Rock-salt ought to be placed within reach of sheep all the year round, as it tends to keep them healthy. Too much cannot be said against early clipping, the disadvantages are so great and the advantages so small, especially in this cold climate. Why should we be the first to divest our sheep of their clothing when it has been proved that a sheep will, when shorn in cold weather, loose several pounds of flesh per week, and by this injudicious practice ewes giving suck are almost deprived of milk? I presume that such folly is kept up because in this district is held the first wool fair of the season.

*June.*—The flock throughout should now be dipped, to secure the destruction of vermin on the skin, whilst the wool is short; amongst the numerous composition sused for this purpose, I have found the glycerine to answer best. About the end of this month lambs may be weaned, when a better pasture can be afforded them, and they rest and fare better than with their dams. Cast ewes are now put on good pasturage, with cake, &c., and forced as quickly as possible, so that when ripe they can be mixed off with a parcel of

young sheep, and consequently fetch a higher price than when sold as ewes in one bargain. Stock ewes from this to the beginning of October should perform the office of field scavengers, by cleaning up all over-eaten pastures, paring down any rough swards, &c.; should be laid rank on the ground, and cost very little in keep.

*July.*—In woody districts flies are now very troublesome, and their constant teasings interfere much with the quietude and well-being of the sheep. The flock, therefore, during this and the rest of the summer months should occasionally be closely packed in a pen, and have a sprinkling of a mixture of spirits of tar and sulphur from a garden watering-can, and their heads dressed with a similar mixture of thicker consistency, which is less heating, and, therefore, preferable to caps. These applications will ward off the flies, and contribute materially to the animals' comfort, and leave them to graze in peace. During this and the following month lambs require the especial vigilance not only of the shepherd but of his master, for it is a difficult matter, in the absence of a second crop of clover, or some such luxurious herbage, to keep them progressing and healthy up to the time of placing them on turnips, and too much attention cannot be paid to the pasturage, change of food, &c., for a few days on an over-grossy old seed or pasture field may cause scouring, and otherwise so derange their weak and sensitive stomachs that months may elapse ere they again begin to thrive, and even serious losses from death have too frequently resulted from this and kindred causes.

*August.*—Stock ewes should now be upon inferior pastures, and cost as little as possible. As pastures, whether permanent grass or clover, now deteriorate in quality feeding sheep should have a little extra artificial food, and also frequent change of pasturage. Lambs ought now to be placed on clover or grass aftermath. During the busy season of harvest the flock too frequently is neglected, and should therefore be dipped just prior to the commencement, in order that there may be less risk from maggotting and loss of condition from fly-teasing.

*September.*—Feeding sheep and lambs should now be put on turnips, some of an early sort having been proved for them. It is customary, and strongly advocated by many flockmasters, that roots should be cut from the first day. Now, after frequent tests, I have found that on white or other soft sorts, it is as well to let them gnaw the turnips, for in this way they sooner acquire a relish for that which they at first have a decided dislike to.

*October.*—So that lambs are not dropped before there is a promise of grass—say the third week in March, the ewes ought to receive the ram about the third week in October, a fortnight both prior to and after which they should be allowed a liberal supply of rape, mustard, or roots, so that they may be in an improving condition, which will ensure a heavy crop of lambs, and I think this is further secured by

“stocking,” which is at all times safe and economical. As so much diversity of opinion exists as to the most profitable and suitable breed of sheep for this district, and as our subject does not deal with the breed but with the management of sheep, I will not venture on this head ; but merely add that, after upwards of twenty years’ experience, during which time I have tried several distinct breeds and crosses, I have found upon my farm that Leicesters can be laid much thicker on the ground, a much greater quantity of both mutton and wool to the acre than any other breed ; the only drawback that I have observed is, that they are light milkers, and, therefore, not adapted for purposes of selling lambs off fat to the butcher, or as stores in autumn.

*November.*—Assuming that the soft turnips are finished, and that the feeding sheep and hoggets are now on swedes, which during this and the following months should be lifted, and that portion which is intended to be consumed on the land should be pitched or carted into small conical heaps, of about one-and-a-half ordinary cart loads each, formed at equal distances—*i. e.*, if the land is of uniform quality throughout the field ; but, if the soil should vary materially, then the heaps should be dispersed with due regard to this, so that the succeeding grain crop should vary as little as possible, and, if cake or corn is given, the troughs should be placed on the poorest part of the field. In storing the root crop, the distance at which the rows of heaps should be placed ought to be regulated by

the magnitude of the flock, so that they pretty well occupy the distance from row to row, and the straw which has covered the preceding row of heaps should be nicely spread over the ground on the opposite side of the break to that on which the troughs must, for the sake of convenience, necessarily be placed, in order that that portion may be equally as well manured as the opposite side. In the days of cattle plague, when it was a difficult matter to get straw converted into manure, I used that article liberally for littering the breaks, with great advantage to the succeeding crop. Whilst on this subject, it may not be out of place to allude to the practice of wintering sheep in yards, although the system seems somewhat unnatural. When, unfortunately, obliged to adopt this plan, I found that sheep were disinclined to leave the yard when allowed to do so, that they consumed much less food than when in the fields, and that they made mutton rapidly ; but the great objection to this course was the difficulty in keeping them sound. Manure made under sheep is of uniform and superior quality.

*December.*—The treatment of the flock generally will not differ much from that of last month. The ewes may be allowed to range over swede land, now cleared of roots, and feed upon the tops, saving the expense of carting, which at all times looks to me injudicious management. During stormy weather, give cotton or rape cake, whichever is cheapest, for I have found them of about equal value for feeding or milk-producing purposes.



## Farm Engineering.

THE increased and increasing number of accidents, many of them fatal to life, all of them more or less destructive to property, which have characterized the use of boilers of steam-engines in rural districts, make it a matter of very considerable importance that those who have them should know best how to use them, so that they will at once secure economy and safety in working. Not at present to go into a review of all or any of the theories which have been promulgated from time to time as to the cause of boiler explosions, some of them very fanciful, and obviously erroneous, all of them more or less conjectural—since, in a matter in which so many occult causes exist, conjecture is all that is left us—it will be sufficient for the purposes we have in view if we state here that *the* causes of boiler explosions arise mainly from, first, “faults in the original construction of the boiler,” and, second, “faults arising from the carelessness of their attendants.” However much may be the divergence of opinion which exists amongst authorities as to the occult causes of explosion, there is none as to the fact that boiler explosions would be less frequent—if, indeed, they would ever occur—if they were originally well constructed, and if they were carefully attended to in working.

It is quite obvious that to go into detail in the matter of safe construction of boilers would be more in keeping with the requirements of a journal devoted to the interests of practical mechanism than this is; we shall, therefore, devote our Note chiefly to a consideration of those points which are concerned with the careful attendance upon boilers while working. It will not, however, be amiss to give a hint or two as to the most recent development of boiler engineering, in the direction of ensuring safe boiler construction. And per-

haps the most remarkable feature of recent practice is the return to the use of *cast-iron* in place of wrought or malleable in the making of boilers. Not here to enter into detailed statements as to the relative value of cast and wrought-iron for boiler-making purposes, it is sufficient to state that cast-iron stands the action of heat and flame very much better than wrought-iron; and it also resists more completely the corrosive action of water. These facts have for long been known to practical men, but the difficulty was to obtain sufficient strength to resist the expansive force of the steam with a moderate degree of size and thickness, and consequent weight. The difficulties surrounding the subject have, in the opinion of the best authorities, been overcome and obviated in the most recently introduced “hollow sphere,” or Harrison boiler, so called from the inventor, an American engineer; the principal feature of which was the result of a great number of experiments instituted to ascertain the best form in which to use cast-iron. As will be

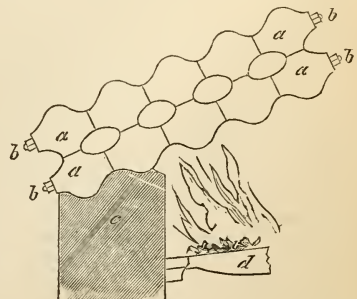


Fig. 10.

seen from the engraving in fig. 10, the “boiler” so-called is made up of a series of “hollow cast-iron spheres” *aa*, joined together by hollow necks, and strung, so to say, upon

a tension-rod or bolt of wrought or malleable iron *bb*. The diameter of each sphere is 8 inches, the thickness of the metal three-eighths of an inch, and the internal diameter of opening of the neck 3 inches. Each sphere is by the inventor termed a "unit," and is connected with its neighbour "unit" or "units" by the hollow neck which is provided with a socket and shoulder, so that a steady as well as close contact is secured, and round the joint thus made a steam-tight iron cap is placed. What are called "slabs" are made up of a definite number of units, all held together by the wrought-iron rods of bolts, and each slab forms a "vessel" containing water and steam, both of which can circulate freely throughout the whole range of units or spheres of which the slab is formed. The slabs may be in any number, according to the evaporative powers of the boilers required; and are placed side by side in a furnace, and connected with the feed-water pipe at bottom, and by a steam pipe at top. The water-level is so arranged that about two-thirds of the spheres in the slabs are filled with water, the remaining third acting as the steam space. The slabs are not placed on the level, but, as shewn in fig. 10, at an inclination. This enables the water to be completely drained off when the boiler is blown out, and has the further advantage of bringing the greatest number possible of the water-filled spheres, directly over the hottest part of the fire, leaving the greatest number of steam-filled spheres at that part of the furnace where ebullition would be least active. The principal points of excellence of this form of boiler are these—*first*, its almost absolute safety; for while the spheres have actually stood the test of 1500 lb. to the square inch, the practical limit may be stated thus, that the "factor of safety" of a boiler of the best construction of the Lancashire form, with a pressure of 50 lb. only on the square inch, is the same as that of a Harrison boiler at 250 lb.—a pressure to which, at least, no agricultural boiler need ever be worked at. *Second*, although free almost entirely from the possibility of an explosion, the Harrison boiler, if worked at a pressure greater than it

ought to be subjected to, acts throughout as its own safety-valve; for, on great pressure, the wrought-iron bolts or rods are so stretched that the connexions or joints between the spheres are so opened that the pressure is at once relieved by the steam or the water escaping. A Harrison boiler may empty itself within such circumstances, but it can scarcely be said to be liable to "burst," involving by this term all the disastrous consequences attendant upon the bursting of a large boiler of the ordinary construction. The *third* point of excellence is the extreme portability of parts. A *fourth*, the readiness with which any part of a boiler can be renewed; and a *fifth*, the great advantage of *adding to a power* of a boiler by simply increasing the size or number of the "slabs." But to these advantages we may add a *sixth*, and this not the least important. All those who have had anything to do with steam boilers know the dangers and inconveniences arising from the incrustation of boilers. Now, in the Harrison boiler, no—at least very little—deposit of matter or "scale," as it is called, takes place; all that is necessary to be attended to is to blow out the boiler once a week—that is, if in regular work—and the spheres will keep themselves quite free from scale. It is needless here to take up space by an inquiry into the causes of the self-cleansing action of the spheres: it is sufficient to know that they are always operative, so that even with the use of very foul water, which would infallibly scale or encrustate wrought-iron boilers, no scale or deposit is made in the spheres of the Harrison boiler. Such is a brief description of the latest form of boiler introduced, and which, according to a very eminent authority, constitutes one "of the most remarkable discoveries in boiler engineering."

We now turn our attention to the care requisite to ensure safety and economy in the working of boilers. An absurd Yankee story is told of a man, in the course of one of those steambot races so common in the western waters of America, volunteering to sit upon the *safety*-value—a dangerous duty shirked by all on board—judging as he said, that

from its name it ought to be the safest place. Very much in name only, do we fear, that many of our safety-valves are "safety." In the reports of the Manchester Steam-Boiler Association there is scarcely more frequent reference made to any point than to the dangers arising from non-attention to the safety-valves of boilers so as to ensure their being in working order. They are found

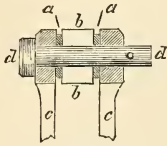


Fig. 11.

overweighted, tied down to prevent their rising, and left for long in such a neglected condition that they stick in their seats, or the lever is found to stick in the joints. The last is a very common occurrence, and the most practical remedy we know of is to have *brass* washers (*a a*, fig. 11) inserted between the sides of the lever *b* and the standard *c c*; while a brass pin (*d d*) should be passed

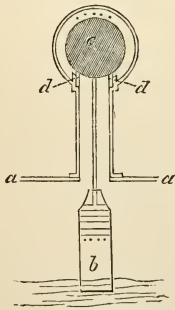


Fig. 12.

through all in place of a steel or iron one. The brass being free from corrosion, the lever will not stick in the joints from rust; but the attendant should nevertheless be most careful in seeing that the safety-valve does work. In Nasmyth's safety-valve (see fig. 12) there is little danger of the valve *c* sticking in its seat, as it is spherical, and rests upon a conical seat, so that the contact is reduced to a mini-

mum; and by the further addition of a sheet-iron flap (*b*), which is being continually acted upon by the surging boiling water and steam, the valve is kept in a continual state of motion in its seat. No overweighing of the valve is possible, as the valve is weighted inside the boiler, and externally it is surrounded by an

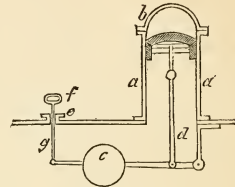


Fig. 13.

iron cap, as in the engraving, pierced with holes through which the steam escapes. A valuable feature of this valve is the direct action of the weight upon it, without the intervention of any jointed levers, which, as already pointed out, are so apt to get out of order. In fig. 13 we give a drawing of the arrangement of Mr Fairbairn, the eminent engineer, by which all tampering with the weight of the valve is prevented, and by which the valve can be lifted now and then out of its seat to prevent sinking. This good in many respects is so far defective, as it depends upon the care of the attendant.

The careful attention of the stocker or tender to the *supply of water to the boiler* is absolutely demanded if safety is required. The appliances to guide him in his judgment in this important department of boiler management are numerous—in many cases too numerous. They may be reduced to three—first, the "float or water-feed apparatus and indicator;" second, the "water and steam-cocks or gauges;" and third, the "water-glass gauge." There is a by no means uncommon notion afloat that if any one of these appliances is alone used, that that is sufficient. Now, let the reader take it for granted that all three are needed in a good boiler designed to be worked safely. The "feed apparatus" of boilers vary much in arrangement; indeed, the name is legion, so many inventors having brought out this and that form. Appliances

of this class should not, however, be trusted to alone as indicative of the condition of the water in the boiler, but a special indicator should be fitted to every boiler. A very

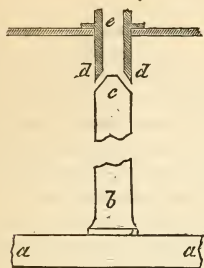


Fig. 14.

common one is shewn in fig. 14, where the rod *a* is connected with a float which rises or falls with the varying level of the water in the boiler. This is connected at its upper end with a chain which passes over a wheel *b*, and is supplied at its other extremity with a counterpoise weight *c*. As the wheel moves partially round, its index or finger point *d* shews how the water level is in the boiler. This apparatus, however simple, is not to be relied upon at all times, as the rod is apt to stick in the stuffing-box *e*. We know of no form of water-indicator so efficient as that

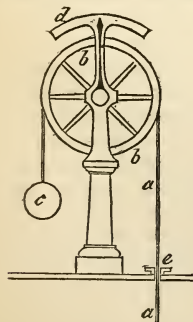


Fig. 15.

known as Haley's, illustrated in fig. 15. The copper float *a* is screwed upon a hollow spindle *b*, and to which steam is supplied through a hole at its upper end, and from it to the interior of the float *a*, so that the pressure is equal within and without. As soon as the

water level falls, the float falls with it, and the conical end *c* drops out of its seat, and allows the steam to pass up the pipe *d*, and acts upon a whistle placed in *c*.

However efficient a form of feed-apparatus may be, it is obvious that if not attended to it might as well not be there; rather, indeed, it would be better absent, for then no trust could be placed in it. Now, suppose that the attendant screws down the handle of the feed valve, closing it and admitting no water to the pump, the pump might continue to work well, yet no water be supplied to the boiler. The reader may here say that surely no man could be so stupid or blameworthy as to do this: as stupid and as blameworthy things as this are done every day, and being done now may be done again. Let the attendant, therefore, be sure that the hand-feed valve is open. Further, let him be sure that the rod *a*, fig. 14, is not sticking in its stuffing-box *e*, for if so the feed will not act. Yet more, he must be positively certain that the force-pump is passing water to the feed-pipe: it may be working obviously enough. This may arise from the "clacks" or valves sticking in their seats, or the pump not drawing. The best form of valve for a pump is the "ball clack," which is not so apt to stick as the conical valve. A good way to start a sticking valve in a pump is to give a few blows with a wooden mallet to the case. To ensure a pump drawing water, it is a good plan to have it provided with a "pet cock." This is a small stop-cock added to the pump and the pipe, by opening which any steam that may have gained admission to the body of the pump may be allowed to escape; or by means of which water may be passed to the pump to enable it to draw, should it have ceased to work. All these remarks shew the importance of attending to all the appliances of a boiler. It is not enough to know that one is working and the other not—the whole of them must be working in conjunction. But we have not yet exhausted the list of those appliances: having, however, exceeded present space, we must leave what we have further to give for a future Note.



## Summary of Agricultural Events.

### THE SEASON AND CROPS.

A CONSIDERABLE quantity of rain has fallen since the commencement of the month, which has had the effect of reviving the pastures to a wonderful extent, and pushing on the turnip crop, so that even seed, which had lain dormant for some time, has now come up in many instances. A heavy, or even a good crop of turnips is not, of course, to be expected from such late growth, but if we have favourable weather during the remaining part of the season the crop will be of great service for sheep. Harvest operations met with a check from the rains, and we regret to say that there has been a good deal of sprouting where the crops were not secured. The wheat crop, and also barley in several places, is turning out well, remarkably good, in fact, but oats are generally short. The potato crop will be light, and there is some reason to fear a second growth in consequence of the rains. One of the features of the season, caused by the great heat and long drought, has been the unusual prevalence of fires in plantations, moors, &c., some of which have proved very destructive. Everything was like tinder, and it only required a smoker's match to be carelessly thrown aside to set the grass, heath, and trees on hundreds of acres on fire.

### THE GRAIN TRADE.

July closed with falling markets, and although with the beginning of August steadiness did not settle down in the corn trade, yet the month had not advanced far when a reaction in the value of wheat took place, amounting to about 2s. per quarter, which was lost, however, at Mark Lane on the 17th, and the country markets which followed also shewed a similar decline. The quality of the new samples has been remarkably good, 66 lb. per bushel being nothing unusual. Oats and barley have been rising in value.

### THE LIVE STOCK TRADE.

The state of the pastures put a total stop

to trade in store stock, and the lamb fairs held in the early part of the month were, therefore, excessively dull, with a decline in prices ranging from 5s. to 7s. 6d. a-head, and even more. Store cattle were unsaleable, and some lots of Irish cattle brought over to England for sale were returned in consequence of the entire absence of demand. The improvement of the pastures consequent on the rains which have fallen of late have tended to improve matters, and a livelier demand has been experienced at some recent fairs. The top prices of beef and mutton have ranged as follow:—At London, beef, from 3s. 10d. to 5d. and 5s. 4d. per 8 lb.; mutton, 4s. 4d. to 5s. 4d. per ditto. At Newcastle, beef, from 7s. 6d. to 9s. per 14 lb.; mutton, 6d. to 7d. per lb. At Edinburgh, beef, from 7s. 6d. to 9s. per 14 lb.; mutton, 6d. to 7d. per lb.

### THE WOOL TRADE.

At the London wool sales competition has been rather quiet, and inferior descriptions 1d. to 1½d. per lb. lower. There has been a tone of confidence in the home trade, especially with regard to good wools; at the same time trade is quiet.

### THE HEALTH OF STOCK.

The principal event in connexion with this subject has been the arrival of large numbers of sheep infected with small-pox at the port of London; and 3700 were condemned to be slaughtered on the spot. All the London wharves have been declared infected. Other cargoes have arrived in suspicious condition, the disease being very general in Holland.

### AGRICULTURAL SOCIETIES.

The show of the Highland and Agricultural Society at Aberdeen was very successful, especially with respect to the exhibition of short-horns, polled cattle, sheep, and implements. Among the shows held during the month were those of the Yorkshire Society at Wetherby, of the Banffshire Society at Cullen, and of the Queen's County Society at Maryborough.

## The Garden.

### CEMETERY GARDENING.

IT has been asserted that a nation's progress in civilization and the arts can be traced by its monumental decorations, and the care bestowed upon the last resting-places of its dead. This saying, however, must only be admitted with wide reservations, for if accepted in anything like its literal sense it would go to prove that the nations of Western Europe, notwithstanding their boasted civilization, actually remained in worse than savage barbarity till the present century, inasmuch as not only the Mahometans and Chinese, but even the most untutored and recently discovered tribes of New Zealand and North-west America cared more for the graves of their departed than did the most enlightened nations of Christendom. The era of cemetery gardening in Christian Europe may be said to have been inaugurated at Paris in 1804, when the extensive gardens and pleasure-grounds on Mount Louis, which had belonged to Pere la Chaise, the favourite confessor of Louis XIV., were converted into a burial-ground, intended at first chiefly for those who could afford to purchase a grave and rear a monument. The Cemetery of Pere la Chaise has always been looked upon, not only as one of the grand sights of Paris, but also as exhibiting the *beau ideal* of what a cemetery should be, and it has greatly influenced foreign visitors, by stimulating in them a taste and desire for cemetery improvement in their native lands.

In our own country comparatively little attention was devoted to cemetery improvement till after the first quarter of the present century, prior to which most of our city-burying grounds were foul pestilential areas, crowded with uncared for monuments, and often so frequently upturned, that, even

the most obnoxious of rank growing weeds, could scarcely sustain an occasional appearance of irregularly scattered verdure. Our country church-yards were interspersed with unsightly mounds, and covered with the coarsest of grasses, nettles, and other vile forms of vegetation, while not unfrequently they were desecrated by depasturing cattle, sheep, or goats; and so little regard was had for antient monumental stones, that grave-diggers frequently sold them to be re-dressed for new owners, converted into hearthstones, or applied to other purposes for which they or their friends might find them useful. General attention became at length directed to cemetery improvement, by the horrid revelations made in the report of a Government Commission, and by the Cemetery Bill, which was brought into Parliament in 1842. About this time also was published the "*Necropolis Glasgoensis*," a most admirably written pamphlet, which did great service in the cause; and in 1843 appeared "*The Principles of Landscape Gardening applied to Public Cemeteries*," by that most voluminous writer, the late John Claudius Loudon (the last of his many useful publications, issued only a few months before his death), in which he gave very full details regarding the proper laying-out, planting, architecture, and after management of cemeteries. For many of the views and recommendations promulgated in this publication, its author incurred a good deal of censure and ridicule; and not a few of his schemes were stigmatized as being extravagant, visionary, and Utopian, although most of them have since come to be very generally approved of and acted upon. Among his opponents were a then rather numerous class, who had been accustomed,

from infancy, to associate grave-yards with all that was gloomy, hideous, and repulsive; instead of considering them places for pleasing contemplative resort, and who looked upon the introduction into them of anything like gardening as a species of modern sacrilege. Such could have no sympathy with Mr Loudon in the following opinion, which was deemed among the wildest of his innovating allusions:—"A church and church-yard in the country, or a general cemetery in the neighbourhood of a town, properly designed, laid out, ornamented with tombs, planted with trees, shrubs, and herbaceous plants, all named, and the above, properly kept, might become a school for architecture, sculpture, landscape-gardening, arboriculture, botany; and in those important parts of general gardening, neatness, order, and high keeping." Some residents in obscure country places, where cattle and sheep have still the run of the church-yards, and where in consequence, neither flowers can be planted to bloom on the graves of departed loved ones, nor ivy trained to cover the bare stone walls, may still be found disposed to deride the opinions here expressed. But they will be acquiesced in by all who have the privilege of frequenting modern city cemeteries where most of Mr Loudon's ideas are now carried out. Such as in

#### THE DEAN CEMETERY AT EDINBURGH,

situated in the western suburbs of the city, on the picturesque banks of the once limpid and salient, but now sewerage- and factory-defiled Water of Leith. The principal portions of these grounds command views of the leading features in the romantic scenery for which the Scottish capital has always been famous. Near by, the towering Castle rock rears its embattled summit; more distant Salisbury Crags present their rugged western face, backed by the lion-couchant ridge of Arthur's Seat, while the vistas in other directions are terminated by the Pentland Hills, Corstorphine Hill, the summits and southly slopes of "the Kingdom of Fife," the fertile hills and plains of East Lothian, and the wide-expanded Firth of Forth, with its

islands "like emeralds chased in gold." Nor are the prominent features in the architecture of the city less conspicuous, for while the more objectionable of these are hidden by the surrounding trees, openings have been formed through which most of the city spires can be seen, as well as some of the finest examples of street dwelling-house architecture; and most of those many palatial "hospitals" for charitable education, for which "Modern Athens" is celebrated beyond all other cities.

On a recent visit to the Dean Cemetery we noticed the following particulars in relation to the gardening department of its management. We may premise that it consists, first, of the burial ground portion, and, secondly, of a steep river bank, covered with old trees, having a flattish belting along its base, which may hereafter be partly devoted to cemetery purposes. In the first, or cemetery portion proper, the whole was in excellent keeping, the grass being short and neatly edged; the walks free from weeds, and well compacted; while the flowers and the earth-surface among them were all that could be desired in the best-managed flower-garden. As should be the case in all such establishments, there is here a small greenhouse for the wintering of tender plants to be planted out in summer, and a small piece of nursery ground for the propagation and rearing of hardy kinds. Tender plants are not, however, allowed to predominate in summer; hardy ones, and especially such as show in winter, being preferred. The collection here catalogued contains about 1500 names of hardy plants, of which we can only merely mention some of the most marked kinds. Among trees and shrubs, the leading conifers are well represented, and among them are large handsome specimens of Deodar cedar, the Weeping Himalayan spruce, *Wellingtonia gigantea*, *Cupressus Lawsoniana*; *Abies Clanbrasiliana*, fully 4 feet high by 5 feet in width, &c. Those who affirm that the mistletoe will not grow well in Scotland would be surprised to see how it thrives and spreads itself here, where we observed it on all the following trees—the American weeping lime, crab apple; common

double-flowered cockspur ; tansy-leaved, and other hawthorns ; the mountain ash, and the almond—the latter shewing a very marked appearance in the size of its leaves and the robust habit of its growth. A very large tree of Waterer's hybrid Laburnum, in full flower, was a splendid object ; and another of the purple flower Laburnum had, in addition to the frequently observed sporting vagaries of this plant, a fertile raceme of creamy white flowers—a large plant of what may be termed a feathery-leaved weeping laburnum—had a fine effect ; although of considerable age, we were told that it had never flowered, and we have not seen it either catalogued or described. A deeply-lacerated leaved cherry (not the *Cerasus serrulata* of Don) formed a handsome as well as a pretty drooping branched little tree ; and conspicuous among its green associates was a fine specimen of the hoary-leaved weeping-branched *Pyrus salicifolia*. On a wall, having a southern exposure, a very large plant of *Escallonia macrantha*, in full flower, was a splendid object, and near to it a downy-leaved *Eurybia*, fully 8 feet in height, and thickly covered with white daisy-like flowers, was not less attractive. The common China rose, as remaining longer than any other in flower, is largely employed, more especially for being trained plinth height around the bases of the principal monuments ; and the Bride of Abydos, white China rose, is used in like manner where its almost snowy whiteness is deemed more emblematical. Among bulbous flowers, one or other of a very complete collection of lilies here keep up a display with their showy blooms from early spring till ending autumn. On a single 6 feet high stem of the gorgeous *Lilium auratum* we counted no less than thirty-five opening blooms, and the yellow flowers of the tall and graceful *L. monadelphum* were conspicuous in various places. *L. Browni*, one of the showiest of the tribe, thrives well ; but, after blooming, it usually takes one year to rest, without putting up a single leaf, a peculiarity which may occasionally lead to its destruction from its owner supposing it to be dead while it is only sleeping. Many kinds of Lupines were conspicuous by the size and

elegance of the spikes ; but all were far surpassed by an unnamed tall white and dark pinky coloured sort, with spikes fully 18 inches in length, and a fine plant of the yellow-flowered shrubby *Lupinus arboreus*, recalled early recollections associated with pre-bedding-out times, when Lupines were universal favourites.

It is, however, in the smaller growing, or, as they are usually termed, Alpine plants, that visitors possessed of botanical tastes will take most interest. Of these the permanent foliaged Saxifrages, and especially the thick rigid-leaved section of them, are employed with excellent effect as dwarf vegetable basements around the monumental stones ; Sedums, *sempervivums*, and other like habited plants being also used for like purposes, as well as for forming edgings ; while over particular graves were formed neat parallelograms with carpet-like coverings of *Araneria cæspitosa*, *Sedum lividum*, and others, grass or other intermixture being entirely excluded. Of plants in vases one of the most suitable as well as beautiful is the *Saxifraga coronopifolia*. *S. Nepalensis*, belonging to the thick-leaved section of this genus, was a prominent object, with its many 2 to 3 feet high branching spikes, densely clothed with prettily-spotted white flowers. *Sedum acre variegata*, and *S. a. grandiflora* were also conspicuous vase plants, as were a good many belonging to this last-named genera, as well as to that of *Sempervivum*. Many of the burying-grounds are surrounded with stone or marble edgings, along the inner sides of which, as well as between them and the stone monuments, and immediately in front of the latter, are planted specimens or masses of many rare alpine, among which the following were conspicuous at the time of our visit :—*Anemone thalictroides*, with pretty double white flowers ; *Araneria montana*, *A. laricifolia*, both with large showy white flowers ; *Coronilla Iberica*, *Erodium hymenodes*, which usually blooms throughout nine months in the year ; the silvery-leaved *Geranium argenteum*, *Hutchinsia alpina*, the pure white large-flowered *Iberis corifolia* ; *Linum flavum*, with its masses of brilliant yellow bloom ; *saxifraga granu-*



*lata*, fl. pleno; *Sedum farinosum*, *Vicia argentea*, *Viola striata*, *V. Canadensis*, &c.

In connexion with the cemetery walks, others are continued throughout the thickly-wooded banks of the Water of Leith, and under the fine old trees, with which they are thickly shaded, ferns and other native plants peculiar to such situations, as well as yews, hollies, and other suitable evergreens, are now being largely introduced; and were we to suggest any further improvements, the first would be the erection of a substantial retaining wall along the water edge, planted on the cemetery side with a yew hedge to conceal the impurities of the stream. Naming at least one specimen of each plant in the grounds with sufficiently conspicuous, but not obtrusive labels, would also be an improvement, and the plants which form the badges of the Highland clans might be more frequently planted on the graves, as is often done in the British American colonies, and others where clansmen rest far from the homes of their fathers. Thus, on the grave of a Buchanan might be planted a birch, an oak on that of a Cameron, a holly on a Drummond, and a Scotch fir for a M'Gregor; while the dwarf growing badge plants might be used to cover the whole surface; as a bed of Sweet gale for a Campbell, one of whortleberry for a Grant, the cross-leaved heath for a Macdonald, the common heather for a Macdonell, and the crowberry for a M'Lean.

It is no part of our present purpose to take notice of the sepulchral monuments which adorn the cemetery, and point out the spots where lie its most illustrious dead; but no visitors who take any interest in either natural history or literature will pass without contemplating a somewhat central and rather unpretending group which mark the graves of Dr Robert Kaye Greville, Dr John Fleming, Edward Forbes (naturalist), John Goodsir (anatomist), Dr John Knapp, Wm. Edmonstone Ayton, and John Wilson, Blackwood's "Christopher North."

We cannot conclude these remarks without mentioning that, to the plant taste of the superintendent, Mr James Rae, all interested are indebted for the successful cemetery gardening at the Dean. Mr Rae is a thoroughly practical gardener, and in his early career he acquired an intimate knowledge of his business, as well as of plants and plant culture, in several leading gardens and nurseries, when it was more the practice than now for young gardeners to study botany, and to make themselves acquainted with native as well as with hardy exotic plants. His success in his present sphere of usefulness affords a good argument in favour of employing plant-loving gardeners as cemetery superintendents, in place of others who, as is too often the case, are devoid alike both of gardening experience and plant knowledge.

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#### *OLD PLANTS THAT ARE NOW UNDESERVEDLY NEGLECTED.*

THAT proverbial fickleness of fashion, which too often prefers novelty to intrinsic merit, has now almost driven from our flower-borders and greenhouses many plants which were held in high esteem by our forefathers, and which would equally delight the eyes of their descendants could they only be led to believe that they are new. In proof of this we could name one who held a first rank place among practical gardeners, and who thought that he had got a foliage bedding-plant treasure, among some others which he had carefully reared from Nepal seeds, until it was brought to his recollection that it was only the red-leaved Orache, which in the days of his apprenticeship had a place annually allotted to it in the kitchen garden. And a young nurseryman, who had picked up a stray plant of the *Blitum capitatum*—the seed of which had probably lain long in a garden rubbish-heap—became convinced that his fortune was to be

made from this wonderful plant, when he saw its spreading stems thickly clothed with beautifully clouded strawberry-like fruit, so unlike anything that he had either seen or heard of; but his hopes were cruelly blighted by "an older hand," who told him that the plant was only the Strawberry-blite, once a common garden annual, the beautiful but insipid fruit of which was formerly used by cooks for colouring puddings.

On lately visiting a number of gardens, embracing all grades, between the cottager's kale-yard and the gardens of royalty, we took note of many kinds of good old plants that are now undeservedly neglected, and which we met with occasionally in the smaller cottage gardens, most frequently in those of plant-loving amateurs, and more rarely in what are termed first-class gardens. And we now give the following extracts from our notes, which must be deemed more illustrative than exhaustive, of a subject which is within the range of every flower-grower's observation, and may be widely extended by any who are desirous of cultivating those plants which are really beautiful or desirable, without being guided in selection by merely considering whether they are old or new.

Of strikingly showy plants, which are especial favourites among cottagers, and the finest specimens of which are usually found under their cultural care, none stands so prominent as the *Onopordium Acanthium*, usually, although according to some improperly, termed the Scotch thistle, but by ancient authors named the Illyrian cotton thistle (*Acanthium Illyricum*), implying that it may have been of foreign extraction, although now admitted as a member of the British flora. And the following descriptions of which, by "old Gerarde," conveys a better idea of its appearance than is done by the more strictly scientific characteristics laid down by modern authors—"From the root ariseth a very large and tall stalke, higher than any man, rather like a tree than the annual growth of an herbe or plant; his leaves are very great, far broader and longer than any other thistle whatsoever, covered with an hoarie cotten or downe." Were a white-flavoured variety of this showy-

est of thistles obtained, the charm of novelty which would attach to it, might lead to its being more generally and justly appreciated. The *Carduus Marianus*—our Lady's, or milk thistle, is scarcely surpassed in the beauty of its white and green foliage by the finest white splashed *Caladiums* of our stoves. The majestic specimens of the woolly-leaved Shepherd's Club—*Verbascum Thapsus*—which may occasionally be seen beside rural cottages, have no counterparts in modern fashionable flower gardens, and the same may be said in relation to some of the taller growing perennial members of the same genus. Where but in the gardens of country labourers are the huge forms of double and single sunflowers to be seen in full bloom and stature? Sunflower seed, as well as the oil and feeding cake prepared from it, are now important articles of commerce; and the pig-feeding properties of the seeds, taken in connexion with the immense produce, have only to be better known in order to make the larger growing single-flowered kinds much more generally cultivated by both cottagers and farmers. Besides tall and dwarf, double and single, deep yellow and pale flowered varieties of the annual sunflower, others of more than ordinary gigantic growth have of late been strongly recommended for ornamental as well as economical purposes. It is questionable, however, if any of these will equal the dimensions stated by Gerarde of carefully nourished up plants in Spain and other hot countries, attaining a height of 24 feet in one year; or that they will even exceed the size of a plant grown by him nearly three centuries ago in his garden at Holborn, within the suburbs of London, of "such stature and talnesse that in one sommer being sown of a seede in April, it hath risen up to the height of fourteene foot, whereon one floure was in weight three pound and two ounces, and crosse overthwart the floure by measure sixteen inches broad." The common hemp (*Cannabis sativa*), occasionally grown by singing bird-keeping cottagers, along with their requisite supplies of canary seed, is a plant of singularly elegant appearance, when, as we have seen it grown by an old matron, of sufficient size to fur-

nish her with a light but strong walking stick. Hemp when so grown fully equals the finest of the now favoured greenhouse *Araliaceae*, in the beauty of its divided foliage, and by making successive sowings, its freshness can be retained till ending autumn. The tree or sea mallow (*Lavatera arborea*) is the only other cottagers' favourite plant we shall here mention, and a noble looking one it is, handsome in foliage as well as robust in habit, when seen from 6 to 10 feet high, as it frequently is in fishermen's sea-side gardens, luxuriating in the saline blasts which stunt and disfigure almost all other vegetation: a fine protection this for the more delicate plants in sea-side gardens, but being a native, as well as old-fashioned, its elegance and its usefulness are alike unappreciated.

In what may be termed the higher classes of gardens, no plant has of late years met with more undeserved neglect than that once universal favourite the *Campanula pyramidalis*, which has few equals, whether grown in the open border, greenhouse, or dwelling-room. The varieties in cultivation are the dark blue, light blue, and white-flowered, and when well grown they should be from nearly 5 to over 6 feet in height, well furnished with branches, and clothed over more than two-thirds of their height with bloom. Such plants we lately saw, growing both out and in doors, where a good selection of flowers were cultivated in a smallish-sized garden, and were especially struck with the fineness of their effect on the greenhouse stage, where, although the weather was extremely hot, they seemed by the coolness of their colours to impart a freshness which contrasted favourably with a far more pretending greenhouse in a neighbouring garden, which contained a goodly show of geraniums and other common summer-flowering greenhouse plants, but where the atmosphere was rendered intolerable by the warm colour, and strong odour of more than a dozen specimens of *Humea elegans*. As a further inducement to cultivate the *C. pyramidalis* we would strongly recommend it to hybridizers for the

purpose of procuring hybrids between it and other large showy bell-flowers. Among plants cultivated in circle and panel centres, for the beauty of their finely divided green foliage, none came up to a large herbaceous border plant of the old but rare *Astragalus alopecuroides*, which, however, was nearly approached by its border associates—*A. galeiformis*, *A. glycyphyllus*, *Glycyrrhiza lepidota*, *Liquortia officinalis*, *Vicia sylvatica*, and the silvery-leaved *V. argentea*. Many lupines, belonging to the *Lupinus polyphyllus* section, were productive of good effects by the diversity of their colour, and the abundance of their tall upright flowered spikes, but none of this tribe appeared to greater advantage than a fine wall-trained plant of the old *L. arboreus*, which, on being reintroduced some years since, had a short run of popularity, till it became known that it had put in its appearance under false pretences. Red and White Honesty (*Lunaria biennis*), those showiest of early spring flowers, which resemble tall Phloxes, but appear at a very different time of the year from them, are now so little known that an amateur lately told us he could not get an ounce of Honesty seed in any London seed-shop. Among large growing grasses, the Spanish reed (*Arundo Donax*), *Panicum latifolium*, and *P. altissimum* are now seldom or never employed for imparting an appearance of tropical vegetation by the showy length and width of their foliage, although a variegated variety of the first takes prominent position among half-hardy variegated plants. Among annuals, neither the tall and graceful white and red *Persicarias*, varieties of the *Polygonum orientale*, nor the Prince's Feather and Love-lies-bleeding, are now allowed any place; or if admitted they have no longer that careful culture bestowed upon them which rendered them elegant and attractive. As before implied, this list of too little cultivated plants might have been much further extended, but the names here given may induce some to search out for neglected old flowers, worthy of receiving renewed attention from cultivators.



## INSECTS IN PREMATURELY FALLEN FRUIT.

OF the many insects which in one stage or other of their existence feed upon the wood, bark, leaves, flowers, and fruit of our orchard and garden trees or bushes, those numerous as well as destructive kinds which penetrate, and so cause the premature falling of the young fruit, demand special attention during the summer months at the hands of careful growers, with the view of accomplishing their destruction as far as possible, and consequently lessening the virulence of their future attacks.

When a good wood-ripening and blossom-bud forming autumn is succeeded by a moderately mild winter, and a favourable blooming as well as fruit-setting spring, nature occasionally assists the requisite process of thinning, by thrusting off many of the young fruit at or shortly before the commencement of what is technically called its second or final swelling, which is equivalent to the stoning or hardening of the seed shells in plums, cherries, and other stone fruit. This thinning process, although not unfrequently assisted by insect agency, is usually looked upon approvingly rather than otherwise; but the case is very different, when at like stages of advancement thinly-set fruit is seen tumbling down till a very scanty, or scarcely no crop is left—an unsatisfactory state of things, for which the weather, blight, or lightning are usually but very often wrongly blamed instead of insects, for the destructive abundance of which cultivators are themselves very much to blame.

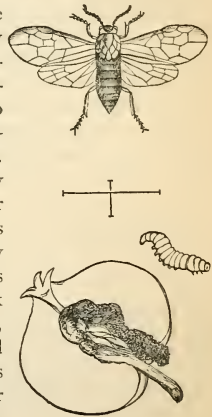
The very apparent mischief caused by leaf-destroying insects, such as the gooseberry caterpillar, the web-forming apple caterpillar, saw flies, aphidæ, red spiders, and many others that might be named, as well as bark-peeling beetles, branch- and fruit-disfiguring mussel-scales, &c., marks them out as subjects for extirpation, while the less evident, but scarcely less mischievous workings of others, secure for them an immunity which should not

and would not be accorded to them were their doings more closely investigated, and their habits better understood. Among these last insects which penetrate into, live upon, and so cause the destruction of young fruit, are much more numerous than is usually supposed, and the following examples may suffice to shew how they act, and also how they may be in a great measure overcome.

For some days in May, when the apple trees were blossoming, the rather timid apple saw-fly, *Tenthredo testudinea*, might be seen in quiet dry weather, actively flitting about, and occasionally settling to deposit its eggs within the opened flowers.

In size it is not widely different from our common house-fly, its wings are slightly tinged with brown, its body shining black on the upper surface, while the front and sides of its head, as well as the under side of its body, shoulders, antennæ

and legs are of a pale orange colour. The eggs then deposited in due time produced little maggots or larvæ of a rather pale dirty buff colour, with tawny heads, and a slender pinkish line along the back of each. These may very frequently be seen on cutting up young apples which fall in June or July, and occasionally in slightly deformed ones which are still hanging. In both fallen and growing apples they remain feeding upon the fleshy parts, till at last they eat their way out; the former then crawling into and the latter dropping upon the earth, where they form their cocoons and remain till the following May, when they,



Apple Saw-fly.



in turn, become transformed into flies, and reappear among the apple blossoms. Now, as by far the greatest number of larvæ are in the prematurely fallen fruit, that has only to be gathered up as it falls, and destroyed before the larvæ escape, and if this is regularly pursued in every year the apple saw-fly will become effectually thinned, if not exterminated. For this purpose some orchardists turn a few sheep or swine into their orchard pastures from the time the first fallings appear, till the later ones have attained to marketable size; but in gardens, as well as in many orchards, gathering will always be preferable, and then, in order to ensure the effectual destruction of their insect contents, they should be burnt, or boiled and given to the pigs. The codlin moth (*Tortrix pomonana*) may also be noticed, from its grubs affecting apples in a somewhat similar manner with those of the preceding; and although more common in continental and American, than in home-grown apples, it is by no means unfrequent in the latter, and its ravages also extend, although in a less degree, to pears. Like the apple saw-fly, the

codlin moth also deposits its eggs in May, but differs in generally choosing the calyx, or the stalk end of the fruit instead of within its blossom; and it reproduces several broods in the season, the larvæ on the growing apples escaping, and forming, when matured, cocoons in the rough bark or crevices of the tree, while those that fall do the same on dry leaves, branches, &c. It is the latter grub brood of this moth which appears too frequently in the finest foreign fruit, and it is most troublesome in dry, warm seasons, which are peculiarly favourable to the preservation of its grubs in the fallen fruit.

We are, as yet, fortunately exempt from that most destructive of American fruit pests, the Curculio or plum-weevil (*Rhynchænus nenuphar*), which, over large districts of that country, frequently causes the most flattering crops of plums, peaches, and apricots, to fall when only half or two-thirds grown; but we have the *Tortrix nigricana* and others, which have a like, though less disastrous, effect upon the same kinds of our stone fruits.

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### DESIGNING FLOWER BEDS.

MORE than a century and a quarter ago (1738), Richard Bradley, a Fellow of the Royal Society, invented a useful instrument for enabling a gardener to lay out, with ease and accuracy, those geometric flower beds which were the rage during the Augustan age of Queen Anne and the reigns of the first two Georges. Previously to Bradley making known his invention, Baptista Porta and Kirscher had given descriptions of instruments consisting of mirrors united at two of their edges, which being opened like two leaves of a book, were capable of multiplying the images of objects. These inventions or discoveries are supposed to have suggested to Sir David Brewster the idea of the kaleidoscope, which he invented in 1817; but the optical investigations alluded to are very remotely connected with the properties of the kaleidoscope; and the application of

the latter to objects which may be moveable, and situated at any distances from the observer, renders Brewster's instrument very different from, and far superior to, the simple contrivances of Porta, Kirscher, and Bradley.

The instrument, however, called the deboscope, brought out in Paris a few years ago (we think in 1860), is nearly identical with that of Bradley, the only difference being that in the deboscope the mirrors are fixed in a small box, at the required angle, while in Bradley's they are loosely hinged, and adjustable to any angle.

Bradley's invention is detailed in a bulky octavo volume, with the title, "New Improvements of Planting and Gardening, both Philosophical and Practical," and the edition we quote from is the seventh, shewing that the work must have been a popular one in its day. We prefer to give the description in the

author's own quaint language to modifying it in any degree:—

*“Description and Use of a New Invention of more speedy Designing of Garden-plats; whereby we may produce more Variety of Figures in an Hour's time, than are to be found in all the Books of Gardening now extant.*

“Since the instrument I now design to treat of has afforded some pleasure to many of my acquaintance, I have been easily persuaded to make it public. It is of that nature that the best designers or draughtsmen may improve and help their fancies by it, and may with more certainty hit the humour of those gentlemen they are to work for, without being at the trouble of making many varieties of figures or garden-plats; which will lose time, and call an unnecessary expense, which frequently discourages gentlemen from making up their gardens. In short, the charge of the instrument is so small, and its use so delightful and profitable, that I doubt not its favourable reception in the world.

“But, to proceed—We must choose two pieces of looking-glass of equal bigness, of the figure of a long square, 5 inches in length, and 4 in breadth; they must be covered on the back with paper or silk to prevent rubbing off the silver; which would else be too apt to crack off by frequent use. This cover for the back of the glasses must be so put on, that nothing of it may appear about the edges of the bright side.

“The glasses being thus prepared, they must be laid face to face, and hinged together, so that they may be made to open and shut at

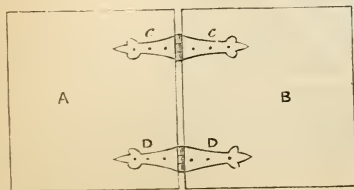


Fig. 1.

pleasure, like the leaves of a book. As for example—The first figure shews us the backs

of the two glasses *a* and *b* joined together by hinges, *c c* and *d d*; so that they may open or shut to any part of a circle. And now the glasses being thus fitted for our purpose, I shall proceed to explain the use of them.

“Draw a large circle upon paper, divide it into three, four, five, six, seven, or eight equal parts; which being done, we may draw in every one of the divisions a figure at our pleasure, either for garden-plats or fortifications. As for example—In the second figure we see a circle divided into six parts, and upon the division marked *a* is drawn part of

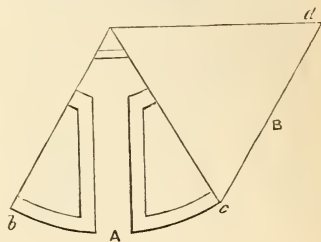


Fig. 2.

a design for a garden. Now, to see that design entire, which is yet confused, we must place our glasses upon the paper, and open them to the sixth part of the circle—*i.e.*, one of them must stand upon the line *b* to the centre, and the other must be opened exactly to the point *c*; so shall we discover an entire garden-plat in a circular form (if we look into the glasses) divided into six parts, with as many walks leading to the centre, where we shall find a basin of a hexagonal figure.

“We may more plainly see how the glasses ought to be placed upon the design, by viewing the third figure. The line *L*, where the glasses join, stands immediately over the centre of the circle; the glass *A* stands upon the line drawn from the centre to the point *C*; and the glass *B* stands upon the line leading from the centre to the point *E*. The glasses being thus placed, cannot fail to produce, by reflection, the complete figure we look for. And so whatever equal part of a circle you mark out, let the line *L* stand always upon the centre; and open your glasses to the division you have made with your com-

passes. If, instead of a circle, you would have the figure of a hexagon, draw a straight line with a pen from the point *c* to the point *d*

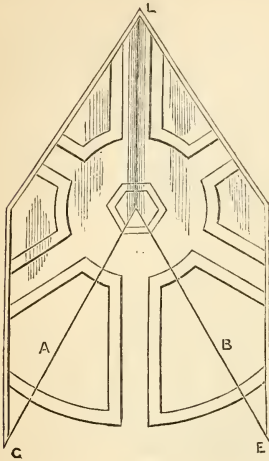


Fig. 3.

figure of equal sides. I easily suppose that a curious person, by a little practice with these glasses, may make many improvements with them, which perhaps I may not yet have discovered, or have for brevity's sake omitted to describe.

“It next follows that I explain how by these glasses we may, from the figure of a circle drawn upon paper, make an oval; and also by the same rule represent a long square from a perfect square. To do this, open the glasses and fix them to an exact square, place them over a circle, and move them to and fro till you see the representation of the oval figure you like best; and so having the glasses fixed, in like manner move them over a square piece of work till you find the figure you desire of a long square. In these trials you will meet with many varieties of designs. As for instance—The fourth figure, although it seems to contain but a confused representation, may be varied into above 200 different representations by moving the glasses over it, which are opened and fixed to an exact square. In a word, from the most trifling designs, we may by this means produce some thousands of good draughts.

in the second figure, and by placing the glasses as before, you will have the figure desired.

“So likewise a pentagon may be perfectly represented, by finding the fifth part of a circle, and placing the glasses upon the out-

“But that the fourth figure may yet be more intelligible and useful, I have drawn on every side of it a scale divided into equal parts; by which means we may ascertain the just por-

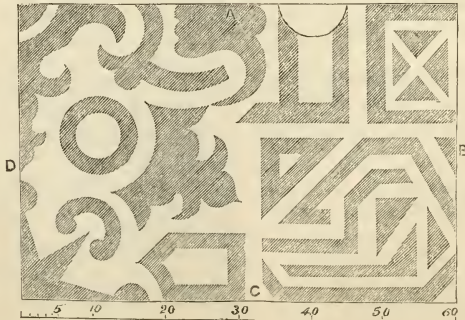


Fig. 4.

lines of it; and the fourth part of a circle will likewise produce a square by means of the glasses, or by the same rule will give us any

portion of any design we shall meet with in it. “I have also marked every side of the fourth figure with a letter, as A, B, C, D, the better

to inform my reader of the use of the invention, and put him in the way to find out every design contained in that figure.

“*Example 1.* Turn the side A to any certain point, either to the north or to the window of your room; and when you have opened your glasses to an exact square, set one of them on the line of the side D, and the other on the side C; you will then have a square figure four times as big as the engraved design in the plate. But if that representation should not be agreeable, move the glasses (still opened to a square) to the number 5, of the side D, so will one of them be parallel to D, and the other stand upon the line of the side C. Your first design will then be varied; and so by moving your glasses in like manner from point to point, the draughts will differ every variation of the glasses, till you have discovered at least fifty plans differing from one another.

“*Example 2.* Turn the side, marked B, of the fourth figure to the same point where A was before, and by moving your glasses as you did in the former example, you will discover as great a variety of designs as had been observed in the foregoing experiment; then turn the side C to the place of B, and managing the glasses in the manner I have directed in the first example, you may have a

great variety of different plans which were not in the former trials; and the fourth D must be managed in the same manner with the others; so that from one plan alone, not exceeding the bigness of a man's hand, we may vary the figure at least two hundred times, and so, consequently, from five figures of the like nature we might shew about a thousand several sorts of garden-plats; and if it should happen that the reader has any number of plans for parterres or wilderness works by him, he may by this method alter them at his pleasure, and produce such innumerable varieties, that it is not possible the most able designer could ever have contrived.”

Now that the long evenings are at hand, our gardening readers, both young and old, will no doubt thank us for bringing this very useful and ingenious instrument under their notice, affording as it does so much scope for multiplying designs, or rather *creating* them; for, as already explained in the extract, lines or designs of the most incongruous and confused character are brought into wonderful order and symmetry by the application of this little instrument adjusted at different angles.

Bradley's volume contains a fund of readable and useful matter; and it is possible that our readers may, ere long, hear more about him in these columns.

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## NEW AND RARE FLOWERS AND FRUITS.

### NO. 8.—CYPRIPEDIUM CARICINUM.

A VERY curious species, with sedge-like leaves, and a creeping above-ground rhizome.

Flowers of a pale greenish hue, except that the sepals and petals have a narrow white margin, while their extremities are tipped with purplish brown.

It comes from Bolivia and Peru.

Mr Bateman, who lately described it in the *Botanical Magazine* (tab. 5466), from which

we have borrowed the figure in the cut, says regarding the treatment:—

“C. caricinum flowered in May 1865, in Messrs Veitch's establishment in the King's Road. It had been kept in a hot and moist stove, where it seemed to thrive; but as its native habitat is a comparatively cool and elevate! region, it will probably succeed as well, or even better, under cool treatment.



To such, indeed, it has already been subjected at Knypersley, where it is growing vigorously, though it has not yet flowered. Being a terrestrial plant it should be potted in good

duced along with it to this country by Dr Wallich.

Stemless—leaves radical, coriaceous, and distichous. The flowers are solitary, very large



*Cypripedium carolinianum.*

fibrous peat, and if its travelling rhizomes are to have fair play it must have plenty of space."

NO. 9.—*CYPRIPEDIUM INSIGNE.*

Nearly allied to *C. Venustum*, and intro-

duced along with it to this country by Dr Wallich. 3 to 4 inches across, the dorsal sepal green, except at the extremity, which is white—the whole richly spotted with brown. The inferior sepal (two united) green, slightly streaked here and there with brown. The petals yellowish green, narrowly streaked with pur-

plish brown, white at the extremity, and pale out, yellow within. Stalk purple, slightly at the base. Lip rich, greenish brown with- pubescent.



*Cypripedium insigne.*

## A Dictionary of Tools and Implements

FOR THE FARM, FOREST, AND GARDEN.

UNDER this heading we purpose to give, from time to time, in alphabetical order, a descriptive list of Tools and Implements in use by the Gardener and Forester, as well as the smaller ones used on the Farm, which, when finished, will form a complete dictionary of these articles.

**ADZE.**—This very useful implement may be called a percussive chisel or cutting tool, having its edge at right angles to the handle. In the Axe the edge is in the same plane with



Fig. 1.—Common Adze.

the handle. Both tools are always used with percussion, and hence differ from the chisel, which acts by pressure. The instrument is held in both hands by the handle, which is from twenty-four to thirty inches long, while the operator stands upon his work in a stoop-

ing position. The weight of the blade is from two to four pounds. The Adze is swung in a circular path almost of the same curvature as the blade, the shoulder-joint being the centre of motion, and the entire arm and tool forming, as it were, one inflexible radius: the tool therefore makes a succession of small arcs, and in each blow the arm of the workman is brought in contact with the thigh, which thus serves as a stop to prevent accident. In coarse preparatory works, the workman directs the Adze through the space between his two feet: he thus surprises us by the quantity of wood removed. In fine works he frequently places his toes over the spot to be wrought, and the Adze penetrates two or three inches beneath the sole of the shoe: and he thus surprises us by the apparent danger, yet perfect working of the instrument, which in the hands of the shipwright in particular, almost rivals the joiner's plane. It is with him the nearly universal paring instrument, and is used upon works in all positions. The small Indian Adze, instead of being circular like the European Adze, is formed at a direct angle of 45 or 50 degrees. Its handle is only twelve or thirteen inches long, and the tool is used with great precision by the motion of the elbow joint. It is grasped so near the head that the fore-finger rests on the metal, the thumb nearly on the back of the handle; the other fingers grasp the front of it, the nails approaching the ball of the thumb. The wrist is held firmly, the stroke being made principally from the elbow, the inclination of the cutting face being nearly a tangent to the circle described, by the instrument round the elbow-joint as a centre, the exact adjustment being made by

the grasp and the inclination of the wrist, which is soon acquired by a little practice. In this way very hard woods may be dressed for any purpose, with a degree of ease and accuracy not attainable with the small axe used in this country. In order to grind the common Adze the handle must be removed, and this is easily done, as the eye of the tool is larger externally than internally, as in the common pickaxe, so that the tool cannot fly off when in use, but a blow on the end of the handle easily removes it.—See AXE.

ANEMOMETER (From the Greek *anemos*, the wind, and *metron*, a measure).—An instrument for determining the force of the wind. A knowledge of the various phenomena which accompany changes in the atmosphere, and of the law by which they are regulated, are of the greatest importance to persons connected with the cultivation of the

anemometer (fig. 2), though not a perfect instrument, is the cheapest and only one within the reach of ordinary observers, and is useful for *comparative* results. It consists of two glass tubes, about nine inches long and four-tenths of an inch in diameter, connected at their lower extremities by another tube of glass only one-tenth of an inch in diameter. The object of the small tube, which connects the two larger ones, is to prevent the oscillation of the fluid by irregular blasts of wind. To the upper extremity of one tube is fitted a thin metal cap bent at right angles, so that its mouth, *d*, may receive the current of air in a horizontal direction. Water is poured in at the mouth till the tubes are nearly half full, and a scale of inches and parts of an inch is placed between the tubes. The whole turns freely on an axis or pivot *p*, and on the top a small vane is attached (not shewn in the engraving), so that the mouth may always be towards the quarter from which the wind blows. When the wind blows in at the mouth of the cap, the column of water is depressed in the tube below the cap, and elevated to a similar extent in the other tube, so that the distance between the surfaces of the fluid in each tube is the length of a column of water, the weight of which is equal to the force of the wind upon equal to the base of the column of fluid. The absolute velocity of the wind is deduced from the height of the column of water, or it may be ascertained from the tables constructed for the purpose. When the column of water is one inch high, the force of the wind on a square foot is nearly  $5\frac{1}{4}$  lb., its velocity  $32\frac{1}{2}$  miles an hour, and its character a high wind. When the column marks three inches, the force is upwards of  $15\frac{1}{2}$  lb. on the square foot, the velocity above  $56\frac{3}{4}$  miles per hour, and the character a storm. At nine inches the force on the square foot is stated to be 64 lb. 14 oz.; the velocity  $97\frac{1}{2}$  miles an hour, producing a most violent hurricane. Thus, it will be observed that in the greatest storms, the difference between the atmospheric pressures on the windward and leeward sides of any object does not amount to one-fiftieth of the pressure of the leeward side; for that is

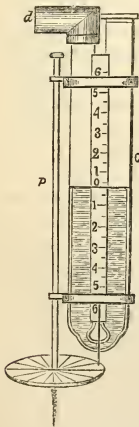


Fig. 2.—Lind's Anemometer.

soil. As the instruments required to record observations are few and inexpensive it is very desirable that all farmers and gardeners should be provided with a set. They comprise an anemometer, or wind gauge, a barometer, thermometer, electrometer, hygrometer, and rain-gauge—all of which will be found described, under their several heads. Lind's



capable of supporting a column of about 33 feet of water.

The tube must always be kept half filled with water—viz., exactly to the zero mark, from which the upward and downward scales begin. For easier observation, the water may be coloured with cochineal, or with decoction of logwood, to which a few grains of alum have been added. In great degrees of cold a saturated solution of sea-salt may be used instead of water, the specific gravity of which is 1.244. If the force in the following table for any height be multiplied by the specific gravity, the product will be the true force, has measured by the solution.

The table exhibits the force of the wind on a square foot, in pounds weight, for different heights in the column of water in Lind's Anemometer:—

Inches.	Common Designation of Wind.	Pressure in lbs. on square foot.
6"	Hurricane . . . . .	31'75
5"	Violent Tempest . . . . .	26'04
4"	Tempest . . . . .	20'83
3"	Storm . . . . .	15'62
2"	Very High Winds. . . . .	10'42
1"	High Wind . . . . .	5'21
0'50	Strong Breeze . . . . .	2'60
0'25	Fresh Breeze . . . . .	1'30
0'10	Breeze . . . . .	0'52
0'05	Pleasant Wind . . . . .	0'26
0'00	Calm . . . . .	0'00

The air depresses the water in the limb which is in connexion with the open horizontal mouth *d* opposed to the wind, and raises it in an equal degree to the other limb *c* (fig. 2). Hence, to measure the force of the wind by this instrument, the amount of depression in the one limb should be added to the amount of elevation in the other. To save this trouble, however, and ensure accuracy, the same end is attained by reckoning each half inch as a whole inch, and dividing it into tenths. The scale is therefore so divided. By looking at either limb the reading is at once taken accurately by reading off the scales as inches and tenths of inches. The instrument, when used, may be carried in the hand to a favourable position on the ground

for receiving the full force of the breeze, far above the interference of buildings or trees; and being placed there and screwed into a firm support, about four feet above the ground, the readings are easily taken. The disc through which the pivot *p* passes, is divided like a compass card, so that by setting the instrument with the north and south points of the card in the direction of the true meridian, the direction, as well as the force of the wind, will be indicated.

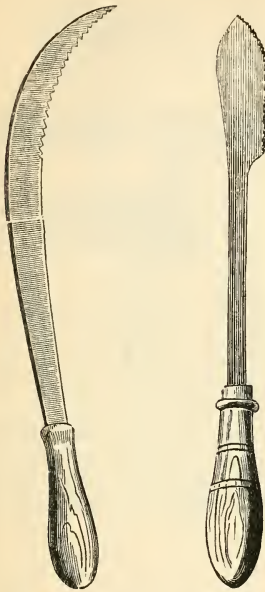
There are several other Anemometers, but of complex and expensive character, suitable only for meteorological observatories. Osler's and Dr Whewell's are the best. Drew's *Practical Meteorology* is a very simple and practical book, and affords full information on the use of the Anemometer as well as all other meteorological instruments.

APHIS BRUSH.—See page 123.

ASPARAGUS KNIFE.—It is not the practice of gardeners to use an implement of this description for cutting the shoots of asparagus. A common pruning knife is thought to answer equally well; but the late Mr M'Intosh, in his excellent *Book of the Garden*, condemns this practice; for the cleanness of a wound with a sharp knife leaves the vessels open, and a considerable waste of sap is the result. Fig. 3 shews the form of knife recommended by Mr M'Intosh. It has a thin blade about nine inches long, with a wooden handle, and is slightly hooked at the point, which renders it less liable to cut the underground buds, while the serratures on the concave side more readily catch the shoot intended to be cut. Fig. 4 represents another form of knife. The following remarks as to the use of this implement, from the same authority, may be useful:—"Remove with the side of the Asparagus Knife *a* little of the soil from around the base of the buds; push the knife gently downwards, keeping it quite parallel and close to the shoot to be cut, taking great care in doing so that none of the buds yet underground are cut or injured. When the knife is as deep as the base of the shoot, give it a slight

twist, pressing it at the same time close to the shoot, and draw it gently upwards,

two parts through the natural line of the fibres, leaving rough uneven surfaces, and the rent will precede the tool. A similar effect



Figs 3 and 4. Asparagus Knives.

by which process the bud will be separated from the crown."

**AVERUNCATOR** (from the Latin *averunco*, to prune).—This implement (fig. 5) is used to remove small branches at heights above the reach of the common pruning shears, so as to save the necessity of ladders. It has a compound blade attached to a handle of greater or less length, and operating by means of a lever acted upon by a cord passing over a pulley. The branch is taken between the cutters, and the cord on being pulled smartly down, acts upon the lever, so as to bring the cutting faces together, severing the branch at the same time.

**AXE**.—The **AXE** differs from the **ADZE** (fig. 1) in being a splitting wedge, not a cutting instrument; for if driven into a block of wood, as at *a* (fig. 6) it will split it into

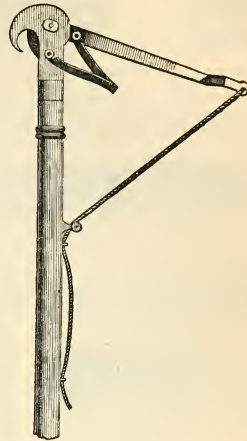


Fig. 5. Averuncator.

will be produced on removing a stout chip from the side of a block of wood with the

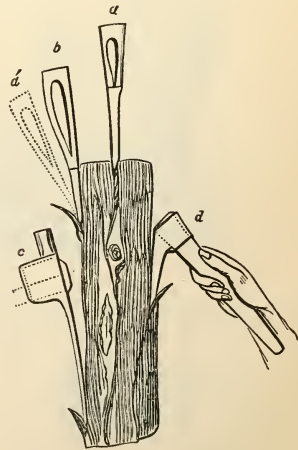


Fig. 6. Diagram shewing action of the Axe and Adze.

hatchet, adze, or paring chisel. So long as the chip is too rigid to bend to the edge of the tool, the rent will precede it. If the instru-

ment is thin and sharp, so that the shaving can bend to the tool, the wood will not split ;

of paring the surface, be applied at the angle *a* (fig. 6), which is a much less convenient and



Fig. 7. Scotch Pruning Axe. Fig. 8. Carrick's Felling Axe.

it will be cut. In paring tools, one face of the wedge or tool is nearly parallel with the

effective position than (*b*) that of the side hatchet with only one chamfer ; but for par-



Fig. 9. Carrick's Improved Felling Axe. Fig. 10. Carrick's Light Felling Axe.

face of the work. In tools ground with only one chamfer this position not only assists in

ing a large or a nearly horizontal surface, the side hatchet is inferior to the Adze *a*. The most approved forms of the Axe are those of which figures are given. They vary in weight from 4 lb. to 8 lb.

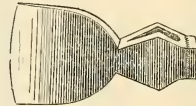


Fig. 13. Sorby's Felling Axe.

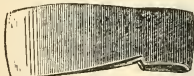


Fig. 11. Merrick's Felling Axe.

giving direction to the tool, but also places the strongest line of the tool in the line of re-

In Vol. ix. of *Loudon's Gardener's Magazine*, a description is given of a BATTERING AXE (fig. 15) for felling timber, the invention of Mr Mallet of Dublin. The inventor, in pre-

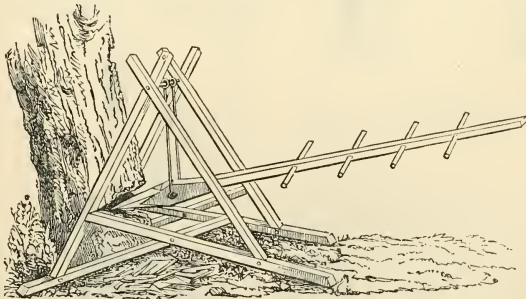


Fig. 15. Battering Axe.

sistance, or of the work to be done. Thus the Axe with two bevils *a* (fig. 6), which is in-

fixing the description of it says, "It has often appeared strange to me that the idea of the battering ram has never, at least to my knowledge, been applied to the felling of timber. When timber is felled for the purpose of clearing, little more than mere strength and endurance are required ; and the accumulation of the former, obtainable by means of the Battering Axe would be very great. It could be readily procured in places where the saws for this purpose could not be obtained.

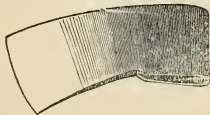


Fig. 12. Merrick's Curved Felling Axe.

tended for hewing and splitting, and not for cutting, must, when required for the purpose

The figure hardly needs explanation. I use the wooden side frames, of the form represented, because they are very strong, and their toes would dig into the ground, and prevent recession from the blows of the axe. The axis of the Battering Axe above is long enough

The blade is made like a large socket, or like the spades called in Ireland "fecks," and spiked to the wood. Four men can work at the one represented, and raise or lower the edge of the axe as required, those nearest the tree guiding it."

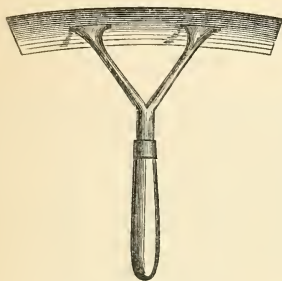


Fig. 16. Barking Iron.

to allow the side frames to be approached or withdrawn respectively, to suit any sized tree : a diagonal stay-bar, dropped upon a pin for the purpose prevents all from falling sidewise.

**BARK SCALER, or BARKING IRON.**  
—This is used for scraping off the dry scales and moss and lichens from the stems and branches of fruit trees, which, if not removed, serve as a refuge for a multitude of troublesome insects. Its common form is shewn in fig. 16, with a blade of about  $1\frac{1}{4}$  inches deep by 7 inches long.—Sometimes two

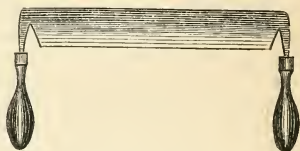


Fig. 17. Barking Iron.

handles are attached, one at each end of the blade, as in fig. 17.



## Plantations and Hedges.

### TREES AND THEIR ASSOCIATIONS.

BY WILLIAM STEVENSON, ESQ. OF NOTTINGHAM.

BY the common consent of mankind, trees have been selected as affording the most appropriate emblems of the passions by which both States and individuals have been swayed. How, then, is it possible, even in these lettered days, bearing their age, importance, or varied beauties in mind, to look upon them without feelings of reverence? How many, not merely generations of men, but whole nations, have adopted trees in some form as objects of veneration. From the humblest minds to those most elevated; from the remotest antiquity to the present time, they have occupied a prominent position, and as lords of the vegetable kingdom they cannot fail to hold their traditional sway over the passions of mankind.

In the present instance we shall not touch upon their artistic merits—the green spring tint of the elm, the glowing hue of the Scotch fir, the yellow anthus of the ash, the orange of the beech, and the many bright and fading hues of the woods, so dear to artists, must be passed over in silence. Our object is to treat upon their many associations with seasons of mirth or sadness, and religious observances.

In taking the subject in this sectional form, we find it a matter of importance, and of such extent, that we must content ourselves with a glance at its various headings.

The plan of my lecture will bear comparison with events of hourly occurrence in our walks of life, as I shall present you with the bright or mirthful side in its introduction, and close with the one shaded in sadness. This may be a questionable step, still I may plead extenuation. I hold that sadness is the companion of solitude, and that solitude is associated with study. Thus, by a simple

arrangement, based upon the commonest laws of logic, I may send you home, if not more strongly imbued with religious zeal, at least converts to the study of botany in its historical and lyrical branches. "Trees," says the Roman naturalist, Pliny, "afforded the first inducement to the barbarous tribes of Gaul to cross the Alps, and spread themselves over Italy. A certain Swiss once came to Rome to learn the art of a smith, and on his return took with him raisins, dried figs, oil, and wine; the taste of which incited his countrymen to invade Italy with a hostile army." Who would have thought it possible that a tree should have been brought from a remote region of the earth for the sake of its shade only? Yet such was the case. The plane tree was first carried across the Ionian Sea to shade the tomb of Diomedes, who was buried in one of the small islands off the coast of Apulia, where it long formed an interesting monument to that hero.

We are told of an antient king who was marching a vast army through a district abounding with plane trees, with one of which he became so enamoured, that he caused his army to halt, whilst he in acknowledgment of its beauty, had a gold band placed around it. It is recorded that this slavish adoration of a tree so delayed the march that they were vanquished in the next battle. In modern times we are told that the great Napoleon, inexorable in his will, so revered an ancient cypress tree at Soma, in Lombardy, that when laying down the plan for his great road across the Simplon, diverged from the straight line to avoid injury to this tree.

It may not be amiss to notice those trees which contribute to the pleasures of Christmas and other festive seasons of the

year. At the head of this class we must place the green holly. Our antient writers called it the "Holy tree" and Christ's thorn, and our botanists the holm holly, a term which is still in use with an evergreen tree—the holm or Ilex oak, because in its leaves it resembles the holly.

Tradition says that the holly was unknown before it sprang up in perfection beneath the footsteps of Christ, when He first trod the earth, and that although men have forgotten its attributes, the beasts all reverence it, and are never known to injure it. This tradition may have arisen from the fact of Christ being born in a stable and nurtured in a manger amidst cattle, who might thus imbibe strong feelings of reverence for everything connected with his early days. Lingered in quiet corners of the country, where only tradition finds a home, we are told that "the thorny leaves of the holly and its scarlet berries like drops of blood, are symbolical of our Saviour's sufferings." It holds a far different place in our festive scenes. "Banfrylde" says—

"With footsteps slow in fairy pall yclad,  
His brows enwreathed with holly never sear,  
Old Christmas comes to close the waning year."

And to use old George Withers' words—

"So now is come our joyful'st feast;  
Let every one be jolly;  
Each room with ivy leaves is drest,  
And every post with holly."

Pliny says "the Greek name for the holly was 'Agria,'" and that if planted in a house or farm, it repels poison; that its flowers cause water to freeze, and that a staff of its wood, if thrown at any animal—even if it fall short of the mark—has the wonderful property of compelling such animal to return and lie down by it. When the holly first became connected with religious feasts is an unsolved question. Dr Chandler supposes the custom to have been derived from the Druids, who, he says, decorated dwelling-places with evergreens during winter, that the sylvan sprites might repair to them, and remain unrippd with the frost and cold winds until a milder season had renewed the foliage of their darling abodes.

Certainly the custom, whencesoever it was derived, was sanctioned by the church, for in old church calendars Christmas eve is marked "*Templa exornantia*"—"churches are decked."

Now, when we recollect that the three great Jewish festivals—the Passover, the Pentecost, and the Feast of Tabernacles—are typical of the three Christian festivals (Easter, Whitsuntide, and Christmas), at least by the periods of the year, may we not infer that the early Christians adopted the custom of decking their churches and dwellings with green boughs, to shew the connexion between the Jewish Feast of Tabernacles and the festival at which they commemorated the fact—"The Word was made flesh, and dwelt," or, as it may be more correctly rendered, "tabernacled amongst us." Other authors are of opinion that the custom sprang from the Romans, who were in the habit of sending boughs of holly, accompanied by other gifts, to their friends during the festival of Saturnalia in December. It is supposed that the early Christians adopted this method of shewing goodwill in order to conciliate their pagan neighbours, and also, to screen themselves from persecution, decked their houses with its branches during their own celebration of the Nativity. History upon the subject throws but little light; we must be content to repose our faith in the origin of these customs on tradition. That the holly has been associated with the festivities of Christmas from very antient times we are all willing to admit, and that "Christmas" is as common a name for holly as "May" is for the flowering hawthorn. We have only to search amongst our old ballads, carols, and manuscripts, for confirmation of these facts. Dr Turner, our earliest writer upon plants, calls it the Holy tree, and the same term is applied to it in an old manuscript ballad in the British Museum, written in praise of the holly. I have extracted a few verses to shew you its character—

"May my May, hyt shal not be I wys  
Let Holy have the maysterie, as the maner ys.  
"Holy stands in the hall, fayre to behold,  
Ivy stoud without the dore, she ys ful sore a cold,  
May my May, &c.

“Holy and hys merry men they dawnsyn and they  
 syng,  
 Ivy and hur maydyns they wepyn and they wryng,  
 May my May, &c.”

In the floral calendars of our old monkish fathers, the common holly is dedicated to St Ethellurge, anno domini 664, and it is worthy of remark that in antient times, on the festival of this saint, which was held on October 1, Furnish was an usual dish.

We find that another variety of holly, the “*Ilex bacciflora*,” is dedicated to the nativity of Jesus Christ. This feast is held upon December 25, and is known as Christmas-day.

It appears that the holly was kept in the houses until Candlemas-day, the 2d of February. Herrick, the old poet, strictly enjoins its removal upon that day. He says:—

“Down with the holly, ivie, all  
 Wherewith ye drest the Christmas hall,  
 That so the superstitious find  
 No one least branch there left behind ;  
 For look, how many loves there be  
 Neglected there, maids, trust to me,  
 So many goblins you shall see.”

It is a common custom with us to take down the dead branches of the holly and burn them after the pagan custom of burning the dead. Those which have been used in the decoration of our churches are burnt in the burial grounds, and those of our houses in the common grates. Your wives and daughters will tell you that it is bad luck to throw them on the dust-heap ; but from what source this and other customs connected with the Christmas holly owe their origin, I must leave with you to decide. I shall conclude my remarks upon this tree with a quotation from Southey—

“And as when all the summer leaves are green—  
 So bright and green,  
 The holly-leaves their fadeless hues display—  
 Less bright than they ;  
 But when the bare and wintry woods we see,  
 What then so cheerful as the holly tree ?”

I shall next call your attention to the Ivy. It is truly said of this plant that it is “never sere,” that its flowers are persistent through the winter, thus affording food to myriads of

insects, and that it possesses a high degree of ambition, inasmuch as it is always struggling to get up in the world.

Robert Tyas, in his “Favourite Field-flowers,” says:—

“Sacred to friendship ; we would place  
 Thy name, dark ivy, on our opening page.  
 And here thy changeless leaf we trace,  
 Trusting that, should our lives endure to age,  
 Our love, without a change or shade  
 May meet all trials with a smile serene,  
 Unaltered, as thy graceful braid  
 In summer's heat and winter's cold is seen.”

Our common ivy, the *Hedera Helix*, is dedicated in the old Floral Calendars to Saint Paul the hermit, anno domini 342. Saint Jerome, his biographer, says:—“When St Paul was twenty-two years of age he fled from the persecution of Decius to a cavern, near which grew a palm tree that supplied him with leaves for clothing and fruit for food till he was forty-three years of age, after which he was daily fed by a raven till he was ninety, and then died. St Anthony, when he approached the body saw two lions digging his grave with their claws, into which he buried him.”

The ivy is a tree of very antient repute, occupying a prominent place in the mythology of the Greeks and Romans, and applied to purposes which were deemed most honourable. The great god Bacchus had his brows and spear decked with ivy. We read in holy writ that the Jews were compelled to go in procession to Bacchus carrying ivy. This was one amongst the many humiliations they had to suffer from their conquerors, and the decree was that they who did not commit idolatry, who did not “conform themselves to the manners of the Gentiles,” and pollute even the temple of their god, should be put to death.

As a further illustration of its high office in antient times we may note that the people of Thrace adorned their armour with the foliage of the same tree, and an ivy crown was the highest prize that was awarded to a successful poet. Horace speaks of

“An ivy wreath, fair learning's prize.”

In more recent times we are told by Miss Strickland that when Queen Catherine Parr's coffin was last opened the temples of the royal lady were found surrounded by a wreath of ivy leaves. From the fact of this plant being associated with Bacchus the god of wine, we owe the antient custom of its use as a vintner's sign. This can scarcely be termed as a "religious association." When times were young, as the poets say, the Grecian priests presented newly married couples with a wreath of ivy as a symbol of the closeness of the tie which ought to bind them together, and it continues a favourite emblem of constancy among the people of our day. A modern writer speaking of this custom, says:—"It very appropriately reminds them of the closeness of the tie which binds them, and of the constant love which should survive the changes of time and adversity, lasting even through the winter of old age." The close manner in which the ivy clings to any tree or shrub to which it may attach itself is often a subject for our naturalists. They have been known to die prematurely by the ivy clasping them too closely in its folds, rocks to be displaced by its roots.

Continuing the subject of its many virtues, we find that in the list of gods known to the classic antients, that the ivy was consecrated to Apollo; but I am not able to say through what cause. It was a common belief that the associations of this plant with the wine cup prevented any ill effects on the brain of those that indulged in its potent draughts. It was also held that ivy possessed wonderful medicinal properties, especially as a remedy for the plague. Bearing these many associations of the ivy in mind, we are led to the conclusion that it has played an important part in festive scenes, but from the fact of its being an evergreen it has not escaped being used as a symbol of immortality. In medieval times, it was strewed upon the coffins of the dead, and planted on the graves. Many people associate the ivy with scenes of gloom, from its inherent love for old sepulchres and ruined buildings; Pliny has remarked, that "it courts retirement and the shade," and we are as familiar with

the churchyard ivy as we are with the yews. Perhaps it is here that we can invest the ivy with religious associations. Be it thus gay or sad, we are all pleaders for it when threatened by ruthless hands, and how few are those who cannot see a beauty in its sombre hue of winter, or its cheerful green of spring. Ruins of monastic piles, which form such lovely features in our landscape, would, if divested of its fond protection, stand out upon the green sward as huge deformities, possessing realities too real. There are some who have moralized upon the ivy in its course through life, who will speak of it approaching some lordly tree as an insignificant weed, that it will seize upon its outward form, and thus gain an altitude that it could not of its own constitution maintain. Thus will it grow in height and strength until it has clothed its arms with dense masses of foliage, which leave it open to the prostrating force of tempestuous wintry winds. Should it resist these destructive forces, it has to endure its deadly embrace, and it is accused of absorbing its nourishment by means of innumerable root-like tendrils, until "it only reigns, it only lives." Could this lord of the forest be invested with power of speech, it would exclaim:—

"He was the ivy which had hid my princely trunk,  
And sucked my verdure out."

Others will maintain that the ivy does not take nourishment from the plant on which it hangs, in vindication of this charge it may say:—

"They blame me, they blame me,  
Who understand me not;  
They say I suck the green boughs blood  
Till all its leaflets rot.

"They say my roots beset the bark,  
Until 'tis little worth;  
'Tis but my tendrils that there cling,  
My roots are in the earth."

The virtues and vices of the ivy have proved a long standing theme for our English poets. In the old Christmas carol, written in phrase of the holly, that I have previously alluded to, the ivy is spoken of with indifference. Its evergreen nature makes it a great favourite at



our Christmas tide. In a carol of 1695 we read of houses decked,

“With holly and ivy, so green and so gay.”

I may close my notice of the religious associations of the ivy, by observing that it was

spoken of by St Paul as forming the “corruptible crown,” competed for at the great Isthmian games, which he so beautifully contrasted with the “incorruptible crown,” which shall hereafter encircle the brows of those who run worthily the race of this mortal life.

[To be continued.]

### STUDIES OF THE BARK OF TREES.

THE bark has not been sufficiently studied as a character, either by artists or by arboriculturists. In many trees it is most distinctive, and most men possessing

Scotch fir, to the mind of our arboricultural readers to satisfy them that this is so. It begins, however, to be more attended to. M. Franz Antoine, in his plates of *Pinus leuco-*



Bark of *Cedrus Deodara*.—From a Photograph.

only a moderate knowledge of trees could with ease determine many of them by a mere glance at it. We have only to recall the beech, the Spanish chestnut, the ash, the oak, the

dermis, gives a large view of parts of the bark as a scientific character, and there is little doubt that in future it will be more largely made use of. It appears to us

that it would be very useful to the classes we mentioned to have a series of careful studies of the bark of different trees to refer to. The aid of photography can always secure the materials for giving this, because there is no difficulty in taking a view of the trunk of a tree at any time, while to get a good view of the foliage requires a day so still that probably a month of them is all that can be got in the course of a year.

We propose to give such a series in this journal as opportunity offers. We shall follow no order and no specified time in doing so. The reader must take them as we can get them, but the index at the end of the year will prevent any serious inconvenience being felt from this want of arrangement.

#### 1. THE DEODAR CEDAR (*Cedrus Deodara*).

The bark of the young Deodar is wholly different from that of the old. It is smooth and glossy, while that of the old tree is rough and wrinkled.

The following is a careful sketch of the trunks of two mature trees taken from a pho-

tograph of a group of Deodars in the Nachar forest on the Stulej.

The bark is close and finely granulated, without any peeling off in scales like the pine, or wrinkling in corrugations like the oak. It will be observed, too, that for a short space above the root its texture is finer and smoother than further up. This is more marked in the photograph from which the woodcut is taken than in the cut itself, and suggests the idea of this being grafted, and that the lower part of the trunk is the stool or stock growing differently from the upper part or scion. This, however, cannot be, for they are trees growing in a native forest in the Himmalayahs, where, it is unnecessary to say, grafting would not be thought of. Another suggestion is that it may be referable to jungle or brushwood, which may have kept the lower part of the bark less exposed. We can trace it more or less in other Deodars in the same photograph (not within the limits of the woodcut), and we have seen something of the same sort in this country in stems of old Cedars. It would seem, therefore, to be of the nature of a character.

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### ON PRUNING AND THINNING FOREST TREES.

IN our last paper (on "Pruning Forest Trees") we condemned the use of the knife. We are now here to plead for that of the axe. The usual phases through which the mind of a lover of trees passes is first an invincible repugnance to cut down anything. The length of time which it has taken to grow is ever present to his mind, and he hesitates, and puts off and puts off, until irremediable mischief is done before he can make up his mind to what he considers the sacrifice. It is only when experience has taught him the necessity of this that he at length recognises the good policy of sacrificing the interests of the present to those of the future.

We well remember the surprise with which we (while still in the first phase of that feeling to which we allude) listened to Mr

Gambier Parry, when he explained to us how for such reasons he had cut down the finest tree on his estate. We have long since recognised the justice of his views, and admired the strength of mind which could thus gallantly deprive itself of present gratification for the sake of future improvement.

This is the principle on which all thinning should be conducted, and it will be found as productive of improvement in plantations as the practice of self-denial—in other words, the sacrifice of the present to the future—will be found to ourselves in everything else.

Now, applying this to the management of plantations, we must look not to their present state, but to what they will be in a year or two—we must always look a-head. We know that air and light are essential to the growth

of plants; therefore, if we find the trees growing near each other, and foresee that by-and-bye they will be too close for the air to circulate freely, or for plenty of light to reach the lower branches, we must then cut and make room for these necessary elements to penetrate.

If any one should say that there is no use in expatiating on this subject, and that every intelligent planter is already convinced of the necessity of air and room in plantations, our reply is that the whole question lies in the meaning attached to these words. Every one admits that air and room are necessary, but what one considers plenty of both, another will regard as absence of either. Our object is to try to shew what a sufficiency of light and air really is. Men generally begin by planting so close, that the young trees speedily touch each other. *A priori*, there may be no objection to close planting at first, if people remembered to thin before the trees do touch each other. The chief objection to it is the chance of their forgetting or neglecting to do so in time. They usually delay thinning until the trees have made such progress that the thinnings are worth something, at least enough to pay the expense of making them. After the first thinning (often without any thinning at all), they are allowed to grow until they are 15 or 20 years old, and are irretrievably ruined. The trees are drawn up into long thin poles, with nought but a tuft of foliage struggling for breath at the top; and no treatment in the world will ever restore these trees to the condition in which they would have been had they been properly treated, or even to the most distant approach to a good tree.

Now, there are two ways in which the trees are injured by this treatment: there is first the physical want of air to breathe, and next the mechanical injury from actual contact. As to the first, we all know that plants breathe as well as animals: that during the day they absorb carbonic acid and give out oxygen; and during the night reverse the process, and absorb oxygen and give out carbonic acid; so that the presence of plants in rooms is healthful during the day and the reverse at night. Not so much so, however, as is generally sup-

posed—any evil effects being easily obviated by a little attention to ventilation at night. If, then, they are smothered up by growing too close together, the leaves which fail to receive a due proportion of oxygen drop off, and the plant is suffocated indirectly from want of air, and directly from want of leaves by which to breathe. This is the physical effect of want of air.

What is the mechanical effect of the trees being so close together that the branches of one tree touch those of its neighbour? At first we see nature in a beautiful way trying to avoid the contact. As the ends of the branches near each other, they appear instinctively to fear and dread the approaching contact; they leave their natural horizontal or oblique direction and grow upwards more directly. But by-and-bye comes a fine warm, moist, growing season; the branches push out on every side, and at last, in spite of all their efforts to avoid it, the ends of the twigs of the neighbouring trees do touch each other. The wind dashes them backward and forward against each other, and the leaves are gradually rubbed off. The twigs and leaves on each tree itself are so beautifully arranged round their axes, that it is rarely that any of them injure each other by friction; but it is very different with trees growing near them and moving in the opposite direction. As soon as this takes place, the rubbed branches are doomed if help does not come. What is it that makes an injury to the lungs, whether caused by a wound or disease, so difficult to heal? It is their unceasing motion—never, while life endures, at rest for a single moment; no sooner does the curative process of nature begin to unite or spread a film of fresh skin over the injured part, than a fresh breath is drawn and the uniting surface again torn asunder. So with the ends of these branches: they are constantly in motion, unless, perchance, in some calm or sultry day, whose duration is too brief to allow the curative process here needed by them (that is, the development of new buds and leaves) to take place. As soon, therefore, as the twigs of the trees begin to approach each other, then is the time to



arrest the mischief by free thinning. See that every tree be left free and untouched by its neighbour.

If that is neglected—if the owner thinks that it will do no harm to wait another year or two until the thinnings shall be of a little more value, and lets them stand—what next takes place? A leaf once shed is never replaced on the same spot. New leaves come, but it is from fresh buds and new branchlets; and these are produced year after year a stage further from the stem. If we get up into a leafy tree, we see that almost all the leaves are at the outside; the bare trunk and branches are surrounded by a leafy cloak or atmosphere of foliage. Those twigs, therefore, which last year lost their leaves by the lashing and rubbing of the twigs of the next tree, advance no further, every attempt at putting out fresh buds and leaves being frustrated by the friction of its neighbour, and by-and-bye the branch which bears them dies. The tree grows in height and years after the same process is repeated upon the higher and higher branches, which in turn die off, until the tree has become a long pole, with no leaves except at the top. While thus suffering from suffocation by the partial destruction of its lungs, it is also suffering from starvation of its stomach. The roots stretch out in the same ratio as the branches, and, simultaneously with them, meet the roots of the neighbour tree. There is not here the same injury from friction, although interference by actual contact no doubt does also occur. But there is another kind of injury. There is only a certain amount of nourishment in the soil in which it grows. If it is enough for it, it is not also enough for both itself and its neighbour; but both have now put their fingers into the same dish, and, in consequence, both suffer from lack of nourishment.

We are told by the advocates of the old system that it is that adopted by Nature herself, and we are referred to the forests of North America as proof that it is so. There we know that in many parts vast forests exist, consisting entirely of tall slender pines, of one species and one size, growing in the same fashion as our worst-managed planta-

tions. Nature not only does everything well, but everything best; therefore, wherever we have her procedure to guide us, we admit that there is no more to be said. However opposed to our own ideas and reasoning, her rule must settle the question. But we must be sure that we really do understand her teaching. And here, how do we know that Nature's object in these American forests is the same as ours? If Nature has one object more at hand than another, it is the preservation and propagation of the species—not the making of fine trees and profitable timber.

Our object, on the other hand, is to produce fine trees and valuable timber; and we can only learn how Nature would proceed were she intent on attaining that object, by first finding such fine specimens as we want, and then studying the conditions under which they have grown. We do not want such small thin poles as are found in the American forests referred to: we should *prefer* them to be four times as thick and strong; and if some other condition of existence than that found in the American forests will make them so, will any one say that we should not adopt them because it is not the plan adopted by Nature in these American forests? When Nature shews good specimens and bad specimens, and we wish to have trees like the good only, should we adopt the plan followed by Nature in making the bad or the good?

Now, we know by experience that the very opposite conditions of existence to those of the choked-up forests of North America do produce the finest and largest trees. Our rule, therefore, is this:—wherever two trees touch each other, down with the worst of the two. This, of course, applies only to young plantations. When the trees are old, and grow in a cluster together, a different treatment is necessary. Generally speaking, these should be viewed as one tree. If they are oaks, the removal of one sometimes proves fatal to the rest. What might have been the most beneficial step for the young and strong, is often fatal, both to plants and animals, when their constitution has reached such a low degree of vitality as to be unable to accommodate itself to any change, even although it be on for the



better. Many a rare plant and animal, which has borne a long voyage from distant regions, has died the day after it has been put ashore in England.

There are some species of tree, also, whose nature seems better able to bear such changes than others: for example, the beech, which even in age does not suffer like the oak from having a close neighbour taken away. But confining ourselves to young plantations, our maxim is simply—never to plume, and never to allow two trees to touch.

In thinning, however, great care must be taken to do it persistently and regularly from the first. If it has been neglected at first, the plantation must not have its whole system thrown open all at once. To lay it as open as a plantation which has been regularly thinned, might be fatal to many of the trees that had been left, and would expose many to being uprooted by the wind. But common sense must guide the forester in such cases: without that, no amount of teaching will keep him out of blunders.

## The Stable.

### INFLUENZA IN HORSES.

DURING the last year influenza has been extensively prevalent throughout England, and in some parts not a little disastrous, and it is now spreading northwards into Scotland, where for the past six weeks a large number of horses have been suffering from this complaint within a radius of five miles of Edinburgh. It is satisfactory to be able to state that the epizootic, so far as it has gone, has not assumed a fatal type; but, at the same time, it is proving a source of no small pecuniary loss to owners of horses, who, in several cases known to us, have had more than half their stud put *hors de combat* from this cause at the same time.

The febrile affection known as *influenza*, as met with in horses, takes on such altered forms, according as it occurs in different places and at different times, that a description of any one epizootic will often appear to apply in a very limited degree only to what is observed at another place and time. Thus, one variety, attended by copious nasal defluxion, has been called *catarrhal influenza*; another, more particularly implicating the lungs, is designated *typhoid-pneumonia*, *broncho-pneumonia*, or *pleuro-pneumonia*; a third form, associated with rheumatism—*rheumatic influenza*; another, involving the digestive organs, and in particular the liver—*bilious* or *mucoous fever*. That maladies so varied should be included under the same name is somewhat anomalous; but a propriety is seen in the classification when we consider how the disease passes from one type to another, as it extends by degrees over the different parts of the same country, and also the variations observed according as it occurs in different situations, healthy or otherwise. They all agree, too, in one important feature, namely,

the low character of the fever, which seems to be the essential part of the malady, and the extraordinary prostration and unfitness for exertion by which it is accompanied.

It is a disease that invariably assumes certain definite characters of a favourable or unfavourable kind, as it finds its subjects in good hygienic condition or otherwise. This is perhaps more the case with this affection than with any other with which we have to contend, and hence the grand necessity for a close attention to such conditions when this disease prevails. This will often make all the difference between a safe and speedy recovery and a fatal issue; and the owner will better consult his own interests by an early attention to this than by employing even the best professional skill after a dangerous attack has set in.

Any case that debilitates the system renders it a dangerous subject for influenza. From the great depression of the vital powers attendant on this disease, it is of primary importance that these be not too far reduced previously, otherwise the strength may be insufficient to throw it off. Spare diet and aliment of an unsuitable or unnutritive kind are frequent causes of untoward results among particular stocks. Another no less important item is immoderate work. The health, it is true, cannot be sustained at the proper standard without a sufficient amount of exercise to cause a healthy assimilation of nutritive materials from the blood, and a sufficient development of the various tissues; yet if the proper proportion is exceeded, the normal assimilation is no less surely arrested, and deterioration and waste of tissues necessarily ensue. No quality of food or increase

in its quantity will compensate for undue destruction of tissue by overwork, for the very sufficient reason, that the system has been exhausted, and is rendered quite unequal to the task of healthy digestion or other normal process. Moderation and regularity in both feeding and work cannot be too strenuously insisted on. Insalubrious stables are similarly injurious. The situation may be low and damp, or exposed to north or east winds, in which cases much may be done by attention to the drainage and to the mode of ventilation, so as to avoid rushes of cold air while ensuring a sufficient fresh supply. Cold draughts are more especially injurious where the seeds of the malady have been sown, and even the late east winds have been keenly enough felt from the unusual susceptibility to cold attendant on the disease. Impurities in the respired air might be much more guarded against than they generally are in agricultural stables. It is difficult to correct such a widely prevailing abuse, yet it ought to be strenuously faced, and rigid cleanliness, as well as perfect ventilation, insisted on. Horses can, no doubt, be in a great degree rendered insusceptible to this evil influence through their having been for a length of time habituated to it, and from the fact that it is only a limited portion of their time that is spent in the stable, yet they can never gain anything like immunity. An animal breathing with the activity of the horse, and having such an extensive surface of delicate mucous membrane exposed to contact with the air, cannot always with safety respire air that is already loaded with organic impurity. If injurious to the healthy animal, such air becomes doubly so to the horse in the incipient stage of influenza, when the air cannot be too pure, nor the breathing too much disembarassed.

Contagion and infection, too, should be guarded against, as many cases of the disease are undoubtedly due to these; though it is equally true that in a large proportion these do not appear to act, but the malady is directly dependent on the prevalent epizootic influence.

As seen in Edinburgh, the malady is

ushered in by great dulness, prostration, and disinclination for exertion. The patient is slightly feverish, loathes his food, and is noticed to shiver more or less intensely in different cases. The nose, the tips of the ears, and the legs are unusually cold; water runs from the eyes, and the animal becomes more dull and lethargic, and often unsteady in his gait. Often within a few hours of the first notice of the illness the pulse is found to have increased in number to sixty-five or seventy per minute: it is easily compressed, and imparts to the finger a peculiar thrill or flutter, which is very characteristic. The heart is found to beat violently when the hand is applied to the chest behind the left elbow. At this stage the mouth is hot, there is great thirst, the loins are rigid and unyielding when pinched, the coat stares, shiverings are frequent, the head is low, and the eyes closed and suffused with tears. On examination the eyelids are usually found to be much swollen, and their internal or mucous membrane highly inflamed. The membrane covering the front of the eyeball is in a similar condition, so that a cloudiness over the transparent cornea arrests the rays of light, and prevents any examination of the interior of the eye. The membrane of the nose has at first a bright red glassy appearance, though at a later stage it often assumes a darker and more dusky hue. It is noticeable that both this membrane and that of the eyelids usually acquire a yellowish tinge, evidently due to a torpid and unhealthy condition of the liver. The breathing is increased, and in some cases there are distinct indications elicited by auscultation and otherwise of complications within the chest. Coughing is by no means a constant symptom, and is sometimes never heard. The bowels are a little costive at the outset, and there seems less tendency to diarrhoea than is commonly the case in such epizootics.

It has not, as already remarked, proved a fatal visitation, except in cases treated on the now exploded and destructive system by bleeding and purging. A mild aloetic laxative at the outset has not only not unduly excited the bowels, but seems to have re-

lieved the animal greatly, and hastened a favourable termination. Small doses of neutral salts and stimulants, such as the spirit of nitrous ether, have sufficed for after medicinal treatment. Much importance, however, attaches to the supply of a spacious, dry, well-littered box, abundant fresh air, avoidance of draughts, comfortable clothing of the body and flannel-bandaging the legs, and to daily or more frequent wispings to promote cutaneous circulation. When such measures are wanting the malady extends over a longer period, and the patient suffers proportionally in condition and otherwise.

Since writing the above, we have noticed in the newspapers assertions that this affection among the horses is closely allied to the cattle plague, if indeed it is not the same complaint modified by virtue of the species of animal affected, and that both are alike due to the same or an analogous atmospheric influence. If so, where has the cattle plague slumbered for the last century, during which influenza has so often invaded our country, attacking men, horses, and dogs? How does it happen that for a hundred years the constitution of British cattle has been insusceptible to this atmospheric influence which affected other animals, but has suddenly, in 1865, become so morbidly obnoxious to its

attacks? How is it that when no longer ago than last year influenza was so extensively prevalent, and so fatal to horses in many parts of England, the cattle in those districts maintained an entire immunity?

All such speculations are the veriest trifling with a momentous subject. Influenza invades countries independently of importations, whereas the cattle plague, even in England, can be clearly traced in connexion with the transit of animals to different parts of the country; the *first* attacks large numbers of animals at once, prostrating a whole stable almost at the same moment; while the *second*, though due to animals newly introduced to a byre, does not affect the herd simultaneously, but leaves an interval—the period of incubation—between the appearance of the first and second class of cases; the *former* spreads over the ocean without visible means of communication, falling at once on ships far from land, and islands having had no intercourse with the mainland; while the *latter* has only spread in the lines of commerce along with certain contaminated cattle, and though attacking both extremities of our country by virtue of immediate or mediate communication, it has carefully respected and avoided exclusively breeding districts, and such as have imported no cattle from infected localities.



## The Kennel.

### GREYHOUND COURSING.

THIS sport, we are told, is of very antient date, having been practised by the Greeks, but with what particular breed of dog is not stated. In our day it is followed by greyhounds—corruption of the word *gazehounds*, from their pursuing their game, the hare, by sight, not by scent. Coursing meetings, since the opening of railways, have increased largely, and are now very general throughout the United Kingdom. The method in which they are conducted is as follows:—A few gentlemen having agreed to hold a meeting, they resolve that it shall take place on a certain date, and, as a rule, they meet the previous day and enter their dogs—*i.e.*, give in the names, with their colours and pedigrees, to the secretary, and at the same time they pay in the entry-moneys they agree to run for—say £1, or it may be £2, £5, or £10, more generally from £2 to £5. The secretary then *draws* the dogs, as it is technically termed—*i.e.*, writes their names down on small pieces of paper of a uniform size, folds them up all in the same shape, and putting them into a jug or hat, requests some uninterested person to take the papers out one by one. The name of the dog drawn first is written down as under, we meanwhile using numbers in lieu of names:—

<i>Red.</i>		<i>White.</i>
No. 1	against	No. 2.
3	—	4.
5	—	6.
7	—	8.

Then suppose No. 1 beats No. 2, he is declared the winner; No. 4 beats No. 3, No. 6 beats No. 5, No. 7 beats No. 8, they have again to run, and

No. 1	meets	4.
6	—	7.

Again, suppose No. 1 beats 4, and No. 6 beats No. 7, No. 1 and No. 6 have to run for the third time and decide which is to be the ultimate winner of the prize. We have only exemplified an 8-dog stake, but the same rule applies to any number of dogs.

A staff of some four to ten beaters, according to the number of dogs entered, are employed to beat the ground—that is, walk a-breast, but some 20 yards apart, in search of hares—the slipper in the middle of them, but a little in advance, with the first brace of dogs, Nos. 1 and 2, in the slips—a pair of couples with a cord attached, which is strapped to the wrist of the slipper, and so constructed that it opens with a spring, and lets both dogs loose at the same time, when he wills it. A judge has been appointed, who in the majority of cases is a paid official of great experience and of undoubted integrity, and who is mounted on a good hunter. His duties are, when a hare rises, to order the slipper to let go the dogs when he thinks the game has had law enough—that is, when it has had a sufficient start of the dogs, say 50 to 80 yards, according to the nature of the ground, so as not to be snapped up at once, but to afford it a chance for life, and allow a trial of speed betwixt the two competitors—the speed to the hare being one of the best points of a greyhound. The judge then rides after them, and mentally takes a note of what each dog does, which turns it oftenest, and, if killed, which one is the killer—the kill being, like the speed to the hare, a meritorious point, but not necessarily a win. After making up his mind which has made the most points—in other words, has shewn most speed, turned it oftenest, and most distressed it, he awards the victory to such

dog, and calls out in a loud voice the colour of the dog to which he has given the award. There is a flag-steward appointed, whose duty it is to carry two flags, a red and a white (the first-named dog on the card always running under the red flag), and on hearing the colour of the dog called out by the judge, he hoists a red or white flag, as the case may be, so that the spectators, although out of hearing of the judge, may know which one he has decided in favour of.

We have supposed No. 1 beats No. 2, consequently the red is hoisted for No. 1; but No. 4 has beaten No. 3, and the white is for No. 4; so is it for No. 6, but No. 7 being on the left hand column of the card, the red is hoisted for it.

As a sport, we know of few equal to Coursing. It can be indulged in by the young and old, the rich and the poor, and from the great amount of exercise (generally walking) that its votaries require to take in the open air, it is most conducive to health; and if Banting's followers will only try Coursing for a season, they will find themselves at the end of it relieved of their superfluous fat, and sound in wind and limb. It also affords persons in rural districts an opportunity of enjoying a day's amusement now and then that they would not otherwise enjoy, and it brings the high and low into pleasant contact, there being in Coursing a freemasonry existing greater almost than in any other sport.

To a proprietor who wishes to perpetuate a breed of strong hares, let him course his hares instead of shooting them, as by shooting, the weak and the strong are destroyed indiscriminately. By Coursing, the weak and deformed are killed, and the stout and healthy are left to breed from.

We recommend any person wishing to see the enjoyment that persons in an isolated part of the country take in a day or two's Coursing, to pay a visit to Stranraer. Since Lord Stair went to that part of the country, he has, on his own grounds, introduced and encouraged Coursing meetings with the happiest results, both in his own district and in the neighbourhood of Wigtown; and he has been backed by most of the gentle-

men of the county, particularly by Mr Vans Agnew of Barnbarroch. His Lordship allows all his tenants to keep Greyhounds, and, if possible, of the best breed. When they want a course or trial, they apply to the keeper, and they obtain it. They have often small meetings; but at the annual one, which is held in January, a club-stake is run for, to which his Lordship adds a sum of money; and there you find his Lordship taking an interest in the drawing of the dogs, presiding at the dinner table after the draw, and on the field doing everything in his power to place the spectators in the most favourable position for obtaining a view of the sport, and directing the beaters. In that district the tenants had almost no sport of any kind; and it was with a view to let them have a day or two that his Lordship got up the meeting, and it has had as excellent a result as any courser could desire—the tenants taking a pride in shewing a good head of game, without any of the grumbling that might have taken place had he not been transformed into a courser by “the laird.”

As previously mentioned, Coursing has very much increased since the introduction of railways; and as an instance of this may be noticed the now great Waterloo Meeting, held each year, in February, at Altcar, near Liverpool, with an entrance-money of £25 each dog, 64 contending for the stake, the winner receiving £500, the second £200; every dog except 16 (which have not won a course), receiving a share according to their merits. This meeting had its commencement in 1836 as an 8-dog stake—from that to a 16—from a 16 to a 32—and in 1856 to a 64, in which year it was won by a Scotch dog, King Lear, belonging to Mr W. Wilson, Dumfries. Since then it has, on two other occasions, come to Scotland. In 1859, Mr J. Jardine ran first and second with Clive and Selby, and in 1861, Mr Hyslop won it with Mr Campbell's Canaradzo. It is not a little singular that Mr A. Graham, who has competed for it every year since its commencement, has never won it, although long long ago he had some of the best rough greyhounds going, such as “Gilbertfield,” “Cacciatore,” “Rough,”

"Rougher," "Roughest," &c., and in modern times, the smooth "British Lion," "Greenwich Time," "Rifle and Pike," "Anarchy," &c. Mr Wilson had a wonderfully good dog in "King Lear;" but it was very curious that the prize should fall to him the first time of asking, while Mr Graham, who had many dogs, particularly "British Lion" and "Greenwich Time," capable of winning it, never yet was victorious.

In breeding, Mr Campbell has had very great luck with his "Old Scotland Yet," who has bred a great many winners—viz., "Canaradzo," "Cazarina," "Canopy," "Coorooran," "Cialogia," "Coodareena," "Sea Foam," "Sea Pink," &c., by "Beacon." The first litter she had was by the celebrated "Bedlamite," all of which turned out of no use, while everything she had by "Beacon" could race—a singular instance of how a judicious crossing of blood tells. "Bedlamite" was a black dog, and although it may be safely asserted that he lined upwards of 100 bitches of all colours, red, white, and blue, all his produce were black. When his owner, Mr Brown of Nottingham, reduced his kennel by a sale at Doncaster, several years ago, "Bedlamite" was bought in at £500, a *bona fide* bid of £480 having been refused for him.

Mr Campbell has never reached this mark, although we fancy he might very nearly have accomplished it with "Canaradzo," who, since he won the Waterloo Cup, was put to the stud at ten guineas a bitch, and must have yielded a large sum annually to his owner; and he has produced more winners than any dog of his day. He was lately sold to a Lancashire courser for £140, Mr Campbell having during the winter also disposed of his nephew "Calabaroon" (by "Cardinal York" out of "Canopy") for £200 with contingencies.

Mr Campbell's success must not be taken as a rule; but a farmer, or indeed any person who has good accommodation for a brood bitch, by securing one of a good breed, and putting her to a well and fashionably bred sire, might easily make it pay as well as a brood mare, inasmuch as, with the same luck attendant upon the one as the other in regard to health, he would be enabled to sell the pups much earlier and at a better price than he would do the foal.

By Coursing, city men may enjoy the beneficial effects of air and exercise; and agriculturists, by following Coursing into different districts, will always find something new in their own line.

## The Dairy and Poultry Yard.

### THE HENWIFE'S KALENDAR FOR SEPTEMBER.

IF the hatching season has been good, and the coops unthinned by disease, the henwife will find it no easy matter to supply corn to fill the crops of the pullets and cockerels, which as chickens were so easily satisfied; she will, therefore, be easily persuaded to send to market, without delay, those which are not required for keeping up the stock. Previous to this, however, she will select from her numerous families those which she means to grace her own pen. Her choice will, doubtless, fall on healthy, handsome, full-bodied, sprightly hens, whatever be the breed she may fancy. Taste varies in this as in other things. The high esteem in which Cochins were at one time held has been found so utterly ridiculous, that a reaction took place and sunk them far below their proper level. From this, however, they are beginning to rise, and a short time, doubtless, will place them in their true position. Where one kind of fowl only is kept, better than Cochins could not be had, especially if the accommodation is limited; for they thrive in a small place, do not wander, are too heavy to fly over enclosures, lay far on in the season, and fatten easily for the table; any want of delicacy in their flesh is compensated by the additional quantity supplied. The frequent desire of the hen for incubation is her great fault; in order to remove this desire when she is not wanted to sit, put her into a dark cellar without any nest, and keep her on low diet three or four days: at the end of that time she may be returned to the yard, and in a week or so she will recommence laying. Should the cure not be effectual at first, repeat it until it is so.

When the principal object in keeping fowls is to have a supply of fine eggs, the Spanish hen is to be preferred before all others. Her eggs are very large, and she produces them

in great numbers also, for she wastes no time in brooding, seldom shewing any desire to sit. The chickens are very delicate, and difficult to rear; the hens are hard moulters, and bad foragers. By crossing them with the Dorking, a kind is produced which, for laying and breeding, cannot be surpassed; and which, for the table, may challenge anything that can be produced. Pure Dorkings are highly esteemed by fowl fanciers. The great weight to which they attain makes them valuable for the table; they are good foragers, good layers, and good mothers, but their eggs are in general smaller than those of the Spanish hen; and where the accommodation is limited, they are very unsuitable, for they are great rovers, and require a fence of great height to keep them within bounds.

Whatever be the kind, breeding in-and-in, as it is called, must be avoided; the very best breed will soon degenerate by this means. To avoid this, the cock should be procured from a totally different strain; he should be in his second year, and changed every two years. He should be lively and sprightly, the best of his kind that can be had. In introducing a new one, he should be quietly and stealthily placed on the baulks after dusk. If introduced in full day-light, the hens might attack him in a body, and injure or even kill him. Should two be brought into the yard at once, they would be sure to fight, and the hens will be found to take to the victor, and unanimously discard his vanquished foe. It is wonderful to see how a good cock will forage for his hens; how he will "luck-luck" to them when he discovers any treasure. We remember how a noble chanticler of ours once on a time refused to share the corn on which his mates were feeding; how he kept restlessly moving about, looking all the while



as if he missed some one; how he turned out of the yard into his run, and presently returned with his favourite hen; and how they then enjoyed together their grains of barley, better to them than grains of gold.

As to the number required, one cock to six or eight hens is the number usually allowed if the eggs are to be set; if not, one might do for a yard of fifteen or twenty hens.

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### A DAIRY FARM IN AUSTRALIA.\*

THE estate of Bodalla, consisting of about 14,000 acres, is situated upon the Tuross River, about 200 miles south of Sydney (the river runs through the centre of the property, a length of nearly twelve miles). It consists of rich alluvial flats, nearly free from timber, backed up by gentle undulations, terminating in hills, with high mountains to the north. The timber on the river consists chiefly of mahogany and oak, and on the hills and ridges, of blackbutt, box, and apple tree. The extent of the property at present cultivated consists of about 2000 acres, of which quantity Mr Mort farms 500 acres; the remainder is let to tenants. On each of the farms comfortable cottages, yards, milking bails, &c., have been erected by the proprietor, who also supplies each tenant with a requisite number of milking cows. The rent they pay is three day's milk a-week, which is delivered at the homestead; there are certain conditions as to the rearing of pigs, &c. As this arrangement has only been in existence for a short time, I cannot say how it will answer, but to my mind a handsome competence must be the consequence. In no part of the world could more favourable terms be granted. With a liberal minded landlord, comfortable homes and appliances, high-class milking cows, rich English grasses, good prices for their produce, and with almost a nominal rental, if non-success follows the fault must be the tenants. I regret to say some of the farms visited were not kept in that tidy order in which I am sure they must have been handed over.

I wish particularly to describe Comerang, the home station, farmed under Mr Mort's supervision, and on which the celebrated Bodalla cheese is made. It consists of 250 acres of the river flats, surrounding the house, fenced into four paddocks. The land is laid down in prairie, cocksfoot, rye, timothy, meadow, fescue, alsace, and clovers (more valuable grasses are now being cultivated). The paddocks are thoroughly drained by box culverts (quite works of engineering skill); each paddock has separate watering places, independent of the river. I cannot describe in too glowing terms the richness and verdure of the fields, more resembling the meadow lands of our best Eng-

lish counties. During my stay, ninety-one cows were milked twice a day (take 11th December), and gave 190 gallons of milk, giving 228 lb. of green cheese. The cheese are kept for four months before being sent to the market; a fortnightly supply is regularly kept up; the cheeses run from 20 lb. to 110 lb. I ought to mention here that no cheese is made on Sundays, but that day's milk is made into butter on the Tuesday. The dairy and cheese-making is under the care of Miss Lillias M'Lean (of long experience with Messrs Hervey of Glasgow), whose constant aim and pride is to keep up the well-merited character of the Bodalla brand, and who seems, judging from the state of her dairy, cheese-room, &c., to consider "cleanliness next to godliness." The milking shed and bails are the most complete I have seen. They consist of four rows of bails, shingled over and slabbed, eighty in number. Each cow is bailed up in her own stall. By a convenient arrangement of ropes and pulleys, it is unnecessary to go up to the head to bail and unbail. A crib is fixed before each, filled with green stuff, on which she quietly feeds during the milking. The cows are not unbailed until the last one is milked. A man precedes the milkers (six in number) who leg-ropes and washes the udders of each cow. A head-man follows, whose duty it is to strip the cows, thus causing a check upon the milking. Silence is strictly enforced during the time. The milk is poured into buckets placed upon a car, and run by a wooden train direct into the dairy. Although only ninety-one cows are now being grazed upon the 250 acres of Comerang, the manager informs me (and of this I feel assured, judging from the quantity of grass after four months' drought) he could easily carry, and carry well, a cow to two acres. The cows do not seem of any particular breed. The Durham appear to be the foundation of the herd, and now crossed by the Ayrshire; but the main rule is "milking," quantity and quality, and constant culling. The calves are taken from the cows immediately after calving, and fed twice a day on whey. During the day they run in a well-grassed paddock, and are housed at night in well-ventilated but warm buildings, with boarded floors, troughs, and hayracks.

The pigs on Comerang (about 200) are the finest I ever saw, being the Prince Albert and Berkshire.

\* An account of the "Bodalla Dairy Farm," the property of Mr T. S. Mort, by a correspondent of the *Australasian*.

The sows are drafted a few days prior to farrowing into well-arranged separate styes. They are allowed a couple of hours' run daily in a small paddock, into which all the styes open by a narrow lane. For six weeks they are fed on maize, whey, &c., when they are turned with their young into a large grassed and well-watered paddock with the general herd, where they get 2 lb. maize daily (a bushel per month), which keeps them in high condition. It seems to me Mr Mort favours the Prince Albert, although he considers the cross with the Berkshire the best for store purposes.

A small flock of Lincoln sheep are also kept. I do not think, for length of staple, good combing qualities, weight of wool, points, and rapid maturity of carcase, they can be surpassed. They kill wethers of fourteen months old regularly, weighing 48lb., and a lamb I saw killed, of four months old, weighed 48 lb.

The whole farm management seems by the arrangements to aim at economy of labour. Improved machinery, superior buildings, tramways, steaming apparatus, stables, sheds, &c., all these, combined with the comfortable cottages for the labourers, give an exhilarating English air to the homestead, breathing of health and contentment.

The climate is truly English. I can only account for this by the quantity of water upon and running through the property, and consequently heavy dews. These dews are increased by keeping the paddocks well covered with grass, thus attracting the moisture and acting as conductors to the roots. Much of the verdure exhibited after a four months' drought must be the result of a careful appropriation of the dews, amounting, at Mr Mort's estimate, to about one-sixth of the yearly rainfall. Therefore, the maxim enforced especially at Bodalla, "keep the grass at a good bite," is one which they have no difficulty in complying with at present; while at the same time it is equally insisted upon that the grass should not be allowed to get too long and rank, as a flood would be the death to it in that condition. In that case it is apt to get laid and rot before the water runs off. To feed judiciously includes the whole law, and thereby hangs the profits (prophets).

The present system on Bodalla seems to be only to lay out the current profits in progressive improvements, of clearing and laying down in English grasses. When the 4000 acres are thus laid down it will indeed be a princely property.

Mr Mort is only what he calls "roughing" the land into grass at present, as he intends, by degrees, to cultivate the land to a depth of 18 inches, which, with thorough drainage and judicious feeding,

will, he considers, enable him to carry a cow to the acre all the year round, but without these the land is comparatively worthless. I would here mention that Mr Mort considers he has to outlay £10 an acre upon these rich flats in order to yield a profitable return. This cost includes, of course, draining, fencing, cultivating, and seeding as well as the necessary buildings for carrying out his system of farming; but this only shews that labour without capital can no more prosper than capital without labour. Suppose this outlay of £10 an acre yields grass for one cow to two acres, and suppose the cost of the land be £5 an acre (for it must be remembered Mr Mort had to pay Government a large sum for worthless land to get 4000 acres of good land), it requires to feed a cow an outlay of £30; this cow yields daily 1½ lb. of selling cheese at 8d. per lb., thus making £18 a year; take from this for expenses of milking, keeping land, fences, &c., in order, say £5 a year, and there is a return of £6, 10s. an acre per annum. Could this be done on a small scale and without capital? Certainly not. If so, why is it the free selector on the rich blocks, which many of them hold scarce makes an existence? The Government ought to find the money to farm with, as well as the land to be farmed, if they will have free selection.

The above calculations are mostly made from conversations I had with Mr Mort. I will now give my idea of what may be done with 4000 such acres, based upon the return of ninety-one cows now farmed at Comerang. 4000 acres will carry say 1500 cows, giving say 2500 gallons milk per day, making say 18,000 lb. of cheese weekly, sold at 8d., or £600 per week, or £28,000 a-year! To this must be added the profits of some 2000 pigs, and 1200 calves which have the uncultivated part of the estate, some 10,000 acres, to run over. I believe £400 per 100 cows yearly is quite sufficient and ample for the expenses—say for the management of 1500 cows, £6000 per annum.

I am well aware the above large return, arising from so apparently small a source, will cause a smile of ridicule and doubt when some of my fellow-colonists peruse this, and more especially emanating from an old squatter, who is not supposed to know any of the minutæ or routine of a dairy farm. I do admit much ignorance on the subject, so far as my previous pursuits are concerned; but I plead in apology that my statement and remarks have been made from facts, strict personal observation, and the well-tried experience of the proprietor's very superior manager, Mr Champneys, to whom I am indebted for much valuable information.

## Hunting, Fishing, and Shooting.

### ON SPORT AS BEARING ON NATIONAL CHARACTER.\*

IT may be said to be almost a truism, that the love of sport is inherent in the breast of man, and nowhere is this taste displayed more strongly than in the British islands. Although the English, Scotch, and Irish differ much from each other in many characteristics, they seem to unite on this common ground, and equally to enjoy the sports of the field. Our French neighbours, on the other hand, care little for the country, with all its charms. For them the social influence of the town is sufficient, and should they ever require to live in the country, the life of the town is transferred thither. In Britain the love of sport seems to be the result of the love of freedom, which may be said to be indigenous to the soil. There are many people who think that every hour spent in field sports is an entire waste of time, but it is only when such amusements are followed so unceasingly as to rob us of that time, wealth, or energy which were given us for other purposes, that the pursuit of them can be censured. Again, it may be said in their favour that by their agency the martial character of our people originated, and has been sustained, longevity promoted, and results, in a commercial point of view, important for the welfare of our country brought about. They are, above all, eminently calculated to encourage the social qualities, and even in those that can be engaged in singly—such as shooting and fishing—it rarely happens that they are not pursued in company; and if so, then not by choice. In former times there was no bond of union between the two great classes of the people—the aristocracy and the lower

orders. The sports of the nobility were confined to jousts and tournaments, hunting, hawking, and the chase generally; but in these the lower orders had no share, except, perhaps, as accessories, or simply as spectators. For them nothing was permitted but the practice of archery, quarter-staff, or wrestling exercises, which, though well adapted to make them hardy and self-reliant, kept them aloof from the higher classes, who regarded them with contempt. At the present day what a change has taken place! Our principal amusements are those which bring together people of all grades, and for the time break down all class barriers; and Lord Wilton observes—"the landlord meets his tenant by the covert's side, the cricket field knows no distinction of persons, and the glories of a Derby-day point to a reign of such universal freedom, such jostlings of high and low, such social mixtures, as could be found in no other country of the world."

Beginning with what may perhaps be considered as the oldest sport—viz., hunting—it is easy to see that this is one of our national amusements, as it is one so freely entered upon by persons of all ranks; the covert's side being the common ground where all classes meet to enjoy an exciting sport, and where, for a time, there is that good fellowship which is one of its especial characteristics. The chase is now confined to stags, foxes, and hares; but it is to the hunting of the fox that, since about the year 1750, packs of hounds have been established in many of the counties of Britain. There is no doubt that, from the cunning of that animal, a fox chase is far more exciting and spirited than any other kind of hunting. As illustrative of the cunning of the fox, Lord Wilton gives us the following anecdote, originally

\* On the Sports and Pursuits of the English as Bearing upon their National Character. By the Right Hon. the Earl of Wilton. 8vo. Lond. 1868.

published in Southey's "Common-Place Book":—

"A tame fox at the White Hart, Bridgewater, was brought up from a cub to run in the wheel of a turn-spit. One day, through the neglect of his keeper, he escaped, got to Sedgemoor, and made wild work among the geese. The writer of this was out the next morning with Mr Portman's dogs, and, going towards Borough Bridge, found the glutton under Alfred Stump. The dogs being laid on, Reynard presently passed through the Parrot, and, taking by North Pethererton, sought the woods above Monkton, but being driven from thence, dashed through the Tone, a mile below Newton, and, turning northward, passed Kingston, and was for a time lost in the thickets above Buncomb. The scent serving, Reynard was at length uncovered, mounted the Catherstone hills, descended to Kenniton, and mounted the stone mountain in Lord Clifford's Park, from whence he was presently driven by the staunch pack. Leaping the poles at Enmore, he took through Lord Egmont's grounds, and, getting again into his old track, recrossed the Parrot just below Pethererton, and taking slowly along the banks of the river, with the pack in full cry, leaped the fence of Mrs Francis' (his mistress) garden, and immediately entered the kitchen, darted into the spit-wheel, and began to perform his domestic office with as much unconcern as if he had been placed there for that purpose. The fat cook, with whom he was a great favourite, spread the place of his retreat with her petticoats, at the same time beating off the eager hounds with all her might and main; but this would have been unavailing if the huntsman had not whipped them off, and, after a chase of nearly thirty miles, left this unlicensed poulterer in his domestic occupation."

As to the benefit the country receives from fox-hunting, a very slight glance at the amount of money distributed by this means will sufficiently prove. According to Colonel Cooke, the cost of a pack of fox-hounds varies according to the number of dogs, and the number of days in each week they are hunted. Twenty-five couple, to hunt twice-a-week, costs £1190; forty couple, to hunt three times a-week, £1625; and fifty couple, to hunt four times a-week, £1936; and if a huntsman is kept, £300 a-year more. Now, according to a statement in the *Field* newspaper, the number of packs kept is about 213; this, multiplied into the several sums stated above as to the cost of keeping hounds, will give a very large aggregate amount circulated throughout the country, to say nothing of the money spent by those who hunt

with the several packs, the purchase of horses, the number of men employed, and the incidental expenses incurred in keeping up the entire business of hunting.

If hunting be the oldest of our national sports, the next, both in point of seniority and importance, is horse-racing, which in England has received its highest development. "If," says Lord Wilton, "Frenchmen are congregated in any locality, a theatrical performance would be a necessary condition of their existence. If Spaniards are gathered together a bull-fight would display the national tendency. Let but a few Englishmen assemble in any quarter of the globe, and it may be safely predicted that a horse race would be organized, thus indicating at once the popular passion. The spirit of this sport pervades, indeed, all classes. It is a common subject of conversation. The pedigree of every thorough-bred horse is curiously scanned, the qualities of sire and dam are the subject of anxious inquiry, and the performances of each animal assign to it its special relation to other animals, and also its pecuniary value; large sums are made up in support of the institution which from early spring to late autumn forms the charm and solace of the Englishman's life."

Horse-racing may be traced back to a very early date, and was patronized by nearly all the English monarchs. At the present day it is at Newmarket, Epsom, and Doncaster that the three great races of the year are held. At the first of these there are six meetings for the purpose of running horses, and the spring meetings there may be said to influence the racing of the year. Besides other well known stakes those of 2000 guineas and 1000 guineas have special reference to the year's running; for the first generally brings out the horses which, as three-year-olds, then make their first appearance, and upon their performance is supposed to depend their qualification to compete for the other great races at Epsom and Doncaster. The Epsom races are held about Whitsunday, on the Downs, in the vicinity of the town of Epsom, and nothing can bear comparison with the appearance they present on the Derby-



day, where, in addition to thousands of pedestrians, almost every kind of equipage, from the four-in-hand coach, down to the humblest vehicle that industrial art can supply, may be seen on the race-ground, while the spectators are of every rank of society, from royalty to the lowest grade of human existence. The last of the three is the Doncaster meeting, held in autumn, at which the St Leger stakes form the great attraction.

In shooting, the national propensity to sport also shews itself; and, indeed, throughout the world, wherever wild animals are killed for the sake of sport, it is mostly by Englishmen. The training of the dogs for this purpose is also not excelled in any other country, and it has reached such a point of excellence that shooting pointers almost display reasoning powers. Lord Wilton gives us the following singular account of a pig which was trained as a pointer, and whose feats seem to have excelled even the best trained dogs:—

“Of this most extraordinary animal (known by the name of Slut) will here be stated a short history, to the veracity of which there are hundreds of living witnesses. Slut was bred in, and was of that sort which maintain themselves in the New Forest without regular feeding, except when they have young, and then but for a few weeks; and was given when about three months old to be a breeding sow by Mr Thomas to Mr Richard Toomer, both at that time keepers in the forest. From having no young she was not fed, or taken very little notice of until about eighteen months old. She was seldom observed near the lodge, but chanced to be seen one day when Mr Edward Toomer was there. The brothers were concerned together in breaking pointers and setters, some of their own breeding, and others which were sent to be broken by different gentlemen. Of the latter, although they would stand and bark, many were so indifferent that they would neither hunt nor express any satisfaction when birds were killed and put before them. The slackness in these dogs first suggested the idea that by the same method any other animal might be made to stand, and do as well as one of those huntless and inactive pointers. At this instant the sow passed by, and was remarked as being handsome. R. Toomer threw her a piece or two of oatmeal roll, for which she appeared gratified, and approached very near. From that time they were determined to make a sporting pig of her. The first step was to give her a name, and that of Slut (given in consequence of soiling herself in a bog) she acknowledged in the course of a day, and never afterwards forgot. Within a fortnight she would find and point partridges or rabbits, and her training was much forwarded by the abundance of both,

which were near the lodge. She daily improved, and in a few weeks would retrieve birds that had run as well the best pointer; nay, her nose was superior to any pointer they ever possessed, and no two men in England had better. They hunted her principally on the moors and heaths. Slut has stood partridges, blackgame, pheasants, snipes, and rabbits in the same day, but was never known to point a hare. She was seldom taken by device more than a mile or two from the lodge, but has frequently joined them when out with the pointers, and continued with them several hours. She has sometimes stood a jack snipe, when all the pointers had passed by it. She would back the dogs when they pointed, but the dogs refused to back her until spoken to; their dogs being all trained to make a general halt when the word was given, whether any dog pointed or not, so that she has been frequently standing in the midst of a field of pointers. In consequence of the dogs not liking to hunt when she was with them, for they dropped their stems and shewed symptoms of jealousy, she did not very often accompany them, except for the novelty, or when she accidentally joined them in the forest. Her pace was mostly a trot, was seldom known to gallop except when called to go out shooting. She would then come home off the forest at full stretch, for she was never shut up but to prevent her being out of the sound of call or whistle when a party of gentlemen had appointed to see her out the next day, and which call she obeyed as readily as a dog, and be as much elated as a dog upon being shewn the gun. She always expressed great pleasure when game, either dead or alive, was placed before her. She has frequently stood a single partridge at forty yards distance, her nose in a direct line to the bird. After standing some considerable time she would drop like a setter, still keeping her nose in an exact line, and would continue in that position until the game moved. If it took wing she would come up to the place, and put her nose down two or three times, but if a bird ran off she would get up and go to the place, and draw slowly after it, and when the bird stopped she would stand as before. The two Mr Toomers lived apart at Rhinefield and Broomey Lodges. Slut has many times gone by herself from one lodge to the other, as if to court the being taken out shooting. She was about five years old when her master died, and at the auction of his pointers, &c., was included in the sale, and bought in at 10 guineas.”

In all the other sports noticed by Lord Wilton, such as coursing, yachting, rowing, cricket, &c., but into which our limits will not allow us to follow him, we find the same ceaseless energy displayed which is characteristic of our countrymen, and which satisfactorily proves the influence which our sports have exerted, and are still more to exercise on the national character.

## DEER DRIVING IN MULL.

BY THE SPORTING CONTRIBUTOR OF "THE FARMER."

"Hunts he Bentalla's nimble deer."

DEER of the woods, although often large and heavy, are seldom gifted with what foresters call "a good head." The cover of trees is unfavourable to that branching development of the horns which a life on the open hills seems more fitted to foster. As "heath-covered Mull" is entirely grazed by sheep, its deer feed chiefly in the tangled woods and copses, and are loath to shew themselves on the bare hill, where they may be chased by a collie dog, or "potted" by its master's "swan post," and no witnesses to the murder but the "wild flock," the eagle, or the raven.

I was tenant of two good deer drives in Mull, distant about ten miles from each other, Bentalla, the truant "Lord of the Isles's," hunting-ground, rising between. The Scalastal range on "the sound" contained two large woods. One of them, however, called Garmony, had been lately cut, and was next to useless. But the Scalastal wood, when the wind was in the right direction, generally harboured some old deer. To keep all quiet, I also rented Scalastal farm and farm-house, turning my shepherds into game-preservers, and training their sheep-dogs to run the deer.

Glenforsa, the other shooting quarter, was situated on the opposite side of the island. In addition to some smaller patches, there were the fine hillside coverts of Garrochree and Torlochan—the former as wild a jungle as even this rugged island could grow. When either of these shootings was driven, especially if the deer were much frightened and the wind favourable, they were apt to cross Bentalla to the other. So after a hunt at Scalastal, we were not unlikely to find the

same deer next day at Glenforsa, and *vice versa*.

Like many tenants of deer, we were limited on both shootings. Three harts and two hinds was the Glenforsa allowance. A like number of hinds of Scalastal, but they were not so strict about the harts. These restrictions seldom annoy the man who kills his full complement, but they are most disgusting to a party who, at the close of a season, are far below the figure it was thus plainly intimated they were *expected* to slay. My predecessor, although assisted by his keeper and other guns, did not kill one deer among them the whole season. I also knew a party in the north, limited to seventy-five harts, end the season with fifteen, and in the shooting of this small lot they were aided by the resident foresters.

The first year of my Glenforsa lease I had only a few days at its deer. Our first stag was killed by my son when I was in England. I had charged him not to disturb the Glenforsa deer until my return, and he had kept strictly to small game at Scalastal. Two days before I was expected in Mull he drove over to Glenforsa House, with my Scalastal farm overseer, to prepare for our hunt. On the low ground along the banks of Loch-na-Gaul, with the river Knock flowing through it, is a detached strip of plantation much liked by deer, and, if undisturbed, seldom without them. When moved they have three escapes from this wood. When they break at the south corner and make for Garrochree, two of these escapes are guarded by the Knock pass. But should they seek safety in Torlochan wood, they slip out from the middle of the plantation, running east over a bare

field, at the top of which, under cover of a drain, is placed the rifle. The Knock pass is far the most certain, not only as commanding two escapes, but also from being more used by the deer.

On the second afternoon, my son, having completed his arrangements, agreed with the manager, that as the deer would be nearly certain to break cover at the Knock pass, there could be no harm in giving this patch an afternoon trial. Of the two chances commanded by the Knock pass, one is exactly 120 yards, the other about 30. It is impossible to equalize the distances without sacrificing one of the chances.

Yarrow's shrill yelp in the plantation soon warned my son that the manager had found deer. A large stag broke on the lower side of the river, came softly round the knolls, and made for the 120 yards' pass. Here he had to cross the water, but seemed in no hurry to wet his feet. The collie had not yet left the wood, and the hart listened and watched to see when he did. All this time the deer, being in a slanting posture, my son refrained from firing, well aware the moment he attempted to ford he must present a fair broadside. Black Yarrow now flitted from the covert, and the stag cautiously waded into the stream. Crack goes the rifle, down came the deer on his knees—recovered, and began to hobble across the current. A shot from the second barrel and he toppled over in mid-stream.

The first act after killing a deer is to examine where the ball has hit him. This time there were two marks through the brisket, on the opposite side to the shooter, but only one on the near side; it was therefore apparent that both balls had entered at the same hole. Considering the distance, this was therefore a beautiful right and left rifle shot. The weight of this deer was 18 stone, and he had a very good head for Mull. I was much pleased with this auspicious start; the more so as the manager saw more deer in the wood, which he had refrained from disturbing.

Dogs thoroughly trained to drive deer coverts, even when running a hot scent, should be taught immediately to quit it, and

return to their master at his whistle. The reason is obvious. When the deer are through the passes, further pursuit by a dog only tires *him* and scares the deer further away. As soon, therefore, as the quarry before them are past the rifles, the dogs should be called back into the covert to find a fresh track. Often a stray hart or hind turn back by facing the drivers, and remain quietly hid until the wood is searched a second time. An old Mull collie, which once aided our drive, was so knowing, that of his own accord he returned to his master whenever the deer had escaped the shooters. This sagacious creature knew every ambush guarding the wood, and as soon as the deer were out of danger, quite comprehended that it was useless to follow where there were no rifles to kill.

Our cover pack consisted of two pure-bred Mull collies, and a mongrel sheep dog, which looked like a cross between the old Scotch cur and a jackal. The island pair were *mis*-named Trim and Yarrow by their Tweedside master (my farm grieve), but the nondescript was more aptly styled "the Ugly Buck." He was a cross-grained, eccentric, unsociable, surly brute—had to have his teeth broken for biting the sheep—would follow or obey no one but his shepherd master, and when fairly "blooded" at deer, considered himself discharged from the meaner duties of sheep. Although Trim and Yarrow had good noses, and stuck well to their track, yet somehow I always felt most certain of a shot when the covert rung with the wolf-like howl of the Ugly Buck.

The day after my landing in Mull was pouring rain, but the following brightened up again. Scarcely expecting above one chance, I only put four bullets in my pocket, and took a single-barrel seal-rifle, which fitted me exactly.

The manager, his two Mull shepherds, and their three dogs, were sent to the far end of the Knock plantation, while I guarded "the Knock pass," and my son watched the other escape to Torlochan wood. The dogs had hardly been thrown into covert when they opened full cry. I distinctly heard the hunt begin at the north end, and gradually near

the south of the plantation. Soon two hinds broke below the river, but instead of making for the ford of the Knock, and giving me the 120-yard chance, they kept the open shore of Loch-na-Gaul, and, *contrary to all precedent*, took refuge on the hills of Knock.

I was testily watching their wilful course, when I heard a step approaching on the *near* side of the river. In a moment I knew it to be a deer's. A dip in the ground concealed the tramper until a pair of horns rose about 30 yards from my hiding. A fairer chance there could not be. He crossed at a trot, and I shot him through the heart. My son from his pass had noted this hart the moment he quitted the wood—had marked him confidently choose his way straight for my hiding-place—was well aware that I could not see him until he came slap upon me—and, to crown all, perceived my attention fixed on the hinds. The thrilling suspense did not cease until he saw me present my rifle. This deer weighed 15 stone, but had a poor head.

The overseer assured us there were two more hinds in the wood, which had "turned back." To give my son *his* turn, we exchanged passes, but fortune again favoured me; the hinds broke at the wood-side for Torlochan, came up the field, and cantered past me at about 60 yards. I rolled over the largest, and if my rifle had been a double-barrel, had an easier chance at her companion.

We now had to choose our stances for a beat of the large hill-wood of Torlochan. Again the most likely pass was awarded to my son, while I chose mine by the side of a detached rock called "the Rock pass." This extensive covert requires to be searched with great care and labour. I heard the shouts of the men—now up the hill, now down, then across—until I was quite tired out; not a deer seemed to be in the wood. All of a sudden our pack struck up a jarring chorus. At first the chase bore for my son's ambush, but passing it out of range, made for mine. A hind soon shewed herself about 100 yards off. I used my rock for a rest and fired; the deer staggered, then slowly walked to-

wards me. When within 40 yards she halted—a lovely chance. Of course I began to load the single barrel. She listened for a moment, then slunk behind the adjoining heights. Taking a circuit for the wind, I came round them, and was expecting every instant to come upon the wounded deer, when a fresh pair of hinds turned up at long range on the open heath. Putting up the 200-yard sight, I fired the last of my balls! I saw it miss the deer and strike the hill about a foot before them. After loading with powder, I put my hand into my pocket for the bullet!! Here was a fix—for within 100 yards of where I threw away my last ball stood the stricken hind. She allowed me to walk within the fairest range, then limped down the hill, taking refuge in the thickets of Garrochree. It was more than an hour ere I could collect my men and dogs, but by that time the scent had cooled, not even the ugly buck deigning to notice it. We searched till dusk, by which time I had come to the conclusion that it is less troublesome to take too many bullets than too few.

#### THE GARROCHREE STAG.

He was a lonely one, caring nothing for company, large, intensely cunning, and carrying a royal head. From his partiality to the impervious whins of Garrochree he had gained his title. He never willingly left his fastness, except when the flies forced him, returning to it whenever the July sun had abated his fierceness. When hunted he ran a ring round and round the thickest underwood, avoiding every open, and confounding the dogs by the labyrinth of his traces. I have known him dodge about in this manner for half a day, and yet never be once seen either by sportsmen or beaters. The well-known "catch a weasel asleep" might well have been applied to him, and yet this big weasel *had* been caught napping, but for breaking the proverb nearly paid the forfeit of his life.

A former tenant of Glenforsa had an eight-barrelled rifle, with which he used to astonish the Mull natives by breaking bottles at fabulous distances, and no doubt he was a



crack rifleman—at the target. One calm summer day, soon after his taking possession, a wood-cutter, in passing through Garrochree wood, spied a pair of antlers peering out above the low whins. Shrewdly suspecting the owner of the horns could not be far off, the man of the axe went to Glenforsa house and apprised Mr — of his discovery. The eight barrels were soon shotted, and the rifleman, guided by the woodman and accompanied by the farm grieve (who told me the above particulars), was soon close to the stag's lair. The rifleman was perfectly concealed, and to increase his chances of success the deer had risen, and, all unconscious of peril, was cropping the rich grass within point blank range. The eight barrels were levelled; barrel 1, the stag started; barrel 2, looked about to see where the noise came from; barrel 3, walked a few paces and then listened; barrel 4, shook his head and looked towards the enemy; barrel 5, the stag, like a determined duellist, having accepted five shots, thought he had done enough to prove his courage, and resolved never to stand fire again.

Our men and dogs having been quite done

up by severe work, we gave them a day's rest, to enable them to do justice to our last deer hunt of the season. But the wind was "wrong" for our final day. No deer consequently in Knock wood—not a track in Torlochan—the evening fast closing in, and our only hope the rugged jungle of Garrochree. To humour the wind and command a view of the hunt, we occupied the high passes, but, after the morning failures, had about equal hope of moving a rhinoceros as a red-deer. I was listlessly looking at the men taking ground ere they threw the dogs into the thicket, when my eye picked up a deer slowly threading a devious course, but evidently making for the open hill. With keen interest I watched its many wayward angles and wheels, when suddenly halting and casting a glance at the baffled dogs and men, it stalked into the bare ground—a majestic royal stag. Choosing the pass immediately beyond those where we were concealed, and bringing his noble profile into full relief against the evening sky, he disappeared leisurely over the ridge of the hill. This was the first time I saw the "Garrochree stag," but it was not the last.

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“THE TWELFTH.”\*

THE “Twelfth” is almost within sight, and we are in perfect ignorance as to what the yield of our chief moors is likely to be. There are people who say that the birds are “more numerous than ever,” but we cannot believe them. Who in the face of what we now know of last year's grouse plague could credit such a statement? The devastation was so great that we had some expectation that a jubilee would this year be proclaimed by the large owners of grouse ground. In former years it was no uncommon circumstance for the birds to obtain a jubilee, which must have been exceedingly distasteful to those persons who hold that all the ills that grouse are heir to result from the moors being overstocked. This theory, which has been well

ventilated of late, is gaining a few converts; but we shall never be numbered among them. When some authentic statement is given on the subject of moor economy—when we know with some approach to exactitude how many brace of grouse can be bred and fed on each acre of ground, and how many of the birds may be safely killed—we shall then be in a better position to determine whether or not there is any foundation for the theory of overbreeding. When we consider the remorselessly logical way that nature keeps up a perfect balance among all animate things and gives the shooting into the bargain, we have no alternative but to throw aside the overgrowth theory.

The army of sportsmen that will render the lonely moor-grounds populous on the “twelfth,” forbids the slightest hope being held out that our grouse will ever

\* Abridged from the *Edinburgh Courant*.

be allowed to multiply overmuch. Besides, are there not the men who are not sportsmen—the grouse murderers, whose mission is simply to kill every winged thing that comes within the range of their guns—to prevent such a desirable circumstance from ever coming to pass? The various incidence of moor-taking and bird-slaughter, as now carried on, may be briefly alluded to, in order to illustrate the position we take up. The best and safest moors, of course, are those which wealthy proprietors keep under their own management; they shoot for the mere pleasure of the sport, inviting relays of visitors to pass a few weeks with them in the season. The birds which are shot are chiefly distributed to friends; and if there be any surplus the head-keeper may have instructions to send them to a dealer; and on such a model moor as we have in our mind's eye a little more shooting may be necessary than can be accomplished by my Lord and his guests, but at no time will the additional shooting be allowed to degenerate into a battue or bird massacre. On such a moor we may allow, by way of argument, that it is possible that too many birds may be left—more birds than there is breeding or feeding ground for, but we don't often hear of such a casualty taking place. Nature keeps up an exquisite balance; and the kind of moor or shooting-ground we have imagined is the best to be obtained for sport and the amenities of sportsmanship.

The next best moor is that which is honestly let by a fair and square proprietor to a fair and square tenant. A country gentleman, we will say, is going to take a Continental trip with his family, and desires to help his expenses by letting his moor. It is taken, we will assume, by a retired Australian "nabob," if we may be allowed to use such a designation, and the game and ground are used as economically and fairly as if they were his own, and as if he looked to future as well as present sport. He is so wealthy, perhaps, that the four or six hundred pounds which he pays for his shooting range is not a deadly drain upon his resources, and he has a succession of visitors whose only desire is new scenery and change of occupation. A raid on the hares and rabbits will pay all his extras, and so for three months or so all is as it should be; he leaves the ground with the respect of the keepers and their good report to their absent master. The moor is none the worse of his visit, indeed all the better from being shot over. A fine stock of breeding birds has been left, and when the proprietor takes possession next year he finds everything as proper as if he had never been away.

But when a person takes a large shooting from an ostentatious desire of making a show, which many persons are now-a-days apt to do, the circumstances begin to be less pleasant. The gentleman lessee finds out that he has been rather going beyond his means by giving so large a rent, and in desperation he commences to "shoot like mad" in order to ease the demand on his bank account; for what with servants, travelling expenses, and "extras" of all kinds, he

begins to see that he has entirely miscalculated his resources, and must, if possible, make up the deficiency by drawing on the dealer with whom he had contracted to take his surplus grouse. How some keepers do gnash their teeth as they see the well-filled hampers being dog-carted off to the nearest railway station *en route* to Manchester or London, the gentleman sending the consignments having all the time but one anxiety—namely, that the price may not have fallen below the last quotation, which, although it were five shillings a brace wholesale, would be all too little for his ambition. The moor being at length exhausted, or nearly so, and the remaining birds being too wild to be conveniently got at, the tenant takes his departure, and the factor or proprietor has just to listen to the complaints and denunciations of the keepers with as much equanimity as he can summon up. There was certainly no bargain as to the number of birds to be bagged; and if the factor or head keeper remonstrated, he may be met with the counter-remonstrances of the moor being altogether "a sell;" the former tenant, it is not improbable, may have been doing likewise; and the deterioration of the moor may have been going on for two or three seasons unknown to those in authority. As no one knew the stock of grouse that was on the range, or the breeding and feeding capacity of the moor, they could scarcely know with any degree of accuracy what number of birds it was proper to kill each season.

We now come to the swindlers—men who are not sportsmen at all, who are mere grouse murderers, with no eye for the beauties of nature, or any love for sport—who have but one desire—namely, to make a profit out of their shooting ground for the year in which they have it. They never get a second chance in the same neighbourhood. "This week Mr Snooks and his brother killed the enormous number of 380 brace of grouse on their shooting-ground of Glen Swindle" is an entry in the local paper after their own heart, as it will represent a remittance from Leadenhall Market of perhaps fifty pounds sterling! A few weeks at that rate soon settles their account, and leaves a little something over. Then Snooks, who keeps a billiard-room in Jermyn Street, has a few "green 'un's" coming down. They will bring with them all sorts of "grub" and liquors. They get as much shooting as they like, and can send off as many birds as they please to private friends whom they wish to know that they are at their shootings; but these are of course debited to their account by Snooks at the market price. "This shooting is so expensive, you know," says Snooks, "that I am positively losing money by the transaction; but I'll get it out of you in London." And so the war goes bravely on; and we need not say that Snooks has by far the best of it at the end of the season. What is it to him or his confederates that the moor is left barren and ruined on the hands of the proprietor? He wanted to "do the grand" with a moor, and he did it to some purpose.

The story of the two Highland chairmen who used to farm a moor has before now been told to our readers, but they were, although vastly industrious, less mischievous than some other men who take moors. They made a business of it, besides having a feeling for the sport; but there are many who have no feeling at all, who simply desire to use their guns as a means of making money, and there has arisen out of this system another system of subletting ground that is certainly becoming disastrous to the grouse and to those proprietors that fall victims to the swindlers, who, however, make a good profit out of it in one way or another. There are so many gullible people now-a-days that we are never surprised at anything. Men will pay a guinea a day to be allowed to capture fish for some innkeeper, and think it capital sport all the time, paying an extravagant hotel bill besides with the greatest possible relish. There are certain smart people in the north who take a moor or a range of shooting and let it out to great advantage, getting their own money out of it and a great deal more in

addition. We need not again go over the tricks of this class; they are getting known, and their greed will in time work its own cure. What we want to teach is, that, with such people at work, the birds cannot obtain fair play; besides, from artificial and natural causes, they may soon be reduced so greatly below the reproductive point as to lead in time to extermination. We are overshooting our grouse in the same way that we are overfishing our herring and our oysters; the breeding cannot keep pace with the killing, and the temptation to kill grouse—in the early days of the season, when they are selling at 5s. each—is not easily overcome, especially by the kind of persons we have depicted—the bird-murderers and grouse-slayers—who must make money out of their sport, thus making sport what it was never intended to be, a business of the most mercenary kind.

That the present will prove but a poor shooting season we are warranted in believing, and, therefore, in all the circumstances of the case, we feel it only right to recommend the grouse to mercy.

## The Country Gentlewoman.

### HOUSEHOLD CLEANING.

(Continued from page 215.)

#### V. SWEEPING AND DUSTING.

**S**WEEPING is an art of a simple nature, but which to do well requires practice and care. The broom in the hands of a thoughtless girl may do more harm than good, by raising the dust from one lodgment only to send it into another, instead of rolling it gently along until a mass is collected sufficient to be swept into the dust-pan and carried off. Before beginning to sweep, the housemaid should close the doors and windows; and, by throwing sheets over the furniture of the room, protect it from any lodgments of dust.

The floor, whether carpeted or uncovered, must be with prodigal hand sprinkled over with moist tea-leaves. Let the housemaid remember that the tea-leaves should not be mouldy, or they will impart no pleasant freshness to the air of the room, nor dried, or they will be useless in catching the dust. Taking her broom she must first sweep gently the dust collected under the furniture, beds, drawers, &c.; and, when sweeping in the open room, she should avoid lifting her broom hastily or high above the ground, which would impel the dust upwards, but she should endeavour to check its rising, while she quietly and gently rolls the mass of leaves and dust into one spot, from which she can most readily sweep it into her dust-pan.

After sweeping, the essential work of dusting should be done. The window-curtains, which had been lifted up considerably above the floor during sweeping, should now be released, opened, shaken, brushed with the proper brush, and properly arranged over the hooks or bands for the day. Tables, sofas, with all the varieties of chairs and seats now in use, are then to be carefully dusted and arranged.

Ledges of wainscots, panels of doors, and window-panes, must be swept with the small brush called the banister brush. Mirrors and pictures, with gilded frames, must be brushed with feathers or silk dusters. A linen rubber spoils them.

Chimney-piece ornaments must be carefully removed, and the mantel-piece either wiped free from dust, or washed with cold soap and water; the ornaments, before being replaced, must be carefully wiped with a fine linen duster.

Sweeping is in most country places a daily business, neither bedroom nor parlour being considered as properly done if this be neglected. In London, where the necessity for sweeping daily is still more urgent, it is customary to sweep the bedrooms twice, and the sitting-rooms only once a-day.

Under beds, wardrobes, and other movable furniture, every particle of dust should be cleared away each day, either by employing a clean damp mop kept for the purpose, or a damp scouring flannel.

For sweeping boarded floors, the common hair broom is used, which costs in purchasing from 3s. to 4s.

The carpet broom, or whisk brush, is made of the dried leaves of a tough grass.

It is not desirable to sweep the carpet with this broom more than once a week, being rather too harsh for daily use. But after a carpet has been well swept with it, the common hair broom will keep it sufficiently clean for several days. The druggist brush, a short-haired broom, answers for stair carpets, and for rooms covered with druggist.

#### VI. CLEANING AND PRESERVATION OF CARPETS.

Carpets, thirty or forty years ago, were



regularly taken up during the summer months, and, after being well beaten, were rolled up and deposited in some convenient part of the house till autumn; the floors, in the meantime, being only partially covered with oil-cloth or matting. This custom rendered scouring and dry-rubbing matters of more importance than they are at present, when sitting and even bedrooms are generally entirely covered with carpets, at all seasons during which a house is occupied by a family; but it is requisite to have them occasionally taken up from the floors and well beaten, if possible, in a field.

The periods at which this beating of carpets should occur must depend on the convenience of every family.

Drawing and dining-room carpets are, in some houses, taken up and beaten twice in the year, in the spring and autumn; in others only once, under the idea that the frequent beating weakens the texture of the carpet. The best mode by which frequent beatings might be avoided would be to turn the carpets up once a week and sweep under them; but the manner in which they are now universally fastened down renders this next to impossible.

In former days carpets were not made to cover the whole room, as at present, and which renders it necessary for them to be closely and firmly nailed to the floor, but were wove as the Turkey carpets and Axminster still continue to be, square, or nearly so; and being loose, could, without much additional trouble, have the dust which collected beneath them frequently cleared away; which, with the floors being oftener washed than at present, tended materially to preserve cleanliness in the texture of the carpets.

Bedroom carpets it is desirable to have made in such a manner as to admit of being frequently taken up and shaken well in a yard or garden. When this can be done, it should be as frequent as twice a-week. In fine weather, bedroom carpets should be occasionally hung out on cords and beaten with small sticks or canes.

Grease in carpets may be removed with spirits of turpentine, as well as by Fullers'

earth, or by soda, ox-gall, and pipe-clay; carpets cleaned by the dyer cost from 6d. to 8d. per yard.

#### VII. CLEANING GRATES, FIRE-IRONS, FENDERS, ETC.

Parlour and drawing-room grates, being of various kinds and forms, require different modes of cleaning. Fire-irons and fenders of polished steel, and such parts of grates as are of the same material, should never, in cleaning them, be touched with any substance that has sufficient roughness to scratch their surface; to preserve their polish they require nothing but security from moisture, together with the daily rubbing with soft wash-leather. Linen is an improper material for rubbing polished steel, as it is apt to be damp. Even the moisture of the hand, if impressed upon steel, is apt to cause spots of rust, if not rubbed off in time with a dry leather.

Once become rusty, steel is scarcely recoverable under the housemaid's hands, nor can the steel polisher entirely restore the even polished surface. This fact should be impressed on the memory of housemaids, that they may not neglect to apply the leather each day to all the polished steel articles under their charge, and to rub carefully away all dull spots, which are the first indications of rust. The leather kept for this purpose should be frequently aired before the fire, and occasionally a little dried putty powder (which may be bought at oil shops), tied in a muslin bag, may be dusted over the steel, and then rubbed off with the leather; but, in truth, good rubbing with the leather only is the best means of keeping steel work bright and unspotted.

When fire-irons or other fine steel work is not likely to be wanted for some weeks or months, and during which period a housemaid may be away with the family she is serving, it is desirable to rub them over with a little Florence oil; when it is requisite to remove the oil from the steel work, a little dry whiting may be dusted over it, and the whole rubbed clean off with leather. Fire-irons in summer should be tied up in green baize bags, and hung up near the kitchen fire,

or in any other office in which there is usually a fire.

Bright iron bars of grates necessarily require a different mode of cleaning from that employed for polished steel ; they are usually stained with the flame, and browned with the moisture or bitumen from the coal. To remove this, many plans are in use among housemaids ; a good one is to cover the bars with a little sweet oil, which is suffered to remain on while the housemaid cleans away the cinders from the grate, and with her proper brush sweeps down all lodgments of soot, as high up the chimney as her brush will permit. On this point it may sometimes be necessary to remind her, or the family may be inconvenienced by the falling of the soot, if not by the firing of the chimney upon any high flame or sparks flying upwards and reaching some of these collections of soots.

This being done, and the grate cleared of ashes and cinders, the oil may be removed, and the bars polished, either by rubbing on them with the leather a little of the smooth white ash formed by the Staffordshire coal, or, where these are not used, by rubbing them either with the Bath brick dust, or with fine emery paper.

Cast-iron grates and fenders are cleaned with blacklead used in different ways. The housemaid commonly mixes a portion of blacklead with water, of a consistence rather thicker than cream ; this, after having cleared her grate of ashes, she puts on the sides and back of her grate with a small brush, and afterwards, when that is dry, with a hard one she rubs the grate with force and briskness until the polish is brought. Blacklead need not be put on the grates more than once, or perhaps twice a week, but each morning the housemaid should brush her grates with the polishing brush.

Another mode is to boil a quarter of a pound of best ivory blacklead in a pint of small beer, adding to it a bit of soap about the size of a walnut ; this mixture is laid on with a painter's brush, and afterwards polished with the hard brush, as above directed.

#### VIII. CLEANING BRASS-WORK.

Fenders, if of lacquered brass, or any lacquered brass ornaments, admit of very little cleaning beyond that of rubbing with a clean leather ; when the lacquer is worn off, and they look dull or greenish in appearance, the plates or ornaments may be re-lacquered at a trifling expense.

Fenders with common brass mouldings may be cleaned, like other brass-work in a house, either with oil and rotten stone rubbed with fine dust of the Bath brick on leather, or polished with polishing paste.

#### IX. CLEANING DRAWING-ROOM ORNAMENTS.

Glass lustres require very careful dusting and rubbing with wash-leather ; when washed, cold soap and water, applied with soft flannel is best.

Ormolu time-pieces, or other ornamental drawing-room articles, although usually protected from the dust by glass coverings, require occasional dusting, but which should be done with a brush of feathers or silk dusters : the friction of linen, cotton, or any harsh substance would injure them, as would also any moist application.

Alabaster figures or vases can scarcely be cleaned by ordinary servants, and should be, therefore, generally encased in glass, and covered over, as much as possible, with silver paper bags.

Looking-glasses and mirrors may be washed with a moist sponge dipped in spirits of wine, no more of the glass being wetted at once than what may be immediately wiped off, as damp, in altering the temperature of the glass, unsettles the backing of the tin coating, which gives it its power of reflecting objects. While wet, the glass should be dusted with powdered blue, or whiting tied up in a muslin bag, and then rubbed off with a soft linen duster or silk handkerchief.

The gilding of pictures and mirror frames, when it is what is termed oil gilding, may be cleaned by washing it gently with soap and water ; but if of burnished gilding, which is most usual, it should never have any moisture applied to it. A brush of cotton wool or of

feathers is best adapted for removing the dust which may settle on it.

To gilding the flies are the greatest enemies; but if, during those periods of the year in which they are numerous and active, gilding were covered over with thin coarse lino or gauze, it might be preserved unsoiled for many years.

#### X. CHINA, EARTHENWARE, AND GLASS.

China and earthenware should be washed in plenty of warm soap and water, rinsed clean in a second bowl of water alone, either warm or cold, should be then turned down to drain, and afterwards wiped dry with linen tea-cloths. Settlings of any liquid which have been suffered to dry up at the bottom of earthen vessels may be dissolved generally by a little pearlash and water, or with soda instead of pearlash; either of these will also quickly remove any oiliness which may be on the surface of earthenware or porcelain. Neither porcelain nor earthenware will bear sudden immersion into hot water, when the weather is cold, without great danger of its cracking.

In washing glass the above caution is still more requisite to observe than in respect to china and earthenware.

To put glass suddenly into boiling water in cold weather would be inevitably to break it. Glass should be washed in water moderately warm; and the quantity of water used should be abundant, and in proportion to the number of articles to be washed. When taken out of the water, each article should be at first turned down on a table or dresser, that the water may run off from them. Afterwards they should be dried with a soft linen cloth, and, before they are placed for use, each should be polished with a clean soft skin of wash leather kept for the purpose. Glass should never be brought to table with the dull linty surface which negligence in wiping it would give it. For cut glass the use of a soft brush may be requisite to polish it well; but if any brush or rubber of a harsh nature be applied, glass, which easily receives scratches on its surface, would lose irrecoverably its beauty and brilliance.

Glass discoloured with the settlings of port wine may require more than common washing. A solution of soda will effect solution of the colouring matter. A bottle brush is sometimes used to remove the wine settlings, but it is liable to scratch the glass.

#### XI. CLEANING PLATE.

Plate is cleaned in various ways, and every butler or footman has a prejudice in favour of one or other mode. In cleaning plate the objects to be attained (when it has been washed in hot soap and water immediately after it has been in use) is to erase all scratches and scores which it had received from being thrown carelessly together, or against substances of a harder and rougher nature than its own, and thus restore the polish. After washing it in hot soap and water, it should be rinsed in cold water; then, before putting it away, it should be rubbed with wash leather. But this may not be always sufficient to remove entirely the dim coating given by the oily matters it has been brought into contact with. If greasy, they will require being washed with a hot solution of alkali, such as potash, or soda and water, which will remove the grease and render them fit for polishing.

For cleaning plate two good-sized skins of wash-leather are requisite, together with a brush of soft and fine bristles, for cleaning away from the cruets, cyphers, and chasings the ingredients with which the plate had been cleaned. With one leather, the plate is first rubbed with the powder employed to clean it, and afterwards with the other, in order to give it a final polish. As this last-mentioned leather should be kept particularly clean, it should be washed occasionally with soap and water and dried, and used for no other purpose.

Polishing powders for plate are sold in the shops; but, as they are apt to wear the silver, they should be used as sparingly as possible. One called rouge powder is much recommended by silversmiths; and, though they find it very useful and effectual, yet, if used as often as plate requires cleaning in a family (perhaps twice a-week), the plate would suffer considerable wear.

Finely washed whiting is one of the safest plate powders. To prepare this, mix some whiting up with water, and stir it well; then, letting the whole remain a minute or two, pour off the white fluid into another vessel, and suffer the sediment of the part poured off to settle. This sediment will, when dried, be the fine washed whiting desired, all the coarse gritty part having been left behind in the first vessel. Whiting, in general, is fine enough without being washed; but this operation secures it from containing any particles of sand. It is by some persons applied in its dry state, and rubbed on with the leather. Others mix it with water, and lay it wet on the plate, and do not rub it off till it is dry.

Rotten stone, mixed with a little Florence oil, is sometimes employed for rubbing away the scratches which plate may accidentally have received; but this must be used with caution.

#### XII. CLEANING PLATED WARES AND BRITISH PLATE.

Plated wares, and what is called British plate, nickel silver, &c. As plated goods consist of inferior metals coated with silver, this coating is easily rubbed off; and hence, in cleaning plated articles, the greatest care is requisite not to wear off the silver coating. All violent rubbing should be avoided, together with the use, in cleaning it, of any ingredient which would wear the silver. When tarnished, plated goods may be best cleaned with fine washed whiting mixed with sweet oil. Warm soap and water also may be safely used.

Of plated candlesticks, snuffer dishes, salvers, &c., the edges and mouldings are now frequently formed of silver alone. This improvement has occasioned plated articles to be much more durable, as it was at the edges that the plating was first destroyed.

The sulphur contained in the sulphuretted hydrogen gas, which exist sometimes in small quantity in the atmospheric air, is constantly acting upon silver, and produces a tarnish. On this account it is very desirable to keep all such articles not in daily use covered with

wash-leather, or with any soft material, to keep them as much as possible from the air.

Amongst the careless practices to be condemned is that of scraping off, with a sharp knife, wax or tallow adhering to plate. If in this practice the surface be scratched, the scratches cannot be removed, except by rubbing off the silver around it until it is levelled to the indentations; hence the injury to plated goods especially, in which silver is merely a thin surface. Another careless mode, and one equally destructive to the articles, is that of exposing the candlesticks to the excessive heat of fire in order to melt the adhesive wax or tallow. The hollow pillars and pediments of most candlesticks are filled with a composition which gives them weight and steadiness. The composition, with the soldering which unites together the different parts of candlesticks, is melted at the same time that the wax or tallow is dissolved by the fire, and thus the united parts are weakened, if not entirely separated. It is a safer plan to immerse in warm water the sockets and nozzles of candlesticks, and to let them lie until the substances become softened by this slight degree of warmth, when they may be easily removed without injuring the surface of the candlesticks. If this moderate warmth be not sufficient to clear away the wax, a little spirits of wine rubbed on it will loosen it, and allow of its being entirely removed. It must be remembered, that very hot water will be as prejudicial to candlesticks as a hot fire. It is requisite that the water should not in temperature exceed that which the hand can endure if held in it for a minute or more. After the wax or tallow is entirely cleared away, the candlesticks must be wiped with a duster very dry, and afterwards polished with the leather and fine whiting.

For the cleaning of candlesticks two leathers and a soft brush are requisite, as well as for the cleaning of the plate used at table. A small skin should be kept for rubbing the articles with the whiting, a larger one for polishing them afterwards, and the brush for removing the powder from the mouldings, &c.



## XIII. PAPIER-MACHE AND JAPANED WARES.

Tea-boards, either of papier-maché or of japanned iron, should never be washed with hot water, because the heat of boiling water is sufficient to crack the varnish on the surface, upon which the blackened coating of either the paper or iron will begin to peel off. When any liquid dries upon tea-trays or waiters, which has in it something of a glutinous nature, water must be employed to wash it off, but whenever simple rubbing with a soft linen rubber removes any spots on japanned wares, water should not be used. Tea-boards are easily cleansed by the use of a few tea leaves, when emptied out of the tea-pot; if tea-boards of japan or papier-maché appear streaky, as if from grease, a little flour or whiting sprinkled over them, and rubbed off with a soft linen duster, will clean them. The fine polish to these wares is in the manufacture given by the use of olive oil, and the friction of the hand alone; hence any scratches on the surface, so slight as not to penetrate through the coating, may be removed by a similar application and means.

Japanned tea-urns should, after use, have any warm water remaining in them poured out before it gets cold. The inside should then be wiped perfectly dry with a linen cloth, and the outside rubbed with a leather kept for the purpose. If any spots caused by the water are rubbed while the urn remains warm after use, they will be soon obliterated then; but, if left till the urn be cold, it will be a more difficult matter; they must in such case be removed by the use of the urn powder, which is to be purchased either at oil shops or at the shops in which japanned wares are sold.

In cleaning japanned candlesticks the same caution must be observed as with other japanned wares—that of not employing great heat, either of the fire or water, in removing from their surface any substance which has adhered to them: with care, these articles may last very long; with carelessness, they are injured immediately. When the coating on their surface is chipped or cracked, they cannot be very long serviceable. Every day's

use and cleaning requisite thereon increases the peeling off of the injured surface.

## XIV. CLEANSING KITCHEN UTENSILS OF METAL, ETC.

In country places, where brick ovens used for baking bread are usually heated with wood fuel, the wood-ashes may be procured, and answer the end of removing the grease from the inside surface of saucepans in which animal substances have been cooked; or a weak solution of potash, boiled in saucepans that require cleansing, will render hard scouring unnecessary, which is sure to wear off the tinning.

Tinplate, of which saucepans are formed, suffers great injury by being frequently scoured with sand, which wears off the tinning rapidly, exposes the iron foundation, and causes the rust to eat it in holes. When any scouring is requisite, some soft powder should be used, as that of Bath brick and whiting, and sand as little as possible. Saucepans, after being cleaned, should be well dried by the fire before being put away, and the shelves on which they are put should be in a dry part of the offices. If iron saucepans and kettles remain long in a damp place, they will be spoilt by rust, if copper by verdigris.

The corrosion on copper, called verdigris, must be removed, in the first instance, by the application of sulphuric acid (oil of vitriol), and afterwards with that of whiting rubbed on with a flannel; copper saucepans tinned should always be carefully examined before they are used. If the tinning of a saucepan be worn away and verdigris formed on the copper beneath, it is unsafe to use it for any purpose whatever, until it has been re-tinned: there have been fatal instances of poison unintentionally given to whole parties at a time, through food cooked in copper vessels from which the tinning had been worn off, and the verdigris formed on the uncovered copper.

Tea-kettles should be well rinsed out every morning before they are filled with water. This rinsing is needful to clear away sediment the water in boiling may leave; but the incrustation formed by chemical action within

the kettle on every side cannot easily be removed.

The outside of metallic kitchen utensils kitchen-maids pride themselves often on keeping highly polished. That they are bright to look upon is very agreeable, especially as it may be inferred that the inside of the vessels corresponds in cleanliness with that of their exterior. But this pride will be carried too far, if it cause the metal to be worn off with needless rubbing, or retard, by the time it occupies, more important business in the kitchen. The soot adhering to the back and sides of the kettles and saucepans ought to be brushed or scraped off, and the fronts, lids, and spouts polished daily; but to polish the whole exterior surface of vessels daily used over smoky fires would be waste of time.

The outside of copper coal-skuttles are best cleaned with a polishing paste bought at the oil shops in London, and similar to the composition with which the brass-work on harnesses and carriages is cleaned. The same composition may be easily made of one ounce of spirits of hartshorn, half-a-pint of vinegar, one ounce of rotten stone, and one ounce of soft soap. The soap and rotten stone are to be mixed first together; the vinegar and hartshorn must be afterwards added.

Iron coal hods may be occasionally done over with a black varnish, which may be purchased at the oil shops, and which will make them last twice as long.

Steel knives and forks are cleaned on either ash or deal boards, and sometimes with boards covered with buck leather, but these are now pretty generally superseded by the india-rubber boards as being less likely to wear away the steel of the articles rubbed on them. The leather and india-rubber which covers knife-boards should be prepared by having a coating of mutton-fat melted and laid on it with a piece of flannel.

The dust of a Flanders' brick, or, better still, a mixture of emery powder and crocus, which forms the substance known as knife-cleaning powder, is then sprinkled over the leather and rubbed well in; and the grease, when a knife is passed over it, ceas-

ing to come through, is the test of the leather being fit for use.

An uncovered board should have very little brickdust or powder sprinkled over it at once, lest, in rubbing the knives over it, distinct and visible scratches should be given to them. Knife-cleaning is, in fact, done by scratching the surface, but in so fine, regular, and uniform a manner as to brighten the whole surface.

The height of the knife-board is another point to be noticed. It should be such as to allow the cleaner to incline his body towards it. Holding a knife in each hand—their backs towards each other—the cleaner should stand in front of the board, and, laying each blade upon it, he should bear equally on both, and rub them backwards and forwards, first on one side and then on the other, until a clean bright surface be restored to each. It is easier to clean two together than one alone. To give a good edge to the knives, the cleaner must scarcely let the blades touch the boards while he expands his arms, but must bear upon them more forcibly in drawing them together again. The edge given by this mode is better than that brought by the steel sharpener.

Forks are quickly cleaned by running the prongs several times into a tub filled with a mixture of gravel, brickdust, or sand and hay or moss, kept a little damp and pressed firmly down. When clean, the prongs will require polishing with a thin bit of stick shaped like a knife and covered with leather. Knife-boards are often spoiled by the backs of knives and forks being cleaned upon them. This might be prevented, if a thong of buck leather were nailed at one end of the board, and the loose end held in the hand while the forks were rubbed up and down until perfectly clean and polished. It is also desirable to have a thick square brush nailed to the board, over which both knives and forks are passed, in order to remove the dust partly from them, but which must be more effectually done by the use of the knife-cloth.

In some houses machines are used for cleaning knives, by which, in ten minutes, as many would be done as would in the common way occupy the cleaner for one hour; but the ad-

vantage of celerity is counterbalanced by the injury done to the blades, which, in one year, will be as much worn away as knives that had been in use for many years, and cleaned in the usual way.

When knives and forks have been cleaned, either on the board or by the machine, they must be wiped with the knife-cloth. The handles of knives and forks require attention, few things being more disagreeable than to feel the handles gritty or greasy.

Ivory handles should be washed with a bit of sponge dipped in soap and water, or with a little spirits of wine and water; when a red

wine or a fruit stain, shews itself on the handles, it may be scraped off with a sharp knife without injuring the haft.

Silver and plated handles are cleaned like other plate and plated wares.

Ebony hafts should be cleaned with a little Florence oil, carefully wiped off.

Knives and forks always, after being used, should have the blades and prongs dipped in warm water, to wash away whatever may adhere to them; afterwards they must be wiped very dry and put into the box to be most thoroughly cleaned on the board or machine.

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### THE CLOTHES-MOTH.

THE following account of this well-known plague of the careful housewife is condensed from an interesting article by Dr Packard, in a recent number of the "American Naturalist," a periodical that we can most cordially recommend to our readers:—

"For over a fortnight we once enjoyed the company of the caterpillar of a common clothes-moth. It is a little pale, delicate worm, about the size of a darning needle, not half-an-inch long, with sixteen feet, the first six of them well developed, and constantly in use to draw the slender body in and out of its case. Its head is armed with a formidable pair of jaws, with which, like a scythe, it mows its way through thick and thin.

"But the case is the most remarkable feature in the history of this caterpillar. Hardly has the helpless, tiny worm broken the egg, previously laid in some old garment or fur, or wool, or perhaps in the hair-cloth of a sofa, when it proceeds to make a shelter by cutting the woolly fibres or soft hairs up into bits, which it places at each end in successive layers, and, joining them together by silken threads, constructs a cylindrical tube of thick, warm felt, lined within with the finest silk the tiny worm can spin. The case before us is of stone-grey colour, with a black stripe along the middle, and with rings of the same

colour round each opening at the ends. Had the caterpillar fed on blue or yellow cloth, the case would, of course, have been of those colours.

"Days go by. A vigorous course of dieting on its feast of wool has given stature to our hero. His case has grown uncomfortably small. Shall he leave it and take another? No housewife is more prudent and saving. Out come those scissor-jaws, and lo! a fearful rent along each side of one end of the case. Two wedge-shaped patches mend the breach, caterpillar retires for a moment; reappears at the other end; scissors once more pulled out; two rents to be filled up by two more patches or gores, and our caterpillar once more breathes freer, laughs and grows fat upon horse hair and lamb's wool. In this way he enlarges his case till he stops growing.

"Our caterpillar seeming to be full-grown, and hence out of employment, we cut the end of his case half off. Two or three days after, he had mended it from the inside, drawing the two edges together by silken threads, and though he had not touched the outside, yet so neatly were the two parts joined together that we had to search for some time with a lens to find the scar.

"To keep our friend busy during the cold,

cheerless weather, for it was in mid-winter, we next cut a third of the case off entirely. Nothing daunted, the little fellow bustled about, drew in a mass of the woolly fibres, filling up the whole mouth of his den, and began to build on afresh, and from the inside, so that the new-made portion was smaller than the rest of the case. The creature worked very slowly, and the addition was left in a rough, unfinished state.

"We could easily spare these voracious little worms hairs enough to serve as food, and to afford material for the construction of their paltry cases; but that restless spirit that ever urges on all beings endowed with life and the power of motion, never forsakes the young clothes-moth for a moment. He will not be forced to drag his heavy case over rough hairs and fuzzy wool, hence he cuts

his way through with those keen jaws; thus the more he travels the more mischief he does.

"After taking his fill of this sort of life he changes to a pupa, and soon appears as one of those delicate, tiny, but richly variegated moths that fly in such numbers from early spring until the fall. Very many do not recognize these moths in their perfect stage, so small are they, and vent their wrath on those great millers that fly around lamps in warm summer evenings. It need scarcely be said that these large millers are utterly guiltless of any attempts on our wardrobes; they expend their attacks in a more open form on our gardens and orchards. The clothes-moths begin to fly in May, and last all through the season, fluttering with a noiseless, stealthy flight in our apartments, and laying their eggs in our woollens."

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### TREATMENT OF CHOLERAIC DIARRHŒA.

SIR THOMAS WATSON, Bart., whose lectures on medicine have most influenced the practice of this half-century, writes in the "British Medical Journal":—"I find it necessary to modify considerably some advice which I formerly gave my auditors as to the treatment of a disorder which appears to be again increasingly prevalent throughout the country. The form and features of this dreaded pestilence have," he says, "been the same in all its visitations to this country. Must we still, as heretofore, make the mortifying confession that our art is unable to cope with it successfully? Not so, I trust. Among the many and discordant experiments which have been brought forward, and fairly tried for the cure of cholera, one, long since suggested, and almost scornfully rejected, has emerged of late into clearer significance and more intelligible and ascertained value. I mean the method, recognised as legitimate and reasonable in various other maladies, of 'elimination,' of which the main advocate

has been Dr George Johnson, Professor of Physic in King's College." After commenting upon the facts and principles involved, Sir Thomas Watson lays down the following rules in language partly his own and partly that of Dr George Johnson:—"Diarrhœa ought not to be neglected even for an hour. One important and guiding rule of treatment is, "not to attempt by opiates, or by other directly repressive means to arrest diarrhœa, while there is reason to believe that the bowels contain a considerable amount of morbid and offensive materials. The purging is the natural way of getting rid of the irritant cause. We may favour the recovery by directing the patient to drink copiously any simple diluent liquid (cold or tepid), toast-water, barley-water, or weak tea; and we may often accelerate the recovery by sweeping out the alimentary canal by some safe purgative, and then, if necessary, soothing it by an opiate. Castor oil, notwithstanding its unpleasant taste, is, on the whole, the



safest and best purgative for this purpose. It has the advantage of being very mild and unirritating, yet withal very quick in its action. A tablespoonful of the oil may be taken, floating on cold water, or any other simple liquid which may be preferred by the patient. A mixture of orange-juice or lemon-juice with water forms an agreeable vehicle for the oil. If the dose be vomited, it should be repeated immediately, and the patient should lie still, and take no more liquid for half an hour, by which time the oil will have passed from the stomach into the bowels. Within an hour or two the oil will usually have acted freely. Then a tablespoonful of brandy may be taken in some thin arrowroot or gruel; and if there be much feeling of irritation, with a sense of sinking, from five to ten drops of laudanum may be given in cold water. These means will suffice for the speedy arrest of most cases of choleraic diarrhoea. If the patient have an insuperable objection to castor oil, or if the oil cannot be retained on the stomach, ten or fifteen grains of powdered rhubarb, or a tablespoonful of Gregory's powder, may be substituted for the oil. If the diarrhoea have continued for some hours, the stools having been copious and liquid; if there be no griping pain in the bowels, no feeling or appearance of distention of the intestines; the abdomen being flaccid and empty, and the tongue clean—we may conclude that the morbid agent has already purged itself away. There will, therefore, be no need for the castor oil or other laxative; and we may immediately give brandy in arrow-root, and the laudanum, as before di-

rected. The rule in all cases is not to give the opiate until the morbid poison and its products have for the most part escaped; not to close the door until the 'enemy' has been expelled.

While there are some cases in which the evacuant dose is required even at the commencement of the attack, there are many more in which the opiate is unnecessary in the later stage. In some cases of severe and prolonged diarrhoea, it may be necessary to repeat the oil and laudanum alternately more than once at intervals of three or four hours. Practical skill and tact are required to discriminate these cases. It must be borne in mind that, when the choleraic secretions are being actively poured out from the blood vessels, the bowel, though it may have been completely emptied by a dose of oil, may quickly again become filled with morbid secretions, and hence the need for an occasional repetition of the evacuant dose. If the diarrhoea be associated with vomiting, this should be encouraged and assisted by copious draughts of tepid water. The vomiting affords relief, partly by the stimulus which it gives to the circulation, but mainly by the speedy ejection of morbid secretions. If there be nausea without vomiting, and more especially if the stomach be supposed to contain undigested or unwholesome food, or morbid secretions, an emetic may be given—either a teaspoonful of powdered mustard, or a tablespoonful of common salt, or twenty grains ipecacuanha powder in warm water. In all cases of severe diarrhoea the patient should remain in bed."

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### USEFUL RECIPES IN COOKERY.

#### I. SOUPE DES GALLES.

ADD to the liquor in which a knuckle of veal has been boiled the usual time for table, as much water as will make altogether six quarts, and stew in it gently,

sixpennyworth of beef bones and sixpennyworth of pork rinds. When the boiling is somewhat advanced, throw in the skin of a calf's head; and in an hour afterwards, or when it is quite tender, lift it out, and set it

aside till wanted. Slice and fry four large mild onions, stick into another eight or ten cloves, and put them into the soup, after it has stewed from six to seven hours. Continue the boiling for two or three hours longer, then strain off the soup and let it remain till perfectly cold. When wanted for table, take it quite clear from the fat and sediment, and heat it anew with the skin of the calf's head cut into dice, three ounces of loaf-sugar, four tablespoonfuls of strained lemon juice, two of soy, and three wine glasses full of sherry; give it one boil, skim it well, and serve it as hot as possible. Salt must be added to it sparingly in the first instance on account of the soy; a proper seasoning of cayenne or pepper must not, of course, be omitted.

This receipt was given to the writer, some years since, as a perfectly successful imitation of a soup which was then, and is still, she believes, selling in London at six shillings the quart. Never having tasted the original *Soupe des Galles*, she cannot say how far it is a correct one; but she had it tested with great exactness when she received it first, and found the result a very good soup prepared at an extremely moderate cost. The pork rinds, when long boiled, afford a strong and flavourless jelly, which might be advantageously used to give consistence to other soups. They may be procured during the winter, usually at the butcher's, but if not, at the pork shops; they should be carefully washed before they are put into the soup-pot. When a knuckle of veal cannot conveniently be had, a pound or two of the neck and a morsel of scrag of mutton may, instead, be boiled down with the beef-bones; and when they cannot be easily obtained, two or three pounds of neck or shin will prove a good substitute; but the expense of the soup will then be augmented.

#### 2. TO PREPARE ARROW-ROOT FOR JELLY, BLANC-MANGE, ETC.

All preparations of arrow-root are rendered more palatable and delicate by *washing* the powder in the following manner:—After it has been passed through a hair sieve, or

ground down in a mortar, or worked free of lumps with the back of a strong spoon, pour to it, by very slow degrees, a few spoonfuls of cold water, and when they form a perfectly smooth paste, add gradually from one to a couple of pints more, and stir the whole well for a minute or so; then leave the mixture quite undisturbed for at least twenty minutes, when the arrow-root will have all subsided to the bottom of the basin. Drain the water closely from it, pouring it off gently, and, before adding any hot liquid, stir it up again with a few spoonfuls of cold.

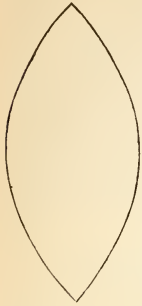
#### 3. ARROW-ROOT BLANC-MANGE.

Prepare five ounces of the best West Indian arrow-root as directed above, and after the water has been poured from it, bring it to the consistence of thin batter with a small portion of new milk taken from an exact quart. Sweeten the remainder of the milk with 3 ounces of sugar in lumps, throw in a grain of salt, and when it boils stir it quickly to the arrow-root. Turn it again into the saucepan, place it over, but not *upon* a very clear fire, and stir, without intermission, until it is as thick as it will become without burning to the pan; four or five minutes will generally render it so. Pour it into moulds, shake the surface smooth, and when it is quite cold it will turn out easily, and be firm, if the preceding directions have been closely followed. Flavour can be given the blanc-mange by boiling in the milk blades of cinnamon or mace, very thin strips of orange or lemon-rind, a couple of inches in length of vanilla cut small or well bruised, a morsel of orange-flower candy, or a few orange-flowers *pralinées*. This last can be procured at any good foreign warehouse, but it must then be strained, and the exact measure required must be made up before it is poured to the arrow-root.

#### 4. A GERMAN CHARLOTTE.

Put into a stewpan or preserving-pan 2 lb. of good boiling apples, pared and taken quite free from the cores, and pour to them a wine-glassful and a-half of white wine. Set the pan over a slow fire, and in ten or fifteen minutes strew

among the fruit 4 oz. of pounded sugar, and boil it gently to a perfectly smooth marmalade; then stir to it half-a-pound more of sifted sugar, and add the finely-grated rinds of two fresh lemons. Boil the mixture quickly until it appears tolerably dry; then pour it into a pan, and when nearly cold mix with it 4 oz. of ratafias rolled almost to powder, put it into a tart-dish, strew crushed ratafias over the top, and place round it leaves of thin, slowly-baked paste, in the annexed form, but



quite double the size, either iced or plain. They should be shaped with a tin cutter, which may easily be procured or made to order, and which will serve also to form a pretty tartlet by placing a ring of paste in the centre of the leaf, and filling it, after it is baked, with clear preserve. The leaves should be placed obliquely round the inside of the dish, with about one-third of their depth inserted in the marmalade. Well drained whipped cream, slightly sweetened, may be laid over the apples instead of ratafias; and an ounce or two of preserved ginger, with a little of the syrup, mixed with the fruit when it is cold, will give an excellent variety of the Charlotte.

#### 5. GERMAN GATEAU DE POMMES.

Prepare the fruit as for the preceding receipt, and add to it the same proportion of wine, and, in the first instance, of sugar also; that is to say, 2 ounces to the lb. When these have been stewed down until the apples are entirely reduced to pulp, take the pan from the fire and stir gradually to them 8 ounces more of sugar to the lb. of fruit, and boil the mixture rapidly, keeping it well skimmed and constantly stirred, until it is very thick, and leaves the bottom of the pan visible and dry, when the spoon is drawn through it; then pour it immediately into moulds of tasteful design, shake them, to render the surface of the

gateaux smooth, and when cold cover them with brandied paper like other preserves, and keep them in a dry place. For winter store, this preparation, which is very useful, furnishing promptly an always good and appropriate dish, either for the second course or for dessert, should be made in the height of the apple season with some richly-flavoured variety of the fruit, which should be also of a good boiling kind, that it may be reduced without difficulty to an entirely smooth marmalade.

#### 6. IMPERIAL MAYONNAISE (AN ELEGANT JELLIED SALAD-SAUCE).

Put into a bowl half a pint of very clear pale jellied stock (that made usually for good white soup will serve for the purpose excellently); add to it a couple of table spoonfuls of the purest olive-oil, one of sharp vinegar, and a little fine salt and cayenne. Break up the jelly quite small with the points of a whisk of osier-twigs, stir the ingredients well together, and then whisk them gently until they are covered into a smooth white sauce. This receipt was derived originally from an admirable French work, published very many years since by an intelligent and highful skilful cook, who stood *quite* at the head of his profession; but as he was accustomed to purvey for the tables of kings and emperors, his directions require some curtailment and simplifying to adapt them to the resources of common English life. He directs the preparation to be mixed and *worlied*—to use a technical expression—over *ice*, which cannot always be commanded easily, except in opulent establishments, and in large towns. It is not, however, essential to the success of this sauce, which will prove extremely good if made and kept in a cool larder; or, if the bowl in which it is mingled be placed in a pan of cold water, into which plenty of saltpetre and sal-ammoniac, roughly powdered, are thrown at the moment it is set into it. In this country a smaller proportion of oil, and a larger one of acid, are usually preferred to the common French salad-dressings, in which there is generally a very small

portion of vinegar. To some tastes a spoonful or two of cream would improve the present Mayonnais, which may be varied also with Chili, tarragon, or any other flavoured vine-

gar. It should be served heaped high in the centre of the salad, for which, if large, double the quantity directed here should be prepared.

### FASHIONS FOR THE MONTH.

THE toilettes at the late Ottoman ball in Paris were the most splendid and richest on record.

The Princess Metternich, notably, had nothing in her hair, two curls of which fell on her neck. Her white toilette, set on a straw-colour transparency, had that exquisite elegance which, above all, distinguishes her from others, was only ornamented by yellow bindweed, the clusters of which fell all around her tunic.

Several charming ladies wore robes of light gauze, cappadined with small flowers or small volants in tarlatan, set in lozenges, which is quite new. Those who wore flowers had not an over-load of them—a camellia or a rose on the middle of the forehead, and another on the side, à l'Espagnole.

The dancers' dresses were round—that is to say, neither long nor short. The ladies with trains danced very little. The epaulettes of flowers worn by a few young ladies, and particularly by Mlle. de Tarente, were a charming novelty.

The dresses of chambery gauze of colour striped on colour, had a great speciality at Djemil Pacha's ball.

For town toilettes one may be very much astonished to see so many novelties appear at the time when the ordinary course of the season is quite finished; but the dressmakers are still occupied with dresses and mantles to match, and have rather neglected black mantles, meant to be worn to the end of the season.

Those milliners of undoubted good taste have invented a great number of Watteau mantles, and mantillas more ample than

those to match with the dress. The pans square, the plaits square, ruches flat and straight, and flounces without ornaments are what are now worn.

The Maintenon mantle has three small volants, straight behind, and long square pans thrown behind. Satin trimming, ruched flat, on fine black taffeta and a hood, very small, and nearly hidden under an enormous bow of black satin. This may appear very warm for the weather, but evenings in the country and seaside are very cool.

At the Fontainebleau races, the Empress was in a robe of plain linen, with volant russes, with a Létorière toquet and black feather. It is needless to say what a success this toilette is. The Létorière toquet is a kind of three-cornered hat, with edges turned up and bound with velvet, and ornamented on the side by a very curly feather, black or coloured, almost covering the hat. In the middle of the feather in front, a fly-bird, or a large rose, or a brooch is set.

Italian straw, which had rather fallen in favour, reappears with grand chapeaux. They have a very low calotte, sides very large, and are fastened by means of elastic passing under the chignon; they are ornamented by branches of light flowers, garlands of cherries, and small blue flowers, mingled with a long feather.

As dresses of exquisite simplicity, I observed robes of white muslin, set on a transparency of coloured lawn, having a plait in the bottom.

The muslin of which they are composed is plain, ornamented by ruches à la vielle or by entre deux, or better, it has Creole satin



stripes, or small embroidered spots. They may be made plain, but it is better if they are cut with tunic turned up, en paniers. There are more than twenty different manners of relieving these robes. The Abeille tunic is one of the prettiest forms: it is ornamented all round by a small volant, or a ruche embroidered with Valenciennes lace, and with the aid of a gauze, sewn under the tunic, turned up in three parts, in front, behind, and on the sides. On the sides only, a large knot and a bow are set. The ends of the sash must fall on the skirt below the tunic. The Abeille tunic may be made in alpaca, Sultana, taffeta, or cashmere. It may be made less easily with heavy stuffs, but it is not necessary to think of this at present.

A more economical fancy is the new striped jupons; they are of white Sultana with satined thread—cerise, blue, pansy, light green, maroon. A large Marie Antoinette volant is set at the bottom. Above these jupons one may wear whatever they like—polonaises or Watteaus in plain lawn, white pique, or coloured jaconets, foulard, Sultanas, Algerines, or taffeta.

The polonaise is buttoned the whole length, with mother-o'-pearl or passementerie buttons. It is rounded in front, and edged by a small volant. The ornament rises on the sides. It is gathered at the waist under a large sash.

The Watteau has in the back a single large plait, which falls to the bottom or only to the waist. The sash must always pass under the plait and be attached to the side.

Many foulards and taffeta are ornamented with tarlatan pipings. This is very neat, and shews good taste. The sash, therefore, must be short, in taffeta, with piping at the bottom.

*Little girls' toilette.*—Robe of white foulard striped with blue. Small bodice à bretelles, ornamented with ruches of azure blue ribbon. Short sleeves. Muslin guimpe with small plaits ornamented by an embroidered entre deux. Sleeves to match. White stockings. Boots of French blue satin, buttoned with mother-o'-pearl.

Robe of plain linen trimmed in the bottom by a plait; on the plait a white galloon Marie Antoinette fichu with a round pelerine

and large pattes. Toquet of maroon straw, ornamented by a scarf of black embroidered tulle rolled round the calotte. White bodice, with fine pique linen, and sleeves and linen cuffs. Boots of plain Russia leather.

Costume for little girl of Scotch poplin, ornamented on the skirt with cerise velvet. Small pocket in cushion form. Bodice of Scotch poplin with veste above, cut quite straight, and not coming lower than the waist, and encircling with cerise velvet. Collar and sleeves of pique lawn. Hat of straw, ornamented by black velvet and wild flowers.

*Boys' toilette.*—Small skirt with flat plaits in light blue fancy sailor cloth. Bow of blue gros grain taffeta on the sides of the skirt. Coat with small pockets ornamented by galloons, and each galloon by silver lozenges. Lozenges of silver, buttoning the coat. On the sleeves three galloons, terminated by a silver lozenge. Large linen collar. Hat of straw, with blue ribbon.

*Concert toilette.*—Robe of white gauze, set on a transparent of mauve taffeta. The robe is relieved on the sides by bows of mauve taffeta. An entre deux of lace, under which is passed a mauve taffeta ribbon, and a volant of white lace ornaments the robe all round. Mauve décolleté bodice. High bodice of white gauze, with a lace entre deux, with mauve ribbons passed underneath. White lace jockey; double entre deux at the bottom of the sleeve, with small knot on the cuff. Around the neck mauve ribbon, and small knot on the collar. This robe has a large flat plait in the back. The sash passes under the plait; it forms two coques of large mauve ribbon; a coque on each side of the plait. Small mauve flowers in the hair.

*Dinner toilette.*—Robe of light green taffeta. This robe has a tunic, relieved in panniers by a cord of green silk, with tassels on each side. Second skirt with train relieved in the middle by a cord tied under the skirt. First skirt of light green taffeta, edged by a ruche flower of cut taffeta. Square décolleté bodice edged by a cut ruche flower. Short sleeves. Gimp of white plaited muslin with ruche of lace around. Muslin sleeves puffing at the elbow.

Robe of striped Sultana of mauve colour. Round skirt, terminated by a volant of gathered bias, with small top mounted by cross plaits. Second skirt in the form of a tunic, edged at the bottom, surmounted by a bias of mauve taffeta. Flat bodice, décolleté with tight sleeves, ornamented in the bottom by two small biases of mauve taffeta. Mantlet; fichu to match with the dress, rising behind, fastening in a heart in front, and crossing to part the sash, where it falls

with pointed pans on the side of the skirt. This fichu mantlet is cut with denticulations, and encircled by a bias of mauve taffeta, with knots of cocarde, knots of mauve taffeta set at the bottom of the pans. Sash of same taffeta, fastened by a bow of same pattern. A small muslin fichu with a denticulated edge. Small toquet hat of black straw, ornamented by a curled feather of mixed white and black.  
—*Abridged from the London and Paris Ladies' Magazine of Fashion.*

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## Miscellany.

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### DESTRUCTION OF SONG BIRDS.

Some of our readers (says the *Inverness Courier*) will recollect our having announced three or four years ago the destruction of a large number of goldfinches and other native songsters by an unprincipled dealer in birds, who, it is said, drowned in one bag, in the River Ness, upwards of 200 goldfinch hens! Since then this beautiful bird has been but rarely seen about our Highland metropolis, and we do not know if it is from the same cause, but we are aware that in several parts of the west coast, and in the Aberdeenshire Highlands, these and other little "warblers of the grove" have of late become scarce. Last year we particularly remarked the absence of singing-birds about Balmoral and Braemar generally; and the want of the blackbird and mavis in some of the west coast districts is the more oppressive, as wherever there is copsewood, as at Applecross and Lochbroom, the gloomy and rainy character of the climate is much relieved by those birds, who, from the darkness, sing there all day as they do elsewhere at night and in the early dawn. Fortunately, on the east side of the island the abundance of whins and broom, as well as of hazel and birch trees, preserve us a good stock of linnets, greenfinches, and thrushes; but the more open and bare fields about towns do not afford so much protection to the skylarks from their numerous enemies. In France the guzzling demands of the people of Paris, it is well known, have nearly cleared the country of small birds, and, in consequence, grubs and worms commit havoc on the crops to a most alarming degree. In London also the sale of sparrows and larks is shamefully enormous; and we trust the same bad taste may not be extending itself to the provinces. Lately we have observed several young men scouring the fields about Inverness with dogs and

guns in quest, it is pretended, of corncrills, but they fire at any skylarks which get up, and we have heard that even the occupants of some of our newest villas do not refrain from shooting those delightful birds while actually singing above them! Such barbarity and bad taste are hardly conceivable, but we would counsel a stop being put to those who roam through fields with guns and dogs by a few prosecutions for trespass being directed against them, and by improving the taste and feelings of our youth for all sorts of living pets.

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### WINDOW VENTILATION.

A window slightly open at top and bottom is the best ventilation; but the window blind is often in the way. To remedy this, fix the roller of your blind on the upper sash of your window, and then, when the sash is pulled down, an open space is left above for the free current of air, and yet the larger part of the window is protected from the scrutiny of outsiders, even though the blind be also rolled up a bit from the bottom.

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### DUST-BINS AND DISEASE.

It would be well if it could be made one of the duties of the sanitary inspector in each locality to visit the basement of every dwelling-house occasionally, for the purpose of ascertaining the condition of the dust-bins, drainpipes, and other matters, which are so generally neglected, even in the houses situated in the best localities. But my special suggestion with regard to dust-bins is intended to prevent the admixture of vegetable and animal matter with the cinder-ash—a very prolific source of fever and diarrhoea at this season of the year. My plan is, for an iron grating to be

made to fit the top of the dust-bin. It should be affixed as a lid, and have a padlock, to prevent servants from removing it, excepting at stated times, for the dust to be taken away by the carts. This would be found by householders to promote both health and economy, and the grating being small, or, rather, fine enough to allow the dust only to pass through, the cinders would remain on the top, and could be collected and replaced in the cinder-scuttle for household purposes. Thus, the lazy extravagant habit of servants, who rarely sift cinders, would be obviated.

#### STOVES AND OVENS.

Black lead is a great institution in this country, and probably few but cooks and housemaids would care to see its use diminished. It certainly has its recommendations, but it can hardly be said to be ornamental, while it entails an immense amount of labour on our servants. In Germany, where a stove and sort of kitchen range is continually to be found in the common sitting-room of a respectable family, the unsightliness seems to have been felt, and a suggestion has been made to do away with the black lead, and paint the stoves and ovens. Oil paint, of course, cannot be employed, but water glass (silicate of potash) coloured with pigment to match the paint of the apartment, is the material recommended. Before this is applied the iron must be thoroughly cleansed from grease, and all rust spots must be rubbed off with a scratch brush. Two or three coats of the paint may then be put on and allowed to dry, after which the fire may then be lighted without fear of injury to the colour, which may, indeed, be heated to redness. Grease or milk spilt over the paint has no effect upon it, and it may be kept clean by washing with soap and water. Dutch ovens and like utensils may also be coated with the same materials,

and the labour spent in polishing be saved. A good coating of the paint, the author says, will last a year or two.

#### PRESERVING EGGS. 2

No egg is fresh that will shake; this is because it has lost some of its albumen. No egg has ever been preserved over a month that will not shake, except it be air-rooted, which is a term not generally understood, and is a new process. The egg has been coated with every conceivable composition, even in solid stone, and galvanised, yet the watery material escapes. The philosophy of this is, that there is air in the egg before it is treated, and this, uniting its oxygen and carbon, produces decomposition by carbonic acid gas, the yellow of the egg first breaking; then follows the destruction. Eggs are naturally designed to last as long as the hen requires to get her brood, and the life-germ can be preserved a few weeks—seven or eight—but no longer. The egg itself may be kept in a preserved state for two years, by greasing with butter, oil, or lard, but from the time it is thus put up, to the end of two years, it will daily lose its albumen by transpiration, and while its carbonic acid escapes to a certain extent, the egg-meat will be reduced two-thirds, and will shake. For culinary purposes they will do well. But we want a whole egg, not a half one, and we want them fresh. Butter, and lard, and suet have been used for half a century; still nothing has recommended itself over the liming system in a commercial point of view. The theory has always been, and still is, that to keep an egg fresh the air must be excluded. It is the only philosophical treatment of it that can be made. Externally kept from the air, the latter is powerless to do harm, but the air inside no mortal can prevent, and that alone in time will decompose the egg.

# THE COUNTRY GENTLEMAN'S MAGAZINE

OCTOBER 1868

*A PRACTICAL VIEW OF THE IRISH LAND QUESTION.*

IN FIVE CHAPTERS.

CHAP. II.

*Landlords and Tenants.*



THE history of the past, as briefly sketched in the preceding chapter, gives us some reasonable explanation of the present state of things in Ireland, and a consideration of the existing necessities of the country will help us to understand the requirements of the future. It is clear, then, that a country, ruined twenty years ago by famine, her system and habits broken up, over-populated, pauperised, undeveloped, and in a great degree unskilled in agriculture, had much, and still has much, to combat. That her difficulties were of no ordinary kind must be apparent, and to say that in the short space of time which has elapsed since the disaster befel her, she has made material progress, is stating a fact which the most ardent agitators cannot deny. The agricultural statistics prove a steady increase in the value of stock, and a considerable annual reclamation of waste land; our Savings' Bank and other deposits are on the increase, and there is no lack of capital; our railway system continues to be developed, and our labour has risen within the past ten years fully thirty per cent.—altogether, I question whether there is any country in the world where the population can more readily obtain employment, or where in the same time such rapid progress has been made. One would

naturally suppose that these results would aid in making the people happy and contented; such, however, is not the case, and it is to this anomaly that I now propose to turn my attention. In speaking of Ireland, or considering any question affecting her, anything bearing on agriculture may be looked upon as embracing every interest and class in the whole community, and it is on this account that a settlement of the Land Laws or Tenant-Right Question would produce such universal good, and find so many adherents. Devoid almost of mineral resources, with an absence of mechanical skill or taste in her people, Ireland up to 1846 had trodden the rude path of agriculture, with her system almost unquestioned. On the downfall of that system, when tenants and labourers were in a state of starvation—with prostration in trade, heavy rates and unpaid accounts, landlords with unpaid rentals, and priests with diminished dues—there was no difficulty in making the people believe that there was something radically wrong in the laws. The tenants having bought interests in their farms, fined down their rents, and created what they conceived to be considerable improvements, and having made capital bargains with their landlords of a most permanent character, found all suddenly swept away, from their temporary inability to fulfil their contract. These men conceived that their downfall was directly due to landlord injustice, and that the whole diffi-



culties under which they laboured arose from bad laws and bad government. The force of circumstances, the real cause, at the time beyond all human control, was never alluded to. That instances of great hardship, and even of injustice, did sometimes occur is well known, but they were exceptional, and on both sides there were thousands of cases, where a better understanding might have been come to, but for the perverted notions which were inculcated and acted upon. The labourer too idle, unskilled, and ill disposed to work from the very training he had received, and the social atmosphere surrounding him—taught to believe that he was the worst housed, worst clothed, and worst fed man in the universe, was imbued with a sense of injustice and oppression from his earliest childhood. The systematic labour of ten hours was too much for his volatile character, and irksome in the last degree. It was, therefore, easy with such a one to supply a reason for his condition outside himself; and it was this state of mind which has borne fruit in what is now known as the Irish difficulty. Let it not be understood from the foregoing that there were, and are still many things in the voluntary treatment of land under the law which are to be condemned. What I wish to indicate is, that the great facts connected with the state of Ireland are due to unforeseen, and, on the part of those in power, inevitable circumstances, and that instead of throwing the blame on this party or that, instead of looking solely to government and new laws to set things right, we must put trust in ourselves, in the individual application of our capital, skill, and industry, which alone can resuscitate and vitalise the country. The present condition of the land must be considered before we can ascertain our immediate requirements. A poor people cannot be expected to hold enriched farms. The ordeal the country has undergone has left a distinct mark upon the acre, and I may say, as a rule, that the bulk of the tillage land of the country is reduced by absolute poverty, over cropping, and a bad system of agriculture, from five to ten years purchase in value. I am fully satisfied, from my own ex-

perience and observation, that to bring the present cultivated area into full bearing it would take, with skill and capital at the command of the tenant, fully ten years—for the reclamation of waste or uncultivated portions even a much longer period. Hence the present condition of the soil would not admit of the profitable outlay of capital by the tenant to bring it from a state of exhaustion to a full state of fertility, unless he is secured by time for his outlay, and placed in a position to reap its benefit. In this there is no parallel between Ireland and England. There the improvements have been effected; the farms are in a workable condition, and a good state of fertility; the tenant has nothing to do but maintain the standard. Here, if he would succeed, *he must create fertility by an outlay of capital upon the staple of the land*; if he does not, either from want of security or any other cause, he will be doing what the great bulk of the tenants of the country are doing—producing very little over half a crop. I am of opinion that the natural fertility of Ireland, as a whole, has been very much over-rated. There is an almost universal absence of clay; this and the excessive moisture of the climate preclude any possibility of a great yield from cereals, to say nothing of the increased cost and difficulties, arising from the continued downpour or mugginess of the atmosphere, in cultivating and securing the crops. From 1859 to 1861, three years consecutively, a large proportion of the crops was never gathered, and such as was secured was so inferior in condition that it returned little over the harvesting and thrashing expenses. Many landlords during these years had to make reductions of from 10 to 20 per cent. in their rentals, to enable tenants to tide over their difficulties, but with such as were depending chiefly on tillage, the losses were so heavy that they had to abandon their farms. This happened through no act of oppression or injustice, through no mismanagement, but simply from climatical causes and neglect in adapting a system of agriculture to the peculiarities of the country. The emigration of 1861-64 was mainly due to the great blow which tillage received.

The farmers, being satisfied that they must conform more to nature, depend less on tillage, and more on pasture, have now laid down large breadths to grass, and thus reduced their labour. The small men, for want of room and means, have joined the unemployed labourers and swelled the tide of emigration to the west.

Whilst the arable portion of the country is in a state of poverty from over-cropping and bad cultivation, the unreclaimed portion, which is large, is in even a worse condition. There are few farms, however small, which have not some tail of waste, and this instead of being developed or improved is as far as practicable despoiled by the tenant. If it is fortunate enough to possess a skin of a turfy nature it is flayed off for the fire; if of a heavier description of soil, it is drawn up into the yard for manure—a costly operation productive of little good to the soil to which the manure is applied, and destructive of the land whence it is drawn. For our consideration the unreclaimed land may be divided into two classes; that which can *profitably* be reclaimed and that which cannot. In the first class may be included all land that would bear an outlay of say £10 per acre for drainage and cultivation. To do this, it is clear after reclamation that each acre must be able to bear an additional rent, as a matter of permanent investment, of 10s. annually, and if the improvement be effected under a *limited* occupancy of a considerably larger sum, in order that the occupier may be able to obtain both principal and interest before the expiration of his term. Now, the obstacles to be overcome where thorough drainage is required must not be very formidable, or this expenditure will be exceeded. Time is required for the consolidation of the surface; the mechanical and chemical working of the constituents of the soil is a slow and gradual process tardily developed. The first course of tillage rarely pays more than the expenses, and is often a losing game, so that the subjects fit for reclamation simply are far from being all the waste lands of Ireland. I am of opinion, too, that the proportion of land stated as waste in the agricultural returns is

much exaggerated; the tenants being interested in putting the worst side out, and the agitators upon the land question readily availing themselves of so extensive an argument for their purposes. A knowledge of the value of land, like a knowledge of horse-flesh, is generally considered to be in the possession of every one. All persons believe that what they see continually before them must present some feature with which they are familiar, and hence the number of suggestions which have appeared upon this Irish Land Question from editors, lawyers, and priests—in fact, from every one except farmers. If those who are so ready to suggest remedies would be as persistent in a *practical* application of their views, the Irish problem would soon be solved, and the unfortunate landlords and occupiers, who are generally supposed to know nothing of their own affairs, would not be slow to follow the example set them by their obliging and benevolent teachers. I see nothing to prevent any of our land reformers from investing any sum they please, either as owners in fee, where they could personally indulge in tenant-right, with all its phases up to fixity of tenure, or from becoming leaseholders with the object of reclamation. One real live example would do more for us than all the theories that have been propounded for the past twelve months. The amount of land to be reclaimed must depend upon its quality when brought into cultivation, and the cost of reclamation. Erratic attempts have been made here and there upon every class of waste, but unless the work be profitable it is impossible it can make continued progress. In considering this Irish Land Question, I have often been surprised that the records of the Landed Estates Court have not been used as furnishing, not the theoretical, but the actual value of land, and that, too, upon a very large area. It will be found that there is no occasion to spend £10 in reclaiming an acre of waste, because land which needs nothing but cultivation can be purchased in fee for little over that sum. I have said thus much upon value, to shew that the existence of waste of the second class is not due to

landlords or injustice to Ireland, but simply to the fact that it will not now pay to reclaim. The amount required to be expended in many cases would be more than would purchase the fee of land of medium quality, whilst the other, after all, would be only indifferent when reclaimed. Money will improve and develop, but it cannot alter the staple of the soil. We are told by theoretical enthusiasts (enthusiasts because they are theorists) of the untold wealth lying neglected in our deep bogs, and upon our mountain sides, and that whilst our people are being driven from their country, millions of acres that only require development under a good system of Land Laws, lie waste and unprofitable. Are we to understand that none of these things have been attempted? that in this vast area there are none who have not tried their hand and endeavoured to make themselves possessors of some of those riches in prospect? Such assertions only prove to my mind the ignorance of those who advance them. Reclamation upon every kind of land has been tried, and with very little success upon the second class. It has been tried not merely by tenants, but by owners in fee, who were not fettered by landlords or bad government, or a want of capital, and to whom success would have proved a fortune, had the anticipations of theorists given good results in practice. Success to them must have been complete as owners and occupiers—they had all to gain; yet this waste land of inferior quality and those deep bogs still remain. The fact of their abandonment tests their real value. Individuals have been bold enough to commence, but found no encouragement to proceed, and in many instances instead of subduing nature, nature subdued them. Such as strove to exist upon their labours waited in hope until hope ended in despair, and the wastes of Ireland were, I think, wisely abandoned for the alluvial plains of America. The true system to work upon—that of thorough drainage, subsoiling, &c., and all the facilities which the introduction of horse labour and machinery afford—is only of very recent origin. The old attempts which were made were on a small scale, and possessed

none of that permanency of character that would entitle them to our consideration. We might as well ask ourselves why there was not a telegraph to America fifty years ago, as inquire why the bogs of Ireland were not drained at the same period. Although our agricultural development is not so brisk and systematic as could be wished, still I am persuaded there is much doing; thousands of acres, now called waste, are annually being converted upon sound principles into arable and pasture land.

From my remarks it is easy to perceive that the landlords, since 1846, have held a very altered position from the one they occupied previous to that period. Such as retained possession of their estates had now to identify themselves with their property—many through incumbrances, recent and remote, being unable to meet the demands made on them, were swept away by the Encumbered Estates Court, and helped to swell the tide of emigration. One of the greatest evils, to my mind, that the country has to complain of is absenteeism. The upper class who ought to initiate and develop, foster and encourage all that is good and progressive, would by their countenance and expenditure be of the utmost service to the country; but all this is lost by their absence. The very life blood—*money*—is drawn out of the country; it has no chance of circulation, and the method of extraction often employed by the landlord's representative, is of the worst possible description. Much of the ill temper and discontent of the agricultural classes may be traced to this source—the want of direct intercourse with those really interested in their welfare, who would enter into their wants, and understand their difficulties, and whose connexion with them would be something more genial than the icy grasp of an agent calculating on his per centage. The large Irish proprietors find, however, a more, to their taste, congenial atmosphere in England and on the Continent than at home. Fashion, too, may not have been without its influence, or it may be that out of Ireland more comfort and luxury could be obtained for the same money for the



elder branches of the family, whilst the education and associates of the junior members were decidedly superior. Estates were often let upon long leases, seldom containing any restrictive clauses, probably beyond the term of the life of the owner. Thus all personal interest was banished, all responsibility removed. With the lease the landlord had ignored his duties, and signed away all his rights, except that of receiving the rent—so long as that was paid he had no further claim upon or interest in his property. Any desire on his part to effect change in the system of cultivation, or develop the resources of his estate, would only have met with the most strenuous opposition from the tenants, and therefore no other course than being satisfied with the *then* state of things was open to him. He was, as owner, practically reduced to the same position with regard to his property, as any one having money invested in the Three Per Cents. This, I contend, is one effect of the *long lease* system: it annihilates the landlord's interest in and influence over his property, and excludes that wholesome personal supervision and interest which many tenants require to stimulate them to progress and good cultivation. Again, where property was not let upon lease, and the landlord was an absentee, an agent, practically as much an absentee as himself, was appointed, whose whole aim and object was to squeeze as much rent out of the land as he could. This gentleman, generally an attorney by profession, and wholly ignorant of agricultural practice, was not slow to take advantage of the keen competition for land, and to put a rack-rent upon every acre. The estate was seldom or ever visited, unless to make a seizure, or eject a tenant. Industry and good cultivation were ignored, and the more money could be obtained, and law mixed up with the relations between landlord and tenants, the more grist was brought to the agent's mill. Here, then, we have the effects of an opposite kind of absenteeism *without leases*; no security for the tenant, and a consequent amount of terrorism and corruption. One circumstance con-

nected with absenteeism is very striking; it is, that we seldom find any trace of modern practice as carried out elsewhere being introduced into Ireland by the owners of the soil, though their opportunities of observation must have been extensive, and the short-comings of home practices very apparent by comparison. With the Irish residents the same system of agency generally existed, sporting and gambling occupying more of their attention, and absorbing more of their time and money than either the duties or development of their estates. Only in rare instances was any knowledge of agricultural practice considered an essential element of a proprietor's education, and thus discernment, the offspring of good training, was absent in the management of their property. Many had estates so encumbered and fettered, that if they had had the heart and head, they had not the means or power to effect the necessary changes, and pay that attention to the comforts of their tenantry which their position demanded from them.

#### CHAP. III.

##### *Long Leases and Short Leases.*

I HAVE said enough of these particular types of landlords to answer the question, why we have so little development of our resources, and why so universal a complaint of neglect and misrule is made by the tenants. Still, it must not be supposed that Irish proprietorship is confined to these two classes; we have amongst us a large body of kind-hearted, attentive men, who identify themselves with the interests of their tenantry, and who act upon the maxim that property has its duties as well as its rights. One would have thought that, if the evils complained of consisted solely in absenteeism and mismanagement, a marked difference would be observable in these cases, both in the condition of the tenantry and the cultivation of the soil—in fact, that these estates would form an oasis in the desert. In some instances an improved appearance is visible, but in the majority they seem to be much the same as the surrounding land. The tenantry console themselves in being better off than their neighbours, having less rent to pay, feeling greater security, and



having a kind-hearted resident landlord to appeal to. But this knowledge has not the effect one would have anticipated; security produces ease, and a low rent indolence and extravagance. I know many instances where property is let 20 per cent. below that which surrounds it, where leases are in existence, and where there is every reason why progress, good cultivation, and the comforts attendant on industry should exist; but in point of fact the land is as much worn out, as badly fenced, drained, and cultivated, and there is as great a difficulty in collecting the rents as under less favourable circumstances. At the same time the sales in the Encumbered Estates Court have had a good effect. In various parts of the country improvements upon a good scale, and upon modern principles have been made; good blood both in cattle and sheep has been imported; and in this way new ideas have become diffused amongst the tenantry, and much real progress made. When we remember such cases as that of Allan Pollok, who is undoubtedly one of Ireland's best friends, devoting himself with his skill and capital to the development of her resources, and the employment of her poor; how he was made the butt of a party and denounced, because he was engaged in closing the grave of a system whose last knell had been tolled, but out of which agitators were anxious to create political capital for themselves—we need not wonder to-day, when we find the same spirit assume the form it has now taken, and shew itself in its true light, as opposed to all progress and all law and order. In passing through the country the almost utter absence of a substantial middle class is apparent everywhere; the mansion and the cabin alone strike the eye. This, I hold, to be an unhealthy state of things. Society is not well constituted, or properly balanced without the elements upper, middle, and lower, being well defined. Each is essential to the others, the upper with its refined tastes and many artificial wants, to give tone; the middle, the backbone of every country, with its energy, knowledge, and capital, to devise; and the lower to execute. The middle class in agriculture, is only of very recent origin

here—men capable of tiding over a temporary difficulty, imbued with notions of progress, and disposed to develop the resources of their farms. Such men have been largely created by the absorption that has taken place, and by the weeding out of those who were unable or unwilling to go with the times. This class of tenants hold by lease, as a rule, with the exception that they may require some provision to induce or enable them to lay out their capital in reclamation and improvements, and to place them in such a position that the fruits of their labour cannot be denied them. They have no real grounds of complaint, and, from my own personal knowledge of this class, I am satisfied that whilst they would hail with delight any well digested measures that would reduce our local burdens, improve our fairs and markets, and create facilities for our agricultural development, they are as sternly opposed to unconstitutional measures, and as free from the dirt through which wild and unscrupulous agitators have tried to drag them, as the most loyal class in the community. By far the largest proportion of tenants (*vide* agricultural returns) are holders of farms under 50 acres, and of these few have leases. So much loss, and so many difficulties have presented themselves from time to time to the landlords in dealing with them, that the general feeling appears to be opposed to granting leases in their case. For whilst it is at all times easy to get a bad tenant to fasten himself on you, if he possesses a lease, it is no light matter to get rid of him. With these small farmers the cultivation is generally of the worst possible description; the soil is impoverished to the last degree, and there is seldom any attempt at reclamation. This may in some measure be due to the tenure, but more generally arises from want of capital or industry. The pretty picture so often drawn by the advocates of this class is in practice generally reversed—*ex nihil, nihil fit*. To expect a man, who is not unusually worse off than a labourer, to fertilize a soil, or reclaim a waste, is simply absurd. The return for outlay in agriculture is necessarily slow, and in cases of reclamation very uncertain—neither suited to the needy

man—and, in regard to improvements effectual by this class, I put any attempt at material legislation for the good of the community altogether beyond consideration. Much has been said and written, from time to time, upon the small holding system, and some of the tenant-right champions have been warm advocates for it. The R. C. Bishop of Cloyne, before a committee of the House, gives his opinion that farms of from 15 to 30 acres would be the proper size; but upon what grounds I am at a loss to conceive. The people themselves occupying such holdings have given a practical answer by their steady diminution, their poverty, their inability to pay rent, and their emigration; neither a spirit of agitation nor attachment to the land could keep them at home when poverty was always at the door. Let us look at the small system practically; suppose the country were divided into 30-acre lots to-morrow, what would the next generation do? Thirty acres is a fixed quantity, but the number of mouths to be fed would be steadily increasing. Again, put a fair rental upon 30 acres of average tillage land, does any one believe it possible to produce £50 annually, over and above all expenses? Yet that is a sum small enough for a family to procure the common necessities of life, and could be earned by a labourer's family either by farming or any other avocation. The system of small holdings would maintain the flail and the spade against the plough and thrashing-machine. You might as well expect the old stage coach to compete with the express train. It is open to every objection as opposed to progress. With the small man, his eggs are all in one basket; a season unsuited to his crop, the loss of a cow or sheep prostrates him utterly. With the larger holder the risk is more divided; occupying a larger area he has greater variety of soil, some sheltered, some exposed, some suited to a dry season, some to a wet—the contingencies are calculated, and an average and comparatively even result is obtained. But with the small man his little lot may all be exposed, it may be all dry or all wet, thus reducing his chance of a crop in even greater proportion than the area he occupies. Again, water power, roadways,

drainage, could never be properly executed upon a sufficiently broad and comprehensive plan to be economical and permanent under the small system. Many operations in agriculture require to be continuous to be effectively performed, and a large staff brought to bear upon a certain point will save a crop by snatching an opportunity where the small man loses it. Upon the large system, too, the agricultural operations can be carried on continuously; there is steady yearly employment for all seasons and all weathers; but with the small system the holder is overpowered to-day to accomplish what ought to be done, and to-morrow he may be idle, having but the one crop to secure, and that unfit from the weather. Apart from the question of economy, of resources, and labour, there is that of capital. We are told that the small holder has his capital in his labour and family, and pretty pictures are drawn how each and all find employment suited to them; how their little farms could be tilled, weeded, and stoned. But how different is the reality! just in proportion as the small system abounds do we find bad cultivation, bad crops, and bad stock. How could it be otherwise? How can the occupier of 15 acres purchase good implements? Aye, implements of any kind? What scope has he upon 15 acres to use them? Fancy a thrashing-machine upon every 15 acres, when one will do for a farm of 500 acres? Fancy a small holder investing £50 in a bull-calf of superior breeding for his dairy of one cow, or a proportionately large sum in a ram for his flock of two ewes. Progress from such a source is simply hopeless and impossible. The champions of the small system clearly do not understand agricultural processes. Suppose small holdings to be established with a large measure of tenant right. Imagine a 30-acre field divided into 20 fields of one and a-half acres each; to say nothing of the miles of fencing that would come under the head of improvements, instead of the one gate and piers (say £2), twenty gates and piers would be required. The expenditure under the small system would be in the inverse ratio of the size of the farms—

apart from the consideration of money capital. That there can be no economy in labour is not true under the small system. The labour from want of connexion with mechanical appliances and continuity of system is badly invested, and, in point of production to cost, bears no comparison with our modern notions. If the small holders, under 30 acres, were converted into labourers, and their holdings into farms of 300 acres each, it would be found that with the aid of capital and machinery the same number of hands would be more than sufficient to cultivate and reclaim the whole, and that in a few years, when the permanent improvements would be effected, there would be an excess of population. There is at the present time a dearth of labour, and many agricultural works are in consequence suspended, not so much from a deficiency of population, as the absence of *economic distribution* and a *steadier* industry. The small holder necessarily contracts habits of indolence from want of full occupation, and is too proud to work outside his farm. Thus his labour is a loss to the community from inertness and bad application. Between the two classes of tenants we have now considered, there is a large body who hold from 30 to 150 acres of land; these men are generally most interested in the land question; they have no intention of leaving the country, and are not sufficiently informed to see the folly of the notions set afloat by demagogues seeking to obtain their support; *their ideas upon tenant-right stop at nothing short of confiscation*; they live in hope that some day or other the land will be their own, and that if things do not go quite so far they will be able to make their own terms with the landlords, and obtain from them payment for everything they ever did upon their farms. I doubt whether any prospective measure will satisfy them. Circumstanced as their farms generally are, without leases, the land in an impoverished and unimproved condition, from fear of a rise of rent, and themselves with a forlorn exterior, in the hope that appearances may excite compassion and extract relief, the only remedy would be some measure which

would create confidence, and make them apply their energies and capital to the soil. Many of them have a good deal of money either in the heel of a stocking, stuck in the thatch, or in the savings' banks, which only comes to light when the interest in some additional acre is to be purchased, or some member of the family married. A few of this class have long leases, but whether it is from ignorance or indolence, or a feeling on their part that they are effecting a good which would not be wholly theirs, they undertake no improvements. In practice, the security of a lease does not create that spirit of enterprise and development which it ought, even where, apart from reclamation, good tillage might be expected, and where capital invested under this security would make an ample return, and could readily be realized at any time during the term. There may be ample labour in the tenants' families to drain and effect every requisite improvement, with the certainty of a fair and equitable allowance from the landlord, and yet no improvements are attempted. The sons of farmers will not lower themselves to the drudgery of common labour; and when parents, anxious that some of the slack season should be occupied in reclamation, urge their boys to work, America is threatened, and rather than lose the youngster, any notion of developing the resources of his farm is abandoned.

From what has been said throughout my remarks, it is easy to perceive that up to 1846, labourers, that is, persons wholly dependent upon labour for their support, were not numerous; every one had his potato garden, a few sheep, or a pig, and paid his rent and any calls he had beyond it by so many service days at seed time, or harvest. Systematic Monday morning to Saturday night work was hardly known amongst them. The pay was small, and the work done generally less; an easy mode of life with some discomfort being preferred to the more industrious one with its attendant independence and abundance. The Irishman has always at command a good share of philosophy; he sees nothing ennobling in labour, and conceives that his position at the head of creation entitles him



to something more. What is life if you cannot enjoy it? Hence labour is always looked upon as the last shift for existence. It is this getting into harness that our modern condition demands, which is so irksome to the volatile character of the feet. Employment is looked upon as nothing short of slavery, and the employer in the light of an oppressor of his race.

To imagine for a moment that there is not plenty of capital in the country for the employment of the lower class is simply absurd. The deposits in our banks, the sales in the Encumbered Estates Court, or the amount to be realized any day by the sale of the *interest* in a good farm, clearly shew a contrary state of things. It is rather that labour has controlled capital. A steamboat company, a new bank, or any similar undertaking, readily draws attention and secures investors. Why is not it so with the land? Some say, and not without reason, that a good Tenant-Right measure would unlock this capital and set us to work developing our agricultural resources. I am not altogether of this opinion. Before capital can be successfully employed, more skill, more industry, and *more honesty of purpose*, will have to be developed amongst our labouring classes. It is through their hands the capital must pass, and if they are not disposed to give a fair day's work for a fair day's wage, despite all legislation upon the subject of Tenant-Right, capital will remain unemployed, and instead of Ireland being a home for our people, they will have to seek their fortunes elsewhere. Any man who has been an employer of labour here is fully alive to the difficulties he has to deal with, and hundreds who, with capital and a knowledge of their business, and close personal attention, have attempted the reclamation of land and farming have abandoned it, finding that from neglect, idleness, and want of principle amongst their labourers, anything like profit or ordinary control is out of the question. Our American connexion has created a spirit of dissatisfaction, and Ireland, instead of being looked upon as a home, is by many regarded merely as a stepping-stone to the land of the

west. The labourer cares little about his character for skill or industry, expecting, from day to day, either the tide of events to turn in his favour should he remain, or a remittance from America. To know his business, or obtain the good wishes and confidence of his master, is a matter of indifference, and instead of instructing his children in obedience, and endeavouring to implant in them a desire to learn and make themselves useful members of society, carelessness and neglect are rather fostered and approved, and the evening's conversation is more frequently devoted to lamenting over the hardships and troubles of the day, than to any identification of their own interest with that of their employers. From all classes of employers I come in contact with, I hear the same complaint: that the labourer is neither disposed to learn nor perform his work. It is this tone amongst the lower classes which has nipped in the bud many attempts at development made by energetic and enterprising men, and we see the consequence in the almost universal buttoning up of the pockets of those who have anything to spend. This has done more to check progress in the country than anything else. In no kind of work is an employer so much at the mercy of his labourers as in agriculture. His business being spread over a large area, precludes that amount of supervision afforded in more circumscribed avocations, whilst the substances to be dealt with are generally of a highly perishable nature from the weather and other causes. Therefore, neglect or inattention by those employed, or the loss of an opportunity, influences the result in a most marked degree. Nor is it to be wondered at that difficulties such as these present themselves (difficulties of our own making, and from which the country has been suffering for the past ten years), when instead of obedience to the laws and a knowledge of our wants being inculcated, we find that the press and the altar have omitted no occasion to pander to the prejudices of the lowest class, and have succeeded in instilling into them hatred of all law and order. In England there is innate obedience to the law; here we



have an innate opposition to it. The *round* man is in the *square* hole; he is ill at ease; he neither pleases himself nor his master; he is dissatisfied not because he has not employment and fair wages, for he has both, but because he reads, and is told that he was born for better things; that the blood of the O'Hagan or O'Flaherty flows in his veins, and that when right and justice to Ireland

are established, every man will have his acre to enjoy. From his position he has all to gain, nothing to lose, so that any proposition put before him, no matter how monstrous or impracticable, which has for its text the overthrow of his superiors, at once enlists his sympathies, in the hope that some day or other something may come of it to his advantage.

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### THE RECLAMATION AND IMPROVEMENT OF LAND.

“CRIBBED, cabined, and confined” within the narrow bounds of our “tight little islands,” with the national family increasing daily, and imposing increasing demands on the national pantry, one would imagine that every available acre of our limited space would be made to produce the greatest possible amount which it is capable of yielding, in order thereby to contribute in some shape or other to the supplies of food required for the use of our teeming population. That such is not the case, however, is evident to any one who travels through the British Islands, and look at things with a farmer's eye. He will see plenty of land lying waste, which only requires the judicious expenditure of capital to bring it into profitable cultivation; and what is worse, he will also see much that has become so reduced in point of fertility, through mismanagement, that it may justly be considered as even a more disheartening and intractable subject to deal with than those lands which have lain since the flood in a natural state.

It is true, there are extensive mountain districts, such as we find in the Highlands of Scotland and similar regions, where reclamation, in the usual sense of the term, is an utter impossibility. These may, indeed, be improved to a considerable extent by draining, which has been done with great effect in a vast number of cases, and some amelioration may also be effected in the climate through the medium of extensive plantations,

but beyond these points the improvement of such tracts of land cannot, for the most part, proceed. Yet these help to swell the total “waste” acreage of the kingdom, although the heath-covered acres of the Highlands cannot be so designated, while such maintain thousands of valuable sheep—and we have occasionally read and heard some very specious but very fallacious arguments on increasing the home supply of food, founded, apparently, on the supposition that it is possible to grow turnips on Ben Nevis and wheat on Snowdon. Such reasoning, or rather such assertions, are not merely useless but mischievous, especially when employed to excite the passions of those who are ignorant of the real merits of the case, but who feel the pressure upon their energies and resources arising from the necessity of providing, with limited earnings, the daily bread required by their families. When we find the “unreclaimed” land in the kingdom estimated at from 30,000,000 to 38,000,000 of acres, we must always be prepared to make a large deduction on account of those districts which are irreclaimable in a culturable sense. Still, with all the deductions we can make, there is unquestionably a considerable margin left, which may profitably be rendered more productive than it can be in its natural state, and, therefore, the reclamation of waste land is a subject which possesses features of much interest to the owners of such land, to farmers generally, and to the community.

In some parts of the kingdom the reclamation of waste land has been carried on for many years, so that the area in such places is rapidly becoming lessened, whilst the cultivated area has, of course, experienced a corresponding increase. It would be an easy matter to point to numerous instances where land which, within the last fifteen or twenty years, and even within the last ten years, afforded only scanty keep during the summer months for a few sheep of a comparatively inferior class, is now producing heavy crops of grain, roots, and sown grasses; and where even grouse would formerly have found it a difficult matter to pick up a living, is now stocked with valuable breeds of sheep and cattle. All this has told, and is telling for the general good of the community; and what is, perhaps, quite as much to the purpose, it has benefited those whose enterprise and skill have brought about these results.

The Highland and Agricultural Society of Scotland has zealously promoted the reclamation of waste land ever since the Society was formed, and the various practical Reports upon this subject which have appeared from time to time in its "Transactions" are by no means the least interesting part of that publication. To the exertions of that Society is owing, in a great measure, the spirit of improvement which has been so strikingly evinced in most parts of North Britain, with reference to the reclamation of waste land and the permanent improvement of land generally; and if it had fulfilled no other end than this, the establishment of the Society would have been of the utmost advantage, and a blessing to the country. Large tracts of land have been brought into cultivation by its means, many thousands of persons have found honest and well paid employment, whilst the capital expended has been amply repaid. To those who contemplate engaging in work of this kind, the careful study of the Reports in the Society's "Transactions" will afford a vast amount of useful information, which cannot fail to be of advantage to them; and it has frequently occurred to us that a digest of those Reports would form an admirable guide on the subject of which they treat. That the informa-

tion conveyed in such Reports must be of a valuable nature, will be evident even to those who are not already acquainted with them, when we state that in the premium list for this year, we find the Society asking for reports from proprietors who shall be able to "report the most judicious, successful, and extensive improvements, comprising reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates." The Society also asks for reports from proprietors or tenants who shall have reclaimed within the last four or six years from ten acres to fifty acres of waste land, and the conditions state that while "the report may comprehend such general observations on the improvement of waste lands as the writer's experience may lead him to make, they must refer especially to the lands reclaimed, to the nature of the soil, the previous state and probable value of the subject, the obstacles opposed to its improvement, the details of the various operations, the mode of cultivation adopted, and the produce and value of the crops produced." It is further required that "the improvement must be of a profitable character, and a rotation of crops must have been concluded before the date of the report. A detailed statement of the expenditure and return, and a certified measurement of the ground are requisite." Other reports are required relating to the improvement of natural pasture without tillage, by means of top-dressing, draining, &c., in situations where tillage may be inexpedient; and when all the conditions are complied with, it is clear, we think, that those who wish to tread in the same path will find much that will be well calculated to guide their proceedings.

When we consider the indifference with which the Royal Agricultural Society of England appears to treat this subject, we might almost suppose that every acre in England which was capable of improvement had been reclaimed and improved to the utmost extent. But it requires little evidence to prove that such is not the case, or to shew that there is not only much bad farming in many parts of England, but that there are also thousands of

acres lying waste which are capable of being reclaimed. Land improvement lies at the foundation of all other improvements in an agricultural sense, and this neglect of the subject to which our remarks refer is not the only instance in which the English Royal has put the cart before the horse.

The Irish Royal Agricultural Society is also restricted in its operations in this department of rural advancement. Want of sufficient funds has been stated as the excuse for the slight attention which the Irish Royal has paid to this matter, and it is a shame that such an excuse can be pled with truth, for the list of members of that Society comprises but a comparatively small proportion of the names of those who ought to be connected with it. It is true, as stated in the paper on the "Irish Land Question," which appeared in our last impression, that there is much land in Ireland "which needs nothing but cultivation," that can be purchased in fee for little more

than the sum which would be required to reclaim what is usually known as waste land; and for a considerable time the energies of improvers in that part of the kingdom will naturally be directed to the amelioration of land of that description. There are, nevertheless, many instances of reclamation to be met with in Ireland, as well as the improvement of previously cultivated but deteriorated land, and those instances will yet, it is to be hoped, stimulate and encourage others. We would merely observe, in concluding our remarks for the present on this subject, that it is well to bear in mind that the soil is a talent committed to our charge, for the abuse or neglect of which we are accountable. The food requirements of the people of this country are daily becoming more pressing, and, as a zealous advocate for agricultural improvement has said, "If it be a sin to waste bread, surely it is wrong to waste that which may be made to produce it."

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## GRASSES FOR PERMANENT PASTURE.

### NO. IV.—*FESTUCA LOLIACEA* \* (*Hudson*)—Spiked Fescue-Grass.

SYNONYMS—*Festuca panicula spicata*, of Royen, in *Flora Leydensis*, 1740; *Festuca longata*, of Ehrhart; *Bucetum loliaceum longiglume*, of Parnell; *Schedonorus loliacus*, of Dumort; *Darnel* or *Rye-grass-like Fescue-grass*.

#### DESCRIPTION.

ROOT fibrous, perennial; leafy stems numerous, lower ones spreading and rooting on the surface of the ground. The root leaves of this species being as broad or broader than those of the stem, it was, along with *F. pratensis* (p. 55) and *F. elatior* (p. 59), transferred by Dr Parnell to the new genus *Bucetum*, and it differs from all the other Fescue-grasses in its inflorescence being racemed or spiked instead of paniced—resembling in this respect the common rye-grass, but differing from it in the spikelets being shortly

stalked, furnished with two unequal-sized calyx scales instead of one, and in their flat sides, instead of their edges, being usually turned towards the rachis or centre. Stems three- or four-jointed, averaging about two feet in length, but attaining to thirty inches in very good soils; of a weak and somewhat straggling-like habit of growth, and abundantly furnished with tenderish root-foilage. Usually in flower about the middle of July, but seldom or never producing perfect seeds; a peculiarity which has led to the belief that it is a mere hybrid or mule—either between the common rye-grass and the floating sweet-grass (*Glyceria fluitans*), or between the former and the *Festuca pratensis*. If a hybrid at all, it certainly par-

\* From the Celtic *Fest*, pasturage, and *Lolium*, the generic name of the rye-grass.

takes most of the habit which might be expected from the first-named parentage; and it would be interesting to ascertain by practical experiment which, or if any, of these theories are correct.

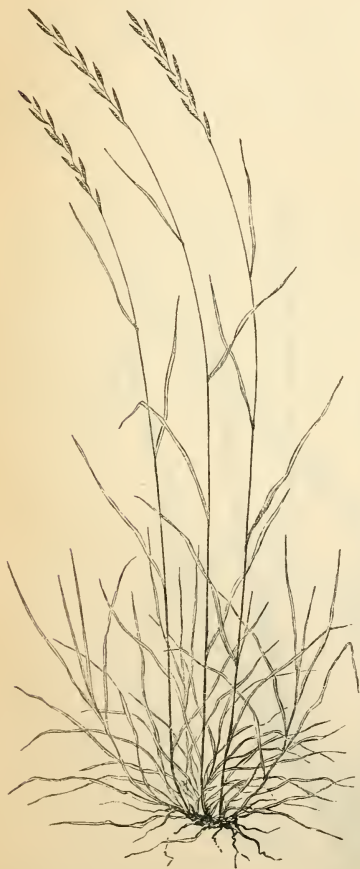
#### NATURAL DISTRIBUTION.

Found in rich moist meadows, and open undrained grassy places throughout southern

when the surface is periodically overflowed, growing generally in isolated patches, but comparatively rare in Scotland; and although 500 feet is the highest altitude usually assigned for it in Britain, we have found it in considerable abundance above 600 feet on the sides of a road near Woll, in Selkirkshire.

#### QUALITIES AND USES.

Compared with the perennial rye-grass, which most resembles this in general appearance, this is earlier, more permanent in duration—being decidedly perennial; better suited



*Festuca loliacea*—Reduced in size, shewing habit of growth.



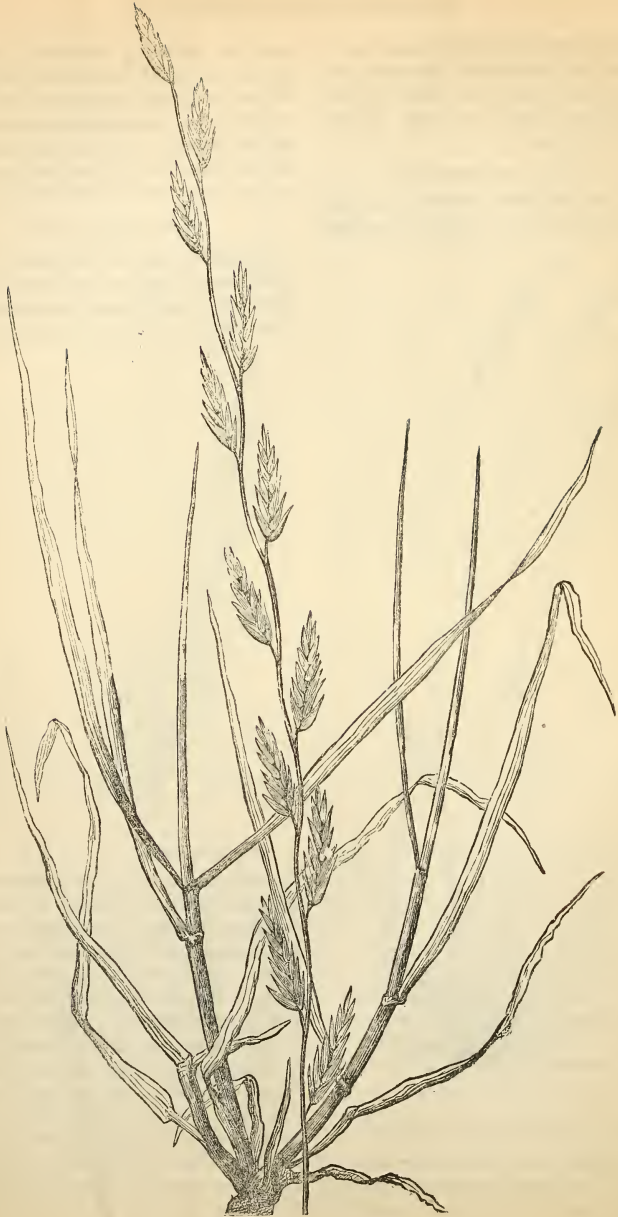
Spikelet magnified.

Calyx magnified.

and central Europe, but hitherto undiscovered elsewhere. It is pretty common in the low and fenny districts of England, particularly

for irrigation, as well as for growing on damp soils, forms a closer sward or turf, and is decidedly superior in the quality as well as the quantity of its produce; but being, as before stated, incapable of producing perfect seeds, it can only be propagated by division and transplantation, the trouble and expense of which have been generally looked upon as an insurmountable bar to its cultivation. These objections, however, are more ideal than real. For, in the first place, a bed 25 by 2 yards of carefully grown two-year-old plants will divide sufficiently to plant an acre at 1 foot apart—requiring 43,560 plants, which may be put in at a cost of 10s. to 15s.





*Festuca loliacea*. — Natural size.

per acre, and would, in course of the first season, closely cover the whole surface; while, in mixture with other grasses newly sown, at one yard apart, the planting would amount to little more than a single day's wages of an ordinary labourer—no great cost, considering the advantages that would accrue from a liberal introduction of the spiked Fescue, either into irrigated grass lands, or the damp hollow parts of ornamental parks. Grown at Woburn, on a rich brown loam, the *F. loliacea* is reported to have produced 16,335 lb. of newly cut grass per acre, which lost 9188 lb. in drying, thus leaving 7147 lb. as the weight of hay; while the grass of the latter-math was 3403 lb. per acre.

#### SEED AND SOWING.

Although *F. loliacea* is a name which frequently appears in seed catalogues, it is only applicable to a variety of the *F. pratensis* (see p. 58), the present species being, as before noticed, incapable of producing seed, or at least we have never, by long and frequent observation, been able to discover a single fertile seed upon it, either when growing naturally or under cultivation.

#### CHEMICAL ANALYSIS.

Not being among those grasses analysed by Professor Way, we can only give the less satisfactory results recorded in the "Hortus Gramineus Woburnensis." When grown on a rich brown loam, the yield of nutritive matter was, when flowering, at the rate of 765 lb. 11 oz. per acre, only 553 lb. when the straw assumed a ripened-like appearance, and about 66½ lb. from the latter-math.

#### VARIETIES.

There are none of any agricultural importance, the *F. loliacea* of the seed shops being more correctly associated with *F. pratensis* (see p. 58). Parnell, in his "Grasses of Britain," has figured and described two varieties under the names of *Bucetum loliaceum longiglume*, and *B. l. elongatum*; but we take the first of them to be the true *Festuca loliacea*, whereas we look upon his *B. loliaceum* as identical with the *F. pratensis spurea* (p. 58). His *B. l. elongatum* is described as differing from *B. l. longiglume* in the large glume or calyx-chaff being shorter, concave, and five-ribbed; and from his *B. loliaceum* in the spikelets being longer, and the whole plant much taller.

## The Farm.

### ARTIFICIAL HARVESTING.

SUCCESSIVE heavy showers, although welcome for many reasons, have served to remind us that in saving our harvests we are not to reckon on a continuance or a frequent recurrence of such weather as we recently experienced, which not only enabled farmers in many parts of the kingdom to cut down, but also to secure the kindly fruits of the earth, without a shower intervening to hinder operations. We all know what it is to endure the inexpressible dreariness of a wet harvest, and the feeling of utter helplessness which besets us when "the rain it raineth every day." How gladly, under such circumstances, is the return of sunshine welcomed, and the sharp breeze which whistles through the soaked sheaves is regarded with feelings of the highest gratification and thankfulness.

The wet harvest of 1866 gave occasion to certain writers—outsiders as regarded agricultural pursuits—to refer in somewhat harsh terms to what they were pleased to consider the backwardness of farmers in not having, long ere now, devised some means by which they would be rendered independent of the weather in securing the ripened crops of the farm. But it was much easier to find fault than to point out any feasible remedy, and the farmer's volunteer advisers just left him where he was. The Society of Arts, however, believing that some light might be thrown on what is certainly a question of vast importance, went to work in a practical manner, and in the course of last year offered a gold medal and a prize of fifty guineas, for the best essay or report on the harvesting of corn in wet weather. The result was that twenty essays were received, and, as we intimated some time ago, the gentlemen who acted as judges—namely, Mr J. C. Morton, Mr C. S. Read, M.P., and

Mr Chandos-Wren Hoskyns—awarded the prize to Mr W. A. Gibbs, of Gillwell Park, Essex, and at the same time commended several essays which had been sent in by other competitors. Mr Gibbs' essay has now been published, and we are thus enabled to judge, in some measure, of the plans he has tried for harvesting corn crops, and even hay crops, under adverse circumstances; plans which his experience, so far, enable him to recommend to the attention of agriculturists, and which have received the sanction of the Society, acting on the judgment of those experienced gentlemen to whom the competing reports were submitted.

A considerable portion of Mr Gibbs' essay is taken up with a review of the expedients which have been already resorted to in this and other countries, for partially averting the effects of unfavourable weather, and that portion should not be overlooked, for although those expedients are comparatively few and meagre, still the information given is of a useful nature. Mr Gibbs next proceeds to give the details of his own attempts in conducting a series of definite experiments upon the artificial drying of hay and corn in wet seasons. Those details consist mainly, as he remarks, of a history of failures, and his apology "for recalling some of these, before giving final results, rests upon the hope that one man's failures may either suggest other men's successes, or save fellow-labourers in the same task from wasting fruitless labours upon methods already proved impracticable."

For the details of those experiments, as well as of the final results, we must refer our readers to the essay itself, as published by Bell & Daldy. The plan finally adopted consists of a drying-house, made of iron or

brick, into which a continuous stream of hot air is driven by a fan propelled by a portable steam-engine, as used for thrashing; and the hay or sheaves when sufficiently dried, are thrown out and elevated by means of an "atmospheric hoist," which, driven by the same engine that works the hot blast, is capable of sending up sheaves of wheat to the top of a stack 22 feet high, at the rate of 960 per hour. Mr Gibbs states that a shed, 12 feet by 24 feet, "would enable the farmer to dry sixty-four sheaves in fifteen minutes, or 256 per hour." This number of sheaves represents "the produce of rather more than half an acre, hence twelve acres in the twenty-four hours could be cleared by this means." Larger quantities can be dealt with by increasing the size of the shed, and the volume of hot air. An eight-horse engine will drive four or five fans, and additional heat can be easily supplied by simple means.

As to the question of expense, Mr Gibbs enters into details, shewing "a final total of 8s. per acre, which, with a four-quarter yield would put 2s. per qr. on the wheat thus saved. For this extra expense, however, it should be fairly allowed that the straw as well as the wheat is secured in better condition, and the increasingly high value of that part of the crop makes this an important point in the calculation."

Mr Gibbs submits for the consideration of practical men a few reasons in favour of his plan, and some of the probable advantages that would follow its wide adoption. These reasons are as follow:—

"1. In the first place, it is not a mere theory, existing only on paper, or in the imagination of a sanguine inventor, but a palpable and very visible fact, that has been, and can be, put to the severest test of practical working.

"2. It is a powerful yet inexpensive arrangement, with no complex nor delicate machinery which would render it liable to break down, clog, or otherwise get out of order.

"3. It is portable and easily adjusted, and adapted to most varieties of engines without requiring any alterations in them.

"4. It leaves the hay and clover, whilst drying, constantly open to the examination of the men, so that the exact requisite point of dryness may be seen and seized upon; whilst with the cereals a definite time can be established by the first batch of sheaves,

after which, the same time may be depended upon for producing the same results without further watching.

"5. It does not pretend to supersede nature, to set aside experience, or to change old and approved modes of harvesting, but merely adds to them a large and easily-managed power of securing with certainty and rapidity each crop in succession.

"6. It does not involve any new system of things, but with an apparent natural sequence 'follows the (steam) plough,' and in the rotation of the seasons helps to harvest the increased growth which that plough has helped to produce.

"7. It fits in most conveniently and practically with the existing mode of hiring engines, offering a good means of paying employment to their owners just at the time of year when they have been hitherto idle, and yet not putting the farmer to one penny of cost, if the rare chance of a fine season for every one of his crops renders him happily independent of all need of help.

"8. It would be a boon to the harvestmen, providing them with work through wet and dry, saving them the loss of wage, and temptation to drink that follows when they are turned off, to lounge about the village, waiting for a change of weather; and enabling them to get through with one job of harvest work in time enough to get another elsewhere."

There is one important fact noticed by Mr Gibbs—namely, that the high temperature used in the drying, from 220° to 320°, does not affect the germinating powers of the grain, as he had five plots sown with the wheat thus dried; and at the time when he wrote—last June—the plants were as well forward as any wheat in the neighbourhood.

It is impossible, of course, to decide definitely, as to the practical merits of the plan invented by Mr Gibbs. That it has merits sufficiently strong to warrant, at least its conditional reception, by practical men, seems evident, not only from the results given by him, but also from the mere fact that such eminent agriculturists as Messrs Morton, Read, and Hoskyns have approved of it. That it will be thoroughly tested we have no doubt, and possibly some further improvements introduced in its working details. Waiting, therefore, further confirmation of Mr Gibbs' experience, we close our remarks for the present by quoting the concluding paragraphs of his really interesting essay:—

"If, therefore, it be remembered that this new adjunct of the steam-engine begins its work with the first crop of hay, can next be applied to wheat, oats, barley, and the whole range of cereals, is then at hand to finish the second crop of hay, and enables us to dry



the artificial grasses at any season of the year, it would seem as if it were destined, perhaps at no very distant period, to complete that perfect circle of systematic husbandry which now begins with the steam-plough, and ends with the thrashing-machine.

“When continuous employment can once be found for the ‘iron horses,’ we may hope to see them on

every considerable farm in the kingdom; first, breaking up and cultivating the soil; next, mowing, reaping, and gathering the produce; and, finally, passing from field to field, and from farm to farm, sowing, drying, and bearing home the harvest.”

A full description of Mr Gibbs' mode of operation will be found at page 351.

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### AUTUMN CULTURE OF THE SOIL.

IT seems but a trite saying to make use of, that the “more carefully you cultivate the soil the better will be its produce;” yet, trite as it is, the principle which it involves is singularly overlooked by many farmers. For if not, how comes it that a by no means extended survey of farming districts serves to shew how that, while one farmer will be busy at the most appropriate season, in turning every minute to account in availing himself of appropriate weather to work his soils, you will find others who are quite indifferent as to the work being done, evidently ignorant that every benefit is to be derived from doing it, for otherwise it can scarcely be that they are too lazy or unwilling to do it. These considerations came up with great force upon us when, a few days ago, we saw a well-known, and in every sense an advanced farmer taking advantage of a double blessing—an early harvest, which cleared his fields from their summer produce, and fine weather, so as to break them up to get all the advantages of the system of autumn culture; while some of, we might say all, his neighbours were as indifferent to these opportunities and these advantages as he was alive to them, and were doing nothing while he was doing much. And yet, even amongst those who are indifferent to the subject, it will not be denied that great advantages are to be derived from the carrying out an autumn cultivation of the soil, not only because it enables the farmer to get rid of weeds, but also to lay up his soil in the best possible condition, to get from the atmospheric influences of the autumn and winter all the advantages which they can and do bring with them.

And first, as to the advantages brought about by the system of autumn culture in the way of getting rid of the weeds. When the crop is on the ground—we here suppose it, of course, to be a cereal one—the weeds do not make much progress; they are, so to say, overshadowed by the superior power of the crop. But the moment that the surface is laid bare to the influences of light and air, then they begin to assert their power, and all who have to do with weeds know what that means and what it involves. And it is just at this point that the difference is shewn between a farmer who really understands his business, and one who does not, or, if knowing it, does not care to apply his knowledge to his practice. The longer the land is allowed to lie in the same condition as it is left after the corn crop is taken from it, just so much more completely will the weeds be allowed to take possession of the soil. It is no uncommon thing to find that the weeds have been allowed to grow unmolested, and for such a time that they take such a possession of the soil, that scarcely anything less than a summer fallow will suffice to get rid of them. The sooner, then, that weeds are brought to the surface after the crop is off the ground the better, so that they may be placed as much as possible under the scorching influence of the autumnal sun—in this year we may almost say the summer one, so early has been the harvest. To bring the weeds to the surface, we believe that there is no implement so effective as the grubber or cultivator; and the advantages of using this are all the more marked where the soil is much infested—as unfortunately too many soils are infested—

with twitch or couch grass (*Triticum repens*). The peculiarity of this plant is, that being possessed of a number of reticulated joints, and each joint possessing the faculty of being reproduced as a special and separate plant, the result is, that the more it is cut up the more does it multiply, and this cutting up is just what the plough, with its peculiar action of double cutting by the coulter and by the sock or share, does. We believe, therefore, that ploughing up stubble lands with the view of getting rid of the weeds does not bring about the end which is in view. Possibly it is, in some of the circumstances mentioned above, the very worst way of treating stubbles much infested with weeds. The action of the grubber, on the contrary, we believe to be the very best adapted to deal with this scourge of strong lands. By it we do not so much divide the couch as bring it in long lengths and great masses to the surface, there to lie to be exposed to all the destructive work of the hot sun and atmospheric influences. Some authorities advise that, being thus acted upon, the weeds may be turned in afterwards by the plough, and add, by way of manure, to the fertility of the soil. This we do not agree with, and simply because, that we are of those who, believing in the extraordinary vitality of the perennial weeds, more especially of the couch or twitch, do not believe that such limited exposure as in our climate we can obtain for them, to the scorching and killing influences of the sun and air during autumn, does effectually kill them; on the contrary, we believe—and having had much to do with them, we may well believe—that if turned into the soil they very rapidly resume their spreading powers, and by the time the spring comes round, and the land has to be brought under the final spring working, the weeds will be found, if not to be as rampant as ever, still to possess the ground in such fashion as to be anything but pleasing to the farmer. It is right, however, here to state, that although being decidedly of opinion that the weeds, when brought to the surface, should, if at all possible, be swept off from it—and *burnt*, not added to the manure heap—still there appears to be one mode available

by which much of the mischief, if not all of it, arising from turning them again into the land, may be avoided, and that is by the use of salt. We have ourselves great faith in the power of this substance in destroying the vitality of couch; we have tried it, and have reason to believe in its efficacy. The quantity to be used will depend upon the bad or foul condition of the land; not less certainly, under ordinary circumstances, than two-and-a-half cwt. to the acre, applied as a top-dressing.

We are, however, strongly under the impression that the best implement adapted to break up the land in autumn is the grubber or cultivator; and certainly there is no part of the experience of the past years, in the history of agriculture, so striking as the position which the grubber as against the plough has taken. Indeed, carefully considering the principle upon which it operates, many authorities are fully in the belief that it is in the extension of the principle—and we need scarcely say, aided more especially by the power of steam—that they look to securing an increase in the productiveness of our soils. They confess to seeing in it a “philosophical fitness,” as it has been called, that they have been long looking for—a fitness by which all the complicated processes of ploughing will be done away with, and others—or another only—substituted for it, by which that complete pulverization of the soil, or tilth, as it is otherwise named, may be secured, by placing it for the longest possible period under the influence of the atmosphere during the autumn and winter months: and by which, moreover, we are enabled to keep in spring the upper soil which was worked in autumn, and which was thus exposed to these influences; so that the work to be done in spring—when so much has to be done and done quickly—may be reduced to a minimum. We therefore are of those who believe that the grubber is the best implement for smashing up the soil and placing it in the position best calculated to receive the atmospheric influences which all wish to place it under, because its action is such that the working tines get under the roots of the couch,

and without cutting them up—which cutting up is, as we have seen, so productive of the very evil which we are so anxious to avoid—brings them to the surface, and *leaves them lying there*; while, on the other hand, the action of the plough is such as to cut up and divide the couch, multiplying its roots, and also turn them over and place them in the position best calculated to enable them to reproduce themselves. At the same time, we must not overlook the advantages of the use of the plough in autumn culture, in conjunction with the grubber, in getting rid of the annual weeds. These, after the soil has been brought to a fairish tilth by the action of the grubber, will, if in abundance, be found to spread over the surface; now, if the plough

is sent in, these will be turned over and destroyed. In this case the plough should be made to take as deep a furrow as possible, so as to expose the largest surface of soil to the atmospheric influences during the autumn and winter months. A good plan will be found to be that of an eminent farmer, in whose practice there is much to admire and to follow, in which the stubbles are broken up by the grubber by steam-power, and finished off for winter in ridges (27 inches) with the double mould-board or breast-plough, and drawn by horses. All that is necessary to be done with this plan in spring is twice harrowing the ridged land, and thereafter putting in the crop.

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#### THE VICTORY OF THE MARROW-BONE AND CLEAVER.\*

A SYSTEM of opposition, as selfish and perverse as any which this year has witnessed—and that is saying much—has succeeded in defeating, or at least postponing, the bill for establishing a separate market for foreign cattle. Once more a well-organized corporate interest—to wit, the London butchers—aided by a railway and dock company, and though last, not least, by the Hebrew salesmen and jobbers who, whether as usurers, dealers in old clothes, or cattle jobbers, seem destined to avenge all the wrongs of their race, have gained a victory, not only over the farmer and provincial grazier, but over all the consumers of meat within the metropolitan area, whether rich or poor. If the Premier had taken the bill in hand from the first, it is fair to suppose that it would not have hung fire at the last moment by reason of the breakdown in financial arrangements. The members who are supposed to represent the butchers' interests have exhibited more dexterity and perseverance than foresight or honesty. That the parties concerned in the opposition have acted severally in their own interests is but in accordance with human nature; still, this is not a circumstance which demands any special consideration in dealing with it. For the sake of some few of the electors of the City of London or the Tower Hamlets, it seems hardly worth while to hazard the meat supply of the whole country; and to enable butchers to continue to fleece their customers is a poor reason for a line of conduct which has undoubtedly jeopardized a good many votes for the

Liberal party. Even compact bodies of enraged butchers, armed with the weapons of their trade, would not perhaps be able to imperil the future return of Mr Goschen, or even of Mr Ayrton; but the farmers, who justly feel themselves aggrieved, and the Aberdeen and Norfolk graziers will not improbably influence the elections favourably for the Conservative party. The opponents of the bill may or may not like to give more for butcher's meat than would be either asked or obtained if the monopoly were broken up; but though they loudly and persistently declared that a new and separate market would raise prices, they carefully abstained from giving any reason for their statement. If they had said candidly and exactly what they thought, it would probably have been something of this kind:—"We know that any change, or any measure, however irrelevant to the matter, will be seized upon by the butchers as a reason for asking a penny or two-pence more per lb. A good harvest or a bad harvest, a large root crop or a deficiency in turnips, dry weather or wet weather, the cattle plague come or the cattle plague gone, a large supply or a short supply of beasts—any and all of these causes have served as an excuse, and will do so again, and a separate market would be gravely assigned as an unanswerable argument why we should pay more for English beef and mutton from Islington." And the butchers would try this plan undoubtedly; but the essential merit of the measure just withdrawn was that it would have rendered this artificial bolstering up of prices almost impossible for any length of time.

\* Abridged from the *Saturday Review*.



That we may not be accused of exaggeration, we will just recall one or two little matters which should not be forgotten. The butchers raised prices as high as they dared when the cattle plague began, and they keep them at the same point now that it has gone, giving them, if anything, a turn higher. There were this week twice as many head of foreign cattle in the market as in the corresponding week last year, but prices did not fall on that account. The supply of all kinds of cattle was of inferior quality; this is, as has been often pointed out, the result of placing the farmer wholly at the mercy of the butcher; and so long as the cordon continues, inferior cattle will be sent to the London market. But though this was so, the supply altogether was larger than it has been for some time. What was the consequence—prices went down? Not at all; meat was 2d. a stone dearer than the Thursday before. Again, a favourite argument is that some witnesses gave evidence that if they had the option to sell their cattle at Islington, or send them elsewhere out of the metropolis if they could not get the price they asked, they would realize 2s. per head more in a general way for their stock; and this sounds rather alarming. As about this 2s. some misconception exists, we will endeavour to throw a little light on it. The graziers and farmers—those especially of Aberdeen and Ayrshire, who were during the plague the main purveyors for the London meat market—affirm unanimously that since the regulations have been in force, whereby London exclusively is made an infected district, which no beast may leave alive, they receive £2 less than before for each beast from the London butchers, London being a kind of *cul de sac* presided over by butchers and jobbers. This the grazier would not so much mind if the retail price were lowered in proportion, because he is well aware that cheap meat means large consumption, and that he can afford to sell his beasts for half profits provided he can dispose of twice as many. But, in point of fact, what does he see? Why, that the retail price in London is exactly what it was before. It is the butcher who saves this £2. He gives £3 or £5 or £7, as the case may be, for what formerly he gave £5, £7, or £9, asking and obtaining from his customers the same full rates as before. These £2 are thus traced into his pocket; but we defy the keenest inspector to trace them any further, and this money, and who shall have it, is the key to the whole affair. The grazier desires that, if he lowers his prices, he should have a larger sale; the butcher loves high prices and small trouble; the London consumer stands aghast at his weekly meat-bills; the poor are helpless and ignorant, and their cause is betrayed by those who professedly are their friends. If the importation of foreign cattle were stopped entirely, the Scotch or English grazier would no doubt refuse to supply until he could obtain the £2 which, in the end, the butcher would be forced to recoup; but this would not benefit the consumer. But by offering proper wharf accommodation, lairs, grazing, and quarantine grounds to foreign cattle dealers,

and perfect liberty of locomotion and sale, as well as security against infection to the good and healthy stock of our home dealers, there would be at once a breakdown of monopoly, and the establishment of an active competition. This would make the butchers our servants instead of our masters, as has too long been the case, and the £2 in dispute would be represented by a general reduction in the price of meat. This is, so far as a careful investigation of evidence has led us, a complete history of the extra £2 per beast which has been paraded as the most formidable of arguments. And yet we are asked to believe that the butchers so dislike high prices that, out of love to hungry humanity, they would spend money out of their own pockets to print tracts and fee counsel, in order to keep down or lower the price of meat! It is a maxim with the police that, whenever a fraud, or what is technically termed "a plant," has been planned or committed, you must look for the culprits among those who have or would have benefited by its success. And we own that, as soon as we behold the zeal of the butchers in scotching this bill, the loudness of their professions, the generosity of their contributions—when we heard how much they feared that the poor would be starved for lack of offal, and the stomachs of the rich disordered by the consuming of inferior meat—we did immediately conceive a suspicion of their motives and a prejudice in favour of the bill.

The truth is, there is little use in crying, "Peace, peace," when there is no peace or likelihood of it. Even while the bill was being withdrawn, accounts were received of fresh outbreaks of the plague within three or four days' distance of our own shores. Mr Stuart Mill very properly observed, that in all future regulations it would be right to proscribe not only infected countries, but all others which were used as a line of communication from such countries. The relaxations which have just been granted by order of the Privy Council go quite as far as can be done with safety, perhaps further; and if the plague is reimposed, the reckoning of the agricultural interest, and the English people generally, with Messrs Gibson, Ayrton, and others, will be a rather heavy one. As it is, no cattle can leave the metropolitan area until after all kinds of formalities and many weeks of waiting, nor can one be moved in any direction for more than 600 yards without a license; and, altogether, the inconvenience and trouble of transit are so enormous and prolonged that we imagine few country salesmen will avail themselves of the new orders. We repeat it that it does seem hard that, in order to protect one twenty-sixth part of our whole cattle supply (*i.e.*, the foreign), our own undeniably healthy and superior stock should be thus branded, and consumers and farmers alike be inconvenienced and plundered for the sake of the London butcher interest. The extortion of which these persons have been guilty has been repeatedly exposed. They may be a very estimable and disinterested body of men; but those who will take the trouble to read the



evidence of some of them at pp. 160-161, and the comment thereon by the committee (p. 167) in the report of 1866, on the meat trade, will be slow to credit them all with that character. The truth is, the whole history of the cattle plague visitation, from the first moment to this day, has been one long melancholy illustration of defects of the Anglo-Saxon nature—arrogant incredulity, sudden panic, amazing superstition and faith in quackery; then a good deal of jobbing, and a display of every kind of extortion and over-reaching. The labours of the Cattle Plague Commission were most successful; there we had men eminent in science, of established character, unlikely to be biased either by butchers, jobbers, or electors, and personally anxious to sustain their professional reputations. They examined witnesses, perused reports and documents furnished by the authorities of almost all European countries; their three reports will be the text-book of future veterinary science, and are exhaustive of the subject of the plague. When we ask what is the practical result of this outlay and trouble, we are forced to admit that it is temporary

and inadequate. "We recommend," they say, "that with regard to the future, foreign cattle should be slaughtered at the port of disembarkation; that good landing-places, lairs, and sheds, in which the cattle may be properly housed, tended, and inspected, should at once be constructed at the ports where cattle arrive. . . . It is now the time to carry out fully and permanently the changes required in the mode in which meat is supplied to our large towns." Yet the first time that a measure is introduced in accordance with these suggestions, and which would at any rate have served as the commencement of progress to a better state of things, a small knot of noisy and unscrupulous persons has had power to defeat it; and the "marrow-bone and cleaver" party are, as well they may be, jubilant and sanguine over their prospective harvest.

Of the average Englishman it has well been said—"To-day and to-morrow is all he looks to; yesterday he cares not for, it is past and gone." He despises science, and men of science, and now and then gets punished accordingly.

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### CATTLE FEEDING STUFFS.

THE residuary matters of oil seeds which have been exposed to heavy pressure for the purpose of extracting the oil, are of considerable value to the agriculturist. Various seeds are crushed for the oil they contain. Amongst the most important are linseed, rape seed, cotton seed, mustard seed, poppy seed, &c. The oil is never effectually separated from these residuary matters, hence this valuable component of a feeding material is present in a much larger quantity than in other cattle food. The feeding value of an oil-cake, however, depends very much upon the nature of the seed employed for crushing, some of these seeds containing medicinal principles, which act in an injurious manner upon the health of animals which consume them, and are only fitted for use as manures.

*Linseed cake* is by far the most extensively used oil-cake for feeding purposes. It is highly valuable for all kinds of stock, but more particularly for animals feeding for the butcher. The great increase in the demand for this kind of cake has led to an enormous amount of adulteration. Various materials have been employed for this purpose, some of them harmless in themselves, but of considerably less value than the genuine material; while others contain poisonous principles highly injurious to animal life. Possibly, one reason why this variety of oil-cake is now so inferior, is the great difficulty the oil-crushers experience in obtaining pure samples of linseed. Few samples of this seed can be obtained free from a large admixture of other seed. Some Petersburg seed has

been found to contain as much as 70 per cent. of impurities; Black Sea linseed, 20 per cent.; and Riga seed nearly 50 per cent. In many instances it is impossible to remove all these foreign seeds from a sample of linseed; still, samples could be vastly improved if crushers were inclined; but as long as they can obtain as good a price for a cake made of impure seed as for one made of genuine seed, no improvement will be attempted. Dr Voelcker, in a lecture on oil-cakes, stated:—"From several samples of linseed, I have separated the seeds and ascertained their botanical characters. In one particular sample I counted not less than twenty-nine different kinds of weed-seeds, and among them the following, which are more or less injurious:—The common dandelion, which is frequently present in considerable quantities in the inferior samples of Petersburg seed; corn cockle, which often produces very serious effects in the animal system; wild raddish, which occurs in some samples of Alexandrian seeds, and is very pungent; wild rape, which is not, properly speaking a rape, but rather a mustard; charlock, or the common wild mustard. All these are seeds which it is positively known are injurious to the health of animals; but there are others which impart a disagreeable taste to the meat of cattle fed on these inferior cakes. The Gold of Pleasure, or *Camelina sativa*, is such a seed, giving a disagreeable taste and also a deep yellow colour to the fat of animals." A ton of linseed, or about 5½ qrs., weighing about 52 lb. per bushel, will yield 58

gallons of oil, weighing nearly 5 cwt. or twenty-five per cent. of the weight of the whole seed; the remaining seventy-five per cent. constitutes the "oil-cake." Formerly this residue was thrown aside as useless; now, however, the large demand for it at a remunerative price enables the oil crusher to sell his oil at a much lower price than would have paid him formerly. In separating the oil from the more solid particles of the seed, it is frequently necessary to put the mass two or three times through the mill; during the third time heat is generally applied. Of course, the more completely this operation is performed the less value is the cake for feeding purposes. In Holland some of the small millers purchase oil-cakes from France and Flanders, break them down, and work the mass into an impalpable paste with water at a boiling point, it is well stirred, and again subjected to heavy pressure, the products resulting being an inferior cake and an oil of the lowest quality.

Besides the cake manufactured in England, we import a large quantity from France, Germany, Holland, Russia, America, and India. Practical men prefer home-made cake, it is generally fresher than foreign cake, and of a much better flavour. Continental cake is, as a rule, much harder, contains much less oil, and is less digestible than English-made cake; besides, it not unfrequently gets damaged through bad storage before reaching this country, becomes mouldy and unfitted for cattle food. From America we obtain oil-cake of first-rate quality. That which is imported in barrels cannot well be excelled as food for lambs. Possibly that imported in bags is little inferior; when it is shipped, however, in this country it seldom commands as high a price.

A good linseed cake should be reddish coloured, neither too dark nor too light; if dark, rappedseed may be suspected; or, if too light, poppy seed mixed with it. When broken across, the smooth and shining coats of the seed should be visible. The cake should not have a tendency to split into layers. When mixed with water it ought to make a pleasant tasting jelly, thick, transparent, and free from any disagreeable smell. When linseed cake has been kept for a length of time its mucilaginous properties, more or less, disappear. A good cake should become gelatinous on being mixed with water.

The details of the qualitative analysis of an oil-cake are as follows:—

1. Burn 50 grains over a spirit lamp in a platinum capsule, and note the amount and nature of the ash. An ordinary cake will yield about 6 or 7 per cent. of ash. This ash should not effervesce very much on the addition of hydrochloric acid.

2. Take a small portion of the cake, boil it until it becomes quite a jelly; allow it to stand until quite cold, then test for starch by adding alcohol and iodine; if the mixture becomes blue, then starch is present, and as starch is seldom found in any extent in oilseed, it may safely be inferred that the cake has been adulterated, possibly with millers' offal.

3. Dissolve another portion of the cake in boiling water, and test the solution with litmus paper, to ascertain whether acid or alkaline.

4. Powder a portion of the cake with a coarse file. Take 120 grains of the powder, and add 4 ounces of water; allow it to stand covered for four or five hours in a warm place. If mustard seed is present to any extent its smell will be detected. Note whether the cake is mucilaginous, add more water, stir the mass freely. If there is much sand in the cake it will settle at the bottom of the vessel; if bran, it will float on the surface and may easily be detected by its structure; in the solution, the husks of any other seed used in the manufacture of the cake, will be found, and with the aid of a microscope may be identified.

We need scarcely trouble our readers with the details of a quantitative analysis; a large amount of apparatus is required, and considerable skill in manipulation. Besides, most of our agricultural societies have made arrangements with qualified analytical chemists for obtaining analysis at a low charge. We would, therefore, suggest that if, after making a qualitative analysis, a cake is suspected to be adulterated, it should be sent to a chemist for analysis. We think it is seldom necessary to have a complete analysis made, in nine cases out of ten a simple determination of the amount of flesh-forming matters, the amount of oil, and the ash is sufficient. Analysis alone is not sufficient for determining the value of a cake. A cake may shew a good analysis and yet be a very inferior one. The physical condition of a cake is of as much importance as its chemical condition. A cake may contain a large amount of flesh-forming matters, may be rich in oil, &c., and may be comparatively worthless from the effects of damp and bad storage. It is quite possible to adulterate a cake very largely, and yet that cake on analysis may prove to contain all that may be expected in the best varieties of oil-cake. Certain oilseeds are rich in flesh-forming matters, but contain poisonous principles which are highly injurious to animal life. These, if mixed with inferior linseed, will improve the analysis, but will greatly deteriorate the feeding value of the cake.

The following is an average analysis of a good linseed cake:—

	Per cent.
Moisture.....	10.67
Oil .....	12.87
1. Protein compounds .....	28.12
Gum, mucilage, &c. ....	27.01
Woody fibre .....	14.11
2. Mineral matters.....	7.22
	<hr/>
	100.00
1. Containing nitrogen .....	4.50
2. Containing sand .....	1.40

The next analysis is that of a cake which was in a very bad physical condition, almost rendering it unfit

for cattle food; it will be observed that it shews a "fair chemical analysis":—

	Per cent.
Moisture.....	11.22
Oil .....	9.13
1. Protein compounds .....	29.19
Gum, mucilage, &c. ....	30.34
Woody fibre .....	12.40
Mineral matters.....	7.72
	100.00
1. Containing nitrogen .....	4.67
Containing ammonia.....	1.90

*Rape cake* is beginning to be appreciated as a food for stock. On the Continent it has long been employed as a manure. Though it is nearly as nutritious as linseed cake, it can generally be purchased at about half its price. Cattle eat it reluctantly at first, but ultimately eat it readily, more especially the kind known as green German rape-cake, of which the following is an analysis:—

	Per cent.
Moisture.....	10.82
Oil .....	8.72
1. Protein compounds .....	32.81
Mucilage, gum, &c. ....	28.45
Woody fibre .....	11.49
2. Ash.....	7.71
	100.00
1. Containing nitrogen .....	5.41
2. Containing sand.....	.52

Foreign rape-cake, especially Indian rape-cake, is seldom free from mustard. It has been stated that rape does not grow in tropical countries, and that the so-called rape of India does not belong to this genus at all, but the genus *Sinapis*. It is certainly true, that rape-cake obtained in these countries is seldom fitted for cattle food. Rape-cake has long been used in Flanders in the form of dust as a manure. In this country, also, it has been largely employed for a similar purpose. Rape-cake may be adulterated with any kind of oil seed, as the oil is less liable to be injured by mixture with other oils. The chief adulteration is mustard. When mixed with molasses, rape-cake is eaten readily by stock of all kinds. It is best suited for store animals and sheep. Boiling water poured over it improves its quality, by preventing the pungent oil of the mustard becoming developed. This should be generally known, as the presence of this volatile oil of mustard in any quantity is highly injurious to the health of the stock consuming the cake. The following analysis is that

of a rape-cake, adulterated with mustard, which poisoned three oxen which were fed on it:—

	Per cent.
Moisture.....	12.07
Oil .....	10.31
1. Albuminous compounds.....	34.02
Gum, mucilage, &c. ....	29.25
Woody fibre.....	7.38
2. Ash.....	6.97
	100.00
1. Containing nitrogen.....	5.46
2. Containing sand.....	.75

The analysis of this cake shews nothing wrong; hence we see the analysis alone is not sufficient to settle the feeding value of a rape-cake. The presence of mustard in a cake of this kind may be detected by taking half an ounce of powdered cake and adding it to 6 ounces of cold water in a stoppered bottle, and placing the bottle aside for twenty-four hours. The contents should then be examined, not before; if the smell of mustard is very strong, it will be scarcely safe to feed with the cake, unless it is steeped in hot water previous to its being given to stock. Smell, however, must not alone be relied on; as pure rape seed has a strong smell, it must taste strong and bite the tongue—this rape seed never does.

*Cotton cake* has recently been added to our list of feeding materials. When first introduced the quality was very good; but we have now many very inferior samples offered for sale. Cotton seed has a hard shell, which in most varieties amounts to nearly half its weight. This shell contains no oil—the oil is all in the kernel. It is sold in our markets in a decorticated and in an undecorticated state. The decorticated cake is certainly far the most valuable; it generally commands £3 or £4 per ton more than the whole seed cake; it contains more nitrogenous matters than cake made of linseed. The following are average analyses of decorticated and undecorticated cakes:—

	Decorticated.	Undecorticated.
Moisture .....	8.88	12.62
Oil.....	17.89	6.24
Albuminous matters.....	43.62 a	20.69 c
Gum, mucilage, &c.....	17.60	33.67
Indigestible fibre.....	4.04	20.42
Ash.....	7.97 b	6.36 d
	100.00	100.00
a Containing nitrogen....	6.98	
b " sand.....	.78	
c " nitrogen.....	—	3.31
d " sand.....	—	1.65

In the whole seed cotton cake there is sometimes such a large amount of indigestible fibre present, that animals often die from an accumulation of this matter

in the lower intestines—the mechanical stoppage having caused inflammation of the whole intestinal canal. Where the whole seed cake is given to animals, it should be accompanied with succulent food. It is seldom advisable to give more than 3 or 4 lb. per head per day. Sometimes it is given to sheep at the rate of  $\frac{1}{2}$  lb. per head per day, along with  $\frac{1}{4}$  lb. of linseed cake; we have found this mixture useful. The best decorticated cotton cake has a light-yellow colour, and is free from any well defined smell or taste. It shews here and there a few cotton threads; but contains very little of the dark-coloured seed shells. Mixed with water, in a roughly powdered state, it does not become gelatinous like linseed, nor does it develop a pungent smell under this treatment like rape-cake. Cattle take at once to this cake, and eat it much more readily than rape-cake. Several other oil-cakes are manufactured, but as they are only sparingly used in agriculture, we shall refer to them very briefly. Amongst the most important of these cakes we have poppy cake, palm-nut kernel cake, hemp cake, mustard cake, earth-nut cake, dodder cake, &c.

*Poppy cake* is seldom offered to farmers; it is gene-

rally used for adulterating linseed cake. It is a greenish grey-coloured cake, has a pleasant taste and smell. It is very nutritive when sweet. It is very liable to mould, when it becomes injurious to stock which consume it. Linseed cake often contains as much as 20 per cent. of this cake.

*Palm-nut cake* is one of the latest introductions in feeding materials. It is the residue after extracting the oil of the palm nut. The cakes are of a light stone colour. It is a good wholesome feeding material, suitable for all kinds of stock, more particularly dairy cattle. The following is an analysis of this cake:—

	Per cent.
Water .....	12.91
Oil .....	9.48
Protein compounds .....	18.35
Sugar, gum, &c. ....	39.06
Woody fibre.....	16.90
Ash .....	3.30
	<hr/>
	100.00
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Containing nitrogen .....	2.92

### TREACLE FOR USE IN STOCK FEEDING.

MR ALEXANDER JEMMETT, Murrell Hill Farm, Binfield Bucks, gives his experience on this subject, as follows, in the *Agricultural Gazette*:—As a West Indian, and for many years engaged on sugar and coco-producing properties, perhaps I may be permitted to add my mite on the above subject. Molasses is largely used on every sugar estate in feeding of stock. Three gallons to about 40 gallons of water, with about a quart of salt, makes a very nourishing drink for the mules and working oxen in hot weather, and is generally given twice, sometimes three times a day—morning, noon, and night. When extra work is required to be done, as in crop time, or when carrying produce to the shipping bays, from 2 to 3 gallons of crushed linseed cake is added about an hour before use, keeping it stirred while the mule or ox is drinking. An old sugar boiler is generally used for the purpose. Four gallons of molasses, 4 gallons of crushed cake or ground linseed,  $1\frac{1}{2}$  quart of salt to 40 gallons of water, would make a good mixture for horses, cattle, or sheep; a pint to a quart over a bushel or more of chopped straw; this, I believe, few animals will refuse; an extra quantity of cake or other meal may be added, according to the object in view, fattening or otherwise. On a sugar plantation it is managed thus:—In cattle or

mule sheds are long troughs; the cane tops are cut, sometimes by machinery, mostly by hand, into lengths varying from  $\frac{3}{4}$  to  $1\frac{1}{2}$  inch, commonly known then as chop-chop; the troughs are two-thirds filled, the quantity above stated is sprinkled and mixed in readiness for the animals, regularly coming in for their noon-day feed—the same at night. When the crop season is over, Guinea grass is principally used; this not being so bulky as the cane-top, is cut into longer lengths, say from 4 to 8 inches, placed in the said troughs, the mixture being sprinkled on and well stirred in, as before stated. I can see no reason why English straw should not be used in the same way, or uncut straw could be sprinkled with the mixture in the racks, where troughs do not exist. Let it be mixed each time as required for use, not forgetting the salt, and in this climate I do not think it is likely to produce colic, as is sometimes the case in the West Indies, where, through carelessness or otherwise, an animal drinks to excess, and when fermentation has set in, in which case the following will be found useful:—1 ounce each of spirits of nitre and paregoric in a quart of warm water, or if not at hand, a quart of warm stout or porter, with two wineglassfuls of brandy or gin.



### THE NEW MEAT MARKET AT SMITHFIELD.

THE *Times*, describing this work, says:—The new meat market at Smithfield, whatever may be its success or value, cannot fail to be one of the handsomest modern buildings of the kind in the metropolis. Its exterior decoration makes it most pleasing—its size and general elevation most imposing. It is built in what is termed the Roman Doric style—a huge parallelogram nearly 700 ft. long by 250 ft. wide, and at the corners are towers 25 ft. square at the bases, but which, at about 50 ft. above the ground, are surmounted with open octagon campaniles covered with very handsome pointed domes, sheathed with copper. It occupies a space of nearly three acres, and the whole of this great area may be said to hang or rest upon girders over an equal space excavated underneath it. The Metropolitan Railway passes below it in every part, and as at this point there are junctions with the Great Western, Great Northern, Midland, and soon will be with the London, Chatham, and Dover Railway, a large space was required, especially for the great extent of sidings which will be requisite for the meat trucks coming from all parts of England. This great underground junction is, therefore, of precisely the same extent as the market above it. It is a little more than 25 feet high, and the whole of the superincumbent mass is carried on a series of square cast-iron columns, or rather pillars, with wrought-iron girders between, the spaces between these again being filled up with brick arches of about 6 feet span, built of great strength and laid in cement. The underground junction is a most wonderful piece of engineering skill, and adds another to the long list of engineering works which, whatever may be its deficiencies in other respects, places London a-head of any other city in the world. The market itself is in the inside a handsome lofty structure, well lighted and amply ventilated. It is crossed from north to south by six avenues or footways 18 feet wide, by one main road running east and west, 25 feet wide, and by one great roadway which

will be used as the thoroughfare for the principal cart traffic, 57 feet wide. Between these paths and roads the blocks of stalls are fixed. There are no less than 162 of these, each 36 feet by 15 feet. These are to be let at the rate of about a penny per foot per week, with an almost nominal toll of 4d. on every 21 lb. of meat sold, or a fraction less than a farthing a pound. At the western end, one bay is reserved for dealers in poultry and game, but no fish or vegetables will be sold in the market. The backs of the stalls are closed in, but the sides they are only screened by a light ironwork, so as to ensure the most perfect ventilation through all of them, and through the market from end to end. The market is built in two storeys; the lower, or basement, is after the Crystal Palace style, with cast-iron columns and cross braces. There are upwards of a thousand of these columns, of 9, 6, and 4½ inches diameter. These have to be somewhat irregularly placed, from the necessity of fixing them exactly over the spots where the girders carrying the floor of the market and the roof of the subterranean junction pass beneath. Yet this slight deviation can only be detected by measurement, for to the eye of a casual spectator they seem wonderfully correct. All the floor of the market is to be paved with wood, to lighten the strain on the roof of the junction below it. Twelve hydrants, always kept at high pressure, supply ample means of washing out the market avenues or stalls, and will be a guarantee against accidents from fire, of which, however, from the peculiar construction of the building and the trade to be carried on in it, there seems to be not much risk. The upper portion of the market consists entirely of rooms built over the stalls. These are never to be used as sale-rooms, but are meant for the use of each stall-keeper, where his clerk may keep his books, and where he himself may have a place to retire to his meals, or to wash and dress, or transact wholesale bargains with his customers.

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### WHITFIELD FARM.

THE following particulars relative to the system pursued on the late Lord Ducie's farm at Whitfield, Gloucestershire, may be interesting to our readers:—The farm consisted of 240 acres of land, which, under the old system, had produced a rental of about £200 per annum. The fences had been levelled with all the timber; the land thoroughly drained, and a wide watercourse cut through the farm, into which

drainage water was conveyed. Instead of the old-fashioned barns, which were more calculated and do generally prove, better preserves for rats and mice than for corn, a large and expensive thrashing-machine had been erected, driven by steam, and the ricks being placed close to the building, and on each side of a rail which led into the thrashing-floor, the process of taking in and thrashing-out the corn proceeded simultaneously

as well as the cleaning and sacking it. The system pursued on the farm was that which alone can answer in the present times—viz., to grow the greatest possible quantity of green crops and root crops, by which a large stock of cattle and sheep may be supported, and thus add to the increase of the wheat crop also. The roots grown on the farm consisted of mangold wurtzel, white carrots, and swedish turnips, the average per acre being 30 tons. Except in the first year, very little artificial manure had been used, and none afterwards, except that made on the premises. Large tanks were made to receive all the liquid manure from the different yards and bullock houses, which, by forcing pumps, was thrown over the compost heaps, standing outside the yards—80 acres of roots, 40 of clover, and 120 of wheat, growing on the farm when I visited it. The trimming of the carrots produced an immense quantity of green food during the summer months, upon which, and the clover cut in a green state, the cattle and stock subsisted. Hay was neither made nor used. The horses used were of a superior description, and their drivers Scotchmen with Scotch ploughs. The allowance of food to each horse was about a peck of oats, which was bruised with a little clean wheat straw at night. The working hours were from seven in the morning until twelve, when the horses were brought into the stable, fed and rested for two hours, and then worked again until five or six in the evening, as their services might be required; this was of course only during the spring, summer, and autumn months, when the days were long. The horses thus treated were in first-rate condition, and full of hard flesh. The system thus pursued on Lord Ducie's farm proves that for slow work carrots and corn are sufficient to keep horses in good working condition, which they certainly were when I saw them. I think the prejudices which some men entertain against carrots being given to race-horses unfounded; but that they may be given with advantage, both as regards the wind and health of the horse, three times a week. With draught horses, certainly, a great saving of hay may be effected by their use. Nor does there exist any necessity for hay being given at all to horses required solely for this purpose. When used by being cut into chaff, the consumption may be reduced to one-half the usual quantity, mixing it with two parts of

wheat straw cut also into chaff. The straw of oats, when cut early and well harvested, is also a good substitute for hay, but I am no advocate for barley straw being given to horses in work, although it may do very well for cattle. By the example set upon Lord Ducie's farm it has been proved that horses can be kept in first-rate working order, and that both cattle and sheep can be made fat for the butcher without tasting hay. It may be asked, why dispense with hay? The answer is, that an acre of land which will produce two tons of hay will produce twenty or thirty tons mangold wurtzel, carrots, or turnips—the usual allowance of hay to a horse being a hundredweight per week, and this with the waste (where hay is used as a fair calculation) you set off the value of the root crop against the hay crop. The former may be put down at £1 per ton, the latter at £3; you have therefore threetimes the money value in the roots, after deducting the expenses of cultivation, not to mention the extra quantity of manure which will be returned to the land. The value of wheat-straw may be put down at about 25s. the ton, and oats at 2s. 6d. per bushel. Two tons of hay would keep two horses twenty weeks, at a cost of £6, or at the weekly rate of 6s.; on the other side, allowing 2 bushels of corn to each horse, the cost would be 10s. for the two; carrots, 3s. per week, or 3 cwt. By feeding on corn and carrots, the expense of keeping two horses for twenty weeks would be £13, in which 3 tons of carrots would be consumed, you have then left from 17 to 20 tons of carrots to meet the extra expense of corn feeding, which would keep two other horses for the same period. It may be seen, therefore, by this plan of growing roots instead of hay, that twice the number of horses may be kept in far better condition than upon hay alone; the value of the manure to be returned to the land will also be proportionably greater. I have here given a fair allowance of corn, more, perhaps, than falls to the lot of farm horses generally. But I have heard it stated that horses have been kept upon carrots and wheat-straw, and even limited upon such food. This may be a fact for anything I can say to the contrary; but I am quite satisfied that horses used for draught purposes will do better upon carrots, wheat, straw, chaff, and a moderate quantity of corn, even half the allowance I have made, than upon hay.—S. A.

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### TIPTRÉE HALL FARM.

IN the early part of last month a deputation from the Midland Farmers' Club visited Tiptree Hall Farm, by invitation from Mr Mechi.

From the character of the soil of the county, and the general healthy appearance of the wheat crops of the district, it was expected that the Tiptree wheat would

present a very creditable appearance, but none of the members of the deputation were, we believe, prepared to see so much good wheat for the whole growth as Mr Mechi shewed them. The total quantity of land in wheat is 72 acres, the farm comprising only 170 acres, of which 13 are in pasture.

The first field entered contained a piece of about  $6\frac{1}{2}$  acres of rye and vetches, after cabbage, which were being mown and carted off, to be cut up with straw, &c., for the cattle in sheds and the horses. Another portion of 6 acres was in oats, which were sown in May, the land receiving a dressing of 2 cwt. of guano and 1 cwt. salt per acre, the previous crop being also cabbage. Next a piece of wheat containing six acres of the club-headed rough chaff variety, a white wheat of good quality, yielding and strong in the straw. This crop was after clover mown for hay first and the aftermath eaten off by sheep, receiving a liberal allowance of rape cake. The clover ley was ploughed twice, and the bushel per acre drilled with the ordinary Suffolk drill (manufactured by Messrs Smyth, of Peasenhall) on the 21st November. Mr Mechi proposes to take a crop of Rivett's bearded wheat after this year's crop, the second year's wheat being followed by mangold wurtzel. The next field,  $9\frac{1}{2}$  acres, was in wheat, the variety being Rivett's bearded, which was drilled on November 16th, at the same rate per acre before mentioned, the previous crops being white wheat, and the land being manured with 2 cwt. guano and 1 cwt. salt per acre.

Another piece of wheat, containing  $11\frac{1}{2}$  acres, after peas, was drilled on 1st November. These wheat crops were all uniform with well-developed ears, almost entirely free from blight, good stiff straw, and clean, the horse-hoe having been freely used in the spring, and were estimated to produce 50 bushels imperial per acre—Mr Mechi and his foreman placing the figure even higher; but, perhaps, the heaviest crop was a piece  $13\frac{1}{2}$  acres after beans, well manured for, which promised to be quite 54 bushels per acre.

The lightest crop of wheat was 9 acres of red, after mangolds, drilled on December 13th, which seems rather late for the one bushel per acre, but this was estimated to produce nearly 40 bushels per acre. This field received the usual dressing of 2 cwt. guano and 1 cwt. salt per acre. In the next field,  $6\frac{1}{4}$  acres of wheat, after clover, there is a small portion dibbled at the rate of one peck per acre, on November 20th, which, although planted at the same time as the rest of the field, will not come to harvest so soon by a week, and which looks thinner than the residue, but still a good crop. Captain Hallett, who has had much experience in thin seeding, was of opinion that there would be quite as large, if not larger, produce per acre; but many of the deputation did not concur in this opinion. There were  $5\frac{1}{2}$  acres in beans, and  $6\frac{1}{4}$  in barley, which were fair crops for the season, but which do not call for special remark. The only roots at present sown were 7 acres of mangolds, a very fair crop, which were planted on 17th and 18th April, after wheat, the land being deeply cultivated in the autumn, and heavily manured from the sheds before Christmas, Mr Mechi never ploughing the land for mangolds in the spring. A piece of about 7 acres, upon which a crop of white clover had been fed off with sheep, was being broken up ready for sowing

white turnips, the *modus operandi* being to send the old-fashioned Essex wood plough, drawn by three horses first, going about 5 inches deep, and then following in the same furrow with a subsoil plough, also drawn by three horses, which pulverized the ground to a depth of about 9 inches more. A field of peas had been picked green for the London market, producing 240 bushels of peas in the pods per acre, and realizing, clear of expenses, £11, 5s. per acre; and this was broken up ready for white turnips, if it could be got ready in time, and a favourable change occurred in the weather.

The portion in ryegrass was inspected with much interest, as here Mr Mechi has gone to great outlay in laying down pipes for irrigation, and fixing hydrants, &c. A crop of hay has been taken, and the sheep folded on it subsequently, and the irrigation process was going on, the intention being to mow a crop of rye-grass, green, for the cattle in the sheds. Mr Mechi stated that he considered that almost 99-100th parts of the liquid applied was water, and that he could not raise more than enough to irrigate 20 acres, applying it at the rate of 100 gallons per minute, and covering about 1 acre per day. The portion on which the sheep were folded was very thin and patchy, and certainly not calculated to prove remunerative for the large outlay incurred.

The secret of success in the growth of Mr Mechi's wheat crops appears to lie in thorough drainage of the land, the removal of all large hedgerows and timber (100 trees having been felled last year), the absence of game except a few pheasants and partridges, deep cultivation, and a complete pulverization of the soil, thus exposing as much as possible to the action of the atmosphere, and bringing it in contact with the manure applied, the clover leys being all twice ploughed; the application to the root and green crops of a heavy dressing of manure from the sheds manufactured by cattle consuming rape cake, corn, and other feeding stuffs, the manure being carefully protected from the action of the sun and rain; careful selection of seed, thin sowing in proper season, and frequent horse-hoeing in spring. With this treatment, a tenacious clayey soil assumes more of a loamy character, and produces in a season like the present, which is peculiarly adapted for it, the successful results chronicled above.

The course of cropping generally adopted on the strong land is; 1, white wheat; 2, Rivett's bearded wheat; 3, mangolds; 4, red wheat; 5, vetches; but sometimes 1, wheat; 2, beans or peas; 3, wheat; 4, mangold are taken instead; on the lighter land, which is gravelly on a clay subsoil, 1, wheat; 2, peas; 3, wheat; 4, turnips; 5, barley; 6, seeds, is the rotation adopted. The quantity sown per acre is: Wheat, 1 bushel; barley, 6 pecks; peas, 2 bushels; beans, 3 bushels; oats, 2 bushels.

The tank which receives the liquid manure from the sheds and the water from the drains is 30 feet deep and 30 feet square; and although there is a solid deposit





the condition of the labourers, those who toil the soil, by which they are reared, so that some good might come of it. Now, the only way by which I see this could be managed would be to discuss at the dinner questions affecting their interests. I have no doubt, if such questions were discussed at the Association's dinner, and by other agricultural associations throughout the country, such an amount of intelligence would be brought to bear on the topics connected with labourers, that, in process of time, some practical results would be arrived at, which would be capable of being carried out by legislation. Now, we are all aware that there are various subjects which might be discussed—for instance, the question of increased house accommodation for farm labourers, in which the labourers themselves take a great interest, the farmers take a great interest, and the proprietors take a great interest. There is a difference of opinion on this subject. Some people say there are plenty of houses for farm labourers. I am not one of these, because I go upon the idea that the farm labourer is entitled to receive good accommodation for himself and his family upon the farm which he helps to labour. We all know that in Buchan that is not the case, for it is often the case that the family lives in a village four or five miles distant from the farm on which the labourer is employed. Well, when I ask myself what is the cause of this, the only conclusion I can come to is, that it is owing to the poverty of the landlords and the law of entail. I believe that a great many landlords are very sensible of the importance of having good accommodation for farm labourers, but they have no ready money with which to build houses for them, while with their entailed properties they find difficulty in borrowing money; and in consequence matters remain very much as they are. I am not prepared to state what is the remedy. I only state that there is a great want of accommodation, and I think it is one of the subjects which ought to be discussed at such meetings as this, in order to come to a conclusion as to the remedy. There is another point connected with farm labourers, namely, how their prospects might be improved. My opinion is that no class of the community have more miserable prospects. A farm labourer may live upon a farm to see it taken in from the heather, and live all his time upon it in the way he began; his children herd together in the same way that children herded together when he was a boy, and he has to look forward to the poorhouse, as his father did before him. It used to be the highest ambition of a farm labourer to get a croft, but now the number of crofts has been greatly lessened by the system of laying out large farms, and labourers cannot be expected to accumulate so much as to be able to take such farms. When I was in England, I went to Suffolk to see a farm where a principle had been carried out which, I think, if adopted in Scotland, might improve the condition of the labourer. It was on a property belonging to Mr Gurdon, who let one of his farms of 130 acres, thirty years

ago, to twenty-one labourers. The farm labourers meet together once a year to elect a committee of management from their own number, who manage the farm, and every year the profits are divided amongst them. I found the farm consisted of 133 acres, for which they paid £194 of rent. There were seven labourers employed on the farm, and there being twenty-one connected with it altogether, the rest work on other farms. I found their wages on the average were about 13s. a-week. I found most capital crops on the farm, and not only that, but I found that the condition of these farm labourers was very far superior indeed to the condition of labourers employed on the neighbouring farms, and that their status was raised in every way by having them raised to the position of farmers. Now, I am quite sure, if the co-operative principle could be applied in that way to farming, that good results would accrue to farm labourers. Of course, I go upon the assumption that they were so educated as to be able to take advantage of co-operation. If any proprietor had the courage to let one of his farms in the same way as Mr Gurdon did, I have no doubt he would be amply repaid. Then, another point in connexion with farm labourers is the question of education; but that leads into a wide field, into which I shall not enter at present. Any one who was at Aberdeen the other day, and saw the implement department, and amongst other things the steam ploughing machine, cannot fail to be impressed with the importance of educating our farm labourers, so that they might be able to know something of mechanics, and be able to work those engines with skill. I suppose there are very few farmers in Aberdeenshire who have labourers of such skill as to be able to understand those machines. I am of opinion that, in every school, the elements of mechanics and of chemistry should be taught, so that farmers and their servants should be able to get that knowledge. In that respect we are far behind other countries. In Germany, for instance, they have got wandering professors, who go about instructing proprietors and farmers in the use of the several improvements in implements and other things connected with agriculture. I have only mentioned these subjects as such as might be taken up at meetings like this.

[The "crofts" spoken of by Mr Fordyce are small holdings common in the north of Scotland, and particularly in Aberdeenshire, which form, as it were, an intermediate stage between the position of farm labourer and that of tenant farmer; and the *Banffshire Journal*, a very competent authority on the subject, discusses the question raised by Mr Fordyce in the following terms:—

Mr Fordyce, in another address, drew attention to the condition and prospects of the farm labourer. There is no doubt whatever that crofts are by no means so numerous as they were; but we are not sorry to observe that Mr Fordyce neither himself proposes to return, nor does he advocate a

return, to the croft system. If one desires to see the croft system in all its fulness, he has only to go to Ireland. The increase in the size of farms is only a necessary consequence of the increased capital among the farming class, and of improvements in machinery, and in general farm economy. The condition which determine the size of farms are those of profitable working, and the capabilities of the tenants to provide the necessary capital. These conditions come to be ascertained in the ordinary course of business; and any attempt, by legislation or other artificial means, to regulate—either in enlarging or reducing—the size of holdings would be mischievous, if not futile. The matter must be left to the regulation of the market. No landlord will throw his lands into large farms if it did not pay him; and if it pay him, better to have large rather than small holdings, by what right is he to be prevented from taking the course that will make the land the most productive?

If in these days crofts are not so plentiful as they were, there is on every large farm a post for a grievance; and we have not the least doubt that the position of overseer on a large farm is one of far greater comfort than that of the crofter, who reclaims and labours his few barren acres.

Admitting that a return to the crofter system is either hopeless or inexpedient, Mr Fordyce submits a case he met in Suffolk, where he found the co-operative principle applied to farming. A proprietor, Mr Gurdon, had let a farm of 133 acres, at a rent of £194, to twenty-one labourers, who chose a committee of their own number to manage it. Seven of the men find occupation on the holding, and the other fourteen work on other farms. The plan seemed to have worked well for both proprietor and tenants, for it had endured for a period of thirty years. There can be no doubt that what is done in Suffolk may be done in Aberdeenshire or Banffshire. But it will be observed that Mr Fordyce is not anxious to begin the experiment. Nor do we blame him. Why should a landlord, of choice, make over a farm to a score of men, and run the risk of their disagreeing long before the end of a lease, when he can have plenty of good offers from substantial men, whose tenancy will give him no trouble whatever? Further,

it is to be pointed out that these twenty-one Suffolk ploughmen must have had some little capital to begin with; and that being the case, as two-thirds of them were not employed on the farm, there is no very pressing reason why they should not have invested their savings in the nearest village co-operative store, or in any other handy form of investment. Probably they put it into a farm, because they knew that branch of business; and if so, the reason was of some value, as it is always better to invest in a business of which you know something, than in one of which you are ignorant. Still, even granting all this, it is evident that, so far as regards bettering their condition, these economical Suffolk men might as well have put their savings into any other good investment as into a farm.

The consideration that they had each a "little capital," underlies the whole question. It presupposes economical habits; for the labourers must have saved the money from their earnings. Can our farm labourers save money? We are sure they can, if they begin early. Of course, if a man gets married before he has some pounds saved, he may truly be said, in most cases, to have, as Mr Fordyce observes, "miserable prospects." All classes feel it necessary to exercise prudence in entering upon marriage; and why should farm labourers be alone improvident in this matter? Many tradesmen in country towns have no more wages in the course of a year than "a first horseman;" and yet tradesmen are seldom in such indigence as many of the farm labourers' families. And why? Because the trades lad saves a little money, and has a house furnished before he marries. If the farm labourer were equally prudent, would he not be equally comfortable?

The farm labourer may rely on it that he can only be truly "helped" by helping himself. Let him avail himself of the many opportunities for acquiring knowledge already, and certain soon to be more, within his reach. Let him read more, and let him save his earnings; and he will find himself gradually attaining a position when one will no longer be able to speak of his "miserable prospects," but when all will view with respect and sympathy the growing comfort and intelligence of his class.]

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### MR GIBBS' PLAN FOR DRYING CORN AND HAY.\*

THE apparatus which Mr Gibbs applies in his drying process consists of a shed made in pieces which can be readily taken apart, conveyed to any desired spot, and there erected in an hour or two. A portable steam-engine, such as is now to be found on all extensive farms, and a fanner or blowing apparatus

are placed at one end of the shed. The flue of the engine communicates with the indraught of the fanner, and its outlet communicates by a metal channel with the lower part of the shed. Thus, when the engine is at work, and the fanner driven by it is in rapid rotation, a blast of hot air is driven into the shed at sufficient pressure to force its way through the interstices of grass or hay laid at the mouth of the air channel.

\* An extract from the *Scientific American*.

When it is necessary to moderate the temperature of the blast, a valve, opened in the supply tube of the fanner, admits atmospheric air to mingle with the hot gases from the furnace of the engine. In cases where a high temperature is required, an additional furnace is provided. Such was the apparatus with which the following experiments were made.

“First, a load of hay that had been wetted by four hours' exposure to rain, was thrown by batches into the shed. Each batch was turned over and over, tossed up, and pulled about for a few minutes by a couple of labourers armed with pitchforks. Every part was thus exposed in its turn to the action of the hot blast, and became dry, sweet hay ready for stacking. The operation on the whole load occupied about three-quarters of an hour.

“Before seeing the experiment actually performed, several objections to the system had presented themselves to our mind, as they did to the minds of others. In the first place, we feared that sparks from the furnace might be blown into the hay, and set the whole batch into a blaze. And sparks were, indeed, blown into it, and through it, but no blaze ensued, for be it remembered that the gaseous products of combustion consist chiefly of carbonic acid, an extinguisher of flame as effectual as it is of animal life. In the next place, we apprehended that these carbonic products and the sulphurous and other noxious fumes which are generally mingled with them, would certainly give the hay an unpleasant flavour, if they do not entirely destroy its nutritious qualities. Here also we were at fault, for we forgot that in undergoing a drying process the hay must give out vapour, not take any matter in. And so, in fact, we found the desiccated hay sweet and pleasant in smell, with a somewhat sugary flavour, like that of sweet wort. On this point the cattle are certainly better judges than we could pretend to be; and, as they exhibited a marked preference for the desiccated hay—even over the sweetest samples of hay dried by sun and wind—we could only bow to their decision and admit that we had been egregiously mistaken. For a third difficulty raised on philanthropic principles, we found that Mr Gibbs had amply provided. How, we asked ourselves, could human beings stand, much less work, in a hot, foul atmosphere such as that which is blown from the furnace of a steam-engine? It may be all very well for wheels, and cranks, and the strong steel arms through which steam

gives out its strength, to labour in a hot and suffocating atmosphere; but mere men must breathe, and 360° of Fahrenheit imply a climate somewhat too tropical for the most vigorous and seasoned constitution. We had not observed that Mr Gibbs had placed a subsidiary fanner at the end of his shed, and that this sent a blast of pure and cool air along that zone whence the workmen had to draw their breath. Thus, while the hay beneath their hands was crackling and baking in a torrid blast, they were enjoying a refreshing breeze of balmy air, fragrant with the perfume of the surrounding fields.

“To shew the power of the apparatus, the inventor had some grass cut in a plantation where it grew rank and dank, and threw it into the desiccating chamber. In a few minutes it became sweet, dry hay, with all its bright green colour preserved, and with no flavour that the most fastidious heifer could object to.

“In another compartment of the shed, Mr Gibbs had arranged apparatus for drying sheaves of corn. As it was not harvest time, we had no opportunity of testing this invention practically, but we could quite understand the process, and could entertain little doubt as to its success. In this case a chamber is formed under the floor, and this chamber is supplied from the hot blast of the fanner. Numerous conical tubes, perforated with many holes, stand up from the floor; on each of these tubes a sheaf is planted, and the hot blast rising through it, and principally through the full-eared head, in a few minutes expels every particle of moisture.

“Mr Gibbs has carried his contrivances a step beyond mere drying, for he has devised a plan for stacking the produce, as amusing as it is ingenious. A fanner placed on the ground discharges a blast of air along a trunk or square wooden tube which rises with a sharp slope to a level above that which the stack has attained. In the lower part of this trunk there is a wide opening fitted with an ingeniously contrived valve, which can be pressed down by hand, but which opens under the pressure of the fan blast. A man standing by the aperture throws in great bundles of hay or whole sheaves of corn, which, almost before one can turn his eyes to the upper extremity of the tube, are shot from it by the blast, and deposited upon the summit of the stack. It is the Pneumatic Despatch principle applied to stacking farm produce, and right well does it do its work.”

## Farm Architecture and Engineering.

### NOTES ON COTTAGES WITH COTTAGE PLANS.

#### CHAPTER THE FIRST.

WHEN, in 1624, the scholarly Sir Henry Wotton published his "Elements of Architecture," he gave expression, with characteristic terseness to the principles which underlie and govern all "well building"—Making allowance for the fluctuation of word-meanings, it is true, now and ever, that "Well building hath three conditions—commodity, firmness, and delight." "Conditions" are these which most influence all good architecture, whether in an Athenian Parthenon, decorated with the sculpture of a Phidias, or the model cottage of a Shropshire agricultural labourer.

In undertaking to lay down certain axioms, upon the observance of which depends the "well building" of cottages, it may not be either useless or impertinent to glance for a moment at the necessity of a great change in our national practice on this subject of domestic architecture for the labouring-classes. Certainly, tomes have been written on this question, rivalling in "cubic inches" and "pounds weight avoirdupois," Dr Nares' "Life of Burghley," by men of the scientific, practical class—tomes great in merit as in substance; but with what results the innumerable magnified pig-styes, or contracted shippons shew, which are now building in all quarters, for beings made in the image of God to dwell in. Let these men, however, of the scientific practical class not despair. "The gods do ultimately triumph," whatever temporary victories stupidity may boast of, and the suggestions of the present will become the doctrines of the future.

Jeremiads, both loud and deep, are common enough in relation to this matter, revealing a state of things which calls for immediate

thought, and for as immediate alteration. Philanthropists, clergymen, town missionaries, medical men, and poor-law officials do at times intrude rough facts upon our attention, which make it quite easy to believe that "one half the world knows not how the other half lives." In well nigh every city and town in the kingdom there are heaps of dwellings scandalously constructed, standing huddled together as if for the purpose of finding a refuge from public indignation and disgust, in the concentration of their multiplied shamefulness. "Commodity" or appropriateness they are utterly without; firmness they almost universally shew a "a plentiful lack of;" delight or beauty they can have in none other eyes than those of a Yahoo. It is in nowise necessary that these jeremiads should be taken upon trust. The data for forming an independent conclusion lie close at hand, and if we will for a time leave "parmaceti" and "pouncet boxes" on one side, and set ourselves down to a thoroughgoing examination of facts, it is likely we shall come to understand that the said jeremiads have in them something other than windy flatulence striving for dismal vent. Cases, by the score, have been adduced of a character similar to the following:—"The underground floor, one apartment, occupied by one man, one woman, and five children; the ground floor, two apartments, occupied by two men, two women, and eight children; the first floor, two apartments, two men, three women, and five children; second floor, two apartments, three men, four women, and six children; garrets, two rooms, occupied by three men, three women, and six children!" Fifty-four persons in a house with seven rooms and two garrets! A pestiferous death-



house this, where even the sun's beams in pity refuse to enter, lest man as well as God should see the filth of soul and body which crouch here to hide themselves! What an infinite pitifulness there is about these unconscious figures! Fifty-four human beings! eleven men, thirteen women, and thirty children, with highest mental and moral possibilities, and with bodies exactly answering to that of which Novalis says, "It is the highest revelation of God—when we touch the human form we are in contact with Divinity." We say it is infinitely mournful to see these human fifty-four going down to death in dirt and darkness and degradation—wondering fitfully if there be a God, whether, indeed, there is any Father for them "the pitiful children" in this wide slumberous universe.

But it is foreign to our purpose to add another to the list of jeremiads, touching which allusion has been made. Our aim is an intensely practical one. We purpose to set before the readers of our journal, in as clear a form as may be possible to us, certain principles under the heads of Commodity, Firmness, and Delight, which necessarily govern all good cottage architecture. We intend, in short, to explain the "well *building*," and the healthy or healthful arrangement of the apartments of houses for the labouring classes. The present division will be occupied with the first of these three principles—viz., that of Commodity or Fitness. Another series of papers may appropriately be taken up for an examination, at a future time, of the laws of sanitation as they effect the building of all kinds of domestic dwellings, including those of the labouring classes.

We intend, then, in our present series to lay down certain maxims relating to Commodity or general Fitness, which should influence the building of cottages. And it may be advisable to explain our general plan before proceeding to particulars, as well that the reader may understand and enter into our method of arrangement, as for readiness of reference in future.

We purpose, then, to consider:—1stly,

the site. 2dly, the accommodation of the house considered under the three heads of number, size, arrangement.

It is, then, our task, in the first place, to lay down certain rules which ought to govern the choice of sites in cottage building.

*Site*—1. It is of the highest importance that low marshy, boggy ground should be avoided. On this point the testimony of the highest authorities is universally at one. Mr Bardwell, in his admirable treatise on "Healthy Homes," says, "The most essential qualities are those most conducive to health, and the easy access to public roads and conveyances, avoiding the proximity of marshes, boggy ground, and stagnant waters." "It is obvious," says Mr J. W. Stevenson, in "The Cottage Homes of England," "that low, marshy, and damp land should be avoided; also, ponds, pools, ditches, stagnant waters, and other similar places should be as far as practicable from the intended erection." The testimony of Mr James Sanderson, in his "Rural Architecture," is of like character. "Wherever," says he, on p. 25, "there is a choice of situation, the proximity of marshes, fens, boggy ground, or stagnant water, should be studiously guarded against, and if rivers are near, the site of the house should be on elevated ground, so as to be out of the reach of fogs and other unwholesome miasmata, which water periodically generates."

2. The site should be well drained, and this for exactly the same reason as makes the former rule of the last importance. Dampness about a house is in everywise to be avoided. Pestilential miasmata (naturally, almost inevitably, associated with undrained ground and dwellings), and their frequent results—contagious diseases of the most fearful character—have more than once attested the necessity of a strict observance of this rule. The following excellent remarks on this point are to be found in the Fourth Annual Report of the Scottish Association:—"Too much care cannot be taken to insulate by very deep drains, the site of the cottage from the surrounding grounds, so as to make the whole underfloor and foundations thoroughly free of damp. The drains (several feet

below the foundations, if declivity allow, so as to take off the subsoil water) should not only go all round, but through and through, below the underfloor of the cottage; and to allow of this deep drainage, elevated sites having a good exposure should be chosen. Drains which go no deeper than the level of the foundations can be of but little service in neutralizing the capillary attraction of the ground on which the house stands, and which is rendered all the more powerful in bringing moisture to the surface by the heat of the house above. Care should be taken not to leave the foundation courses as it were a kind of trough for the water to lodge in; the whole earth to the depth of foundations ought to be excavated, not only over the whole site within, but for 18 inches beyond the walls, filling up the outside space with small stones or gravel to within 6 inches of the finished surface, and inside, where pavement is used, with dry stone shivers and refuse of lime." We avail ourselves, also, of the following remarks of Mr J. Sanderson, in his "Rural Architecture," on this subject of site drainage:—"Before we dilate, however, upon the nature of foundations, let us direct attention to the drains, the structure of which, though of the first importance, is not sufficiently attended to. In digging to form the foundation, especially in towns, a proper level ought to be taken, in order that drains should have a regular fall into the common receptacle or sewer, which would effectually take off the refuse. In addition to this precaution, a close trap should be fixed at the junction with the sewer to prevent rats and unpleasant odours from coming into the drain, both of which are of common occurrence. These inconveniences most householders in towns have, more or less, to endure, and in many instances they prove a positive nuisance, for, with rats in the house, and odoriferous smells constantly assailing the olfactory nerves, there can be but little comfort or enjoyment, however convenient may be the arrangements in other respects. A common S trap is sufficient for this purpose, and is easily and cheaply procured, though regular builders, as they are called, seldom pay attention to this

point, and generally shirk it, unless a rather sharp eye be kept upon their proceedings. Dr Watson asserts that "houses, generally, require to be surrounded by a well-made drain, laid with tile pipes and broken stones, for the double purpose of carrying off all dampness from the ground, as well as rain and foul water from the house." Indeed, the necessity for the drainage of the site is so universally admitted, that to dwell upon it would be a work of supererogation, as in hundreds of other instances the truth of the theory is generally conceded, its lack of practical application being the real ground of complaint. We shall treat somewhat at large upon this topic in the paper on the "Sanitation of Cottages."

3. The situation of a cottage should be as cheerful as possible. The influence of joyous accessories on the health and character of human beings cannot be too highly estimated. It has been repeated for the thousandth time, that between mind and body there is a mutual sympathy, which produces the most wonderful consequences; and an examination of our experience, however limited, will convince us of the truth of the principle. How, otherwise, is it, that almost every man born and bred in the Faubourg St Antoine turns out a vagabond or a thief? The degraded sensuality of the parents, the sin-impressed, physical frame of the child, the squalor and the filth, the stench and the gloom, the drunkard's vileness, and the harlot's pollution, all undoubtedly have to do with this result: and not the least of the causes is to be reckoned the darkness, as of death, the total absence of joyousness which lower over the degraded street. The site, then, of a house should be as cheerful as we have it in our power to make it. If possible, let it have plenty of sunshine about it, which will impart this "cheerful" aspect to it in a way that nothing else can. And in order to secure as much of sunshine as may be, it is necessary to observe two or three particulars:—Give your cottage a southern aspect. Do not, if in the country, embosom it in trees. Do not build it on a slope, whose shadow shall envelope it. If convenient, let it stand alone.

On these points we shall adduce the testimony of some eminent writers on cottage architecture. The writer of the prize essay in the *Journal* of the Royal Agricultural Society, vol. 10, speaks as follows:—"The aspect should be south, or as nearly so as can be obtained, and the value of the situation would be enhanced if protected on the north and east from the inclemency of the weather." Mr Bardwell in his "Healthy Homes," already referred to, says—"A cheerful situation is, above all things, to be desired, as it has generally a beneficial influence upon the spirits: and the position of the house ought to be such that it would have the benefit of the sun every day in the year." "A cheerful appearance," says J. W. Stevenson in his "Cottage Homes of England" "in a building adds much to the apparent respectability of it, and gains the attention and commendation of the inhabitants, and also casual passers by. This arrangement causes the occupier to cultivate his plot of land with care, and as he probably expects a little praise for his exertions, it encourages him to pay attention to, and makes him proud of his garden. Get a man to the point of keeping neat and pretty his front plot, and you may rely upon his becoming attached to his cottage and all it contains; it will lead him also to a proper cultivation of his kitchen garden, and thence to the improvement of his own station and respectability, and the education and welfare of his family." These remarks of Mr Stevenson of course presuppose the possession of a garden. The value of his observations, however, touching the formation by working men of habits of respectability through living in a house of "cheerful" aspect, is in nowise influenced by the fact that the vast majority of working men in large towns and cities have no gardens to cultivate. In such cases these habits, where they exist, will become developed, and find scope for progress in the pursuit, after a humble fashion, of literature, science, or art, as has been so recently proved by the success of an Art Workmen's Exhibition in the Royal Institution, Manchester, as well as lately also in London. Mr Stevenson is perfectly right as to the prin-

ple. Again, hear Dr Watson. In his pamphlet on the "Economic and Sanitary Improvement of Dwelling-Houses of Agricultural Labourers, Cupar Fife," he says, "The situation to be selected for the houses or cottages of agricultural labourers should be such that, if possible, their front should be to the south. The situation selected for the house or houses (if more than one is to be built) should have sufficient space to render them free and open all round, but particularly in front and back, in order to secure the circulation of fresh air without dampness or moisture. There should be no trees close to the house."

4. Choose a chalky substratum for your site if possible. The next preferable is a dry gravelly or sandy soil, desirable on account of their absorptive qualities. Do not select clayey soil if you have much choice as to site, for its damp-retaining character will in some cases act in opposition to your best efforts at thorough drainage. It is well in case you have to deal with marshy land to make an artificial substratum upon which to place your foundation. Various such substrata have at times been suggested, as "concrete twelve inches thick," "bedding slate in cement," "or laying asphalte through the whole thickness of the wall under the floor level." The foundations of the Labourers' Friend Society's Model Cottages on Shooter's Hill are grouted—that is, are composed of a mixture of gravel, fresh lime, and water, which, upon being mixed, should be immediately spread and well beaten down, then left some days to become firm. Mr James Sanderson says, on this point of substrata—"In the first place, if there be a choice, select a gravelly soil, or one embedded with stone; these conditions may be said to form a natural foundation, which requires little or no artificial preparation." "A bed of gravel, which is pretty firmly placed, requires little or no artificial means, as we have just remarked, to render it a safe foundation; but in localities where clay, sand, loam, or earth prevail, recourse must be had to those means in order to make the ground sufficiently compact and solid to bear the weight of the building.



The great object, then, in dealing with soils of this kind is to keep them as much as possible from the action of the atmosphere. This can only be effectually accomplished by covering them with a good concrete, which, if properly prepared of sand and gravel, and cemented with a due proportion of lime, becomes an artificial rock, and capable of bearing almost any weight that can be placed upon it. Every inequality of settlement and lateral yielding of the supporting material are prevented by adopting this precaution; and the fractures which so frequently disfigure different structures, and endanger their stability, are likewise completely obviated." These remarks epitomise the subject. We will pass on to lay down a few miscellaneous maxims as to site, and dismiss this portion of our subject.

5. Lord Bacon, with that keenness of observation which distinguished the great inductive philosopher, remarks, "that he who builds a fair house upon an ill seat committeth himself to prison; neither do I reckon it an ill seat only where the air is unwholesome, but likewise where the air is unequal, as you shall see many fine seats upon a knap of ground, environed with higher hills round about it, whereby the heat of the sun is pent in, and the wind gathereth as in troughs; so as you shall have, and that suddenly, as great diversity of heat and cold as if you dwelt in several places."

6. Mr Sanderson has the following judicious remarks, of which we gladly avail ourselves:—"Easy access to public roads and conveyances, with supplies of water and

fuel, are indispensable requisites in the choice of a situation."

7. "Again, it is preferable to have a house sheltered by trees than by mountain scenery, because the former afford a cool and refreshing air in the heat of summer, and in winter they serve as a shelter from the keenness of the cold winds which periodically prevail; while mountains, especially if their position be directly east or south, are singularly disagreeable at certain seasons of the year, and only afford a partial protection from the winds."

8. "Wherever clouds, also, are frequently gathering, it must be an unhealthy site, for vapours are the natural complement to clouds; and as they hang about and saturate the air with their dampy particles, there may be expected agues, rheumatism, and other 'ills which flesh is heir to,' under such peculiar influences."

9. "A soft breeze, moreover, is preferable to a strong wind, but the stiffest wind is less hurtful to human health than a heavy and sluggish atmosphere, which generates so many physical inconveniences."

10. "It follows, therefore, that the site which can command a good current of air, whether circulating gently or strongly, ought to be chosen before all others for building purposes; and the more we can secure the several advantages just enumerated, the more likely are we to augment the sum of human comfort and convenience in our habitations, at which we are continually aiming, but very rarely attaining."

### VENTILATORS FOR CORN STACKS.

IN order to afford information on the construction of ventilators used in stacking grain in several parts of this kingdom, we have got the woodcuts embodied in this article prepared, and can assure our readers that they will find the ventilators of much service, and easily as well as cheaply constructed.

Fig. 1 represents one form of these ventilators, or *bosses*, as they are called in the north. It is constructed of three light poles, 8 feet in length, usually the thinnings of a larch plantation, placed in a triangular form, and kept apart and steady by means of short pieces of wood nailed upon them at regular intervals. The three poles are either tied



together at the top, as represented in the figure, or have a wooden pin passed through them. When put in their proper position, the lower ends of the poles will be 3 feet

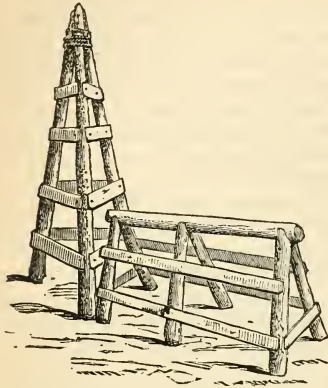


Fig. 1.

apart from each other. Where the corn stack is built on a frame elevated on pillars, the ventilator is placed in the centre of the frame, and the air enters from underneath; but where the stack is built on the ground it is

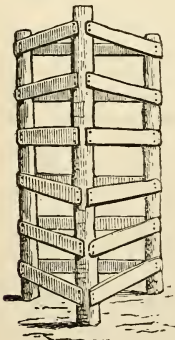


Fig. 2.

necessary to have a small trestle, 2 feet high, and long enough to reach to the outside of the stack, for the purpose of making an opening for admitting the air. No ventilator is

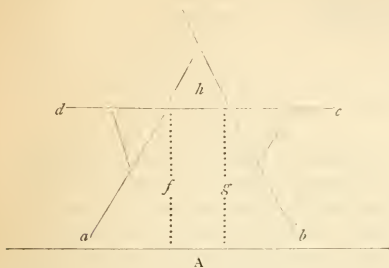
required at the top, as the air passes out readily enough through the upper part of the stack. Fig. 1 shews the centre ventilator or boss, with the trestle placed in position previous to commencing building the stack. Sometimes two trestles are used, one on each side, in order to secure perfect ventilation.

Fig. 2 is another form of ventilator. In this case the upright poles are equi-distant at top and bottom. This form of ventilator can be used, as in the other case, both with stacks built on frames or with such as are built on the ground, and trestles are also necessary in the latter case. Both forms of ventilators, when placed on frames elevated above the ground, should be attached to the frame by nailing one end of a stay to each leg and the other to the frame. We have experienced great advantage from the use of such ventilators, especially when the weather was not favourable to thorough drying, and with the help of these have stacked corn in a state which would have entirely prevented any attempt to save it without the help of these simple contrivances.

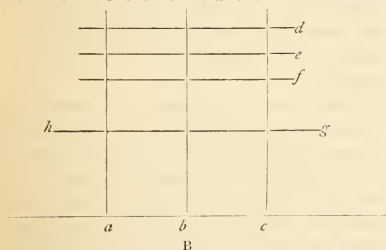
Another great improvement is placing the stacks not immediately upon the ground but upon a horizontal framing covered by vertical uprights of cast-iron or of stone. Where this is done the ricks or stacks may be considered as both damp and vermin proof to a large extent.

Mr Darwick, of Roxburghshire, designed what he called a "stack kiln," which is deserving of notice. In this home timber is largely used, and the main idea is to have through the stack in its entire bulk a passage for the air. The following diagrams will illustrate roughly the nature and the mode of erecting this appliance. The diagram A representing an end section of the timber forming the width of the stack, being the same as the length of the timber,  $c d$ , and width of stretch of the legs,  $a b$ . These cross trusses, as they may be called, are placed at intervals along the side which the stack kiln is intended to occupy, as at  $a b c$  in the diagram B; the longitudinal spars,  $d e f$ , are nailed to the trusses  $a b$ , diagram A; but the spar  $h g$  (B), corresponding to  $d c$  (A), is mov-

able, and put on when the building of the stack has got up to the line  $d c$  (A). A space, as indicated by the dotted lines  $f g$  (A), is left in the inside of the stack in addition to



the space  $h$ ; thus a thorough ventilation of the stack in the direction of its length is secured. Cross or transverse ventilation



might be also secured by having openings not filled in with corn in the side walls of the kiln, although these will not be so much required, as a good amount of air will pass through the corn which makes up the sides. All these plans, of having spaces within the stacks, obviously admit of the application of means of drying their contents artificially, and in a manner easily compassed where there is a steam-engine on the premises.

We shall conclude by describing a rick ventilator, patented by Mr E. Lyewood, a Hampshire farmer, which appears to be

likely to be of much utility. In order that it may be better understood by our readers we give the following engraving and description:—

A wrought-iron tube (A) 3 inches in diameter, long enough to reach the centre of a stack, perforated with holes about two-thirds the length, and furnished with a point (B) at one end, and a strong iron band (C) with lugs (D) at the other. This tube is driven horizontally into a heated rick with a mallet or beetle, and at once affords the means of ascertaining the temperature of the stack, which is done by passing a thermometer on

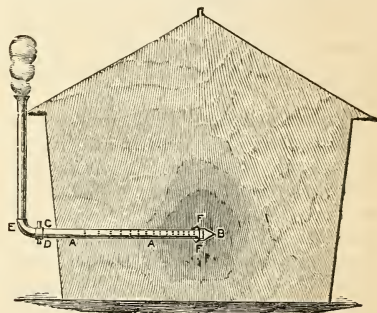


Fig. 3.

a stick into the tube. When it is ascertained by this means that any part of a stack into which a tube is inserted is of too high a temperature, a vertical sheet-iron funnel (E) is attached to the neck of the tube, at once establishing a current of air from the centre of the rick to the atmosphere, and immediately removing the superfluous heat, without disturbing or damaging the contents of the rick in any way. At the back of the point B several small hooks (F) are placed, so that in drawing out the tube a sample is brought from the centre of the rick.

## The Garden.

### CELERY CULTURE IN AMERICA.

THE following article by Mr Peter Henderson, South Bergen, New York, will be found to differ in many particulars from the modes of Celery Culture practised in Great Britain, and we would especially direct attention to "The preparation of the soil and planting of celery for winter use," as being worthy of trial in course of the present autumn.

I know no vegetable on the cultivation of which there is so much useless labour expended with such unsatisfactory results as celery. Almost all private cultivators still think it necessary to dig out trenches, from 6 to 12 inches deep, involving great labour and expense, and giving a very inferior crop to that planted on the level surface, in the manner practised on hundreds of acres by the market gardeners in the vicinity of New York.

Our manner of treating the celery crop, of late years, is very much simplified. Instead of sowing the seed in a hot-bed or cold frame, as formerly, it is sown in the open ground as soon as the ground is fit to work in spring—here about first week in April—on a level piece of rich mellow soil, that has been specially prepared by thorough pulverising and mixing with short stable manure. The bed being fined down by raking, so that it is clear of stones and all inequalities, lines are drawn out by the "marker," 8 or 9 inches apart, in beds of 8 rows in a bed, rubbing out every 9th line for an alley, on which to walk when weeding, &c. The seed should be sown rather thinly, one ounce being sufficient for every 20 feet in length of such a bed. After sowing, the bed should be rolled, or patted down with a spade, *which will give the seed sufficient covering.*

As soon as the seeds of celery begin to

germinate, so that the rows can be traced, hoe lightly between the rows, and begin to pull out the weeds as soon as they can be seen. One day's work, at the proper time, will be better than a dozen after the seed-bed gets enveloped with weeds, besides ensuring much finer plants.

As the plants advance in growth, the tops are shorn off generally twice before the time of setting out, so as to induce a stocky growth; plants, thus treated, suffer less on being transplanted.

Celery may be planted any time from middle of June to middle of August; but the time we most prefer is during July, as there is but little gained by attempting it early. In fact, I have often seen plants raised in hot-beds and planted out in June, far surpassed both in size and quality by those raised in the open ground a month later. Celery is a plant requiring a cool moist atmosphere, and it is nonsense to attempt to grow it early in our hot and dry climate; and even when grown it is not a vegetable that is ever very palatable until cool weather. This our market experience well proves, for although we always have a few bunches exposed for sale in August and September, there is not one root sold then for a thousand that are sold in October and November. Celery is always grown as a "second crop" by us—that is, it follows after the spring crop of beets, onions, cabbage, cauliflower, or peas, which are cleared off and marketed, at latest by middle of July; the ground is then thoroughly ploughed and harrowed. No additional manure is used, as enough remains in the ground, from the heavy coat it has received in the spring, to carry through the crop of celery. After the ground has been nicely prepared, lines are struck out

on the level surface, 3 feet apart, and the plants set 6 inches apart in the rows. If the weather is dry at the time of planting, great care should be taken that the roots are properly "firmed." Our custom is, to turn back on the row, and press by the side of each plant gently with the foot. This compacts the soil and partially excludes the air from the root until new rootlets are formed, which will usually be in forty-eight hours, after which all danger is over. This practice of pressing the soil closely around the roots is essential in planting of all kinds, and millions of plants are annually destroyed by its omission. After the planting of the celery is completed, nothing further is to be done for six or seven weeks, except running through between the rows with the cultivator or hoe, and freeing the plants of weeds until they get strong enough to crowd them down. This will bring us to about the middle of August, by which time we usually have that moist and cool atmosphere essential to the growth of celery. Then we begin the earthing up, necessary for blanching or whitening that which is wanted for use during the months of September, October, and November. The first operation is that of "handling," as we term it, that is, after the soil has been drawn up against the plant with the hoe, it is further drawn close around each plant by the hand, firm enough to keep the leaves in an upright position and prevent them from spreading, which will leave them as shewn in fig. 1. This being done, more soil is drawn against the row (either by the plough or hoe, as circumstances require), so as to keep the plant in this upright position. The blanching process must, however, be finished by the spade, which is done by digging the soil from between the rows and banking it clear to the top on each side of the row of celery, as in fig. 2. Three feet is ample distance between the dwarf varieties, but when "Seymour's Superb," "Giant," or other large sorts are used, the width between the rows must be at least  $4\frac{1}{2}$  or 5 feet, which entails much more labour and loss of ground. For the past eight years I have grown none but the dwarf varieties, and have saved in consequence at least one-half in labour, and one-

third in ground, while the average price per root in the market, has been always equal and occasionally higher than for the tall growing sorts.

My neighbours around me have at last got their eyes opened to the value of the dwarf sorts; and I think that a few years more will suffice to throw the large and coarse-flavoured sorts, such as "Seymour's Superb" and "Giant," out of our markets.

The preparation of the soil and planting of celery for *winter use* is the same in all respects, except that, what is intended for winter need never be "banked up" with the spade. It merely requires to be put through the handling process, to put it in a compact and upright position preparatory to being stowed away in winter quarters. This should not be done before the middle of September, or just long enough before the celery is dug up, to keep it in the upright position.

We have, however, another method which we have found to answer very well for the late crop, and it is one by which more roots can be grown on the same space, and with less labour than by any other. It is simply to plant the celery 1 foot apart, *each way*, nothing further being required after planting, except twice or thrice hoeing to clear the crop of weeds until it grows enough to cover the ground. No handling or earthing up is required by this method, for, as the plants struggle for light, they naturally assume an upright position, the leaves all assuming the perpendicular instead of the horizontal, which is the condition essential before being put in winter quarters. This method is not quite so general with us as planting in rows, and it is perhaps better adapted for private gardens than for market; as the plant is more excluded from the air, the root hardly attains as much thickness as by the other plan.

Our manner of preserving it during winter is now very simple, but as the knowledge of the process is yet quite local, being confined almost exclusively to the Jersey market gardeners, I will endeavour to put it plain enough, so that my readers "may go and do likewise." In this locality we begin to dig up that which we intend for winter use about



the end of October, and continue the work (always on dry days) until the 20th or 25th of November, which is as late as we dare risk it out for fear of frost. Let it be understood that celery will stand quite a sharp frost, say 10 or even 15 degrees, while 20 or 25

depth exactly of the height of the celery; that is, if the plant of the celery be 2 feet in length, the depth of the drain or trench should be 2 feet also. The celery is now placed in the trench or as near as perpendicular as possible, so as to fill it up entirely, its green

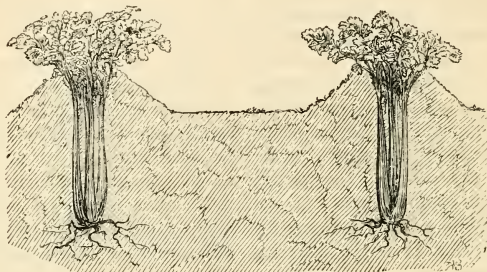


Fig. 1.—Celery after handling.

degrees will destroy it. Hence, experience has taught us, that the sharp frosts that we usually have during the early part of November rarely hurt it, though often causing it to droop flat on the ground, until thawed out by the sun. It must, however, never be touched when in the frozen state, or it is almost cer-

tops being on a level with the top of the trench. Figure 3 represents a section across a trench filled with celery in the manner just described. No earth whatever is put to the roots other than what may adhere to them after being dug up. It being closely packed together, there is moisture enough always at

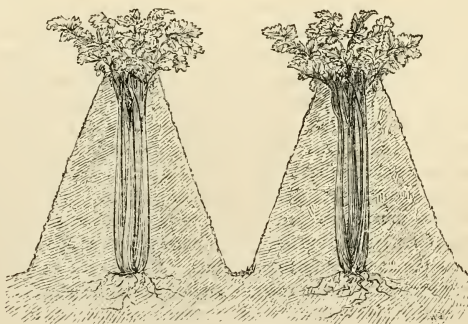


Fig. 2.—Celery earthed up.

tain to decay. The ground in which it is placed for winter use should be as dry as possible, or if not dry, so arranged that no water will remain in the trench. The trench should be dug as narrow as possible, not more than 10 or 12 inches wide, and of the

the bottom of the trench, to keep this plant, at the cool season of the year, from wilting. That which is put in trenches about the 25th of October, is usually ready to be taken up for use about the 1st of December; that a couple of weeks later, by first January; and

the last (which we try always to defer to 15th or 20th November) may be used during the winter and until the 1st of April. For the first lot no covering is required, but that for use during the winter months must be gradually covered up, from the middle of December on until 1st of January, when it will require at least a foot of covering of some light, dry material—hay, straw, or leaves—the latter perhaps the best. I have said the covering up should be gradual. This is very important, for if the full weight of covering is put on at once, it prevents the passing off of the heat generated by the closely packed mass of celery, and in consequence it to some extent "heats," and decay takes place. Covered

per acre. But for the last six or eight years, by adopting the flat culture, and the drain or trench system for winter storage, it has done much better, and is now a very profitable "second crop," averaging a clear profit of \$300 per acre, though it rarely brings over \$3 per 100 roots. No doubt, in many parts of the country, it would be much more profitable than in the crowded markets of New York. It is shipped from here in all directions—to Philadelphia (largely), Baltimore and Washington (South), and to Newport, Providence, Hartford, and New Haven (East). It is a bulky and expensive article to ship, and the dealer must realize more than double on the purchase or it will not pay his risk. It

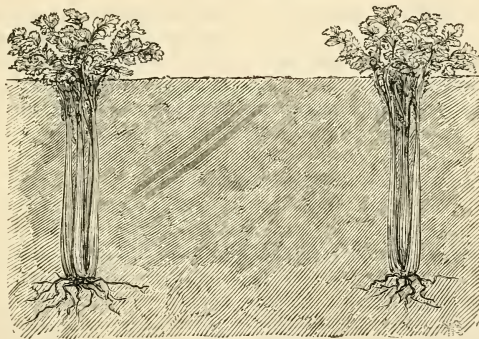


Fig. 3.—Celery stored for winter.

up in this manner it can be got out with ease, during the coldest weather in winter, and with perfect safety. These dates of operations, like all others named throughout, are for this latitude; the cultivator must use his judgment carefully in this matter, to suit the section in which he is located.

Regarding the *profits* of this crop I can speak from a very extensive experience, in its culture, having cultivated an average of ten acres for the past eighteen years. For many years, in the early part of that time, it was by no means what we would now call a profitable crop. By persisting in raising the large growing sorts, and the awkward and expensive mode we had then of working it, we were satisfied if it gave us a profit of \$50 or \$75

must thus cost the consumer, in these towns to which we send it, 8 or 10 cents a head, a price at which it would pay a clear profit of \$1000, or \$1500 per acre.

If the awkward and laborious system of cultivation, still persisted in for the growing of celery, is a mistake, the continued use of the tall growing and coarse varieties, we believe to be even a far greater one. The kinds that should be grown, either for private or market use, are very limited.

"Incomparable Dwarf."—This, so far, is decidedly our best variety; under good cultivation it attains a height of 2 feet, and a circumference of 12 inches; it is perfectly solid, the stalks half round, the leaves and stems being rather light green. When blanched, it

is a yellowish-white, crisp, tender, and of a most agreeable nutty flavour. The great advantage of this, and other dwarf sorts, over the large kinds, is, that nearly every part of the plant is fit to eat when blanched; for instance, if in the dwarf varieties the length is only 2 feet, and in large sorts 3 feet, the extra length of the large sort is unfit for use, being usually only an elongation of the outer leaves, the *heart* or edible part rarely rising more than 18 inches in the large sorts, while the dwarf sorts may be said to be all heart. This variety, for *fall use*, is planted 3 feet between the rows, by 6 inches between the plants, or nearly 27,000 roots per acre. For *winter use*, when it does not require to be "banked," we plant 2 feet between rows, and 6 inches between plants, or about 40,000 roots per acre.

"Boston Market."—A variety very similar to the above, but rather more robust, though a dwarf variety; the leaves are darker green,

the stalks when blanched nearly white; it is solid, crisp, and tender; an excellent variety.

"Dwarf Red."—A variety similar in all respects to the "Incomparable Dwarf," except in colour of the stalks, which are of a rosy crimson; although the flavour of the red varieties of celery is acknowledged to be superior to the white, and the appearance, when blanched certainly far richer, yet, for some unexplained reason, they do not so readily sell in our markets. In the London markets, about equal quantities of each are sold.

"Seymour's Superb."—The best of the large-growing sorts, attaining a height, under good culture, of 3 feet. It should never be planted closer than 4 feet between the rows, or it cannot be worked properly. For southern sections of the country, this variety is more suitable than the dwarfs, as it grows freer in a hot and dry atmosphere.

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### AUTUMN SOWING IN THE KITCHEN GARDEN.

THE autumn sowing of certain culinary crops for use in spring or early summer, and of a few annual flowers which are intended for early blooming, is very generally practised in gardens; but seed sowing in autumn might be advantageously performed to a far greater extent than is usually done, either by gardeners or others. Where succession crops or displays of floral beauty are desiderated, then succession sowings at different periods must be made; but where the mere rearing or multiplying of plants from seed is the object in view, a safe rule is to follow nature by sowing the seeds of native and acclimatized plants at those times or seasons when they are naturally dispersed, but which, it must be remembered, is not in all cases coincident with their ripening. Thus, the seeds of groundsel are blown off and scattered about almost as soon as they attain to maturity; but those of the Scotch fir, although

ripened in autumn, remain clasped by the close adhering cone-scales till these are opened, and the seed liberated by the drought and sunshine of early spring.

Seeds which, if sown when newly ripened, will, under the favourable influences of moisture and warmth, vegetate in a short time, are more numerous in some kinds than others, and they are in greater proportion among annuals and biennials than among plants of longer duration; but among them, many will lie in the ground for a year or even more, if they are dried and hardened by long keeping before they are sown; and there are also a few kinds which will entirely perish if the sowing of them is delayed till the first spring after they are ripened. Next, in point of numbers, are those kinds of seeds which, although sown as soon as they are ripened, do not vegetate till the succeeding spring, and a considerable number of which, if not sown till



then, will lie in the ground inert till the succeeding spring. And, lastly, as well as least in numbers, are those kinds of seeds which will not, under any circumstances, vegetate till they have lain over the first year in the soil; and some of which, if not sown till the next spring after they have ripened, will lie for two, three, and even four or more years before sprouting.

Among seeds which braird freely when shed or sown at the period of their ripening, those of the natural grasses are conspicuous; and the seeds of one of the prettiest of these, the *Briza media*, will scarcely vegetate at all if kept over till the spring; therefore, we are safe in concluding that July, or the beginning of August, is a very suitable, if not the best period for sowing down grass lawns or pastures, more especially if newly-ripened seeds are used, seeing that their greater vital strength, combined with the higher temperature of the soil at that season, is productive of more vigorous growth in the young plants than those present which are the produce of spring-sown seeds. Of seeds which lie over till spring, although sown as soon as they are ripe, most kinds will come up notwithstanding that their sowing is delayed till towards the end of autumn; but there are others, such as many members of the Gentian family, which will only come up thinly if such delay is made, and that, in some instances, only after they have lain till the second spring. The splendid Nepaul lily (*Lilium giganteum*) presents a notable example of seeds which will not braird till the second spring, although sown as soon as they ripen, and which if not then sown will lie till the third or fourth spring. Many had received the seeds of this elegant plant from friends in its native country, and tossed away the soil in which they had sown them, on finding no appearance of young plants, after they had lain for a year or two; nor was it added to our cultivated flora till young plants appeared in some laid-aside pots, the fourth year after sowing. The seeds of the hawthorn, holly, common ash, and other plants which usually lie over a year, are prepared in "the rot-heap," as it is technically called, by mixing them with earth or

sand, and allowing these to lie in a pit or heap for about a year before they are sown, but even some of them may be got to braird the first spring, if taken when nearly ripe, their pulpy or other outer covering rubbed off, and immediately sown.

Seeds of some by no means very delicate growing plants, such as those of Indian corn, kidney beans, gourds, &c., will quickly perish if sown before the temperature of the soil and atmosphere is sufficiently high to promote their growth. All such, however, are natives of warm climates, and do not come under the designation of either native or acclimatized plants; hence, although sowing at the period of their seed ripening may be suitable for them in their native regions, it is inapplicable in colder climates. But, on the other hand, it does not follow that because plants are natives of warmer regions their seeds may not be sown in our climate when they ripen; for some seeds, such as those of the potato, tobacco, Cape gooseberry, thorn-apple, &c., will retain their vitality in the earth throughout our coldest winters, although the plants producing them would, in all stages of their growth, be killed by only very slight frosts.

From the preceding remarks it will appear evident that much valuable time might be saved in rearing plants, were the sowing of newly ripened seeds more generally practised. Doubtless this can only be done with home-grown seeds, or those which are procurable at the proper time; but even these are no inconsiderable portion of what plant growers have to deal with. And surely it is not beyond the reach of botanical or horticultural science to discover modes or means, whereby delays in brairding, even the most obdurate of over-dried or long-kept seeds, may be overcome. Some little advances in this direction have, no doubt, been made, but much yet remains to be done; for the "rot-heap" previously alluded to is but a dilatory and clumsy mode of overcoming the resistance of the seed shell to the vegetating of its kernel. Of other modes which are employed for the like purposes, the following are among the most successful, but their application has hitherto partaken too



much of the hap-hazard element for their being safely and extensively applied. The speedy germination of seeds is impeded by the nature of their covering : thus some, as those of the holly, are, in addition to their own indurated shell, enveloped in a berry or pulpy mass, which although buried in the earth, resists decomposition for a long period, during which the shell proper remains intact and firm. Others, as the famous Guinea grass of the Southern United States, and the pretty black-eyed scarlet seed of the *Abrus precatorius*, which are used as beads in Indian ornaments, on becoming dried, acquire such a bony hardness, that they will lie for years without presenting the least change in either colour or texture, although if their shell is filed through or cracked by a hammer, germination speedily ensues. Boiling some berry-covered, as well as strong-shelled seeds, from two to five minutes has been found to facilitate their vegetation. So has steeping them in hot water at from 200° to the boiling point, and allowing them to remain till it cooled. Diluted vitriol is another agent recommended for the same purpose ; so is oxalic acid and lime water. The last, as well as newly-slaked lime, is particularly serviceable for destroying the pulpy substances of berries after their outer skin has been broken, such as those of the holly.

Some, we are aware, feel disposed to cavil at the idea of sowing seeds, even of native plants, at the natural seasons of their dispersion, arguing that they might as well follow nature further and dispense with their soil covering. Nature, however, does not

dispense with soil covering to seeds, for the smaller ones are soon sufficiently overspread by showers, wormcasts, decayed vegetation, &c., to ensure their vegetation, while the larger seeds, such as acorns and nuts, are mainly spread and planted by rooks, mice, squirrels, and other animal agents carrying them off and depositing them for future use, but where, like the money hordes hidden in the earth during troubled times, they are allowed to remain, in consequence of the death or forgetfulness of their depositors. Such examples of nature-planting may be often seen in gardens where beans or peas are allowed to ripen. An excellent one once fell under our notice, when, having got a bag of *Ilex* acorns, which were allowed to lie for some weeks in an out-house, the mice operated with them to such an extent, that next spring young *Ilex* plants came up in many surrounding spots, some of them at distances of 200 to 300 yards from where the acorns were taken.

It must in fairness be admitted that nature in sowing seeds provides also for the shelter of the young plants, whether grown in autumn or spring, by protecting them with surrounding vegetation. In this she should be also imitated wherever shelter is requisite ; and as upright grassy foliage, which admits both light and air, is better for this purpose than that of broad leaved plants, nothing can be recommended for growing in occasional drills, or as interspread-plants, that is superior to common rye for its remarkable resistance of the hardest winter weather, as well as its early and rapid growth in spring.

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### GARDEN WEEDS.

WHILE the excessive drought of the present season has been highly inimical to the growth and development of most kinds of kitchen and flower garden plants, it has been remarkably favourable for effecting the destruction of garden weeds ; and those are much to blame who have not taken

full advantage of it, by keeping annual weeds under the economic or seeding point, and who have not eradicated their perennial weeds by exposing every root and rootlet to destruction under the scorching influence of the weather. Seeds, as is well known, when once buried beyond vegetating depths, will

lie fresh for indefinite periods, until brought, by digging or otherwise, within the proper depth of covering requisite for promoting the vivifying influences of light, air, and moisture. Hence the impropriety of the too prevalent practice of digging down weeds that are in full seed, and of throwing them into the manure or compost heap. True, in economically kept gardens no weeds should ever be allowed to perfect their seeds; but herein sound theory is seldom backed by practice; and where weeds have run to seed they should, before the ground is dug, be cleared off and burnt, the ground surface smooth-raked, and allowed to lie for a few days, till any seeds which may have been shed are sprouted. We are aware that many disapprove of burning seeded weeds, preferring, for manurial purposes, to throw them into a heap, where they will quickly waste by heating or fermentation; but it is astonishing how few seeds are actually destroyed by this process; and few who will take the trouble to satisfy themselves of its inefficacy, by actual experiment, will afterwards stop short of burning their seeded weeds. Or if these are disposed of in the compost-heap, among waste leaves and garden haulm, such compost should never be laid on the ground till all the seeds contained in it have been brought to vegetate by the often-repeated turning of its whole mass.

Annual weeds have been affected in a somewhat unusual manner by the peculiarities of the present season. In spring an unusual quantity of their seeds vegetated, and the young plants were stimulated into exuberant growth by a rather unusual excess of rain, while the dry weather that followed allowed of their being easily destroyed before the maturation of their seeds. Then the long continuance of drought which followed was adverse to the further brairding of those seeds which had been ripened and deposited in former years, while it ensured the early destruction of any which did appear; and more recently while the growth of these have been further induced by occasional showers; intervening short tracts of drought have accomplished their destruction wherever the hoe was passed through them. And at the present

advanced period, many kinds now brairding, even if allowed to grow unchecked, will not have time to ripen their seeds; others, however, may, and it will be safe policy to keep the hoe going whenever the weather is suitable. Some may feel inclined to ask, why not recommend the rake as well as the hoe? We have certainly no objection to the rake whenever its employment does not involve an unnecessary waste of time; but an hour with the hoe, say in the morning of a sunny day, when weeds are just brairding, will be of more service, and that without disfiguring the ground surface, than a day at the hoe and the rake, when they have begun to seed, and wet weather may have set in. Insects have this season been unusually abundant upon weeds. Green fly on groundsel has been so prevalent over wide districts that the young plants appeared as if quite crumpled up, and such as did flower only produced small weakly stems, and very little seed. The panicles of the all-prevailing annual meadow-grass is much infested with a small brownish aphid, but we cannot perceive much injury which it has done either to the foliage or seeds; and the shepherd's purse is in many places much infected, as well as injured by mildew.

Perennial garden weeds have no place in well-kept gardens, but in those that are slovenly managed bishop-weed may be found in the hedges, dandelions in the strawberry breaks; couch, and other creeping-rooted grasses in the edgings; nettles among the roots of raspberry bushes, or in the perennial herb ground; and the white-flowered bindweed (*Convolvulus sepium*) anywhere except where it should be; and that according to a recognised authority, is in a flower-pot, and hung in the air. These may all be got rid of by carefully grubbing up and picking out the roots, watching diligently for any left remnants, and removing them on their first appearance. Spreading-rooted perennials are, in general indifferent producers of seed, and as perennial seedlings do not develop themselves nearly so rapidly as annuals, they are when young, easily destroyed. Even seedling dandelions are no exception to this rule, for they will quickly perish if merely hoed when

their young leaves are not more than from 2 to 3 inches in length, and before their roots have passed from the appearance of slender whitish threads to that of thick brownish cord. This is a fact worthy of the attention of all whose gardens are situated near dandelion covered railway banks or pastures, and where, when the weather is favourable, they may expect the appearance of the young seedlings within a fortnight after observing the dandelion seeds wafted in downy clouds within their precincts.

We cannot here avoid noticing a very reprehensible, but common piece of garden mismanagement—namely, that of allowing the weeds to grow and seed almost unrestrictedly from towards the end of summer onward throughout the autumn months, more especially among the culinary crops. How frequently do we see the spring and summer crops all sown or planted, and properly cared for, every weed, it may be, extirpated, up till the commencement of the small fruit season, after which, weed destroying receives little or almost no further attention, on the plea that all hands are now needed for fruit-gathering, grape-thinning, summer-training, and keeping the flower-beds as well as other essential parts clean and trim. Most short-sighted policy this, the extravagance of which becomes evident when it is considered that the number of seeds shed by these neglected weeds are almost beyond comprehension, even allowing that a moderate per-centage of them are devoured by birds or otherwise destroyed, seeing that the growth of the remainder will entail an after excess of labour far beyond what, if taken in time, was requisite to have kept them under proper control. To illustrate this more fully, it is only requisite to look at the quantities of seeds that some of our most troublesome weeds are capable of producing, even when only grown to mode-

rate sizes. Thus, a plant of shepherd's purse, having no more than a 9-inch long central; and two 6-inch long side seed-bearing branches, will carry about 125 pods, with, on an average, twenty seeds in each, or in all 2500 seeds. A plant of annual meadow grass, with only six panicles, and thirty six-seeded spikelets on each, will have upwards of 1000 seeds upon it; while its earlier and its later succession stems may produce twice that number. A plant of the common groundsel, from 10 to 12 inches high, contains about sixty florets, capable of producing about sixty seeds in each, making in all 3600. A chickweed of sufficient size to cover a square foot may be estimated to produce, from first to last, about 400 capsules, having eight seeds in each, or in all, 3200 seeds. In a single head of dandelion the average number of mature seeds may be stated at fully 300, and as an ordinary sized plant contains six heads, its produce will be nearly 2000 seeds. And for the common annual sow-thistle, 300 flowers may be estimated as the produce of a good but not extraordinary sized plant; each of which will contain, on an average, fully 160 seeds capable of vegetating, so that its total produce may be set down at the almost incredible number of about 50,000. Of these six very common weeds, the first four are capable of producing several generations of plants in one year, so that the actual number of seeds emanating within that time from a single plant of either sort, will be several times the number above stated, more especially if that plant is an autumn seedling which may have withstood the winter, or even one of early spring growth. The sow-thistle, on the other hand, may be included among once-in-the-year seeding annuals; and it is well for cultivators that the crops of this and other enormous seeders are not oftener repeated.

# A Dictionary of Tools and Emplements

FOR

THE FARM, FOREST, AND GARDEN.

(Continued from page 277.)

**BASKETS.**—Various kinds of materials are used in making these useful articles, according to the purpose they are intended to serve. Those made of willow and rushes are principally used by the gardener and farmer. Several kinds of willow (*Salix*) are employed. The finest baskets are made of Forby's willow (*Salix Forbyana*). The coarser and strongest of the common osier (*S. viminalis*), and basket willow (*S. triandra*). The willows, which are at their prime about five or six years after planting, are cut in the spring, just before the bursting of the leaf buds, and must be kept moist till cleaned, which operation is performed by a hand scraper.

A very strong, useful, and convenient basket (fig. 18) for gathering potatoes and other



Fig. 18.

roots, is in common use in all parts of the north, and is worthy the attention of English gardeners.

The coarser and larger kinds of fruit and vegetables are brought to Covent Garden market, and disposed of to the retail dealers in osier baskets called *Sieves*, *Half-Sieves*,

*Bushel Sieves*, and *Bushel Baskets*. The following are the sizes:—

*The Sieve.*—Fifteen inches in diameter and 8 inches deep. Contains 7 imperial gallons.

*Half-Sieve.*—Twelve and a half inches in diameter and 6 inches deep. Contains  $3\frac{1}{2}$  gallons.

*Quarter-Sieve.*—Contains  $1\frac{3}{4}$  gallons.

*Bushel Sieve.*—Seventeen and three-fourths in diameter at top and 17 inches at bottom; depth,  $11\frac{1}{4}$  inches. Contains  $10\frac{1}{2}$  gallons.

*Bushel Basket.*—Fourteen and a half inches in diameter at top and 10 inches at bottom; depth, 17 inches. Walnuts, nuts, apples, and potatoes are sold by this measure. When heaped (although contrary to the statute) this measure contains an imperial bushel.

In the "Mechanics' Magazine" of May 18, 1833, Mr B. Bevan of Leighton, gives the following particulars as to the capacity of these measures:—"To obtain the required information for myself and others, I purchased a new set of these measures of one of the principal vendors in Covent Garden market, and have ascertained their capacities, heaped measure, to be as follows:—The sieve contained 1644 cubic inches, or about half a bushel; the half-sieve, 822 cubic inches, or about a peck; the quarter of a sieve, 362 cubic inches, or about a gallon; the largest punnet, 284 cubic inches; the second punnet, 228 cubic inches, or about a pottle; the third punnet, 90 cubic inches, or about a quart; the smallest punnet, 60 cubic inches, or about  $1\frac{1}{3}$  pint. These dimensions shew nearly the



quantity sold under these denominations; the precise quantity will, of course, depend upon the manner of filling them and heaping them." In the "Philosophical Magazine," vol. ii., p. 482, we find the following additional information in regard to these measures:—"There are four sizes of punnets, which leaves the capacity of this measure very uncertain, unless the particular variety is indicated. From Mr Bevan's experiments the greatest capacity of the

Sieve is .....	1644	cubic inches.
Half-sieve.....	822	"
Quarter-sieve .....	362	"
Largest punnet ...	248	"
Second punnet.....	220	"
Third punnet .....	90	"
Least punnet .....	60	"

But as, in practice, they may not be filled to the maximum, it may be inferred that, relatively to a bushel, the proportion will stand as follows:—

2 Sieves .....	equal to	1 bushel.
4 Half-sieves .....	"	1 bushel.
8 Quarter-sieves .....	"	1 bushel.
12 Large punnets .....	"	1 bushel.
16 Second punnets ...	"	1 bushel.
32 Third punnets .....	"	1 bushel.
48 Least punnets .....	"	1 bushel.

forced potatoes, kidney beans, sea-kale, Brussels sprouts, mushrooms, &c., are carried to Covent Garden market in baskets called *Punnets* (fig. 19). They are made of thin split laths, and are of various sizes—from 3 to 6 inches deep, and from 6 to 9 inches in diameter, according to the sort of vegetable or fruit to be placed in them, and with or

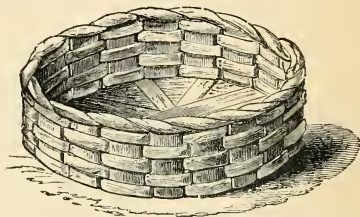


Fig. 19.

without handles, to suit specific purposes. This is a branch of garden refinement that has not generally reached Scotland. Punnets are so very inexpensive that no garden should be without a stock of them. The following are the special sizes known to the London market gardeners:—

*Strawberry Pottle*.—A long tapering cone, holding about a pint and a half.

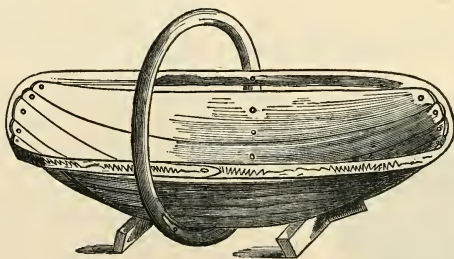


Fig. 20.

In other words, they may be considered as follows:—

Sieve.....	equal to	½ bushel.
Half-sieve .....	"	1 peck.
Quarter-sieve .....	"	1 gallon.
Large punnet .....	"	5⅓ pints.
Second punnet.....	"	1 pottle.
Third punnet .....	"	1 quart.
Least punnet .....	"	1½ pint.

All the most choice vegetables, such as

*Seakale Punnets*.—Eight inches in diameter at top, 7½ at bottom, and 2 inches deep.

*Radish Punnets*.—These are made 8 and 9 inches in diameter and 1 inch deep—the former to hold 6 *hands*, and the latter to hold 12 *hands*.

*Mushroom Punnets*.—Seven inches in diameter and 1 inch deep.

*Salad Punnets.*—Five inches in diameter and 2 inches deep (fig. 19).

In Loudon's "Gardener's Magazine" for 1842, a correspondent, with the initials "B. H. A.," gives a description of a basket called

two brackets or feet for the convenience of standing upon the ground. Our engraving (fig. 20) is taken from Loudon's Magazine. At the Great Exhibition of 1851, a similar basket, called the Sussex Truck Basket (fig. 21) was exhibited as the invention of a Mr T.

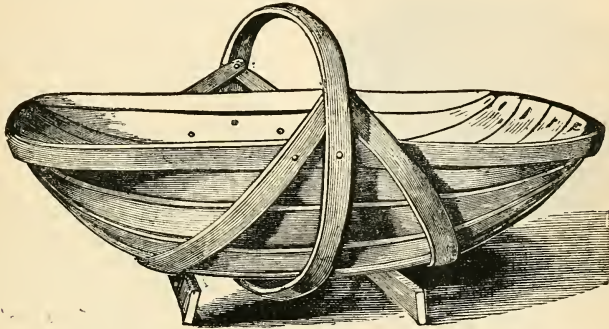


Fig. 21.

a "Seed Carrier" (fig. 20). He describes it as being made like a shallow cross-handled basket, and very light. Several sizes were in use, the small ones, made of white willow (*Salix alba*), are exceedingly useful for carrying seed at the time of sowing. The larger

Smith, of Hurstmonceaux, to which the jury awarded a prize medal. But probably B. H. A. and Mr T. Smith are the same person.

A sowing basket used in Scotland by sowers who sow with both hands is shewn in fig. 22. It has a curved form to suit the

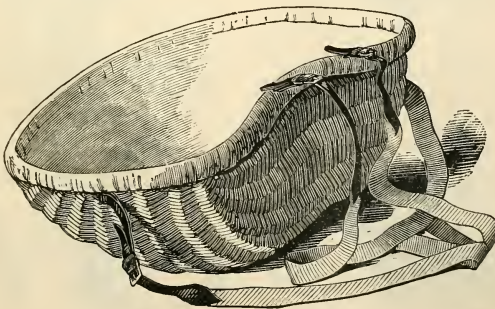


Fig. 22.

ones, which are sometimes made to contain a bushel, are made of ash, are useful for a variety of purposes, such as picking up litter in the flower garden, or carrying soil; and, in fact, for every purpose for which the common basket is generally used. They have

front of the body, is fastened round the body by a strap and buckle, and is suspended besides by girthing attached to loops on the side next the sower, and passed round the back of his neck. It is lined with strong canvas.

Fig. 23 represents a form of basket for sowing seed used in England. It is suspended by girthing fastened to the two handles on the rim of the basket, and passed either over the left shoulder and

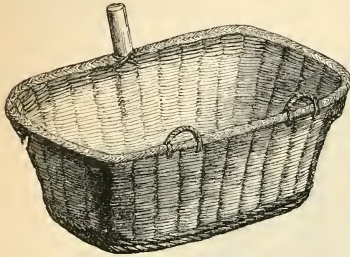


Fig. 23.

under the right arm, or round the back of the neck: and the left hand holds it steady by the head of the wooden stave shewn on the other side of the basket.

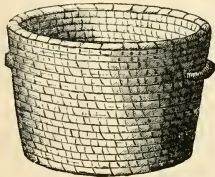


Fig. 24.

The seed-corn basket (*Scotice*, *ruskie*) is usually made of twisted straw, laid in rows along each other, and fastened together by means of withes of willow (fig. 24). It is

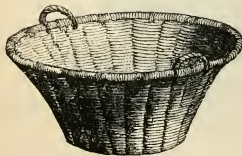


Fig. 25.

provided with a couple of handles of the same material, sufficient to admit the points of the fingers, and also a rim round the bottom, upon which it stands. In the Border counties it is carried on the head of the seed

carrier when full; in other parts it is carried in the arms, with the bottom rim supported by the haunch.

The best form of corn basket (*Scotice*, *wecht* or *maund*) for use in the barn is that shewn in fig. 25. They are sometimes made of wood, or of skin, or strong canvas, attached to a hoop of wood.

It is an interesting fact to notice, in regard to baskets, that the facility of teaching and acquiring the art of basket-making renders it a favourite, indeed the most important, employment for the blind in the asylums established for their reception.

**BLANCHING POT.**—The pots are of various shapes. The best are made of burnt clay. Figs. 26 and 27 represent the most approved for blanching sea-kale. They consist of two parts, a body, *a*, and a top, *b*, which latter, on being taken off, permits the gardener to examine the state of the crop, and also to gather it, without having to remove the whole; thus



Fig. 26.

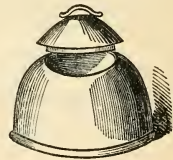


Fig. 27.

preventing the trouble arising from the escape of the spreading shoots, or the entire removal of the dung at the time of forcing. These

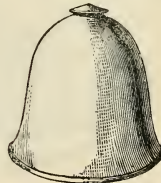


Fig. 28.

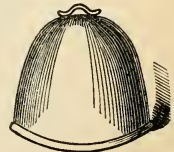


Fig. 29.

pots are of various sizes, from 10 to 18 inches in diameter, and from 12 to 20 inches in height. A modification of the above form is used for blanching endive (figs. 28 and 29); and as there is no occasion for a portable top



or lid to enable the cultivator to examine his crop, they are made all in one piece, having a knob or handle at the top to serve as a handle for lifting them off or on. They are from 9 to 12 inches in diameter and the same in height; are placed over the plants when nearly full grown, the leaves being gathered up with one hand, while with the other the pot is placed over them so as to enclose them completely, and thus ensure their blanching, while they are protected from frost, snow, or rain. The curled leaved varieties of endive are much more readily blanched than the broad-leaved or Batavian sorts, therefore a corresponding degree of care must be used in performing the process.

**BOITE-A-HOUPPE** (*French*, signifying a puff-box).—This simple apparatus (fig. 30), a French invention, is used for the application of sulphur for the prevention or cure of the

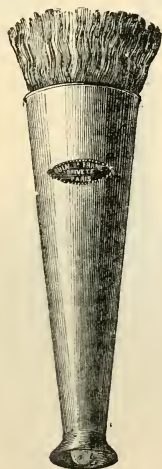


Fig. 30.

disease which affects the vine and other plants. It consists of a hollow cone, the smaller end containing an opening for the introduction of the sulphur, the larger end being closed with perforated metal. Strands of worsted are inserted in some of the holes, and as the box is shaken, the sulphur, as it falls through the holes, slightly adheres to the worsted, from whence it is shaken evenly upon the plants.

The Boite-à-Houpe is very easily used, allowing the operator one hand always at liberty to separate the leaves and uncover the parts which are to be sulphured, distributing the sulphur regularly in impalpable powder (which is indispensable in order to obtain a successful result); the other hand being used in merely shaking the box. Two or three applications only are necessary—namely, when the plant first begins to shoot, after it has blossomed, and, if necessary, when the fruit begins to ripen. There are many other uses to which this invention may be applied—such as the distribution of lime, or any similar material. The apparatus is used very extensively in France. An instrument like a pepper-box is sometimes applied to the same purpose; but it distributes too freely, causing much waste. The advantage of the Boite-à-Houpe is, that before distribution the sulphur passes through short lengths of wool; by this means it falls in almost imperceptible particles upon the plants, without the waste which takes place by other methods.

**BROOMS** (*Anglo-Saxon broom*).—This name is strictly due only to those which are made of the twigs of the broom (*Spartium scoparium*, or *Cytisus scoparius* of botanists), but common usage has applied it to all kinds of long-handled besoms, whether made of broom, heather, birch, whalebone, bristles, wire, or of cocoa-nut or other vegetable filaments. Birch is the material most generally used for brooms for the garden or farm, and they are made of various shapes. For garden-walks which are liable to become mossy, a broom made of wire may be usefully employed. If of iron wire, it ought to be well dried and dipped in oil, both before and after being used, or it will soon be destroyed by rust. The form best adapted for a wire broom is given in fig. 31, which is that of the ordinary kind used for stables or other coarse work. The common kind of brooms used by gardeners are formed of twigs of the birch, strongly bound together, into which a handle of wood is inserted. Fig. 32 represents the form best adapted for ordinary purposes. In 1855, Mr William Henderson, gardener to the Duke of Athole at Dunkeld, took out a patent for im-



provements in brooms, which consisted in the handle or stock being so constructed as to enable any ordinary gardener to substitute new twigs for those which are worn out. These stocks made of wrought-iron, are of three kinds—viz., fan-shaped (fig. 33), flat (fig. 34), and round (fig. 35). The two former have a handle socket, to which is attached a pair of iron plates. Through these are passed screws with square heads. When the broom is worn out the screws are undone to the full extent, and the pair of plates

fan-shaped brooms when completed. Another form of these brooms is shewn in fig. 35. The head consists of a hollow cylinder or socket of iron or brass, in the inside of which is a strong screw, extending about 3 inches below the mouth of the cylinder. At the end of the screw is inserted a strong piece of wire, terminated by an eye, the use of which will



Fig. 31.

separated. The material is then filled in lightly between the two plates at the one end or division of the broom-head; and when this division is filled, the operation is repeated at the other end. A key is then applied to the square heads of the screws, and the whole is securely fastened. The ends of the material which protrude on the outside of the head are then neatly cut off. To keep the material in its place, a clasp of strong iron wire is attached, about 3 inches from the head, securely fastened with nuts. Figs. 33 and 34 shew the flat and

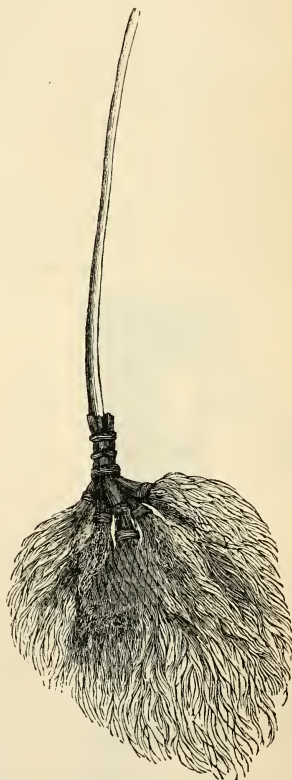


Fig. 32.

be afterwards explained. When the broom is required to be filled, the cylinder is placed with its mouth upwards, and a small cone of iron or brass, corresponding in shape with the interior of the cylinder, and pierced with a female screw, is inserted on the screw attached to the cylinder, and turned round about half-

an-inch. The material is then filled in as tightly as possible, and is secured in its position by screwing up the cone. A ring is then passed over the head and brought down to the extremity of the wire which terminates the screw. This ring has a small hole, and

Gardeners and all who use brooms should particularly bear in mind that, whatever the material of which they are made, they will last much longer if soaked in water for some time before using; and that, if kept constantly in water, they will be still less brittle.

The Rev. Gilbert White, in his "Natural History of Selbourne," mentions a pretty implement of housewifery which he has not seen anywhere else; that is, "little neat besoms

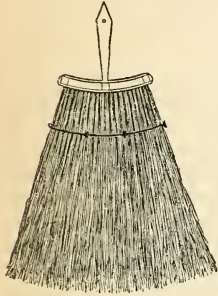


Fig. 33.



Fig. 34.



at the opposite a female screw. A strong pin with a screw at the end is then inserted in the ring, and, passing through the eye of the centre wire, is screwed into the opposite side of the ring. Fig. 35 shews the head complete. Ingenious though Mr Henderson's invention undoubtedly is, an insuperable objection to its general use (we allude more particularly to the flat and fan-shaped kinds) is the great weight of the head. In a broom for sweeping short grass and leaves lightness is the great desideratum. The round broom-heads are light enough for all ordinary purposes; and were it possible to produce them at a cheap rate, so as to compete in some degree with the common brooms, we have little doubt of their becoming great favourites.

which our foresters make from the stalks of the *Polytricum commune*, or great golden maiden-hair, which they call silk-wood, and find plenty in the bogs. When this moss is well combed and dressed, and divested of its outer skin, it becomes of a beautiful bright chestnut colour, and being soft and pliant, is very proper for the dusting of beds, curtains, carpets, hangings, &c. If these besoms were known to the brush-makers in towns, it is probable they might come much in use for the purpose above mentioned."

## Rambles by Road, River, and Rail.

### A TOUR IN THE WEST OF SCOTLAND.

#### BUCHANAN HOUSE.

DURING the intense sultry heat of the first days of August, in company with a distinguished horticulturist, we arranged for our holidays being spent seeing notable places in the West of Scotland. What we did see, and the writer's notions respecting such, shall form a subject for a continued series of chapters, which, it is to be hoped, may prove generally interesting.

Avoiding all preliminaries as to the journey between metropolis and metropolis, we will commence our observations from the commercial capital of the West. Electing to proceed to the pleasure grounds and gardens of his Grace the Duke of Montrose, per rail *en route* to Balloch, we find the agricultural state of the country by no means in so lamentable a plight as in many other localities of which we shall hereafter have to speak upon. The heavy crops, as indicated by the quantity and bulk of the ricks, scattered over the fields from which it had been cut, seemed to be fully up to the average. The corn fields were not rank, but they did not indicate that leanness which is certainly more the rule than the exception over the general districts of the country. As we run along, and pass on the left the tall chimneys of some of the public works of Partick and Govan, the thin haze of smoke which envelopes the city and its suburbs becomes almost invisible in the distance, and the sky assumes more an eastern aspect than usual among the hills and valleys of Renfrewshire on the one hand, and Dumbar-tonshire on the other—the narrow Firth of Clyde that separates the two being scarcely visible. The old thatch house, tenanted chiefly by the Scotch husbandman, crops up occasionally in the landscape, with its

speckled coating of green and grey, indicative of frequent repairs, like a patched-up pair of "unmentionables." Whisking along with considerable rapidity past the roadside stations (for it is one of the "North British" express trains that carry us), we catch the word Kilpatrick, in large letters, done with sea-pink (*Armeria maritima*), and in beautiful style, very creditable indeed to the station-agent. As we near Bowling, the scenery increases in interest, for, what with the crested hills on the one side, and the richly wooded undulating slopes, comprising the policies of Lord Blantyre on the other, and the river between, widening out to some expanse, clad with a covey of vessels, some with merchandise and some with multitudes of human beings, it assumes quite a panoramic aspect. Our attention is called in passing to the Bowling Hotel, once a famous resort of the Glasgwegians before the railway was inaugurated; indeed, a sort of "Star and Garter" for style and viands. Here, too, is to be seen jutting out seaward the end of the old Roman wall, which passes right through Dumbarton and Linlithgowshires, and is always scanned with a certain degree of interest. Dumbarton Hill, as if planted into, or vomited out of the Firth, is passed with its tiny-looking castle, and then the busy commercial little town itself, which is remarkable for the style and comfort of workmen's houses, arranged in streets with pediment-like windows in the upper stories, and fine arched stairs leading thereto. Then passing Alexandria, somewhat famous for its print manufactories, we run on to Balloch. Time being an object, we proceed at once across the bridge, for which we are respectfully reminded of pontage dues, to the

hotel for the purpose of hiring a conveyance to Buchanan. Between bad beer and a rickety dog-cart, with a roarer of a horse to boot, we were in anything but good humour, notwithstanding the flattering notice painted on the door-post, that the Empress of the French had visited that hotel; *ergo*, it was an honour for all and sundry to be admitted within its portals. On, however, we go upon a well macadamized, well kept road, through a fertile district for the first mile or two of the road, passing Boturick Castle, and some other places of less note. Like most counties, some of the farms are apparently well cared for, and others not. Deep plough stirring and manuring are visible at a glance, even to the untutored eye. Many fields of green crops looked well, having in the case of turnips few wants. Some of the farmers were having them stirred with the horse-hoe—an operation practically sound in a period of drought, although a theory which many people receive with dubiety. As we pass Kilmarnock, and near the walled policies of the Duke's estate, the landscape is simply magnificent. Benlomond as a background, and the great chain of hills that join it, with the beautiful Loch at its base, which delights and astonishes the tourist and traveller, are of themselves worthy of a journey to see; and when the sky is troubled, and the clouds kissing the peaks of these high mountains, like dense great volumes of smoke, with the sun glistening upon the hill sides, the light and shade over the various undulations are such as no pencil could doadequate justice to; and not only commands but compels admiration, and binds the eye of the beholder as if with a spell.

While musing in that kind of mood upon the variety and magnificence of the scenery that met our gaze, we found ourselves confronting the portals of one of the principal entrances to the demesne. Finding a ready admission, we pass up the approach, and at once dive with gusto beneath the shade of some wonderful specimens of arboriculture. It is so agreeable, the change from purely rural scenery, where a tree or a clump is only scattered here and there, to come in contact

with giants, whose lifetime must cover a period of at least six hundred years, and in such numbers as to engender and promote a gratification which the enthusiastic arboriculturist so fully enjoys. The oaks, all over the plantations of the estate, are marvellous specimens, not only in respect of size but of robust health. Many of the specimens measure from 16 to 18 feet in circumference 3 feet above ground. One in particular, called the "Five sisters," from its having five great limbs of about equal proportions, shooting as if it were simultaneously from the trunks, about 3 feet above ground, measures over 22 feet below the junction, and is the picture of health and beauty. These oaks meet you in no isolated individual spot, but are in the thickets of the forest, in the park, where hundreds of cattle are browsing, and cover, in fact, an island called Inch Murrian, in the famous Loch Lomond, which, by the way, has long been celebrated for "fish without fins, waves without winds, and a floating island." Truly the grounds of his Grace of Montrose are a home for the oak revelling to the greatest perfection, and at this period of the age of the world, A.D. 1868, they happen to be in full stature, without the slightest affection or affliction, resulting from age or other debilitating influence, to mar their beauty among a host of numerous compeers.

As it is with the oak, so it is with the lime, the beech, the ash, and the elm. These, however, occupy as they deserve to do, a subordinate place as to numbers over the demesne. It has been an object evidently all along to nurse and preserve the most valuable timber trees upon the estate generally, so that the denizens of the forest above enumerated are to be rather preserved to give variety of form and feature, as individual trees in the parks, than take their place as permanent tenants of the purely-wooded scenery, cultivated for its importance from a timber point of view. No one having a regard for beauty of outline in our large parks can depreciate either the lime or the horse chestnut. Our *Tilias* and our *Castaneas* shall ever be sought after for their decorative importance, and it was with delight that we saw them studded over the great



park, receding from the mansion in company with their regal compeer. How beautifully formal, and withal so graceful, did all these fellows appear, looking at them from salient points! The cattle cropped the branches within their reach as formal as if it had been done with a hedge knife, and what a triumph for our great plant growers to exhibit their specimens in such form, as while naturally a little dressed like, withal not to trespass too severely upon the bounds of elegance. Let them open their eyes and take a lesson from nature, as it is to be seen, after the fashion described, not unfrequently in our parks and pleasure-grounds.

But while the grounds we are describing prove a home for the purely forest denizens, it also kindly influences the growth of certain Coniferæ. The spruce is very lofty and of giant proportions, cultivated in quantities. The larch is by no means numerous, although it revels in great luxuriance where seen. In making a remark of the kind to Mr Connon, our respected cicerone, whose department of management we shall presently enlarge upon, that this tree seemed conspicuous by its absence, he rejoined, "the reason why, it has been cut in quantities for the building—principally the roofing of the new castle," which, of course, satisfied our curiosity. The Douglas fir (*Abies Douglasi*) is simply magnificent, quite eclipsing for health and beauty, and probably size, anything we have seen in Scotland; and what a noble tree it is, of rapid growth and with such great lustrous fan-like branches, spreading out in a style that is superlatively captivating. There are a couple far in advance of their fellows, the largest of them measuring 80 feet in height by 8 feet 8 inches in circumference! This is a marvellous specimen, and so interested is the present noble Duke in this tree, as being a likely fellow to rank in value as a timber tree, that he has given orders to plant the estate in quantities; so many, in fact, are to be seen in the plantations, that they must count by the thousands. Nor is the hemlock spruce (*Abies Canadensis*), judging by the specimens, less worthy of a place where beauty is desired. The density of the

branches, and their fine depending habit, gives the tree the character of a huge *Adiantum* adorned with its graceful leafy drapery.

In and about the site of the old mansion, which, like houses of old, was planted down at a much lower level than is selected for our palaces and castles and mansions of the present day, the planting has been after the antique fashion. *Arborvitæ*, and such like formal shrubs, have been planted in quantities, and many excellent specimens are hedged in, falling a prey to the principle of natural selection. Many of these, years ago, would have made splendid individuals for transplanting into proper quarters, but now that they are so ensconced, and the roots gone beyond bounds, it would be no easy matter to transfer them safely and successfully, however well prepared. True, a Barron or a M'Nab might make an effort, but cautious, let-well-alone people would tremble to incur the responsibility of moving these Oriental *Thujas*, quite 40 feet high, and of proportionate circumference.

Ascending the rising ground, the present castle comes within view. It is a capital specimen of the Scotch baronial, and on ascending to its summit we find the following inscription on the copestone of the square, from whose base the four towers spring:—"Erected for James, Duke of Montrose. Peter Manuel, Clerk of Works, Edinburgh, 1857. William Burn, Esq., Architect, London; Thomas M'Caffie, Contractor, Glasgow." From this point the landscape is wonderfully diversified with the beautiful foreground of the woods and parks we have been endeavouring to describe, the famous Benlomond range, with its classical loch on the one hand, and the Fintry range on the other in the far background; indeed, such a site for beauty and interest as seldom falls within the province of even the lordly owners of broad acres to select. But what is the monument that we see standing out in the distance in the front of a cosy-like belting of trees? "It is," says Mr Connon, "that of George Buchanan, the historian and preceptor of James I. of Eng-

land, the pedantic king." Descending this pile, which, too, has been furnished out of a quarry on the estate, within a few minutes' drive of its stance, and so nicely is this said quarry embedded in and among forest specimens, that unless it was pointed out and personal inspection made, no one would think of anything of the kind. Most quarries, after serving a purpose, remain unoccupied, but this one is utilized, which shews what forethought and judgment are capable of doing if properly directed. What an admirable idea to build a gas work for supplying the house in this deep cavity, concealing everything

that would be called ugly, cropping up in any demesne, and then, in point of efficiency, just the very thing that was wanted. The lower the gasometer from the point where supply is drawn the better the quality of the gas. "Necessity is the mother of invention," and whether it was necessity or ability that prompted the undertaking we are not curious to inquire. That, like many other simple things which turn out very useful, is a wrinkle for all, whether placed or not in similar circumstances to note.

We must reserve the conclusion of this article until our next number.

## Plantations and Hedges.

### TREES AND THEIR ASSOCIATIONS.

BY WILLIAM STEVENSON, ESQ. OF NOTTINGHAM.

(Concluded from page 282.)

THE mistleto, in connexion with religious observances, carries our subject to remote times. It is associated with the antient Druids, and the once densely wooded island upon which we live, whose groves were scenes for their savage rites. History, which is almost silent with its pen on the blank leaves of two thousand years ago, affords but little proof of its antient offices. That it was a holy plant, invested with high attributes, there is little doubt, and that the people of every age have venerated the plant, we are ready to admit; but why the Christian Church in all times should fail to acknowledge it is not so easily explained. We find, upon searching the pages of history, that civil and ecclesiastical enactments have stamped out the usages and customs of antient times; nor has the mother tongue, nor even distinct races or types of men, been able to hold their own against their potent sway. Admitting all their powers, we are led to wonder upon what basis an insignificant plant should hold such a prominent position in the minds of men against ages of persecution. The Christian Church has always taught its children that the mistleto was a plant associated with idolatry, and as such was not worthy their regard. As a plant for decorating holy places on festive occasions it is never used, but away from the pale of religion, amidst the carnival of the festive hall, it has always held its sway. This reverence of the mistleto, by those without the pale of Holy Church, bespeaks a long succession of sinful worshippers, generations who would conform to the rites and usages laid down by their holy fathers in all things save their veneration of a heathen plant. This affords us a fine example of the retention of antient usages

amongst unlettered people, and ought to learn us to attach more weight to matters whose only title rests upon tradition or legendary lore.

The mistleto of the oak, "that vexed question with us naturalists," was that most sought for by the antient Druids. Pliny describes the custom as follows:—"The Druids held nothing so sacred as the mistleto of the oak, as this is very scarce and rarely to be found. When any of it is discovered they go with great pomp and ceremony to gather it. When they have got everything in readiness under the oak, both for the sacrifice and the banquet which they make on this great festival, which was observed on the sixth day of the moon, they begin by tying two white bulls to it by the horns, then one of the Druids, clothed in white, mounts the tree, and with a knife of gold cuts the mistleto, which is received in a white sagram. This done, they proceed to their sacrifices and their feastings."

Brand, quoting from one of Stukeley's works, says:—"This was one of the most respectable festivals of our Druids, called 'Yule tide,' when mistleto, which they called 'All heal,' was carried in their hands, and laid on their altars as an emblem of the salutarious advent of the Messiah." From other sources, we learn that the people went in procession to cut the mistleto. The bards, or antient poets, walked first, singing canticles and hymns, next followed a herald, who preceded three Druids carrying implements for cutting the mistleto, and lastly followed the prince of the Druids, followed by all the people. The office of cutting the mistleto devolved upon the arch-Druid, who presented it to the other Druids. On the first day of

the year it was distributed amongst the people as a sacred and holy plant, crying, "The mistleto for the new year." It would appear that these sprigs of mistleto were highly prized by the people, and from the virtues invested in them by the Druids were hung up in their houses. Its presence was held as a charm against every disease, and the malignant operations of evil spirits. It was also used in the highest office of friendship—being a valuable matter of interchange with their friends. A modern writer says, "Some remnant of these antient superstitions remain with us to this day, for we cannot gaze upon it without some slight feeling of reverence, although utterly disconnected with any religious ceremony, unless it be that of matrimony." This custom of hanging up a bush of mistleto at the festivals of Yule tide has always been observed in the kitchen or servants' hail; and although it may be invested with religious associations, still it is not without its superstitious charms, for we are told that the maid who has not been kissed under it at Christmas will remain in single wretchedness for the following year. Kissing a fair one under the mistleto, and wishing her a happy new year as you present her with one of the berries for luck, is also a custom of our time.

The religious veneration of the mistleto in antient times was not peculiar to this island, but extended over the continent of Europe, and we learn from Virgil, who compares it to the golden bough in *Infernus*, that its use was not unknown to the antient Greeks. This author speaks of it as growing on the sacred oak in the neighbourhood of a baleful stinking lake. Shakspeare follows in his path. In "*Titus Andronicus*" he describes a melancholy valley, where he associates the plant with unlucky omens.

The allusions to the plant as one of evil omen are very rare. Most of our authors and poets speak of its golden boughs in terms of praise. In the antient Christmas carols it is not spoken of until the seventeenth century. The holly and ivy may be traced at least two centuries earlier. Herrick is about the first to speak of it on Candlemas-day.

Gay, speaking of the festival of Christmas, says:—

"Now with bright holly all the temples strew,  
With laurel green and sacred mistleto."

Gay has been taken to task about terming it the sacred mistleto, and it is inferred that he must have overlooked the fact of its never being allowed to enter the sacred precincts of the Holy Church. Most writers upon religious subjects agree in terming it a profane plant, from the high distinction it held in the Pagan rites of the antient Druids.

As we are now approaching the shady side of our subject, which speaks of trees of a monumental character, I shall allude but cursorily to the ash and the elm. The weeping ash, as also a variety of the elm partaking of that character, are modern innovations amongst the older race of monumental trees, and have evidently been selected for that purpose from their resemblance to the weeping willow. The Scotch and English elms are often associated with churchyards, but from their size are only planted in the fence or boundaries. The churchyard elms are familiar objects, but they bear no higher historical associations than in connexion with the Romans, who planted them on their grave mounds.

Hood speaks of its weird associations, and many of our modern poets have bestowed a share of their notice upon it.

The associations of the willow are too numerous to be thus disposed of. The willow is to be found throughout the whole of Europe and Asia, and from the fact of its many associations with the captives of Israel, and other scenes of sadness spoken of in holy writ, we are able to reverence it in person. This is not the case with the cypress and the palm, which are not indigenous to our changeable climate, and for which we have to find substitutes. The willow serves its own purpose with us, and is used in the instance of the goat willow, whose silvery catkins speaks of the early spring, as the palm branches which were strewed in the pathway of Christ on his entry into Jerusalem. This does not speak of sadness, but reminds us of the long weary pilgrimages of our fore-



fathers, whose bourne was the shrine of our Saviour, and whose greatest prize on their return was a staff of palm wood. These pilgrims, or "palmers," as they were more correctly termed, have left their names unaltered in the list of surnames common amongst our people. The willow, in addition to this pleasing association, claims kindred with mirthful scenes in its early history. In the twenty-third chapter of Leviticus we have the following :—"Also in the fifteenth day of the seventh month, when ye have gathered in the fruit of the land, ye shall keep a feast unto the Lord seven days; on the first day shall be a Sabbath, and on the eighth day shall be a Sabbath. And ye shall take you on the first day the boughs of goodly trees, branches of palm trees, and the boughs of thick trees, and willows of the brook; and ye shall rejoice before the Lord your God seven days."

We find this observance of the willow to continue to the time of the Israelites, when they were settled in the land, "the joy of all lands."

The great turning point in the history of the willow was in connexion with the children of Israel, for under its branches they lamented their captivity in a land of strangers, and they hung their silent harps upon its branches.

From that time we fail to associate it with scenes of gladness, and it has continued as an emblem of grief down to our own time. The willow alluded to in scripture is the variety known as the "*Salix Babylonica*," or weeping willow, and many are the anecdotes connected with its introduction into this country. The tree planted by Pope at Twickenham is said to be the parent of those so common in this country; and it is sad to think that the next proprietor of the villa had it felled to prevent the annoyance of the poet's admirers visiting this beautiful tree. The *St James Chronicle*, for August 1801, contains the following notice of this remarkable tree :—"The young twig came from Spain, forming a portion of a basket enclosing a present for Lady Suffolk. Mr Pope, who was in the company when the covering was removed, observed that the twigs appeared as if they had some

vegetation, and added, 'perhaps they may produce something we have not in England.' Under this idea he planted them in his garden, and one of them produced the celebrated tree under notice."

We have evidence that long before the introduction of the weeping willow the willows were associated with scenes of sadness. Old Fuller calls it a sad tree, whereof such who have lost their love make their mourning garlands. It is a common saying to our day, when witnessing a maid in grief, to say "she is in her willows."

The weeping willow, since its introduction, has been used as a monumental tree. It was one of the European trees introduced into the Island of St Helena, and we are told that the central tree of the beautiful group of willows which skirts the Arboretum Lake of Nottingham is a cutting from the weeping willow that was planted over Napoleon's grave. From the great beauty of this tree it has become the leading favourite for shading the tombs of the departed; and it is worthy of remark that it has obtained this position amongst us in a remarkably short space of time, as it was not cultivated in this country before 1730. Mr Meyen says it serves with us to point out the resting-place of our ancestors, and speaks more impressively than any epitaph.

With this notice of the pale sad willows, I shall call your attention to the "sombre yews." In dealing with the yew tree, we have the assistance of a host of writers and poets, but, from not investigating the matter, they are mostly at a loss to account for its traditional uses. They are all agreed that it is indigenous to this country, and that it is intimately associated with the earliest of religious worship. Pliny, the poet, writing upon it, says :—"It was a tree of evil omen, that its berries were deemed poisonous, and that vessels made of its wood imported its poisonous qualities to wine kept in them; and further, that it was considered more than hazardous to sleep or take food under its deadly branches. Virgil joins in this condemnation, and calls it a noxious tree, and recommends that it should not be allowed to stand near bee hives. It is also spoken of in

this light by Nicander, Galen, and other antient writers. I shall endeavour to treat this matter in its fullest light, in the hope that some key may be found to the many vexed questions connected with this remarkable tree. At this early stage it may be out of place to venture an opinion, but still it may assist you to somewhat digest the mass of matter I shall lay before you. My opinion is, that it has occupied the position of the cypress of the East, that it has been used as its substitute in this country from the remotest time, and that the other observances and customs connected with it in its eventful history has been in a manner pinned upon it.

There is little doubt but our Pagan ancestors used its branches for sacred purposes, and decked with it the graves of the dead. It is supposed, with some show of reason, that our earliest Christian churches were erected on the sites of heathen temples, and that even these temples owe their origin to the fact of groves of shady trees, invested with high religious attributes, previously occupying their sites. In the works of a very antient Welsh bard, we are told of two churches renowned for their sheltering yews. One of these, "Henllan," signifies by its name an antient grove. Our best authors are of opinion that churches were built in yew groves, or near old yew trees, rather than that the trees were planted in the churchyards after the churches were built. Building a church was simply placing a covering over the altars, and as we are aware that altars were erected in groves without other covering than at times a canopy of trees, we may trace the custom of building churches in the neighbourhood of sacred trees to very antient times. We read in Moses of the devotions and sacrifices of Israel among the Moabites, and the idolatrous rites of the Canaanites and other tribes of Gentiles, to have been performed in groves and high places. The Druids were known to have worshipped in groves of the sacred oak; but this does not set aside the claims of the yew tree, for, as it symbolized immortality, it could not fail to occupy a prominent position. In proof of this, Phillips quotes a table taken from the

antient laws of Wales, from which it appears that the yews were solemnly dedicated to religious purposes, and were consequently more highly valued than others.

When Christianity was first introduced into this country by St Augustine, it was strictly enjoined by Gregory the Great that the heathen temples should not be destroyed, but that they were to remove the images, and to wash the walls with holy water, to erect their altars, &c., and to convert them into Christian churches. It would appear that the yew trees were allowed to remain as not necessarily conveying any erroneous impression. As it was their policy not to interfere with matters not essential, the antient observances of the yew tree were retained and engrafted upon Christianity. In these early times we have no evidence of its use further than being a symbol of immortality, and a tree of sacred shade. It may be noted that its branches were carried in solemn procession to the graves, and deposited therein under the bodies of their friends. The learned Ray asserts that this custom is still observed in the North of Devon. Shakspeare, whose learning is not to be despised, alludes to a similar custom. Pliny speaks of the use of dark evergreens for similar purposes. He says—the spruce fir being a gloomy tree, its branches were used to attach to doors as a sign of a funeral about to take place. In Sweden and Norway at the present day, when a funeral is about to take place, the road into the churchyard and to the grave is strewn with these green sprigs; the gathering and selling of which is a sort of trade for poor old people about the towns. As time wore on, and it became customary to erect crosses in the churchyards, or emblems of the victory over death achieved by the Author of our faith, and the custom of interring the dead in the neighbourhood of the church became common, the position of the yew trees would rise in importance. Their sombre hue, their durability, and slowly altering features, would symbolize the patient watching for the resurrection to those who committed the bodies of their friends to the holy ground. At this stage it is well to bear the fact in mind, that

there was no proper consecration of the burial grounds before the eighth century, and of interring within the precincts of the church until a century later.

In the neighbourhood of Chichester is the most remarkable assemblage of yew trees in Great Britain. The place is called Kingsley Bottom, supposed to be a corruption of "King's slain Bottom," or the place memorable for the death of Sygbert, King of the West Saxons, who, being deposed from his royal throne, was in this place stabbed by a swineherd of the forest. It is held with some shew of reason that these yew trees have been planted as monuments to his memory. In mediæval times, when the antient associations of the yew was lost in the vista of departed years, we learn that they were invested with new powers, and intimately associated with the superstitions of the times; and as many authors have seized upon their uses and observances as the true key to its antient history, I propose to treat upon them in illustration of my subject. Most of you may probably have observed, that they generally stand on the south or sunny side of the churches, and as this was the principal side for worshippers entering the sacred edifice, it has been inferred that they were so planted to afford a shade in the absence of porches to those who arrived at the church before the doors were opened, or during the time of prayer. In strength of this view it must be borne in mind that porches were rare features even to the most important churches as late as the 13th century. It was further customary to form seats round these trees, as is the case with the old Yew at Darley, in Derbyshire, hence the fact of seats in the porches of our churches.

We have next to notice the belief that they were planted on the south sides of the churches as important features in the village feasts. In former times these feasts were held as charters by the churchwardens, and the churchyards were scenes of frolic and gambol for the young, and the old people were provided with seats under the shady yews. We are also told that banners were erected on a tree near the church door, and

that the company were supplied with ale and provisions by the churchwardens. These innovations upon the sanctity of the church were held as innocent amusements, as the profits arising therefrom were distributed to the poor. Another authority thinks that they were planted in the churchyards to supply branches to be carried in procession on Palm Sunday, instead of the palm, and he asserts the fact that it is still customary in Ireland for the peasants to wear sprigs of yew in their hats from that day until Easter day. This substitution of one plant for another I have previously noticed in the willow, and I may note that the palm used in the grand religious processions at Rome are not the true palms. They are leaves of the Date tree, a species of palm which are cultivated on the African coast of the Mediterranean Sea, and sent to Italy under the name of palms.

Pursuing our subject, we have the authority of Dr Aikin, that yews were so planted for the sake of furnishing evergreens to decorate the churches at Christmas. Miss Kent says: "Had a tree been planted in churchyards for that use, it would more probably have been the holly, which was never omitted in the Christmas decoration of the churches."

Others allude to the superstitious age when every living thing was invested with supernatural powers. In those days the yew, from its lonely situation in the garden of the dead, was associated with ghosts and fairies, and it was held to have the power of absorbing the foul and noxious vapours arising from the graves, and thus playing a great part as a sanitary agent—hence its poisonous qualities.

Another opinion is, that yew trees were so planted to be out of the reach of cattle, to which they are a deadly poison. It is held that yews were highly necessary in those times for making the long bows for which our English archers were so famous. If this be the case, it is strange that holy ground should be selected for growing materials to be used for warlike purposes. Bearing the importance of the yew in mind for furnishing bow staves, it is strange that we hear nothing of antient forests or plantations of these trees; this fact strengthens the supposition that they were



grown in enclosed grounds. In 1307, a statute was passed by Edward the First, "to deter the rector or guardians of the churchyards from felling the trees." Now, as we seldom hear of any other class of tree being grown than the one under notice, it is fairly inferred that this statute must have principally related to yews.

The yew, through its connexion with warlike instruments, has often been the subject of legislation. Statutes were passed by many of our sovereigns, forbidding the exportation of yew wood, and obliging Venetian and other merchants to import ten bow staves with every butt of wine. By an act passed in the reign of Edward IV., every Englishman residing in Ireland was expressly ordered to have an English bow of his own height.

The last statute that appears in the books respecting the use of yew for bow staves is in the 13th of Elizabeth, which directs that bow staves shall be imported into England from the Hanse towns and other places. There are some amusing anecdotes of this tree in connexion with the English long bow. Bows as instruments of warfare are not mentioned until the time of the Saxons, when they were introduced by Vortigern, and soon became general.

The bows mentioned in scripture were composed of metal, and many were made of two goat's horns joined together, with a piece of wood for the handle.

Henry VIII. commonly held archery matches at Windsor, where the principal archers of the day were engaged. Upon one occasion when they had nearly all shot, the king noticed one of his body guard who had yet to shoot. "Win them," cried he, "and I will make thee duke over all archers." He did win them, and the gratified king made him Duke of Shoreditch, and for many years an annual show was held to commemorate the event.

In 1570 the Bowyers and Fletchers—that is, the arrow makers—petitioned Queen Elizabeth to enforce in their favour a statute of Henry VIII., enjoining every man to have a bow in his house. She did so, and butts were erected in different places. Those at

Nottingham were in the Old Town Ditch or Park Row, which, until recently, bore the name of "Butts Dyke." I must conclude my notice of this interesting tree, by observing that it is dedicated to St Leonard, a saint of the 6th century, in the old floral calendars.

The associations of the old tree at Runnymede, with King John and his barons at the memorable signing of the Magna Charta, and also of Henry VIII., who wooed the ill-starred Anne Boleyn in its shade, must be passed over in silence. I would fain allude to the Cruxton yew, under whose shade tradition says Queen Mary was wooed and won by Darnley; but time does not permit. I must consequently pass on to my notice of the "Cypress tree."

My object in giving place to this tree is to throw more light upon the yew tree, which you will bear in mind I ventured to assert was its substitute in this country. It was my intention to confine the subject to trees indigenous to this country, or to those which were introduced and commonly known amongst us. I may be allowed to observe that the cypress is not generally known to us; but as it may truly be termed the father of our monumental trees it would be unkind to pass it over in silence.

The cypress I shall treat upon is the one known as the upright variety, the "*Cupressus stricta*" of the botanists. It is a native of the Isle of Cypress. The cypress is mentioned in the book of Ecclesiastes—"I am exalted like the cedar in Lebanon and like a cypress on Mount Sion." The gopher wood of the ark is supposed by some to be the cypress.

Ovid, the celebrated Roman poet, who lived at the time of our Saviour, treats us with the legendary origin of the cypress. He informs us that a beautiful stag, the favourite of Apollo, was accustomed to come every day to be fed by the god, or his beautiful attendant, Cyprisus. One day the youth was hurling his spear—merely for exercise—when, unfortunately, it struck and killed the stag, which was coming bounding from the forest to Cyprisus, expecting to be caressed as usual. The youth's grief at this accident was so great that Apollo endeavoured in vain to



comfort him—he threw himself to the ground in despair.

This tree was known to the Greeks and Romans, and their historians inform us that the Egyptians made their mummy cases of the wood, and that the Greeks who died for their country had their ashes preserved in cypress. We are also told that it was sacred to the heathen goddess Night, the daughter of Chaos, who sat with pale face and scythe in hand at the foot of Pluto's throne. We are also told that it was dedicated to Pluto, because, when cut down, the tree never throws up suckers.

The cypress was esteemed the emblem of immortality, from its being evergreen, and from its powers of rising again when bent down by the wind. Horace mentions the custom of shutting up in the tombs with the dead a branch of cypress, and enveloping the body in its branches, and he speaks of its balsamic odour being able to neutralize the infectious exhalations proceeding from the corpse. We also learn that it was commonly used at the funerals of people of eminence, and it was placed at the door or in the vestibule of the house in which the body lay, to denote that death had visited the family. Virgil frequently speaks of its use in funeral ceremonies, particularly in that of Misenos. It has long been a custom with the Turks and other eastern nations to plant cypress trees at each end of the graves when they inter their dead. These cypress trees are so numerous at Scutari that the cemetery there resembles one vast forest. The common phrase with us, of calling our burial places the garden of the dead, bears an eastern origin, for in antient times, tombs and cemeteries were more decorated than gardens; hence the custom of planting trees in such numbers. They served as objects of decoration on the one hand, and as emblems of immortality on the other. In the Middle

ages we are treated with anecdotes and superstitious tales in connexion with this tree, which mostly turns upon the point of its durability. As this quality is associated with its unchangeableness in life, it bears upon my subject. I may note that the Popes were buried in coffins of this wood from the belief that it would never decay. Leon Alberti, a celebrated Florentine architect of the 15th century, tells us that he found a vessel of this wood, that had been submerged 1300 years, to be perfectly sound. The doors of St. Peter's at Rome, which had lasted from the time of Constantine to that of Eugene the Fourth (that is, above 1100 years) were perfectly sound when removed to give place to gates of brass. I am not able to say what came of these doors, but we have a miracle of St Giles recorded in the "Golden Legend" which bears closely upon them. We are informed that the Saint, when at Rome, cast two doors of cypress wood into the Tiber, and recommended them to heavenly guidance, and that on his return to France found them at the gates of his monastery, and set them up as the doors of his own church.

I could enlarge upon this subject did time permit, but I must pass the point of its durability over, with a quotation from Pliny, who informs us that the statue of Jupiter in the capital, which was formed of cypress, had existed 600 years without shewing the slightest symptoms of decay. He also adds, that the doors of the temple of Diana at Ephesus, which were of this wood, when 400 years old, had the appearance of being quite new, and that Plato, who looked upon this wood as more durable than brass, had his code of laws engraved upon it. Our highest poets make frequent allusions to the cypress. Lord Byron, speaking of the simoon, alludes to the cypress as "the only constant mourner of the dead."

## The Dairy and Poultry Yard.

### NOTES ON THE VARIOUS BREEDS OF POULTRY.

BY "THE HENWIFE."

IN describing the points of the different varieties of our domestic fowls, with a view to aid intending exhibitors in forming perfectly matched pens, I shall commence with

#### I. THE DORKING BREED,

Our own national fowl, whose merits cannot be too much lauded, as it is indeed the *ne plus ultra* of excellence.

Whether we glory in its rich beauty of colouring, or its more substantial qualities of shape, size, and plumpness, we may claim for it a place in any poultry tournament—abroad as at home. Indeed, on the Continent, our Dorking is making its way into general favour wherever known. At the Paris Exhibition in 1863, amongst other valuable prizes, I became the fortunate possessor of a gold medal offered by the Emperor for the best pen of fowls in the Exhibition. My Dorkings proved victorious over all the finest French varieties, and the birds could have been sold at enormous prices; but being intended for competition at Birmingham, they returned to Scotland none the worse of their trip across the Channel, and week's residence in the fairy city of Paris. In selecting a pen for exhibition, the points essential to success in the *grey* Dorking cock are the following:—

*Comb*—Straight, single, erect, evenly serrated, and free from sprigs or side shoots.

*Wattles*—Long, red, and pendulous, but firm and not too thin.

*Ear-lobes*—Red.

*Breast*—Black or slightly speckled with white.

*Tail*—Black, large and sweeping, sickle feathers well carried, a white feather no disqualification.

*Side tail feathers*—Abundant and long.

*Saddle hackle*—Light straw colour or silvery grey, long and silky.

*Neck hackle*—Ditto, coming well round to the breast.

*Primary quills*—Black or dark grey.

*Secondary quills*—Light grey.

*Upper wing coverts*—Grey.

*Lower wing coverts*—Dark grey.

*Thighs*—Straight, strong, black, or spotted with white.

*Legs and feet*—White, and free from feathers.

*Toes*—Five in number, and quite distinct, the fifth pointing upwards, and not a mere branch of the fourth, as too often seen.

The Dorking hen should have the following points:—

*Comb*—Red, falling over on either side.

*Wattles*—Red and firm.

*Ear-lobes*—Red.

*Breast*—Reddish brown, or, if the cock is much spotted with white, salmon colour.

*Tail*—Dark grey or black.

*Neck hackle*—Black and white, or duck grey, long and full.

*Back*—Dark ash or grey.

*Primary quills*—Black, or tinged with dark brown.

*Secondary quills*—Brown, spotted.

*Upper wing coverts*—Grey.

*Lower wing coverts*—Grey, and very distinct.

In addition to points and colouring, size

and weight must be considered, as the latter is often the criterion where there are pens of equal merit competing in a class. In form the Dorking should be as near a square as possible—broad and full in breast—and should stand on short legs, set well apart; the cock must be of upright, bold carriage, and if an adult bird, be not less than 10 lb. in weight: 7 lb. each would be about the equivalent weight in the hens. Of these, it must be borne in mind that perfect matching is required in every particular.

While allowing the Dorking breed of fowls full and just praise, I must warn my readers that, unless with assistance from hens of other varieties, *very early* chickens cannot be obtained from them. They are tardy sitters; therefore any winter-laid Dorking eggs (and these can only be expected from the few and precious *early watched* pullets) must be entrusted to the care of foster-mothers. It becomes a necessity to have these at hand, and the Cochins and Brahmas come in admirably to supply this want; but we must also consider how the eggs for household use during winter are to be procured, besides those required for setting. If poultry is kept at all, it should be made to meet our wants at the dearest as well as cheapest season of the year—only thus can it pay—and we must therefore have a stock of early-hatched pullets of good laying kinds to supply eggs which, in market, are worth from 1s. 6d. to 2s. per dozen during the cold, frosty winter months.

## 2. THE HOUDAN BREED.

The French breeds are, as a rule, excellent layers of large, white, delicately-flavoured eggs, and as they rarely sit, five eggs weekly can be depended upon from each hen. Unlike the Dorking, they lay in winter quite irrespective of age; and adult hens, if highly fed, will lay during nine months of the year. I particularly recommend the "Houdans," and can, from experience, speak highly of their many good qualities. In addition to their laying powers, as table fowls they are excellent—smaller than the Dorking, but equally white

in flesh and well shaped. I have found them quite hardy, and in damp weather much more easily reared than Dorkings. Their feathers quickly, and are altogether more precocious than any other breed, unless the Hamburg—*that pretty, graceful bird, diminutive in form, but of rare beauty.* "Houdans" are imported in large numbers from France, and as they are not expensive, will be widely spread, I hope, throughout our own land. They should be seen in every farm-yard, and I can guarantee that the earliest chickens sent to market will be from that breed. Houdans, in their own country, have no particular points of colouring beyond the black and white plumage, as free from any tinge of yellow as possible. In our exhibitions we are, however, more ambitious and exclusive, and I shall endeavour to describe the points of merit aimed at by English fanciers and breeders. Size in this breed should have much influence in the decision of judges, just as in "coloured Dorkings," where, provided the hens are matched perfectly, a mere shade of brown, darker or lighter, is not considered a disqualification. Premising that the pens of Houdans will be matched in colour of leg, the other points are as follows; and first of the cock:—

*Breast*—Black and white, regularly spotted, full and deep.

*Thighs*—Spotted, as short and fleshy as possible.

*Legs and feet*—Light grey or white, free from feathers.

*Tail*—White, carried well up, and abundant.

*Saddle hackles*—White and long.

*Neck hackles*—White and black streaked, very full and long.

*Body*—Spotted black and white.

*Comb*—Branched, and slightly cupped.

*Wattles*—Red and long, but firm.

*Crest or top-knot*—Scanty, streaked black and white.

*Carriage*—Upright and bold.

The points of the hen are as follows:—

*Breast*—Black and white, regularly spotted.

*Body*—Ditto.

*Legs and feet*—Light grey or white.

*Crest or top-knot*—Very full and globular, mixed black and white.

*Beard*—Full and long.

*Comb*—Small and spiked, or slightly cupped.

The Houdan breed is also distinguished by a fifth claw.

I have given as many particulars as I think necessary to aid in selecting an exhibition pen. There are some varieties of Houdans very dark in colour—the ground black, with very little white; but the rules hold good for these as for the lighter, only the tail feathers must in the cock be almost black, and the hackles also be of dark hue. Either variety breeds true to colour. I consider them very hardy, much more so than any other breed I know of, and as winter layers they cannot be surpassed.

### 3. THE BRAHMAPOOTRA BREED.

I have alluded to the Brahma-pootra fowl, recommending it to be kept along with Dorkings as a valuable variety. It is quite hardy; the hens lay well, especially in winter, and as they sit early, and are excellent mothers, to them should be entrusted the eggs of Dorkings (laid by pullets in January), and those of non-sitting hens, such as Spanish, Houdans, Hamburgs, &c. Brahmas are, in my opinion, very beautiful; and although I cannot say they are good table fowls in an *adult* state, as chickens they are not to be despised. They cross well with the Dorking or French breeds, and very early strong chickens may be obtained in this way. There are two distinct varieties of Brahmas recognized—the light or white, and the dark or pencilled. Both are pure, and breed true to colour. They are easily kept within bounds; a wire fence 3 feet high is sufficient to confine them to their yards, and they do not require so much range as Dorkings or game. The pullets attain full growth at five months, and begin to lay; their eggs are of fair average size, and of a beautiful pale brown or buff tint. To those who have only

a limited space for their poultry, I can strongly recommend the Brahma. It is handsome, docile, useful, and at present quite the fashion, so the stock commands good prices. A cross with it improves the mongrel, leggy, small breeds generally seen in farm-yards, and wherever it has been introduced a very evident increase in the size of the chickens may be observed. Farmers will not *all* allow poultry fair play; they consider it beneath their notice, and do not take pains to improve it. I should like to see it recognized as part of the live stock, bearing its full value, and as well treated and cared for as—well, at all events—the porcine race!. The sweepings of the hen-house are of quite as much value as those of the pig-stye; and if only pure breeds are kept, every head of poultry will be *as well* sold as pigs at the age of four weeks. True to my sex, I am wandering from my particular subject, the description of the Brahma-pootra, and must now return to it, to give the exhibition points of both the light and dark varieties, as specified by the “standard of excellence.” The points of the cock (dark or pencilled) are as follows:—

*Comb*—Pea, small, straight on the head, not leaning to either side, distinctly divided to have the appearance of three small combs joined together, the largest in the middle, each part slightly and evenly serrated.

*Head*—White and small.

*Wattles*—Small, well-rounded.

*Neck*—Long, neatly curved, slender near the head.

*Hackle*—Full and flowing, well over the shoulders, silvery white, striped with black.

*Saddle hackle*—Very abundant, silvery white striped with black.

*Back*—Broad and flat, white.

*Tail*—Black and small, carried very upright; the higher feathers spreading out laterally.

*Thighs*—Very large, and strong, covered with soft fluffy feathers (black, mottled with white), curving inward round the hock, so as to hide the joint. Vulture hocks are objectionable, but not a disqualification.

*Legs*—Yellow, short, and strong, set well



apart, and abundantly feathered (black, mottled with white) down the outside to the end of the toes.

*Toes*—Straight and long, the outer and middle toe well feathered.

*Carriage*—Very upright.

*Breast*—Full and broad, black, slightly spotted with white.

*Wing*—White and small.

*Wing coverts*—Metallic green, black, forming a well-defined bar across the wing.

*Tail coverts*—Rich, greenish black; lesser coverts edged with white.

*Under part of body*—Black, or slightly mottled with white.

The points of the hen (dark or pencilled) are as follows :—

*Comb*—Pea, very small and low.

*Head*—Grey, small and slender.

*Neck*—Silvery white, striped with black, rather short, neatly covered, slender near the head.

*Breast*—Very deep, broad, and prominent, the feathers dull white, minutely pencilled with dark pencilling, so as almost to cover the ground colour.

*Legs*—Yellow, well feathered, set wide apart.

*Toes*—Straight and long, the outer and middle toe well feathered, scales yellow, with a dusky shade.

*General plumage*—Grey, well pencilled throughout.

*Carriage*—Low as compared with the cock.

The points of the light variety of the Brahmepootra cock are as follows :—

*Comb*—Pea, rich bright red.

*Head*—White; small and slender.

*Neck*—White, with a distinct black stripe down the centre of each feather.

*Hackle*—Full and abundant, flowing well over the shoulder.

*Saddle Hackle*—White, striped with black.

*Breast*—White; full and broad.

*Wing, base, and coverts*—White.

*Wing primaries*—Black.

*Wing secondaries*—White on outside web; black on inside web.

*Tail*—Black, small, and carried well up.

*Tail coverts*—Glossy green, black.

*Legs*—Straight and strong, set well apart; scales yellow, well feathered down the outside to the end of the toes; feathers white, slightly mottled with black.

The points of the light Brahmepootra hen are the following :—

*Comb*—Pea.

*Head*—White; small.

*Neck*—White, distinctly striped down the middle of each feather with rich black.

*Breast*—White; broad and deep.

*Wing*—White, the primaries alone being black.

*Tail*—Black, but the two highest feathers edged with white.

*Thighs*—White, well covered with very soft feathers.

*Legs*—Yellow; short and strong; feathered down the outside to the toes with white feathers slightly mottled with black.

*Carriage*—Low.

The Brahmepootra hen should be of good size, and have a broad and deep appearance from the abundant soft fluff in which the tail is almost buried, also the wings. The back must be broad but short, with soft feathers rising to the tail; and finally, in both cock and hen, the eye should be prominent and bright. Brahmepootras may be fed up to great weights, but this renders them useless for breeding purposes; and as the hens have a tendency after the first year to accumulate internal fat, they should have a limited diet, or the egg organs will become diseased, and the natural activity of the birds impaired.

## POULTRY SHOWS.—PREPARING FOR EXHIBITION.

BY "THE HENWIFE."

THIS being the season for making preparation for poultry shows, a little advice to those who are about to make their *debut* in poultry life may be acceptable from one who has "trod the boards," and experienced the anxiety, and frequent disappointment, which attend the footsteps of the exhibitor. This very day I am preparing sixty birds for show, and I cannot do better than relate my own mode of procedure. About the middle of July I selected from the free runs of pullets and cockerels a few of the best of each kind of fowls, and shut them up in the wired-in range of the poultry-yard, where they were well fed and had regular exercise. Three weeks ago I matched a cockerel and three pullets of each kind, returning the rejected ones to their old homes none the worse for their change of abode and extra feeding. The selected champions of the poultry-yard were then made the objects of peculiar care and attention. While at exercise they were watched to prevent fighting, which is certain destruction to the combs and toes of cocks. Their food consisted of meal mixed with ale or milk, scraps of meat from the table, linseed soaked and mixed with rice or meal, hempseed, groats, and wheat. Nothing is too good for exhibition birds, the expected winners of first prizes and silver cups. Having put up three pullets with each cockerel, I have had to select from them the best pair and return one to its plantation run. It is not an easy matter to match a pen of fowls, though only three in number. There are so many points to be considered, and the matching of combs, hackles, breasts, shape, and colour, must be perfect. All other points being equal, I determined the final choice by weight, and I have just completed my entries by weighing my beautiful Rouen ducklings, which turned the scale at 18 lb. To-day, also, has been devoted to washing the white Cochins and light Brahmas. Old birds are yellow and shabby

at this season, and require to be thoroughly cleansed to look at all well. I use a brush, white soap, and hot water, taking care to brush the feathers straight down, and always pouring tepid water over the bird to remove any traces of the soap. Immediately after washing, and drying with soft towels, put the birds into hampers with straw, and keep them under cover till quite dry. I always wash the feet of dorkings carefully before putting them into their exhibition hampers, because the white leg and foot are "points" of excellence; and it freshens up all birds to have their legs, combs, and faces washed and made tidy before leaving home to be admired of hundreds, and to undergo the scrutiny of keen, quick-sighted judges. It is often so difficult to decide between two cocks of apparently equal merits that I always pen them up in a row, and select the one that shews himself off to the best advantage. A drooping dull bird is seldom successful; sprightliness is a sign of health and boldness of mien, indicative of vigour and courage—two essentials in male birds. Tomorrow I shall, with the help of many willing assistants (for a poultry show is a great event, and speculation is rife upon the merits of the different birds), put my beauties into their hampers and despatch them to their destination. Their breakfast preparatory to their journey is entirely of meal, with a little spice (pimento or pepper) in it to give warmth, and I always send along with the birds a bag containing food for at least one day. The hampers are best when circular in form, as fowls often creep into corners and destroy their feathers. They must be sufficiently high to enable the birds to stand upright, and in each should be a good bedding of hay. I consider a lining imperative for all birds *lut* geese, ducks, and turkeys, and even for these in cold weather a little straw stitched inside the hampers adds very much to their comfort.

Coarse canvas or calico fastened round the basket is what I use, and from time to time these linings are taken out, washed, and put aside for future occasions. The hampers should have wicker-work lids, to tie down with strings, and I always, if possible, superintend the putting the birds into their hampers, and tying on the labels. Mistakes are of frequent occurrence; and it is almost too much for one's temper to have a fine pen of

birds disqualified from [having] been placed in a wrong hamper. I have known this sad event happen, and experienced the inevitable effect. During exhibition I strongly deprecate the use of grain. Much discomfort is consequent upon the liberal supply given on these occasions to poultry; and I have even seen sawdust put in the bottoms of the coops, which reprehensible plan is certain to cause illness of a very serious nature.

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### THE HENWIFE'S KALENDAR FOR OCTOBER.

THE henwife may continue to dispose of eggs as soon as gathered. They change rapidly during summer and autumn, and so are liable to deteriorate in value more than during spring. She may also continue to add to her store of preserved eggs, whether buttered or preserved in lime-water. Some of the later broods will now be ready for market or table. Cockerels, unless destined for roosters, should be killed off as soon as they have sufficient flesh. All they eat after this is simply so much food wasted. The pullets not suited for mothers or for layers should also meet with similar treatment, and the yard thus be gradually reduced before the setting-in of winter. If the remainder be turned out into the stubble, as in farm places they are almost sure to be, they will feed sumptuously, and greatly add to the contents of the egg-basket. In kitchen-gardens, too, when the potatoes are taken up, and much of the green crop consumed, poultry will be found to do little or no harm; the worms and insects they find contribute much to the egg-producing powers; their droppings give fertility to the soil, and almost compensate any injury they may do. The fresh air sets them up wonderfully, and prepares them for the confinement of winter.

By this time the henwife will have a stock of feathers collected, and if she has acted prudently they will be nearly all ready for use. The plan is simple. Let each fowl be plucked while warm; separate the large wing feathers, put the others into a dry tub, or basket, or

box, in a dry place; shake them up each day, so that all may alternately be exposed to the air; then put them into paper bags, put the bags into a *coolish* oven, let them remain till thoroughly dry, when they will be fit for use—or the bags may be suspended from the roof of the kitchen, but in this case they will take longer to dry. Some of the small feathers require to have the hard quilly portion cut off with a pair of scissors. The wing feathers may be stripped and added to the others.

We have hitherto made no mention of the diseases to which fowls are subject, and of the remedies for them, for two reasons: first, we think that the henwife who scrupulously attends to the conditions of health on which we have enlarged—viz., warmth, cleanliness, proper feeding, and proper cleaning, will have little reason to complain of disease in her poultry-yard. Secondly, when disease does make its appearance, we have little faith in the remedies propounded for its removal, having rarely seen them produce any good effect. We would seek, then, by steady adherence to the plans laid down, rather to prevent disease than to cure it. But should the fowls at any time shew symptoms of illness, hanging the wing, or delaying to leave the hen-house, good might be done by mixing in their food some simple medicine, such as Epsom salts or jalap, in the proportion of a teaspoonful to twenty fowls. Some give this occasionally to all their poultry, and find it do them good. The warmth of a fire, or

even of the hand, often restores a chicken, when apparently dead. And whatever be the treatment in case of disease, the patient must be removed from the yard: for, strange to say, the other fowls invariably illuse those which are ill, and not unfrequently peck them to death.

Disease in the feet is often caused by the fowls descending from high perches. Though they often ascend by means of a ladder, yet they *never* use it in their descent; hence the necessity of having the perches placed near the ground. The feet of young turkeys are injured by treading on nettles.

It may be supposed that something should be said about the quantity as well as the quality of food required for a given num-

ber of fowls. This might easily have been done, but we imagine that it would be productive of no good results. A very little experience will shew the attentive henwife the quantity requisite. Should she at first err, as it is likely she will, on the side of profusion, the wasted food will disclose her error, and lead her to give in future more stinted supplies. Should the opposite error be made, the mistake will be even more readily discovered. Her feathered dependents will have no difficulty in conveying to her a sense of their wants, nor will their eager look be misunderstood or neglected, by the faithful henwife, whose happiness it ever is to anticipate the wants and minister to the necessities of her confiding flock.



## The Naturalist.

### THE CROCODILE POND OF MUGGERPEER.

MR ADAMS in his interesting work, "Wanderings of a Naturalist in India,"\* contributes a good quota of original field observations, and the closet naturalist will find many facts among them which he may apply to theoretical purposes. As an interesting example, we may take the account given by him of a visit which he paid to the crocodile pond called Muggereepeer in Scinde. This resort of crocodiles occurs in an oasis lying in the heart of sandy deserts, a considerable distance to the north-west of Kurrachee; and how these reptiles came there forms a subject of speculation somewhat akin to the puzzle of the reel in a bottle, and as the reader will, we think, find only to be explained on the same principle.

The accompanying illustration from Mr Adams' work will help to give an idea of this reptilian depôt, although his graphic description scarcely requires it:—

"The journey for the first few miles is of the usual uninteresting description—sandy plains, intersected with deep fissures and ravines, or studded here and there with 'scrub,' the oleander-leaved spurge (*Euphorbia neriefolia*), plentiful in all waste and desert parts of Scinde.

"Emerging from a defile, which leads through a low range of hills, the traveller enters on a desert waste, stretching westward towards the mountains of Beloochistan. In the far distance two oases are visible, whose date and coco-nut trees are refreshing to the sight after eight miles of the most monotonous scenery. In the vicinity of the nearest grove is an antique burial-ground, where may be observed several curiously carved gravestones.

"I visited the crocodiles (*Crocodylus palustris*) on two occasions, at an interval of several years, and although during that time they had been seen by hundreds of Europeans, including a certain class of mischievous young Englishmen (whose chief amusement, we were told, had been to shy stones and sticks down the throats of the gaping monsters as they basking

on the banks of the pond), yet there seemed no diminution in their numbers, and the wild and unearthly interest of the scene was to us as great as ever. From beneath a little banyan-tree on the verge of the pond, the spectacle, during the steaming heat of a mid-day sun, might call up to the mind of the geologist the eons of the world, when the 'great monsters' wallowed in the seething waters of the oolitic ages, when the mighty 'Ichthyosaurus,' and a host of 'fearfully great lizards,' dragons, &c., reigned supreme over sea and land. And as the date-palm now waves its shady boughs over the crocodiles of Muggereepeer, so then did the magnificent tree-ferns, gigantic reeds, and club-mosses, shelter their extinct predecessors.

"The greater pond is about 300 yards in circumference, and contains many little grassy islands, on which the majority of the crocodiles were then basking; some were asleep on its slimy sides, others half-submerged in the muddy water, while now and then a huge monster would raise himself upon his diminutive legs, and waddling for a few paces, fall flat on his belly, Young ones, from a foot in length and upwards, ran nimbly along the margin of the pond, disappearing suddenly in the turbid waters as soon as we approached. The largest crocodile lives in a long narrow tank, separate from the others. The Fakirs, and natives who worship in the neighbouring temples, have painted his forehead red; they venerate the old monster, making a salaam to his majesty whenever he shews himself above water. A handsome young Beloochee, whose occupation it was to feed the animals, informed us that the said king was upwards of two hundred years old! (?) and that, by way of a 'tit-bit,' he was in the habit of devouring the young crocodiles. During our visit, this enormous brute was asleep on the banks of his dwelling-place, and seemed quite indifferent to our presence, although we came within a foot of him, and even attempted to arouse him, by rubbing his nose with a leg of goat's flesh, which, however, a young one greedily seized, and dived under water. Our attendant tried in vain to excite their ferocity, but beyond a feeble attempt to snap their trenchant teeth, the animals shewed no disposition to attack us.

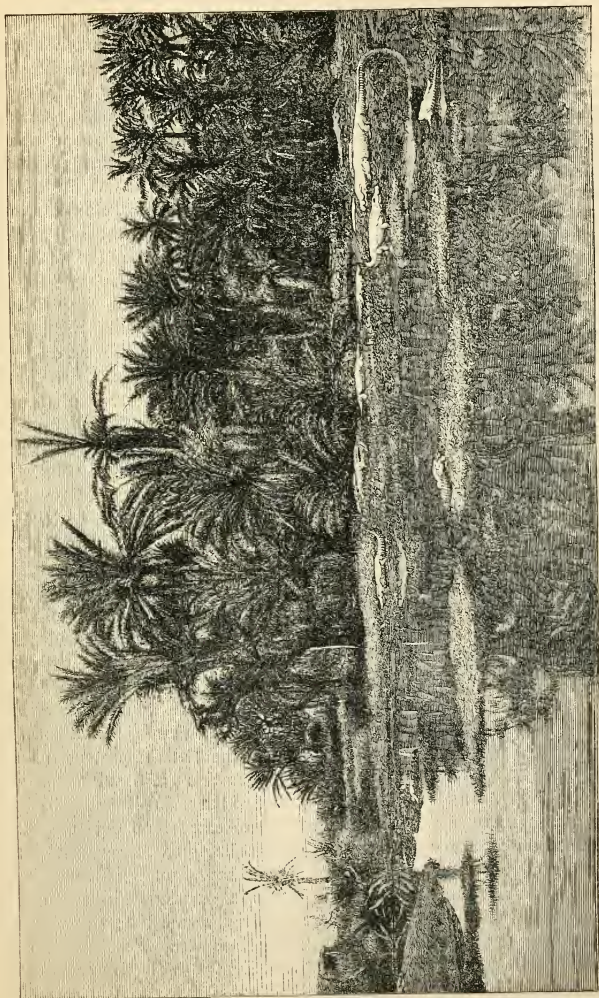
"A pony was wading about in the pond, and feeding on the grassy hillocks, but the crocodiles took no notice of him.

"The water in the pond felt cold, although fed from two hot springs, one of which was of so high a temperature that I could not retain my hand in it; yet

\* Edinburgh: Edmonston & Douglas. 1867.

animal life existed, for I found where the water bubbled up from its sandy bottom, and in the little lade running to the tank, abundance of a small species

“The other spring gushes from under a bed of limestone, containing numbers of fossils, chiefly coral, and other marine zoophites. We had a refreshing bathe



Crocodile Pond at Muggerpcer.

of small black spiral shell, which Mr Woodward informed me is 'very like some in the British Museum, named *Melania pyramis*, an allied species of which frequents the river Jordan.'

in a reservoir close by; the temperature, though not so high as the last, was still warm and pleasant. I should be sorry, however, to repeat the experiment, not from the chances of meeting with a crocodile

(for, I believe, the Fakirs of the temple guard well against such accidents), but from the circumstance that (as is generally the case all over the East) lepers and persons afflicted with loathsome diseases repair to such localities.

“The crocodiles dig deep in the sand, under the neighbouring date-trees, and there deposit their eggs. Quantities of deciduous teeth of various sizes were strewn along the slimy sides of the pond.

“Strangers are expected to stand treat, not only by the Fakirs and natives who gain a livelihood by hanging about the pond and shewing the monsters, but even the crocodiles themselves seem to anticipate a feast, and on the arrival of a party, come out in unusual numbers. Accordingly, we had a goat slaughtered, during which operation the brutes seemed to rouse themselves, as if preparing for a rush. Then our guide, taking piece after piece of the flesh, dashed it on the bank, uttering a low growling sound, at which the whole tank became in motion, and crocodiles, of whose existence we had been before ignorant, splashed through the shallow water, struggling which should seize the prize. The shore was literally covered with scaly monsters, snapping their jaws at one another.

“They seize their food with the side of the mouth, and toss the head backward, in order that it may fall into the throat.

“A few were observed to bolt their portion on shore after very slight mastication, but the majority, anxious to escape from their greedy companions, made instantly for the water, and disappeared with the piece of flesh sticking between their jaws. Our young Belooch friend informed us that they generally swallow their food at once, and do not, as has been asserted, bury it until it becomes putrid; also, that other large individuals besides the old king frequently devour the young soon after they are hatched. Crocodiles wallowing in the mud of the Nile, or gavials in the Indus, are sights which one is prepared to encounter; but the traveller may wander far before he meets with a scene so strange and unexpected as that just described. How these animals found their way inland to this solitary oasis we could not discover. It can only be surmised that they had probably been introduced by the natives.”—(Pp. 41-45.)

Noteworthy as are many of the incidental facts above noticed, by far the most interesting and important question is not, indeed, that put by Mr Adams at the conclusion of the above paragraph, “How these animals found their way inland to this solitary oasis?” (for that is assuming a part of the question—that they did find their way inland), but how it happens that these animals are now found there? The reader sees that there is another way in which this fact may have come about, than that of the animals having come

to the oasis; the oasis may have come to them. There are many facts which prove beyond doubt that at a very recent geological period, the now sandy deserts of the Punjab and Scinde were covered with water. Falconer and Cautley have abundantly proved that the elevation of the Sevalik, or outer range of the Himmalayahs, took place almost, if not absolutely, within the human era; and it is, doubtless, to the influence which upheaved these mountains that the uprising and laying bare of the bed of this Scindian sea is due. It is more than probable that originally an estuary, or bed of the sea, united the Bay of Bengal with the Indian Ocean. This estuary or sea seems to have been afterwards cut off from the Bay of Bengal by the elevation of the level between the Indus and the Ganges, and divided from the Indian Ocean by the barrier along the coast line. When so circumscribed, Scinde and the Punjab must have been one vast inland fresh water, or brackish lake—doubtless inhabited by abundance of crocodiles. When the continued elevation of the level of the country in the direction of the Himmalayahs tilted up the basin which held the water, and it found its way through the barrier at Kurachee, the bed of the lake would gradually become dry, leaving water only in the deeper holes and pools, which would become oases like that of Muggerspeer. In them, of course, the crocodiles and all other aquatic and amphibious life would take refuge; and it seems more than probable that those which we see there at the present day are the solitary remains of multitudes which once crowded the wide shores of that inland sea.

There can be no objection to this, from any doubt as to the present crocodile having, perhaps, not been in existence at the period in question. In fact, long anterior to that—viz., at the time when the Sevalik beds themselves were deposited, many animals now living in India had already made their appearance; and among these, it would really appear that the present crocodile, and, at all events, the gavial, were of the number, both of which now occur in these districts. The reptile in the crocodile pond



at Muggerpeer is the crocodile, *Crocodylus palustris*. The gavia (*Gavialis Gangeticus*), or Indian alligator, does not occur there, but abounds in all the great rivers of northern India, and in the Indus is found from its delta northwards to Attock. Captain Cautley, in a memoir published in the "Asiatic Researches," xix., 25 (1836), "On the Fossil Crocodiles of the Sewalik Hills,"\* says—

"Of the crocodile of these strata I have attempted in the preceding section to shew, as far as measurements and my limited means point out, that the main difference between the fossil and the existing animal of the present rivers is in the breadth; a difference that might tend to an opinion of its being allied to the Cayman, did not other more distinct characters separate it at once from that sub-genus. In the Gharial (*Gavialis*) now under review, I am unable to recognise any difference from the living animal; and there are certain peculiarities about the external surface of the skull of the existing Gharial (*Gavialis*) in slight indentations and rugosities, which are singularly coincident with those of the fossil."

If this is the case with fossil remains, so old as the Sewalik beds themselves, it can excite no surprise that, at any rate, the crocodile of a period long subsequent to the consolidation and upheaval of these very beds should be so.

This is not the only instance of such an occurrence. According to M. Duveyrier, exactly the same thing has happened in the desert of Sahara. He tells us ("Explorations du Sahara," p. 29 and 232), that the crocodile still lives on the north side of the Saharan desert, particularly in the little lakes of Mihero, which must have once formed part of the great Saharan sea.

The idea that a breed of the crocodiles could, or would, have been brought over the desert, and deposited in the oases by natives, seems to be wholly without foundation. It involves an anticipation of and preparation for the future greatly beyond the intelligence or practice of the present natives. The occurrence of a fresh water dolphin (*Platanista Inda*) in the Indus is another fact which seems to point to a change from a marine bay to a fresh water lake; for the dolphin is a

marine animal, although capable of living for a time in fresh water. A slow change from salt to fresh might have kept the species alive until it, as well as the medium in which it lived, were changed. The only other fresh water dolphins (one in the Ganges and one in the Amazons) doubtless owe their origin to similar machinery.

The salt ranges of the Punjab have no relation to this sequence of events. Any deposits of salt that might have been left, as in other cases by the drying up of a sea, could not occur here; for, by our hypothesis, before it was dried up, the sea had become fresh water, of course from the flow of fresh water into it from the snowy range of the Himalayahs. No salt lakes or incrustations of salt or soda, as in the deserts in North-west America or the Sahara, occur in the sandy wastes of the Punjab. The salt in the salt ranges is derived, not from surface deposits at all, but from beds in strata, at least as old as the new red sandstone, if not referable to the still older period—the carboniferous epoch.

Mr Adams' description of this remarkable district is as follows:—

"The salt range extends from the Himalayahs across the Punjab in about a straight line to the Suliman mountains on their west flank, and is composed of low hills, intersected by narrow ravines or prominent ridges, for the most part devoid of vegetation. Limestones, saliferous red and grey sandstones, would appear to form the chief geological formations, which, according to Professor Fleming, belong to the carboniferous period (Quart. Journ. Geol. Soc., 1853 and 1862; also, Journ. As. Soc., Beng., 1853, &c.). The plateaux, excepting where extensive denudation has taken place, are covered with rounded pebbles, mostly formed from the breaking up of the limestone beds. Salt is found in veins in various situations, more especially among the sandstone and marl beds in the neighbourhood of Kuller Kahar, where there are extensive salt mines. The barren and sunburnt appearance of these mountains strikes the traveller; indeed, it is chiefly on that account that they become a safe retreat to the wild sheep, for, except in the cultivated districts, these dreary and desolate wastes are seldom disturbed by man."—(P. 138.)

"The ravines in the district of Jubba have a peculiar appearance. Viewed from a height they present a series of worn and angular-shaped hillocks, intersected by narrow defiles, by no means inviting to the traveller, for not a blade of grass is visible, and the

\* See Reprint in Palæontological Memoirs of Dr Hugh Falconer, vol. i., p. 351. Hardwicke, 1868.



disintegrated red sandstone and marl suggest the idea of sleeping volcanic embers, which we found during the heat of mid-day had more than a mere resemblance. I do not think I have ever witnessed a scene so perfect in its desolation. However, we determined to descend in spite of the stewing heat and reflection from the hillocks on each side. Whilst threading our way among a series of narrow lanes we came on a young houriar (*Caprovis Vignei*), just dropped, and evidently abandoned by its mother on seeing us approach. Several herds of rams (which separate from the ewes during the breeding season) were observed dashing across ravines, offering a snap shot occasionally. As we anticipated, the heat by noon became excessive, and our thirst intolerable. No water could be procured save what was strongly impregnated with salt. At last exhausted, I gave in, and

must have been verging on a *coup de soleil*, as my senses began to leave me, and I felt that both eyesight and hearing were rapidly failing, accompanied by a loud buzzing sound in both ears. In this condition I lay stretched on one of the red banks, whilst the Shikaree set off in search of a spring. I think I may have remained for nearly half an hour in this condition when I was aroused by the voice of a native, and looking up, beheld a half naked man carrying a basin of milk and platter full of cakes, which he at once begged I would accept. This good Samaritan had seen my distress from his grass-built hut on the top of a neighbouring hill, where he resided for the purpose of guarding a vein of salt. Never can I forget the kindness of the poor fellow, who, unsolicited, came to my aid at a time his services were so sorely needed."—(P. 150.)

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### BIRD MURDER ON THE BASS ROCK AND AILSA CRAIG.

A WRITER in the editorial columns of the *Edinburgh Courant* discusses the bird murder which has been carried on at the Bass Rock and Ailsa Craig in the following terms :—

In the articles that have appeared in our columns on the grouse question—which, despite the elections, is at present one of the questions of the day with country gentlemen and others interested in the economy of the moors—we have always advocated that, in practice as in theory, the balance of nature should be as little disturbed as possible. We said so during last grouse season, and this year we have over and over again taken occasion to repeat our opinion; and, as was the case last year, we are supported by an important utterance of the British Association, besides some excellent corroborative evidence which has recently been communicated to the *Times* about bird murder at Ailsa Craig and the Bass Rock.

One would have supposed that the Solan geese of these island crags might have been allowed to go on for ever undisturbed, except by occasional parties of shooters and egg-gatherers. They have, of course, their mission to fulfil in the economy of nature, and the space on which they live being so

limited they could scarcely increase to such an extent as to become a nuisance to inland living persons. If any class of human beings has a right to object to them and to insist upon their extermination it is the fisherman, for these birds live chiefly upon fish, and are said to eat an extraordinary number of herrings—millions per annum, we are told! So far, however, from the fishermen desiring the destruction of these animals, they rather like them, as they play an important part in the gathering of the herring harvest—they guide the men to the fish. The herring gulls—as the sailors call these birds—have a keen scent for a shoal of fish. We have seen hundreds of them hovering over the water, and we knew by the sign that the herrings were below them in serried armies of incalculable strength. The wise men of the Isle of Man decreed last year that sea gulls ought to be preserved by statute, and accordingly an Act was passed by the Tynwald, which received the Royal assent, decreeing that any person destroying a gull, taking its eggs, or having in his possession any plumage recently stripped from these birds, should forfeit the sum of £5. The preamble of the Act states that the birds are considered of great importance to fishermen

in guiding them to shoals of fish, and also for sanitary purposes by removing offal of fish from our shores and harbours. There is apparently no Act of the kind in Scotland, and so these birds are being slain in such numbers as forbids the hope of a breeding stock being left. The *plumassiers* will ere long exterminate the gulls. They give 1s. a head for them; and one enterprising dealer recently gave an order at Ailsa Craig for one thousand kittiwakes per week! What power of breeding could stand out against such wholesale destruction? In a letter to a contemporary we see that one man boasted of having killed last year with his own gun at Flamborough Head four thousand of these gulls, and that another sea-fowl butcher had an order from a London house for ten thousand, all for the "plume trade." To meet the great demand from London, we are told that the tacksman of Ailsa Craig spread his nets while the birds were sitting on the newly hatched young, which were left in hundreds to perish on the ledges—most truly a killing of the goose for the sake of the golden egg.

The British Association has taken this matter in hand. Mr Newton came forward with a still more forcible exposition of the views of Mr Tristram than was indicated last year. He contends that birds of prey are the sanitary police of nature, and that if these birds had existed in their old strength, they would have stamped out the disease among the grouse as the Order in Council stamped out the cattle plague. There was an interesting discussion on the question of what we designate "the balance of nature." Mr Buckland defended the rat as a sanitary animal of great value, and said it ought not to be exterminated even to provide gloves for ladies; and as to "gull murder," Miss Becker, of Manchester, said that "No lady would willingly wear the feather of a bird that was destroyed in the act of feeding its young. Ladies should be instructed on these and other subjects, and should be allowed to meet with the other sex on equal terms, not as listeners only, in the discussion and acquisition of the various branches of knowledge in which they were all

interested, instead of meeting, as they did, with discouragement. If that plan were pursued, naturalists would have no reason to complain of the conduct of ladies."

We have so recently given our opinion upon the grouse disease and the question of moor economy, that we have no great desire to "hark back" upon it at present, except to shew that the inconsiderate destruction of birds of prey by gamekeepers and others is not an unmixed good; indeed, some men say that it is to the officiousness of the gamekeepers that we owe the grouse disease. They are generally paid so much a head for the destruction of what are called "vermin," and, of course, they are desirous of swelling this extra amount which falls to be added to their wages. The Rev. Mr Tristram last year told us, at Dundee, a few plain truths about the consequences of destroying the hawks. We had, before he spoke, expressed a similar opinion, that the hawks and falcons did very good service in attacking and killing off birds that would have proved very bad breeding stock. To the absence of these birds of prey much evil was attributed. If, as nature evidently intended, these keen-eyed birds had been allowed to swoop down on the weaker members of the grouse family, the disease would have been much milder than it was, for it is only by the action of such birds of prey as have been named that the race is kept at a healthy standard. So much shooting leaves upon the moors many helpless birds; these, it is fair to assume, cannot breed a healthy progeny; and as weak birds are more liable to disease than strong ones, *ergo* we have the case proved.

We shall not, like some of the *savants* at Norwich, mourn over the disappearance of the great copper moth, although that fact illustrates the position we take up, and supplies also an apt illustration of what we have been lately arguing about "over-fishing" and "over-shooting." Our desire is that all food products, even when, as in the case of the grouse, they assume the guise of luxuries, should be dealt with according to the laws of nature. Of course nature never intended that every young grouse should live, or that every sal-

mon egg should be hatched ; but, on the other hand, did nature ever contemplate that what was once a sport would become a business, and that every grouse would be shot? As there are "sermons and sermons," so there are shooters *and* shooters. One shooter is a sportsman, another is a bird-butcher, who takes a moor and clears it of every living thing. Bird murder is, however, attracting attention, and men are beginning to know that even our sparrows have their proper mission. "Kill off your sparrows and so increase your caterpillars," is pretty much what would express the result of the kind of small bird murder which has of late been advocated by some people. Farmers, for instance, ought never to grumble at the presence of "peesweeps;" they are the most indefatigable of all farm labourers, and work hard both night and day in the destruction of turnip-fly, grubs, wire-worms, slugs, caterpillars, &c. A few of these birds are of more value to our arable land farmers than an

army of young ducks ; they do their work so cleanly and expeditiously.

"But where is your advocacy to end?" we hear some one say ; "how far do you go?" Our reply is, that we just go as far as our going would aid nature, and no further. We are not willing, for instance, to allow the bull trout to exterminate the salmon, nor are we willing that too long a close time for these fish should be allowed. If it could be shewn that salmon multiplied too rapidly, and that they died for want of living room or for lack of food, then the open time should be extended. As regards grouse, there can be no doubt that the account is being overdrawn ; and if gull murder goes on at the rate that has been indicated, that useful bird will very soon be numbered among the extinct animals of Scotland. Nature regulates her own affairs so well that we must be chary in our interference ; at any rate, if we interfere in an injudicious way we shall have ourselves to thank for whatever consequences may follow.

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### THE VEGETABLE PRODUCTIONS OF ABYSSINIA.

BY W. B. HEMSLEY, FORMERLY ASSISTANT IN THE HERBARIUM OF THE ROYAL GARDENS, KEW.

AT a time when so much interest is still concentrated upon Abyssinia, a few words on its vegetable productions may be acceptable. In the following notes I have endeavoured to condense as much information as possible in a few sentences, so I shall not apologise for the disjointed character of their composition. It is now nearly a century since Bruce returned from Abyssinia, after an absence of about six years, and enlightened the world considerably on the history, geography, and zoology, and, to a certain extent, on the botany also of that part of the world ; but his imperfect knowledge of the art of describing plants renders his descriptions useless, except those accompanied by plates. The plates, however, are excellent for the period. Since then, numerous English,

French, and German travellers have visited that country, and, thanks to their exertions, we are now tolerably well acquainted with its botany. The flora of tropical Africa generally is not of that profusely abundant and luxuriant character prevalent in most tropical countries. In the mountainous regions, however, on both the eastern and western coasts, forests of considerable extent, and grassy uplands, exist where vegetable life is rich and varied. Trees of surprising magnitude, and flowers unsurpassed in brilliancy, are met with ; and vegetable anomalies and curiosities are nowhere more abundant. The vast sandy plains intervening, are here and there enlivened by the presence of clumps of strange looking, gouty-stemmed dwarf trees, bulbous-rooted and succulent plants,

which are peculiarly adapted to the ever-shifting soil. In this they are sometimes deeply buried, and lie dormant for several years, when the winds come and denude them as suddenly as they previously overwhelmed them; and they recommence growing, and produce their flowers as if nothing particular had happened to them. The flora of Abyssinia, and of the eastern coast generally, is, perhaps, less diversified than that of the western coast; but it is, nevertheless, on account of the great height to which the mountains rise, exceedingly interesting and very comprehensive in its features. From a rough calculation, the flora of Abyssinia, excluding the lower Cryptogams, may be estimated at about 2500 species. In certain sterile and arid districts it partakes in some degree of the desert character, abounding in fleshy-stemmed Euphorbias and Adeniums, thorny Acacias and Jujube bushes. In other places, again, the presence of balsam-producing trees and shrubs indicates an affinity to the flora of the opposite coast of Arabia. Notwithstanding the immense desert lying between Abyssinia and the fertile regions of the western coast, a large proportion of the plants are common to both parts. This applies more especially to those occurring above an elevation of 5000 feet. In the lowlands, the species peculiar to each coast are more numerous; but even here the genera are to a great extent the same. Some Abyssinian species extend northwards to the Mediterranean, others southwards to the Cape of Good Hope, and a very few, excepting ubiquitous tropical weeds, to Madagascar, India, and Australia. Many genera and species are common to the mountains of tropical Africa and the plains of Europe. Several British species are found on the mountains of Abyssinia and Biafra—*Cardamine hirsuta*, *Cerastium vulgatum*, *Oxalis corniculata*, *Umbilicus pendulinus*, *Galium aparine*, *Scabiosa succisa*, *Myosotis stricta*, *Limosella aquatica*, *Sibthorpia Europæa*, *Solanum nigrum*, *Rumex obtusifolius*, *Deschampsia cæspitosa*, *Aira caryophyllea*, *Poa nemoralis*, *Koeleria cristata*, *Vulpia bromoides*, *Brachypodium sylvaticum*, *Asplenium adian-*

*tum-nigrum*, *A. filix-fœmina*, and *Lastrea filix-mas*. Besides these species, common to Britain and Abyssinia, many of our other genera are represented by allied species, as—*Viola*, *Silene*, *Arenaria*, *Sagina*, *Hypericum*, *Geranium*, *Trifolium*, *Rubus*, *Alchemilla*, *Pimpinella*, *Cynoglossum*, *Utricularia*, *Vernonia*, *Hartsia*, *Stachys*, *Calamintha*, *Polygonum*, *Thesium*, *Avena*, etc. It should be borne in mind, too, that many of the foregoing species or genera are also found on the Himalayan mountains, and eastward to China and Japan.

With these European forms are associated many tropical or subtropical genera, as the following:—*Vitis*, *Schmidelia*, *Desmodium*, *Vernonia*, *Mikania*, *Ubeia*, *Boleum*, *Plectranthus*, *Cyathula*, *Lasiosiphon*, *Pilea*, *Peperomia*, *Commelina*, *Cyperus*, *Panicum*, etc. But of these many, of course, do not ascend to the highest points. The flora has been described as poor in comparison with that of other tropical countries. But this must be understood as referring to the number of species dispersed over the whole territory, for the well-watered valleys are rich in species and individuals, while the volcanic mountains and sandy plains are either almost destitute of vegetation, or only occupied by very few species.

*Cycadaceæ*, *Lauraceæ*, *Ternstroemiaceæ*, *Dipterocarpeæ*, *Ilicineæ*, *Magnoliaceæ*, *Berberideæ*, and other families, are entirely absent from Abyssinia. The large family *Myrtaceæ* is sparingly represented, while the neighbouring family, *Combretaceæ*, is abundant. There is no family of plants exclusively confined to Abyssinia, nor indeed to tropical Africa; but several genera are limited either to Abyssinia or tropical Africa. Many genera, formerly supposed to be peculiar to Abyssinia, have recently been discovered by explorers on the western side of the continent, as *Bucea*, *Nathusia*, etc.

I will now pass in review a few of the more important and interesting families represented in Abyssinia, specially noticing those plants employed either medicinally or economically. It is almost superfluous to remark, that the Abyssinians have tilled the



ground, more or less, from time immemorial, and have introduced and cultivate many useful plants from the surrounding countries. Of the Gramineæ no fewer than 200 species are reported; and several species peculiar to the country are cultivated for their grain: wheat, barley, maize, and oats are grown, the first and second extensively.

The principal indigenous cereals cultivated are the Teff (*Poa Abyssinia*), the Dagussa or Tocusso (*Elleusine Tocusso*), and the Michella (*Andropogon Sorghum*). Of the foregoing, Teff is the most important, being extensively cultivated throughout the country, at an elevation of between 6000 and 7000 feet above the level of the sea. There are many varieties of Teff, such as white, red, green, and purple.

According to M. Richard,\* four months from the time of sowing are necessary to bring the seed of Teff to maturity. In the environs of Gondar it is sown in August, and cut about the end of November or beginning of December; and in favourable seasons produces forty-fold, but oftener less than ten-fold.

Speaking of this grain Bruce says:—

“The Abyssinians, indeed, have plenty of wheat, and some of it of an excellent quality. They likewise make as fine wheaten bread as any in the world, both for colour and for taste; but the use of wheat-bread is chiefly confined to people of the first rank. On the other hand, Teff is used by all sorts of people, from the king downwards; and there are kinds of it which are esteemed fully as much as the wheat. The best of these is as white as flour, exceedingly light, and easily digested. There are others of a browner colour, and some nearly black; this last is the food of soldiers and servants.”

Michella is largely grown, and offers innumerable varieties. Another grain extensively cultivated is the Tocusso. The meal of this is also used for making bread and cakes, but Tocusso is chiefly employed in the preparation of beer. Previous to being used for the latter purpose, it undergoes the same process as barley in this country. Barley is grown in considerable quantities in the highlands, and is also employed both in making beer and as food for man and beast.

According to Bruce, their Bouza or beer is made in the following manner:—

“A jar of Tocusso contains as much as is sufficient to make two loaves, that are a tenth part of the whole jar; besides which, they use about half a votal of ‘Ghesh’ leaves (*Rhamnus* sp.). The first part of the process is to grind the Tocusso, after which they take a fourth part of it, and knead it with water and leaven, as if to make bread. This they put in a jar to ferment for two days; at the end of which they make a good many thin large cakes, and dry them on the fire until they become as hard as stone, then break them down into crumbs, and put them into a large vessel full of water, capable of holding six times the volume of the grain. The remainder of the meal must be put into a hollow oven, over a fire, with a small quantity of water, and constantly stirred until it becomes a black paste, which, with the bruised gheshe leaves, is put into the jars containing the crumbs and water, let alone for a day, and then poured off, and preserved in jars well stopped. At the end of seven or eight days this liquor begins to be too strong, and is best when fresh, two or three days old.”

Sedges, or Cyperaceæ, are numerous, and employed in various ways. The Papyrus, according to Bruce, is a native of Abyssinia, and boats made of the stalks were the only ones in use at the time he resided in that country; but subsequent travellers have not met with, or have neglected to collect it, and make no mention of it.

Palms are rare in tropical Africa, or rather the species are few in number, and three only are reported from Abyssinia—namely, *Phoenix dactylifera* (the Date), *Hyphæne thabica* (the Doum), and an unnamed species, described as stemless. The Date is cultivated. The Doum or Doom is indigenous, and is found in the vicinity of Gondar, up to an elevation of 6000 feet above the sea level. This palm is remarkable on account of its stem being often two or three times branched, deviating in this respect from all other known members of the family; the normal state being a simple or undivided trunk. There are five species of the Yam family, *Dioscoreaceæ*, natives of Abyssinia; and one, *Dioscorea Schimperiana*, is found in almost every part, but whether any use is made of its roots is unknown to me. Aroideæ are not largely represented. A species of *Arum*, called “Ambatcha,” has tuberous roots, similar to

\* “Flora Abyssinia.”

those of our "Lords-and-ladies," which are, when peeled, eaten in a raw state.

The Banana tribe (*Musaceæ*) is represented by one native species, figured by Bruce under the native name, *Ensete*; but he was so ignorant of what constitutes botanical characters that he would not be persuaded that it was a species of *Musa*.

This species is now called *Musa Ensete*, and has long been cultivated in this country.\* Besides its botanical characters, it differs from the other species in having a shorter stem, larger leaves, and an inedible fruit. M. Richard refers specimens collected by Quartin-Dillon to *M. Paradisiaca*, the

Plantain, but with a doubt, and asks if it is not the same as the one figured by Bruce; but most likely *M. Paradisiaca* is cultivated in this, as in many other parts of tropical Africa, where it is extensively used as an article of diet. At any rate there is no doubt about the existence of a *Musa*, as described and figured by Bruce. The *Ensete* is also cultivated for the edible leaf-stalks and stem. Bruce says:—

"When you make use of this *Ensete* for eating, you cut it immediately above the small detached roots, and perhaps a foot or two higher; as the plant is of age, you strip the green from the upper part until it becomes white; when soft, like a turnip well boiled, it has the taste of the best new wheat bread, not perfectly baked, and is the best of all food, wholesome, nourishing, and easily digested. It is cultivated around Gondar."

The root of the *Ensete* is also eaten as a vegetable by the natives, and tastes somewhat like a potato; and the leaves are said to furnish good fodder for cattle.

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\* In the "Gardeners' Chronicle" of January 25, 1868, is the following notice:—"A fine specimen of the grand *Musa Ensete*, generally known as Bruce's Banana, is now flowering in an orangery at Stowe, the seat of the Duke of Buckingham and Chandos."

## Hunting, Fishing, and Shooting.

### DEER DRIVING IN MULL.

#### SECOND DAY.

BY THE SPORTING CONTRIBUTOR OF "THE FARMER."

OUR second Mull season began as prosperously as the first, but we had the advantage of another gun, both my sons having got a fortnight's leave from their regiments. Before settling to regular work, the "green hand" had the honour of drawing first blood, by killing a hart of 14 stone, at a scrambling afternoon beat of Torlochan wood. It was a snap in the thick of the trees with an S.S.G. cartridge, and the only shot fired that day.

Our plan was to give several days first to Scalastal, reserving the last week for Glenforsa, as a *bonne bouche*.

It was the first week of October, and the stags had given notice by some trumpet blasts that the season of warfare was at hand. The Scalastal overseer told us they came down after nightfall to feed on a field of turnips close to the farm-house, and one of them for the last few nights had been "roaring like mad." I was seated by a good fire reading, when the man popped in his head to say that the stag was "at it again," and urging me to come out and hear his defiant music. The sudden change from the bright and comfortable glare of the fire and candles to the solemn gloom of a moonless and starless night, whose silence was only broken by occasional bellowings of the stag, suggested to one's fancy an Indian prairie or African desert rather than one of our own Hebrides covered with its brown heath and shaggy wood.

When the griever thought my mettle was up for a shot, he slyly observed that a fowling-piece loaded with buck-shot *might* hit them even in so dark a night, and felt confident that he could grope his way to the gap in the wall where the deer entered to "*spoil!* the neeps," and by which they also retreated when satisfied. To prevent them getting our

wind, we had to make a considerable circuit through rough hill ground, to clamber over a high fence, and, worst of all, to cross Scalastal brook. Had I not been confident the man could find his way blindfold, I should certainly have declined the whole thing. No sooner had we quitted the outer door into the black still darkness, than I felt powerless as a child. The overseer, however, was alert enough. First tracing a sheep-path to guide him to the fence, which he followed down until he discovered the rude steps he sought, then listening for the brook, he rather anxiously whispered, "if we were but through the burn," and led the way. The burn was full of large stones, deep linns, and swollen by recent rain; but by finding the ford we managed to scramble through, about knee deep. Guided by the bellowing of the deer (for we now distinguished more than one roaring), the gap in the turnip field was easily found, and I was quickly squatted so as to have the quarry between me and the sky when steadying themselves for the leap down from the field into the moor. My sons and the shepherds had to move them from the lower end, where they were now feeding, and when they reached the gap they would be about ten paces from my ambush. A few minutes of suspense, and we heard the rush of the deer bounding in our direction. They halted with only the wall between us. Every moment I expected a dark figure on the skyline, but they seemed bent on trying our patience. Only when the drivers were close on them did they deign to move, and then, instead of their convenient egress, wandered alongside the wall and made an uncomfortable exit at the burn! The wind being all right, it was impossible they could either have smelt, seen, or heard us, and we could

only account for the mishap by that caprice common to *all living creatures* as well as deer. When groping our way home, we consoled ourselves by the hope that we should certainly find these same harts next day in Scalastal wood.

When the wind is north, the south passes of course guard the extensive oak copse of Scalastal. They are four in number, nearly in line. As the wood hangs on a hillside the passes rise one above the other, and were known to us as the high pass, the middle pass, the low pass, and *the lowest pass!* Attended by the griever, to point out the ground, we scaled the hill, directing the shepherds to allow us twenty minutes law, before throwing the dogs into the low side of the copsewood flanked by the burn. I preferred the middle pass (*medio tut, &c.*), my eldest son the high one (*exelsior*), his brother the highest he could get! And the lowest was left to itself and *the deer*.

Both my sons had taken their ground, but the overseer was in the act of pointing out mine, when the lugubrious tones of the ugly buck swelled out in the wood close beneath. In an instant a hart burst from the thicket, and ran past at a sling gallop. "Noo, sir," from behind me—certainly a thoughtless hint which has coaxed many a young sportsman into a dead miss. Fortunately, in this instance the shooter was old and callous, so he took his time, and the hart fell dead in the heather. "Look oot, sir, for anither." The second warning fully atoned for the first. It was scarcely given, when another hart galloped fair across our path, and he also rolled head over heels on the hillside. My favourite "Henry" rifle was loaded again in a twinkling, but no more deer turned out, neither did any try my sons' ground; but we heard from a neighbouring shepherd that a third hart had sneaked out at the *rejected* pass. The two killed were exactly the same weight, 15 stone, and both were shot through the shoulder galloping, at 70 yards' distance.

The turnip field was quiet enough to-night, and not a roar heard far or near. Suspecting that "the lowest pass" fugitive would return in the night to Scalastal wood in search of

his brethren, we arranged another drive for next morning. At this hunt our posts were the same, except that my second son was now convinced that it is sometimes good policy to choose the lowest place. The dogs soon found a hot track, but the run was long and the deer stubborn. For nearly two hours they stuck to the scent, threading their nimble quarry round every rugged knoll and through many a tangled thicket. At last, when least expected, and the cry of the dogs at the furthest point of the covert, the object of their pursuit, in the shape of an old hind, quietly stole out of the wood and stood opposite me listening—a fine broadside, though rather distant chance. I fired and struck her hard; she turned again for hiding to the copse, but a shot from the second barrel brought her down. There were no more deer found all day, so the hart had not returned.

Our last Scalastal day was intended for black game and grouse, and as the cutting of Garmony wood (which had spoilt it for deer) made fine open shooting at black game, we gave it the first trial. Our bags were fast filling with young blackcocks, and old ones too, before we got to the further end of the wood, where the moor-ground of Garmony and Fishness begins. Here we meant to range for grouse, but to our surprise a deer was watching our motions on this open moor, distant about half a-mile. As it was a very small hind, we thought the No. 5, *if near enough*, might possibly add her to the game list of the day. Leaving my youngest son at the spot where the deer was likely to enter the wood, and sending my eldest round the knolls to take post a little way above her, I coupled up our brace of setters, making them and the retriever follow me. The attention of the deer was at once fixed on me and my dogs. She never took her eye from us, until, having got fairly in her rear, I began to whistle and draw up. As I hoped, she went away at a walk, looking now and then over her shoulder to see if she was pursued. The marksman above had thus ample time to shift his ground, so as to meet her at the nearest point among the heights. She never detected the ambus-



cade until within 40 yards, when she was saluted by a right and left. Starting off at speed she made straight for the other gun, but the rough ground soon hid her until we heard a single shot. Glad that it was not a *double* one, we hurried up to see the sportsman triumphantly seated on his quarry. It was only a yearling, and had been fairly hit by the double shot, some of the pellets we picked out of the hair, not having even penetrated the hide. The single shot was only about 10 yards off, and killed her on the spot.

Early next morning our "bus" was at the door for Glenforsa. This massive equipage had a railed roof strong enough to bear a ton, immovable windows, and a low door at the stern, usually strapped open. We yoked the heaviest of the farm-horses as wheeler, and in the lead an old white Mull garron of 25, harnessed with cart ropes, and ridden by the lightest shepherd as postilion. When the top was loaded with provisions, and the inside filled by sportsmen, dogs, and rifles, with the overseer as state coachman, we grinded slowly but merrily along to the wonder and amusement of Mull residents.

The wind had not been in "the richt Glenforsa airt" for some days, so of course there were few deer on the ground. Our first hunt was thoroughly unsuccessful. Only one hind in "The Knock," which bounded past me out of all fair distance for Torlochan wood. I put up the long sight, and missed with both barrels. We were now sure at least of one deer in Torlochan, and as usual took post to guard the runs from this wood to Garrochree. The highest Torlochan pass

which I chose, commands a fine view of Garrochree, so I was nearly certain to detect deer leaving either wood. The dogs soon found the hind in Torlochan, chased her round the wood, when she bolted through an unguarded pass into Garrochree. Trim and Yarrow followed in company, and I was tracing their course, and trying to make out the quarry among the trees, when full before me, and within a short distance of his first escape, stood the Garrochree stag. Well aware that the dogs were not after him, he was complacently watching the hunt, and when he saw his territory fairly invaded retreated through his customary defile. I looked revengefully at his exit, and hoped to come round him yet. With the exception of these two deer, all our coverts were drawn blank; and after a hard day's work we returned to Glenforsa House—cheered, however, by a change of the wind.

The customary rest-day was given to the pack, which we devoted to the Glenforsa pheasants, killing the round dozen, besides hares and rabbits. As the wind had continued steady, we felt sure of deer next day, and in walking home were concerting the best mode of driving the covers, when the overseer met us with dejected mien. "The ugly buck has bolted after his master to Scalastal," says he. "We cheated him a' day that Dugal was here, but the naasty beast fan' us oot and set after him." To supply the place of the truant we asked a day's driving from the shepherd who owned the old dog already referred to, which was at once cheerfully given.

## The Country Gentlewoman.

### HOUSEHOLD CLEANING.

[Concluded from page 312.]

#### XV. CLEANLINESS, A MEANS OF EXEMPTION FROM TROUBLESOME INSECTS.

CLEANLINESS, undoubtedly, can effect better than any other means the destruction of, and freedom from, those insects whom nature leads to harbour in houses, and in the vicinity of beds. Such insects, in their first state of existence, are nourished by the dust, which collects in the downy fabric of woollen articles especially. In the fur of the cat, and hairy skin of the dog, they also find the warmth and nutriment which brings them to maturity.

#### XVI. FLEAS AND BUGS.

Of the flea, one of the most annoying of such invaders of domestic comfort, particularly where children are inmates, it has been said that to destroy one in the month of March is to exempt a house of a hundred. The greatest security is that of keeping rooms as free from dust as it is possible.

Carpets, blankets, and everything manufactured from wool, should be so well attended to as to prevent any accumulation of dust from setting in them. The flea seeks to lay its eggs wherever dust and down are combined, for in them consist the nourishment nature has ordained for its offspring.

The blankets used in the cribs and beds of children should, for this reason, be daily shaken, and, weather permitting, hung before an open window that the air may pass through and clear from dust their loosely woven fabrics.

The vicinity of dog-kennels and pigeon cotes are amongst the causes of the rapid production of fleas in some houses. Children, in particular, suffer from the inflammation and consequent irritation caused by flea-bites.

Hence it should be a particular object to prevent its infesting the nursery. Many recipes for this purpose have been circulated, but none appear to be entirely successful.

A lump of camphor left in the ewers whence the water is taken in which children are washed, and in which portions of the camphor being dissolved gradually in the water, it is said, renders the skin washed in it obnoxious to the flea, but this is very doubtful.

The bug is chiefly found in large towns. It is a more formidable enemy than the flea, because it evades detection by the most rigid concealment during the day, emerging only at night from its dark lurking-places.

If not infesting the wood-work of old houses or the cracks of the plaster-work, still it may be brought into our dwellings by many different channels. Sometimes bugs have been introduced between the leaves of old books; in wicker-baskets, which they are said peculiarly to affect; in servants' trunks; and even in the folds of fresh washed linen from laundress's houses. Hence in London, how to prevent their increase, as well as to remedy the evil entirely, is sometimes difficult.

Prevention of the increase both of bug and flea in houses is mainly in the hands of housemaids. Let them carefully practise the cleanly arts of their department, and they will, with more certainty effect the limitation, even to extermination, of this foe to personal comfort, than by the use of corrosive sublimate, or than that of any other kind of poison. The ground upon which cleanliness proves so effectual in checking the increase of the flea has been shewn in a foregoing paragraph. It may be well to point out how similar effects may spring from the same cause.

As the bug lives, it is said, only a year, the preventive means should be principally ap-

plied to check its amazing increase each year by destroying the eggs. These are deposited, generally, in scarcely visible cracks and holes in the wood-work of bedsteads and skirting boards. There they might remain until the proper period should arrive for the commencement of their warfare on the human species. The great object of the housemaid must be to displace and wash away these embryo torments, and this, with her scouring brush and cold soap and water, she may very materially effect. The bristles of her brush will enter where no larger implement could, and detach them from the places where they adhere. If housemaids once in the week during the summer were to scrub with their brushes and cold water all the wood-work of each bed, and to carry the wet mop or scouring flannel under the beds daily and by the skirting board, the increase of this odious insect would be prevented, especially if the bedding and hangings were also frequently cleared of dust by brushing or shaking them out in the open air.

Bedsteads much infested should be taken to pieces twice a-year, in the spring and autumn, and the joints and head-board should be well scrubbed with the scrubbing brush. For those who doubt this truth, are subjoined such recipes as have been adopted in some houses, and which for a short time may have checked the evil in them.

1. Tar-water washed over the wood-work of bedsteads.
2. A solution of potash also applied to the frame-work of bedsteads.
3. A paste composed of Scotch snuff and soft soap, to be inserted within the joints or cracks in the wooden parts of bedsteads.
4. Bug poison : spirits of wine, half pint ; spirits of turpentine, half pint ; crude sal-ammoniac, 1 oz. ; corrosive sublimate, 1 oz. ; camphor, 1 oz. This mixture should be inserted into the joints of bedsteads with a syringe, and with a sponge fastened to a stick, every other part of the wood-work must be washed with it. Spirit of turpentine also kills the insects, though it is more volatile, and therefore less preventive and secure than the former recipes.

Many poisons are to be purchased at chemists for the destruction of bugs ; but it is

unpleasant, if not dangerous, to have such mixtures in a house, and, with confidence we may assert that they are all far less effectual than the frequent application of the scouring brush and cold soap and water to the bedsteads, and daily searching habits of cleanliness in respect to the other parts of the bed furniture.

We will add the following precautionary hints. The heads of all bedsteads should stand a few inches away from the walls. If there be any cracks in the paper behind the bed's head they should be carefully pasted over with fresh paper ; or, if the paper become loose from the wall, that also should be again closed fast. Bugs often harbour in plaster-work ; but unless the paper be broken or loose, they cannot find their way through it. If it be suspected that the enemy is secreted under the skirting-board it may be blocked up by pasting, or by glueing strong brown paper over the chink between the skirting-board and the floor.

#### VII. THE MOTH.

The moth is a pretty, yet formidable, enemy in a house. In all woollen manufactures, blankets, flannels, moreen curtains, carpets, as well as in furs, and amidst feathers, it seeks to form its nest and to deposit its eggs ; whence in the spring of the year issue the larvæ which from such substances derive nourishment. In this stage of the insect's existence the ruin takes place of the fabrics upon which it feeds. This is visible in the innumerable small circular holes through which it has eaten, and which, destroying the strength and tenacity of the material render it worthless.

Many persons suppose that moths are produced in clothes that are laid by, merely by their being shut up in closed places ; but this is an error. None of the little larvæ or caterpillars of the moth, that really do the mischief, ever appear among clothes or articles of any kind, provided none of the winged moths can have access to them to lay their eggs there, for no insects can be engendered otherwise than by the usual method of propagation. The moth is an insect that, like all other winged insects goes through three transforma-

tions. The winged moth, that flies about in the dark, does not, cannot eat or destroy cloth of any kind: but it lays its eggs in woollen articles, upon which alone nature dictates to her that her young must feed. These eggs in time produce little caterpillars, and it is they who eat holes in and destroy clothes, &c. After a time these caterpillars assume the pupa state, out of which burst forth the winged insects, to proceed, as before described, in laying eggs. From this account it is easy to see that, provided you can prevent the winged moth from having access to what you wish to preserve, no injury by moths can happen to them. For instance, if you tie up any article that is quite free from moths in a bag of linen, cotton, or paper, no winged moth can enter the bag to lay its eggs, and therefore the bag will be a perfect security. But it is to be observed the winged animal is very cunning, or rather instinct impels it to search with great care for suitable places to lay its eggs; and, therefore, simply putting things into drawers, however tight, or covering them over with paper, will not be sufficient: if there are chinks by which the winged animal can insinuate itself, such places will not be safe from moths.

Nature has likewise given the instinct to moths, not to lay their eggs in places liable to be often disturbed: therefore, if you shake any articles very frequently, it is not likely that moths will deposit their eggs there; and if not there can be no caterpillars to do mischief. These facts being clearly understood, the means of guarding against these destructive insects will be comparatively easy. Should any articles of wool appear to be beginning to be attacked by moths, beating and brushing should be resorted to, and, if possible, they should be put into hot water to destroy the young larvæ. It sometimes happens that on discovering the winged moth in some places, they are driven out to fly about, when they resort to some other part of the house, where they will be more safe. This must, if possible, be prevented; otherwise they will continue to propagate somewhere, and the breed will be kept up. Even if driven out of the house they have been known to enter again at the windows.

Curtains of moreen or cloth, when taken from the windows for the summer season, should be well cleansed (by brushing and shaking in the open air) from every particle of dust, and then folded and enclosed in strong unfractured linen, or brown Holland wrappers, and laid away in some dry airy room or closet. If the moth have not previously deposited its mischievous embryo, the curtains so enveloped may be considered as safe, without further notice for the summer. But if any doubt be entertained on this point, it will be requisite to open the envelopes once or twice during the three or four months of the summer, and to take out and shake well in the open air, if the weather be dry, the curtains or other articles enclosed.

It is said that the cloth moth declines as a receptacle for its eggs any spot in which it can detect the odour of the wood of the cedar, or of camphor, Russia leather, black peppercorns, and the tallow of a rushlight. It is, therefore, very usual to enfold woollens and furs with one or other of these supposed specifics. But it is a fact that furriers adopt no other means of saving their stores of furs from the moth than that of frequently shaking each article in the open air and in the sun.

#### XVIII. THE HOUSE FLY.

The common house fly it would be vain to attempt to exclude from our houses entirely. Wherever there are food and warmth there will they find entrance. The only remedy for the injuries they inflict on clean paint work and whitewash, or on the cook's bright dish covers, is to wash and clean them as often as the spots become very apparent, and to cover such articles as do not admit of being so cleansed.

Kitchens are the favourite resort of the common fly. In these a fly trap, as it is called, may be used to attract the fly to settle upon it rather than upon the walls or ceiling. Flies seem to incline to settle more on suspended objects than on any other; and thence the use of "the fly trap," which is usually formed of papers of various colours cut out fancifully, in order to render them somewhat ornamental as well as useful.



Fly poison is to be procured from chemists; but there seems little advantage to be derived from its use, as it attracts more flies into a house than it destroys. All are not alike tempted to taste of it. Quassia and sugar, with a little water, set about a kitchen in saucers, is a poison for flies, and not for human beings, and may therefore be safely used.

#### XIX. MICE AND RATS.

Mice and rats are animals well known, and against which our best defence is the cat. In the absence of a good mouser traps are employed, of which various kinds are sold in the shops. As neither mice nor rats can harbour where there are no holes for them to take refuge in, great care should be taken to stop up

all such where they are discovered: to a neglect of this may be attributed frequent visits from the animals that might have been avoided. Holes in brickwork should be stopped with Parker's cement. As both mice and rats will gnaw wood, they will often make entrances for themselves into places where provisions are kept: as soon as any of these are discovered the carpenter or bricklayer should be sent for. We object to the employment of poisonous substances for destroying these vermin, on account of the fatal accidents that have been known to result from their incautious use. Rats frequently come from the drains, but the use of proper drain traps prevents this.

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### HINTS ON CHOOSING PROVISIONS.

IN the right royal "Book of Cookery" by M. Gouffé, her Majesty's *chef de cuisine*, are some excellent hints to housewives on choosing meat, fish, poultry, &c., from which we select the following:—

#### BUTCHER MEAT.

Beef should be chosen of a bright red colour, with light yellow fat, approaching the hue of fresh butter. If the beef should be hard and firm to the touch, with flaccid and little fat, of a brown and dull colour, these are sure indications of inferior quality. As complement to what concerns beef, we represent beef kidney of superior and inferior qualities. Veal should be chosen of a light colour, with very white and transparent fat. Avoid lean veal of a reddish tint, and the kidney of which is surrounded by red-looking fat. Prime mutton is known by the same signs as good beef—viz., a bright red colour, freedom from gristle, and very white and transparent fat. Inferior mutton is of a dull red colour, with yellow and opaque fat.

#### POULTRY.

In the first place, poultry should be selected very tender, particularly when not in

season, from the 1st of December to the 1st of May. Spring chickens begin in May, but at any time they should be carefully examined before buying. A tender chicken is known by the size of its feet and neck: a young fowl always has large feet and knee-joints. These characteristics disappear with age. A tough fowl has a thin neck and feet, and the flesh of the thigh has a slight violet tinge. After examining these external signs, the flesh of the pinion and breast should be tried: if tender in both these places, the fowl can be used with confidence.

Never use old fowls.

I call particular attention to this principle, which I consider a very important one. Never use an old fowl in cookery. Which ever way you dress it, it will never be good. It is a great mistake to recommend, as in many cookery books, the putting of an old hen in the stock-pot. Instead of improving the broth, it can do nothing but impart to it the unpleasant flavour of the hen-house. It is also a mistake to expect to make a good *daube* with an old goose or turkey: nothing but a bad result will be obtained. It is well, however, to distinguish between hard, but

young, poultry, and the toughness of an old fowl. With the former something may be done; but with the old and tough birds, I repeat most emphatically, nothing can be done. A good turkey will be recognised by the whiteness of the flesh and fat. Beware of those with long hairs, and whose flesh on the legs and back is of a violet tinge. To select a goose, try the flesh of the pinion, and break off the lower part of the beak, which should break easily. The fat should be light-coloured and transparent. Ducks are chosen in the same way. Pigeons should have fillets of a light red colour; when old, these darken to blackish violet, and the legs get thin.

## FISH.

A fresh fish is recognisable by the redness of the gills, the brightness of the eyes, and the firmness of the flesh. It is not enough to be guided by the smell: it may lie days on ice without acquiring any noticeable smell, but the flesh in such a case will be dull and flaccid, and care should be taken not to employ fish in that condition. It should be borne in mind that fish will lose in quality in the spawning season. This should regulate one's purchases. My remarks on old poultry apply even more particularly to old fish, which should never on any consideration appear on the table.

## GAME.

Old hares should be discarded; they can be turned to no good account. Leverets and young hares alone should be bought. You can tell a tender hare by the ease with which the fore-paw may be broken, by its large knees, and short stumpy neck. Good wild rabbits are known by the same indications. Pheasants should be selected with the spur but little developed; the tenderness of the bird is known by trying the flesh of the

pinion. Woodcocks are also tried by pinching the pinion and breast. Similarly with respect to wild ducks, teal, widgeon, and other water-fowl. Partridges are also tested in the same way; their age can be ascertained by examining the long feathers of the wing—round at the tip in an old bird, and pointed in a young.

## GROCERIES, ETC.

As to all articles to be had from the grocer, the oilman, and dairyman, I would urge more than ever that none but the best be bought. This is sure in the end to prove more satisfactory and economical. An inferior quality of oil used in cookery will spoil the same, or whatever else it may be added to; the same with butter, which should always be selected of the freshest and best. A small quantity of sweet butter will improve any preparation where it is required; whereas, with bad butter, the result will be exactly the reverse: the more you add of it the worse will your dish become. Never buy butter without carefully smelling and tasting it; these two tests are indispensable. If you have any doubts as to its freshness, do not on any account buy it, but try elsewhere; it is an invariable rule that "no good cookery is to be done with questionable butter." Never employ eggs without examining them carefully, not only when buying them, but also when they are broken. An egg may appear perfectly good, and still have an unpleasant damp-straw flavour, which is sufficient to spoil a whole dish. Eggs should be broken one after the other, and none put into the basin until their freshness has been ascertained. With respect to bacon, one should likewise be very particular in selecting none but what is very white, with the least gristle possible, and quite fresh and free from rustiness. Fresh pork should be of a light brownish hue, and free from any inequalities of colour.

## USEFUL RECIPES IN COOKERY.

[Continued from page 317.]

## 7. A NEW BAKED APPLE PUDDING.

**T**HIS, when carefully made and well baked, is a very nice, wholesome pudding, the crust being remarkably light and crisp, though containing no butter. First, weigh six ounces of the crumb of a light, stale loaf, and grate it down small; then add, and mix thoroughly with it, three ounces and a half of pounded sugar, and a very slight pinch of salt. Next, take from a pound to a pound and a quarter of russetings, or of any other good baking apples; pare and take off the cores in quarters, without dividing the fruit; arrange them in compact layers in a deep tart dish, which holds about a pint and a half, and strew amongst them four ounces of sugar, and the grated rind of a fine fresh lemon; add the strained juice of the lemon, and pour the bread-crumbs gently in the centre, then with a spoon spread them into a layer of equal thickness over the apples, making it very smooth. Sift powdered sugar over, wipe the edge of the dish, and send the pudding to a rather brisk oven for something more than three quarters of an hour. Very pale brown sugar will answer for it almost as well as pounded; and the writer has had it very successfully baked several times in a baker's oven, of which the heat in general is too fierce for the more delicate kinds of pudding. For the nursery some crumbs of bread may be strewed between the layers of apples, and when cinnamon is much liked, a large teaspoonful may be used instead of lemon-rind to flavour them. An ounce or more of ratafias, crushed to powder, may be added to the crust, or sifted over the pudding just before it is served, when they are considered an improvement.

## 8. A BAKED CHRISTMAS PUDDING.

This dish is but a variety of the above; the writer, thinks, however, that it may be unacceptable to those of our readers who are forbidden to eat *pastry* in any form. It may

be simplified or enriched according to taste, but the present recipe will be found very good. Chop separately, and mix as for mincemeat, four ounces of stoned raisins and four of apples, and two of beef kidney suet; add three of currants, three of pounded sugar, one and a half of crusted ratafias, two of candied citron or orange-rind, half a glass of brandy, half a glass of sherry, or any other good white wine, the juice of half a large lemon, and the grated rind of more than the half, a grain or two of salt, some grated nutmeg, and a small portion of pounded mace or of cloves. Put these ingredients smoothly into a small buttered tart-dish, and lay over them four ounces of fine, lightly-grated, bread crumbs, thoroughly mixed with three of pounded sugar, and the slightest pinch of salt. Should the pudding prove too sweet, less sugar must be added to the mince, as the crust will not be firm and crisp without a certain proportion of it. The top may be brushed with clarified butter before the sugar is sifted on. The directions given for that of the apple-pudding apply equally to this, and need not be repeated. Half an hour in a moderate oven will quite suffice to bake it, as it is small.

*Observe.*—The authoress has had excellent puddings of this kind made with summer fruit; those of cherries, of black currants, and of damsons were particularly good. When large plums are used for them they should be split, and a few of the kernels laid amongst them.

## 9. INFANT'S PUDDING.

Butter slightly a large cup without a handle, or a very small basin, and break lightly into it a penny sponge cake; pour over it one well-whisked full-sized egg, mixed with a quarter of a pint of milk; let it stand half an hour, and boil it gently, or steam it for eighteen minutes. Lay writing-paper over it, and then a thin well-floured cloth before it is put into the saucepan. The safer plan is to

set it into about an inch and a half depth of boiling water, and to keep the cover closely shut while it is steaming in it, taking care that neither the cloth nor the paper over it shall touch the water. The pudding should not be turned out of the basin for five minutes after it is taken up.

#### 10. AN EASTER PUDDING.

To 4 oz. of fresh rice flour, add by slow degrees half a pint of cold new milk, being careful to keep the mixture free from lumps. Pour it into a pint of boiling milk, and stir it without intermission over a very clear and gentle fire for three or four minutes; then throw in 2 oz. of fresh butter and 2 of pounded sugar, and continue the boiling for eight or ten minutes longer. Let the rice cool down, and give it an occasional stir, to prevent the surface from hardening. When it has stood for fifteen or twenty minutes, pour to it a quarter of a pint of cold milk, and stir well into it a few grains of salt, the grated rind of a large sound lemon, five full-sized, or six small, eggs, properly cleared and well whisked, first by themselves and then with two additional ounces of pounded sugar. Beat up these ingredients thoroughly together, pour them into a deep dish which has been rubbed with butter, and in which about a tablespoonful should be left liquified, that it may rise to the surface of the pudding; strew lightly upon it 4 oz. of clean, dry currants, and bake it *gently* from three quarters of an hour to a full hour. Some nutmeg, a spoonful or two of brandy, and an ounce or two of citron sliced thin, can be added if thought desirable. The pudding will be excellent if the baking be well conducted. A border of ratafias, laid on the edge of the dish and fastened to it with a little beaten white of egg mingled with a dust of flour, after it is drawn from the oven, will give a nice finish to its appearance; or cakes of pale puff crust not so large as a shilling, may be used for the purpose when preferred. Should a richer pudding be liked, use for it the yolks of seven or of eight eggs, and the whites of four; and if it be baked in an American oven, let it be placed sufficiently *high* in front of the fire for the heat to be well

reflected to the under part; for when this is not attended to, recipes will often fail from want of more uniform baking—the surface of a dish being even overdone, while the inside has been but slightly acted on by the fire. When time will permit, it is better to allow the rice for this pudding to become nearly or quite cold before the eggs are stirred to it.

#### 11. SNOWDON PUDDING.

Ornament a well-buttered mould or basin with some fine raisins split open and stoned, but not divided, pressing the cut side on the butter to make them adhere; next, mix 8 oz. of *very* finely minced beef-kidney suet with half a pound of bread crumbs and an ounce and a half of rice flour, a pinch of salt, and 6 oz. of lemon marmalade, or of orange when the lemon cannot be procured; add 6 oz. of pale brown sugar, six thoroughly whisked eggs, and the grated rinds of two lemons. Beat the whole until all the ingredients are perfectly mixed, pour it gently into the mould, cover it with a buttered paper and a floured cloth, and boil it for one hour and a half. It will turn out remarkably well if carefully prepared. Half the quantity given above will fill a mould or basin which will contain rather more than a pint, and will be sufficiently boiled in ten minutes less than an hour. To many tastes a slight diminution in the proportion of suet would be an improvement to the pudding; and the substitution of pounded sugar for the brown, might likewise be considered so. Both the suet and eggs used for it should be as fresh as possible.

#### 12. KENTISH CUSTARD.

Arrange in a glass dish five or six penny sponge-cakes, and add to them as much white wine as they will entirely absorb—but no more. Place on the top of each a slice or layer of bright coloured preserve, and pour round—but not upon—them from half to three-quarters of a pint of thick boiled custard. Spikes of almonds or of pistachio nuts may be used to ornament the cakes, but they will be no real improvement to the dish, which is very nice even without any preserve.



## FASHIONS FOR THE MONTH.

WE are now arriving at the commencement of the Autumn season, and our *Artistes de Modes* are busily engaged in the preparation of the choicest and most elegant novelties.

As the greatest changes in style have lately been in the form of dress skirts, we will first devote our observations to this part of the toilette. The long train skirts are still most fashionable for the afternoon promenade; they are made plain at front and sides and with a good deal of fulness just at back.

The short skirted dresses à deux jupes, are however steadily increasing in favour, even for the afternoon promenade. For these short double skirted dresses, the upper skirt is generally looped up *en panier*.

There is an increasing tendency towards the adoption of flounces, at the bottom of the under skirts; indeed, in some dresses the under skirts are composed entirely of very narrow flounces.

The Polonaise style of dress, made with the opening of fronts placed in a slanting direction from one side to the other, is a very elegant and fashionable style.

For out-door costumes, while there are still a few of the square cut or loose styles of jacket and paletot, the close-fitting styles of casaque or paletot will certainly be the most fashionable: they will often be worn with a *fichu* of the same material over them; and it is indeed this that will cause the general adoption of the close-fitting style. The *fichu* has been too fashionable this Summer to be laid aside, and, as it would not be warm enough by itself, it will necessarily form the complement or finish to the new style of tight-fitting *casaque* or paletot, for Autumn and Winter wear.

The *fichu* mantelet of black velvet, without sleeves, is one of the latest and most elegant novelties, and is admirably adapted for the earlier part of the Autumn season.

*Morning Walking Costume.*—Dress à deux jupes of maize coloured silk. The under skirt is entirely without trimming. The upper skirt is edged by a flounce of the same silk, caught up on each side, and fastened by a rosette. The paletot is of slate-coloured silk; it is made with short loose sleeves, which, with the bottom of the paletot, are edged by a broad flounce of black lace, headed by a knotted fringe of black silk, and a double row of braid, which is carried up the centre of back, round the neck, and down the sides of the opening. The back of the paletot is also trimmed by a group of bows and long floating ends of black velvet ribbon, with tassels of black silk. Black velvet hat, trimmed at the side by a rose and foliage.

*Costume for Home.*—Dress à deux jupes, of Metternich green silk, or green shot with violet. The bottom of the lower skirt is trimmed by a broad flounce of the same silk, headed by a small *douillon*. The upper skirt is scalloped out, and edged by a similar but narrower trimming, which is continued about halfway up the skirt between the scallops. The front is *en tunique*; at the back of the waist are two bows and long floating ends of the silk edged by a narrow green ribbon. The sleeves are trimmed at the armholes by *ruches* of the silk with narrow green ribbon in the centre; and at the wrists by a broad plaiting.

*Carriage Costume.*—Dress of *mauve* silk; the skirt entirely without trimming. Polonaise of black silk, fastening *a la redingote*. The part which wraps over, is caught up, and fastened at the lower corner by a rosette of *mauve* ribbon, in the centre of which is a black silk button. The Polonaise is edged all round and up the opening by a band of *mauve* ribbon, which passes under the waist-belt (also of *mauve* ribbon), and is carried all round the deep black velvet collar, which crosses over the chest, and forms the trimming of the body. Pointed cuffs are imitated

on the sleeves by bands of *mauve* ribbon. Bonnet of white *crêpe*, trimmed with *mauve* ribbon.

*Afternoon Promenade Costume*.—Dress of Havannah silk, the skirt is *en train*, and entirely without trimming. The *mantelet* is of black velvet. It consists of a back and fronts only, is quite open at the sides and is fastened in at the waist by a belt composed of folds of black satin, a broad *bias* band of which is carried entirely round the *mantelet*. The upper part is covered by a small *pelerine*, similarly trimmed, to the back of which are attached two bows of black satin ribbon, with long floating ends reaching below the *mantelet*. Bonnet of pink *crêpe*, trimmed by a rose and buds, and black lace.

*Ball Costume*.—Dress of white silk, the skirt entirely without trimming. The *sortie de bal* is of white cachemire. It is composed of two separate parts, the upper part consists of a cape with a hood, and the lower portion is *en casaque*, the whole edged by a gold fringe, above which are four rows of braid of the same material. The hood is trimmed (near the back of the neck) by a star formed of seven small gold leaves, starting from which, four rows of gold braid are carried down the centre to the point, terminating in two large bows of white cachemire, and a star and tassels of gold, by which the cape is fastened to the lower part of the *sortie de bal*.

Among new designs of Bonnets, Hats, &c., we may mention the following:—

1. A *Hat* entirely covered with grey ostrich feathers, and trimmed at the left side by bows of grey satin ribbon, and in front by a full blown rose with a bud and foliage.

2. A *Cap* of *guyure* lace, with bows and strings of blue velvet, having at the right side a rose, with buds and foliage.

3. A *Bonnet* of grey terry velvet, trimmed by black lace, violet velvet ribbon, and flowers of the same colour. The *brides* are of violet velvet and black lace, and there are strings of violet velvet to fasten under the *chignon*.

4. A *Bonnet* of grey satin, trimmed at the

left side by bows of black ribbon, starting from which, a wreath of rose-buds is carried across the centre of the bonnet. The back is trimmed by black lace, which is continued down the sides, forming *brides* to fasten under the chin with a group of rose-buds. There are black satin strings to fasten under the *chignon*.

5. A *Hat* of black velvet, trimmed with lace of the same colour. At the back is a fall of black spotted *tulle*, edged by black lace, and in front is a large group of pink, white, and yellow roses, with buds and foliage.

6. A *Head-dress* composed of rose-coloured ribbon, and lappets of white embroidered muslin edged with lace, and having a coronet of rose-coloured ribbon and narrow white lace. The lappets fasten under the chin by a group of bows of rose-coloured ribbon.

7. A *Pelerine-Cardinal* of white embroidered muslin, trimmed all round by a deep frill of the same material, above which is a heading formed of a *bouillon* of muslin, edged on each side by a narrow insertion, and this is carried up the sides of opening. The neck is trimmed by a narrow frill of worked muslin, and a band of green ribbon fastening in front, with bows and long floating ends.

8. A *Canesou* of white muslin, edged all round and up the sides of the opening by a flounce of *Valenciennes* lace, above which is a trimming composed of squares of the lace, edged by a narrow frill of worked muslin. The sleeves are trimmed to correspond.

9. A *Hat* of the *casquette* form. It is composed of black velvet, and is trimmed by a wreath of Bengal roses, leaves, and foliage, terminating in a long trail at the back.

10. A *Bonnet* composed of black velvet, and trimmed by lace of the same colour, a frill of which crosses the back of the bonnet, and is continued down the sides, forming *brides*, which are terminated by bows and ends of black satin ribbon. At the left side is a half-blown rose, surrounded by grapes and leaves. There are strings of black satin ribbon to fasten under the *chignon*.

## Miscellanea.

### A NEW CEMENT.

The following directions are given for making cement impermeable by air and steam, which is said to be superior to any in use for steam and gas pipes. Six parts of finely-powdered graphite, three parts of slaked lime, and eight parts of sulphate, are mixed with seven parts of boiled oil. The mass must be well kneaded until the mixture is perfect.—*Mechanics' Magazine.*

### MUSHROOMS.

The old division of fungi, by the ignorant, was into mushrooms and toadstools; the former to be ranked as delicacies, the latter to be abhorred as poisonous. Modern science shews us that we may make our divisions of fungi by the thousand, and that though, as in other descriptions of plants, there are some that are noxious, yet the bulk are harmless, and many are excellent in a dietary point of view. Botanists of the amateur order have toiled hard among wild flowers, ferns, mosses, and algae, heaths, too, have had their day; but, for some reason or other, fungi, which can shew among their ranks beauty of form, tints of the most exquisite hue, scents of the sweetest, and flavours that would gratify the most sensual of gourmands, have been neglected, with some few exceptions, where from their gastronomic value, they have, as it were, forced their way into notice. We are most of us familiar with the ordinary field mushroom (*Agaricus campestris*), the morel (*Morchella esculenta*), and the truffle (*Tuber aestivum*); but though they are by no means really in the highest rank, custom and prejudice have assigned them the topmost dignities, while fungi equal to and surpassing them in flavour, are year by year allowed to rot by the ton in woods and fields, because "my father" said that they were poisonous. The Russians and Italians seem thoroughly to understand these wonderful but neglected productions of nature, evidently seeing the peculiar position they hold—partaking strangely, though vegetable, of the nitrogenous compounds of animal life, that they are not only highly nutritious, but wonderfully satisfying, and, in many cases, so flesh-like in flavour and odour that he who partakes of the banquet can easily be deceived. This is no light assertion derived from book lore, but the result of the practical experience of one who is in the habit of feasting right royally, in due season, upon the puff ball's delicate brain fritters, the hydnum's scalloped oysters, the brown, piquant, juicy steak of the liver fungus, the tender lamb kidneys of *Agaricus deliciosus*, and so on—delicacies all, and spread bounteously by the lavish hand of nature for her neglectful children.—*Once a Week.*

### PRESERVATION OF LEATHER.

A contributor to the *Shoe and Leather Reporter* gives some valuable hints in relation to the preservation of leather. The extreme heat to which most men and women expose boots and shoes during winter deprives leather of its vitality, rendering it liable to break and crack. Patent leather particularly is often destroyed in this manner. When leather becomes so warm as to give off the smell of leather, it is singed. Next to the singeing caused by fire heat, is the heat and dampness caused by the covering of India rubber. India rubber shoes destroy the life of leather. The practice of washing harness in warm water and with soap is very damaging. If a coat of oil is put on immediately after washing the damage is repaired. No harness is ever so soiled that a damp sponge will not remove the dirt; but, even when the sponge is applied, it is useful to add a slight coat of oil by the use of another sponge. All varnishes and all blacking containing the properties of varnish should be avoided. Ignorant and indolent ostlers are apt to use such substances on their harness as will give the most immediate effect, and these, as a general thing, are most destructive to the leather. When harness loses its lustre and turns brown, which almost any leather will do after long exposure to the air, the harness should be given a new coat of grain black. Before using this grain black, the grain surface should be thoroughly washed with potash water until all the grease is killed; and after the application of the grain black, oil and tallow should be applied to the surface. This will not only "fasten" the colour, but make the leather flexible. Harness which is grained can be cleaned with kerosene or spirits of turpentine, and no harm will result if the parts affected are washed and oiled immediately afterward. Shoe leather is generally abused. Persons know nothing or care less about the kind of material used than they do about the polish produced. Vitriol blacking is used until every particle of the oil in the leather is destroyed. To remedy this abuse the leather should be washed once a month with warm water, and when about half dry, a coat of oil and tallow should be applied, and the boots set aside for a day or two. This will renew the elasticity and life in the leather, and when thus used upper leather will seldom crack or break. When oil is applied to belting dry it does not spread uniformly, and does not incorporate itself with the fibre as when partly damped with water. The best way to oil a belt is to take it from the pulleys and immerse it in a warm solution of tallow and oil. After allowing it to remain a few moments the belt should be immersed in water heated to one hundred degrees, and instantly removed. This will drive the oil and tallow all in, and at the same time properly temper the leather.

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A PRACTICAL VIEW OF THE IRISH LAND QUESTION.

IN FIVE CHAPTERS.

CHAP. IV.

*Fixity of Tenure, &c.*



MUCH stress has been laid by the Irish party upon emigration as affording an undoubted proof of misgovernment. The fact of large masses abandoning their country in search of labour, while within the country there are large tracts of land unimproved and undeveloped, does appear enigmatical, but, as already stated, the circumstances of the last twenty years demanded a change in the number and habits of the people, and what has been the result? Do we find land unoccupied? Do we find increased pauperism or increased crime? No. The change that has been brought about is, that we miss the once half-fed, ill clad peasant—the mass of struggling humanity who were hardly in a position to keep body and soul together; and we have now an enlarged sphere of action for those who remain. Two men are not now looking to reap the one blade of corn, but the one is able by the aid of appliances to effect, secure, and enjoy that which heretofore he could never have accomplished. No longer, then, requiring assistance in the production, I do not see how he would be benefited in having an additional mouth to aid him in the consumption. Apart from this, America has inducements to offer to men of *every country*, who do not occupy an established position at home, boundless

acres of maiden fertility, with a freedom of thought and action, and, in some parts, immunity from the heavy taxation which the luxuries and habits of an old country must necessarily impose. In the free atmosphere of the republic, too, such as have disliked the restraint imposed by their clergy in secular as well as religious matters, have an additional inducement for emigration. Here an independent course would be met by persecution, and the number of channels through which it would be made to flow would drown any one who attempted to stem the torrents of priestly influence thus set in motion. Perhaps the soundest reason for stating that one of Ireland's grievances is emigration, is a pecuniary one. If we consider for a moment that population is with the priesthood synonymous with power, influence, and money, it is not to be wondered at that emigration with them finds no favour—how could it be otherwise? The 80,000 persons leaving our shores annually represent at least as many half-crowns, or a reduction in the church revenue of £10,000—in itself a very substantial reason for the outcry that has been raised against the movement by the professed friends of the people, who are not slow to perceive that in the diminished number at home a spirit of thought and independence is springing up that has been wafted across from the shores of the Atlantic. There was a time when the agitation upon Tenant



Right was considered sufficient by the priests and political agitators to keep themselves forward as champions of the people's cause, and to create an identity of interest, but the spread of thought and public opinion amongst the class intended to be cajoled, has been too much for them to hold their ground. The substantial farmer is now too well informed to be caught by a machine of so clumsy a construction, and has more faith in himself and his well-considered bargain on parchment, than in the empty schemes that have been so frequently dressed up to attract and delude. In order, then, to make another bid, and once more to lead the van, something more substantial than Tenant Right has to be produced; the two classes who were outside the pale hitherto are now appealed to; the small farmer, with the assurance of fixity of tenure, and the labourer, is not without his hope that the sympathy extended to Fenianism will some day be productive of such anarchy and confusion as to leave him in possession of property, to which his title-deed is descent from Adam, and from which, since Eden was dispeopled, he has been unlawfully dispossessed. Such, then, is the tone produced amongst the ignorant and deluded people of this country by the press, and by political agitators, lay and clerical, that I am satisfied upon the Land Question any legislation which falls short of placing every man under the shade of his own vine and fig tree will fail to create that spirit of contentment and progress, without which it is difficult for any country to flourish. Our hope, then, for better things must be in the spread of education, and the growth of sound public opinion. Until these have become engrafted in the Irish character, and maudling sentimentality and ready gullability have been driven out, it is of no use to talk of peace where there is no peace—it is of no use to attempt to legislate for a class whose full measure is nothing short of the overthrow of Government and confiscation of the land.

Thus, in considering the question of tenure, there are two interests to be dealt with, that of the landlord and tenant directly, and that of the community at large in a more remote

degree, who are, of course, interested in this question, inasmuch as any legislation which tends to encourage agricultural development, and increase the produce of the soil, must increase the staff of life, while to landlord and tenant the farms would be benefited by having their inert capital rendered active, their income improved and *more certain*. The latter would have an enlarged workable area and heavier crops, could cheerfully pay the improved rent, as many of the expenses attendant on cultivation are not dependent on the yield, but are generally in the inverse ratio. It must be admitted that Irish cultivation is bad, and partakes in a great measure of a hand-to-mouth system. There is also great room for reclamation, drainage, and buildings, and other permanent improvements. Now, the object of legislation must clearly be to encourage the farmer *freely* to apply his capital to the soil, to raise its fertility, and to induce or make the landlord sink his money in the profitable development of the resources of his estate; or failing this, to make such provisions for the tenant as shall enable him to be reimbursed for any outlay he may make in permanent improvements, for which his tenure does not fully provide. I look upon the tenant *prima facie* as a *surface* man with *floating* capital, and the landlord as the fixed interest, the owner of the material upon which the tenant has to work. If this was the invariable relative position of the two, legislation would be easy or hardly required at all, but in practice there are a thousand phases in the joint relationship. Still, whatever may be done as to minor details, the broad principles of tenure ought to be legally defined, so as to give every tenant security for his cultivation, and if he engages in works of *permanent* utility to place him in a position to reap the fruits of his industry and capital, either by such a time as will enable him to recoup himself, or by annual reduction of rent for work done, upon which a percentage might be charged by the landlord for the remainder of the term. I am not one of those who would annihilate the duties of landlords by long leases, much less fixity of tenure. It

was the removal of their duties and burdens under the long lease system that produced absenteeism, middlemen, and the numerous interests and complicity under which Ireland is labouring at this day. Agricultural produce varies more in price perhaps than any other; readjustment of rent, or a balancing of the proportion of rent to the value of the produce of the acre would be the amount that in equity the landlord ought to receive, and the tenant ought to pay. Put land on a low rent upon long leases, and you have immediately a number of interests created until it reaches its full value. The long lease wipes out all a landlord's responsibility, and the system which grows up under it is for every one to plunder the fee as much as they can. Again, if you have a long lease, with too high a rental, the uttermost farthing is screwed out of the acre, and the farm abandoned in poverty as soon as it ceases to yield an existence over expenses. This clearly must always be so, and hence I argue that *occasional* re-adjustment is necessary for *both* interests. Some are disposed to look on the fee as a fixed idea, and that over and above this the fluctuations are for the occupier. I am in favour of the opposite notion; a more easy transfer, and a more commercial spirit in reference to land, with less of feudalism and imaginary ancestral right. One of the great causes of the heart-burnings to be found here, arises from the possession of valuable interests under long leases. These interests may have been enjoyed by a family for generations, may have been of their own creating, and may be foolishly reckoned upon as permanent; a life drops, the term expires, and all they have in the world is transferred to their landlord. It is difficult then to make them believe that anything short of absolute robbery has taken place. Others again have interests through the progress in the times; proximity to a railway, or a flourishing town or any of the many external causes which affect the value of land. Here the occupier may have created nothing, but it would not be easy to convince him upon the fall of the lease, that the landlord might fairly put the increased value into his own

pocket. If the dealings in land were characterised by the same spirit as in commerce, and the limited occupier made his outlay upon a fair calculation of repayment during his term, he ought to be satisfied with the result; but if his term does not admit of that full profit being obtained, he must blame himself for his want of calculation and his too great faith in humanity. Does any one conceive for a moment that the Marquis of Westminster, if at the end he takes possession under his building leases, robs every one who ever placed a house upon his estate? The same may be said of improvements under long leases here. Many middlemen, previous to 1846, with long leases, laid out large sums in buildings and other improvements who, when the famine came, were unable to fulfil the conditions of their leases, and had therefore to abandon their farms and improvements before they had reaped the benefits they had fairly calculated on. Such cases, and they are numerous, are cases of great hardship, and arise from too great confidence in security, and from not making provision for unforeseen contingencies. Leases for lives, sometimes with years, and sometimes without, are very common, and afford an extraordinary instance of how the spirit of gambling or uncertainty is preferred to a more defined system. One of the most important acts in a tenant farmer's life, that upon which the profit to be derived from the outlay of his capital and very existence depends, is, we find, governed by the most precarious of all tenures—that of human life. Leases of this nature are to be condemned, and whatever other terms leases may contain, let the tenure, at all events, be clearly defined. It has been so often asserted that our Irish tenants have no leases, and are only the abject vassals of their landlord, depending upon their obedience to his fancies and whims, and subject to ejection at every six months, that I have been astonished that a statement which is so easy to disprove, and upon which exact information could be obtained so readily, has not been brought to book by those interested in the Land Question. Here again I would point to the value of the records

of the Landed Estates Court as furnishing correct data upon such a point. If we presume that good management of property depends upon leases, we may infer that the worst managed naturally came to the hammer, and were therefore deficient in this important particular; a return, then, of the acreage sold and the tenure would exhibit the exact state of things, and, in my opinion, would shew that a very large proportion of the land was held upon leases so long as to prevent that judicious interference and interest which every landlord ought to possess in regard to his estate. Long leases, too, are granted by some landlords to shelve all responsibility and demands. I know of many instances where farms are in a very undeveloped condition, unfit to be occupied, with a purely floating capital, and in reply to questions about improvements the landlord says, "There is the land, I will spend nothing, but give you a long lease and you can do what you like." This is a very safe game for the landlord, if improvements are effected. His tenant's interest makes the rent more secure; if circumstances should arise by which the tenant had to leave the farm before the expiration of the term he would leave his improvements after him. The landlord, therefore, has all to gain and nothing to lose. It is this same tone which influences tenants under leases in their cultivation; they, too, wish to play the safe game; if they have a pound in the bank, it is theirs beyond yea or nay; if it should be in the land, some contingency might deprive them of it. So, instead of developing or improving they try to realize, and thus have a reduced staple and a reduced fertility.

How this notion of fixity of tenure is to work I am at a loss to conceive. If prices are fixed, if labour is fixed, if everything human is fixed, then I can perfectly understand fixity of tenure. If the present occupiers are fixed, what is to become of those who wish to become farmers hereafter? Are they to remain outside the pale for ever? Are we to assume that once a farmer, always a farmer? Fixity of tenure would place the development and control of property in the hands of a class, who, at present, have neither

energy, capital, nor education, equal to the position they would occupy. We should be attempting as great an experiment in its way with the tenant farmers of Ireland, as the Americans have done with the slave population of the south, with this important difference, that the slave, now free, is made to obey the laws. He may pine from want of organization, unfitness for independency of thought or action, and is worsted in his effort to adapt himself to his freedom. The suffering and the reaction is of a personal character, and comparatively, therefore, of a temporary kind. With the tenant farmer the change would be as great, and the unfitness even greater and more decided. Here there would be no control, if the system did not work well where are we? It would be easy to give permanent power to a class, but in case of failure how hard it would be to deny it. The working of the temporary system in cases of non-fulfilment is difficult enough, and what would it be under fixity of tenure? Such a tenure would nullify capital and education, and defeat the very object for which it would be instituted. A periodical change admits of competition; it allows the idler, the drunkard, and the spendthrift to be weeded out, and throws increasing areas into the hands of the careful, the energetic, and the industrious agriculturists—into the hands of men who know their business and are well able to make a bargain and protect themselves. Tenure should be of such duration as to allow the occupier time to reap the full fruits of his expenditure in cultivation, or in case of his effecting permanent improvements, to obtain a return for his outlay calculated on a certain number of years, which if not enjoyed by the tenant should be recouped to him either by his successor or the landlord. So far as the development of the soil is concerned, the tenant will have all the advantages of fixity of tenure, but if fixity of tenure means that the rent to be paid for his land is to bear a less proportion to the value of the produce than a fairly adjusted rent, then it is clear the idea means nothing short of taking from the landlord a proportion of his income and putting it into the pocket of the tenant.

## CHAP. V.

*Small Proprietary System.*

The small proprietary system is another form which this discussion on tenure has taken. We have three ideas before us, all tending in the same direction, all aiming at possession of the soil. Fixity of tenure giving possession, subject only to a rent which might not be the value; the proprietary system, which would indulge in ownership without the full means of purchase; and Fenianism, which would take possession free from any of the drawbacks of the other two. The small proprietary system could readily be indulged in by any company or individual who allowed his convictions to take the practical form of purchasing an estate and cutting it up, or by men of capital making advances to enable tenants to become purchasers. With this view it has been proposed to organize a department in one of the Cork banks, but how the proposition will benefit the tenant I do not understand. It proposes to him something very sweet, when it offers to make him his own landlord; but the terms upon which so pleasant a metamorphosis is to take place are not very clear; landlords know something of the drawbacks in connexion with landed property, whatever bankers may do. Protection, time allowances, and often no rent and no assets are terms upon which many tenants hold under their present landlords, but prompt payments, and in cases of nonfulfilment, a writ, are more likely to be the terms upon which the money would be advanced by a company who are in the habit of making out a half-yearly balance-sheet. This notion of sinking capital, or rather fixing it, is as foreign to a farmer as any other man in business. If a tenant can make, say 10 per cent. of his floating capital upon the land, how is he to be benefited by investing it in land at 3 per cent.? It is clear the more he farms and the less he owns the better his income. The position of the two interests, owner and occupier are, as society is at present constituted, totally distinct; whilst as occupier a limited capital admits, by the combination of energy and skill, of a good

per-centage; as owner, a limited capital, having to stand alone, would be quite inadequate to create a livelihood. The possession of land in the British isles may be looked upon as a luxury where the acreage is comparatively very limited, and the capital unlimited, and must be paid for accordingly. I need not say that poor tenant farmers are not the men to indulge in luxuries. Instead, then, of confounding the two positions, the tendency of legislation ought to be rather to create as marked a distinction as possible, and by every means in our power endeavour to make the landlord develop the latent resources of his estate, and the tenant, by his capital and industry, cultivate in such a manner as to produce the greatest permanent return. The division of duties would give a common interest. If a tenant steps outside the bounds of cultivation and enters upon development, let him enjoy his improvements for so many years, or be paid for work done as he goes on; a certain per-centage being charged upon such outlay during the occupancy. Then there would be a mutual interest in the work being done cheaply and efficiently. If improvements were in part executed by the tenant, there would be economy. Improvements would admit of the keeping of an extra staff, who would be available at hurried seasons to secure and sow the crops, and the whole force of the farm at slack time could be turned upon the improvements. I know of some instances under the Board of Works where the charge for drainage was more than the land was worth, but had the reclamation been worked in gradually with the farm labour, it might have been profitably carried out.

Besides the question of security for improvements by tenants, there is that where property is only held as a life estate. Property so circumstanced is at a standstill; all outlay is avoided, and the uttermost farthing wrung out of the tenants. To effect an improvement is to ensure an immediate rise in rent. This is one of the instances where tenants require legal protection, and where owners of such interests ought to be in such a position as to be able to charge their suc-



cessors with a fair proportion of the improvements. Owners would not then hesitate to carry on works from which, if they did not fully benefit them, would be no loss to their children. As the law stands at present it is possible a whole country side may languish for half a century, placing a damp upon all energy, and creating an untold loss to the community and those immediately interested. There are, in my opinion, many other subjects affecting the farmer's interests, even more than tenure, which require legislation, but whether it is because they are subjects which, if taken in hand, would speedily be remedied, or the interests they effect are too strong and combined, I know not. One of the greatest boons we have received was in the recent Weights and Measures Act doing away with all kinds of deductions and allowances. In the same direction, and with the same spirit, we want a complete alteration in our fairs and markets. First catch your hare, &c., is good advice; we have the animal, the commodity, but we have not the accommodation to dispose of him to the best advantage. Under the patent for fairs there appears the power to collect tolls, but as to situation, arrangement, accommodation, prevention of disease, pens, or of anything appertaining to order or business, there is not the remotest idea. We need not go further than mention the fact that at the market in Cork, men, women, cattle, sheep, and swine, have promiscuously to pass in and out through one opening of 10 feet, and that at this opening tickets have to be collected from the different lots passing out, whose egress is stopped by corporate officials, armed with stout clubs, until the proper scrutiny has taken place, whilst other lots being goaded in, get mixed and give rise to scenes of brutality that beggar all description. Another sad example of the want of some change is to be found at the Great Cahirmee Horse Fair. The site is in the heart of a country where there is neither accommodation for man or beast within miles; a feed of oats, or a bed to more than half the frequenters cannot be obtained at any price; and upon strangers, who must have some place to rest themselves and stow away their purchases, the greatest

extortion is practised; whilst the great bulk of both men and horses remain in the roads, or the streets of the neighbouring villages, exposed to the elements for the night—so much then for the fairs. One example of our market system will suffice:—Take the Cork butter market, where one and a-half millions sterling are annually turned over, it is under no legal control. With the exception, I believe, of the weigh-master there is nothing legal about it, and I understand that this official's duties have been perverted, and that instead of being paid his fees under the Act, he is now in the hands of the committee who appointed him and pay him a fixed salary. The market system is a huge monopoly, and the regulations and practices of the market are most detrimental to every man sending in his butter for sale. The local agricultural societies have from time to time remonstrated against these practices, but are powerless to put a stop to them. The butter merchants being a large and wealthy body, with a good balance in hand, derived from the fees of the market, are at all times prepared to fight the farmers with their *own money*; combination, wealth, and influence, are all brought to bear upon the maintenance of a system which, whilst it has created hundreds of living examples of rapidly-made large fortunes by dealing in butter, fails to exhibit one solitary instance of marked success amongst the producers. The whole subject calls for a searching inquiry, and requires to be dealt with in a broad and comprehensive spirit. If the alterations in the times require Parliamentary Reform of our boroughs and constituencies, believe me the details affecting our agricultural system, and none more so than our fairs and markets, demand it. So long as they are controlled and in the hands of interested parties, they will fail to give that accommodation and means of obtaining such prices to the producer as he ought to realize in an open and properly constituted market. Besides the change required of a purely agricultural character, there are others in which farmers are indirectly interested; I refer to our local taxation, which is unnecessarily heavy; the

county cess, which is paid entirely by the occupier, amounts to nearly 2s. in the pound—this, with few, if any new works, no creation, but merely maintenance, is very heavy, when we consider the great reduction of local road traffic by our railway system. The whole grand jury system wants revision; taxation and representation ought to go together; the ratepayers, as the law is at present constituted, have practically no voice; the whole machinery is too cumbersome, and not sufficiently local; large staffs of high salaried officers eat us up, and, being beyond the reach of the ratepayers, work the abuses under the law as only trained men know how. The same may be said of the poor rates, as high as 2s. in the pound, without a pauper in some rural divisions. This arises from the class of guardians who are returned for the rural districts. The priest, anxious to display his power in opposition to the Protestant or landed interest, returns men ignorant and uneducated, who instead of performing and knowing their duties are merely the tools of their patrons to vote and execute a job when required. Between jobbing and mock philanthropy, which feeds and cares for paupers often better than many of the ratepayers are able to feed themselves, hundreds are reared in idleness, whose labour is required in the country districts, and whose very want of training, even if disposed to work, renders them unfit for the hardships the world demands from persons who would earn an honest livelihood. In this way a mass of humanity is reared up, and becomes a permanent burden upon the industry of this country.

The foregoing remarks lead me to the following conclusions for adjustment of the Irish Land Question:—

1. In order to induce tenant farmers to invest their capital in *improving the cultivation* of their land, they shall be entitled to have the security of a lease for a term not exceeding twenty-one years.

2. In cases *where the tenant effects permanent improvements at his own cost*, of such a nature as to add a material value to the property, he shall either enjoy such improvements for a

term, which in gross shall not exceed thirty-one years, or shall be allowed to dispose of his unexpired interest to the landlord or incoming tenant.

3. Owners of life estates shall be empowered to charge upon their successors the proportion of any amount expended on permanent improvements not fully exhausted during the existence of the life interest effecting the improvements.

4. Where permanent improvements can only be effected by the concurrence of adjacent landowners, the majority of the parties interested shall have the power to assess in proportion the whole properties benefited.

5. Local taxation requires adjustment and relief by a revision of the Grand Jury Laws.

6. It is desirable to institute some system in our workhouses by which able-bodied paupers and children may be regularly instructed in agricultural work, so as to relieve the rates from the support of many who are able, but unwilling, to work, and also to render those institutions more self-maintaining.

7. Instruction in agricultural details should form part of the teaching in our national schools in rural districts.

8. Fairs and markets require some legislative regulation, in order to afford the best facilities for disposing of produce.

9. A tax upon absentee landowners with incomes over £300 per annum, of 5 per cent. on their nett income, would give satisfaction. The proceeds of this tax to be applied in the reduction of the poor rate.

10. It is necessary that the law of trespass should be made more stringent, as it is carried on professionally under the existing law.

As a minor matter, I may allude to the great loss occasioned by bulls "going at large." The loss to immense numbers of heifers is equal to £1 per head, and with shipments of about ten thousand animals per week, it forms a serious item. I should recommend that all bulls over nine months old be housed by law, unless under the immediate control of the owner or his servants.

*THE AGRICULTURAL INTEREST.*

THE Earl of Minto, when presiding lately at the dinner in connexion with the show of the Border Union Agricultural Society, took occasion to make some remarks relative to the decrease of population in rural districts. Referring to the improved dwellings for the labouring classes, which have been erected of late years in many districts, his lordship stated that he had heard that this was driving the people into the towns, which he believed to be perfectly true, but did not think it a symptom of deterioration in any respect. "He believed, at this moment, that there was a far larger number of persons engaged in agricultural pursuits in some way or another than there were 50 or 100 years ago, though it might be perfectly true that the agricultural residents in the country districts were lower than they were. A farmer, no doubt, engaged persons on his farm who had to live on the spot, but the requirements which agriculture had upon industry was a hundred per cent. greater than they used to be. A farmer now sent to South America for guano, to Russia, perhaps, for oil-cake, besides employing hundreds of men in the manufacture of agricultural implements, draining tiles, &c. In short, if they compared the present time with a hundred years ago, they would see that the number of persons employed in agricultural interests was infinitely greater now than formerly. It was quite true that the population of purely rural parts had not increased, but it was a great mistake to infer that the persons employed in agricultural industry had decreased. He had perfect confidence that the greater amount of industry, of skill, and of science applied to the ground, the greater would be the produce and prosperity of the district, the larger would be the demand for labour, which would be felt not only in our own manufacturing towns but even in foreign countries."

There is much in Lord Minto's remarks

which deserves consideration, and we are glad to observe that he pointed out certain facts which have been too much overlooked by social and political economists.

When "the agricultural interest" is talked of, there are many who seem to suppose that it is confined to those who are immediately engaged in farming pursuits, such as tenant farmers and those employed by them. Landed proprietors are also considered as belonging to "the agricultural interest," although not perhaps to the same extent as the cultivators of the soil, seeing that the proprietors of land may, and often do derive a considerable portion of their incomes from other sources than the land.

This is, however, a very narrow and erroneous view of the subject. It is no doubt true that at one time "the agricultural interest" might, with considerable justice, be regarded as confined to those who owned and those who cultivated the soil. The business of a farmer was at that time, in a great measure, what we may call self-contained. The man who held the plough was expected to be competent to make one when required; the fertility of a farm depended on its own resources; a pair of staves, tied together at one end with a strip of sheep's skin, was all the machinery necessary for thrashing out the crop; while the wind of heaven, blowing through two open doors opposite to each other, or on the top of some elevated knoll, was the simple means employed in preparing the grain for market.

All this has been changed, and so numerous are the agencies which have been called into existence by the demands of modern agriculture, that it becomes exceedingly difficult to say where the various ramifications of "the agricultural interest" actually cease. The rudely constructed plough, which served the purposes of a former generation, has been superseded by implements fashioned

according to the strictest rules of mechanical science, and wrought by the most skilful artificers; and even these are now in their turn giving place to a higher class of machinery, in which steam is the great moving power. The picturesque and animating sight of a busy group of reapers or haymakers, plying their cheerful task, is becoming every year more rarely witnessed, from the increasing number of machines, by means of which the crops are mown, reaped, and gathered; and unless in some very backward districts, we cannot now "discern the thrasher at his task, sweating o'er his bread before he eats it." No longer "thump after thump resounds the constant flail;" for its place has been taken by machinery which does the work by a multitude of thrashers, winnowers, and carriers. The implement department of a Royal show-yard is one of the most astonishing sights that can be witnessed; more especially when it is taken into account that the innumerable articles which are there displayed have been called into existence by the requirements of that "interest" which some parties are accustomed to speak of in slighting terms as an "interest" of little weight in the country. Nor do those articles, as they are brought under our notice, fully represent the various industrial occupations which have been called into action. The iron manufacture, in its various branches, depends greatly upon the demand for agricultural implements and machinery. Manures and feeding stuffs, as Lord Minto remarked, are brought from distant parts of the world, and give employment to a large fleet of ships and thousands of seamen. The wages of those who are engaged in supplying the wants of agriculturists afford a livelihood to a host of bakers, butchers, grocers, manufacturers of clothing and other materials; and, in short, "the agricultural interest" is the great wheel which keeps all the other ma-

chinery of our social system in motion. Just let it get out of order, or stop moving, and what would be the consequence? Thousands who at present scarcely recognize the benefits they derive from it, would be reduced to starvation from lack of employment. Suppose, for a moment, that we went back to the system of agriculture which prevailed only fifty years ago; that the busy workshops of Bedford, Ipswich, Saxmundham, and many other places were shut up, what a blank there would be! Nine-tenths of the population would be in the poorhouse, and Macaulay's *New Zealander* might almost find that the time had arrived when he could fulfil his destiny as a moralizer over the ruins of a deserted metropolis.

Such, however, is not likely to be the fate of "the agricultural interest." The pressure of population against the means of subsistence will continue to stimulate men to exertion, and the advance which has already been gained, great as it is, will prove only a stage in our progress towards still more important results. "The boundaries of agricultural improvement are far from being capable of distinct definition, and may be placed at a distance far more remote than our present knowledge can warrant us to assign. From past experience we have reason to conclude that the field will gradually open as the necessities of man require. Such is the un-deviating system; and, as this system is not the result of chance, but the appointment of an infinitely intelligent and all-powerful mind, we may rest assured that it will continue to fulfil its high destination to the last. The power of producing additional food, by whatever means it may be acquired, will undoubtedly prove co-extensive with the increasing propagation of our species. Both shall have an end—so the divine oracles declare—but they will end together."



*THE CONDITION OF THE AGRICULTURAL LABOURER.*

THE social condition of the agricultural labourer formed the subject of a lengthened discussion at the recent meetings of the British Association. Papers were read by the Rev. Canon Girdlestone, and Mr Corrance, M.P., which called up Mr Read, M.P., Dr Crisp, Dr Hodson, the Rev. W. L. Brereton, Sir Willoughby Jones, Professor Leone Levi, Sir John Bowring, and other speakers.

Canon Girdlestone's statements related chiefly to the condition of agricultural labourers in the west of England, and were merely a repetition of what he has said of late on the same subject, at different times. He insisted on the lowness of the wages which he alleged are paid in Devonshire, and the insufficiency of the food of the labouring classes. He blamed the landed proprietors and the farmers of that part of the country for this state of matters, asserting that, as a body, they were of the old school, and resisted all progress. What the agricultural labourer really requires, he said, is independence. By all accounts, agricultural labourers in Devonshire get as much as they are worth, and if the Rev. gentleman wishes to secure their independence, he should strive to have them so trained that their labour will be worth more money than it is at present. As Mr Read very justly remarked, "let them do more work and they will receive more wages." As to their independence, are they not free to go where they choose to better themselves, if they have a mind to do so? They are not tethered to Halberton, or any other part of Devonshire. England is open to them, and if they are not satisfied with the old country, the colonies or the United States will receive them with open arms. Are they less independent than the Irish, who swarm all over the world, wherever work and wages are going. But we suspect the truth is, that Devonshire labourers prefer easy work, although it should give them only "tea-kettle broth," to good living,

which requires hard work to earn it. We certainly admire the Rev. Canon's persevering philanthropy, but we question the soundness of his philosophy.

The measures proposed by Canon Girdlestone to improve the condition of agricultural labourers, and to secure their "independence" are as follows:—Good wages; sufficient cottage accommodation; greater facilities for education; the abolition of all "mops" and hiring fairs; agricultural labourers' unions of a strictly protective character; and special legislation in their favour.

Mr Corrance gave a history of agricultural labour, and shewed that there had been a great amount of special legislation in their favour without producing much good effect. "Laws of settlement have not cured vagrancy; poor laws have not corrected the improvidence of the poor; model prisons and milder codes have not subdued the devil's regiment of the line. Self-education has produced trades' unions. Free labour does not follow free trade. Emigration neither raises up a kindred people nor contents those who stay. The enforcement of better sanitary laws produces unforeseen hardship upon the poorer class."

Mr Corrance advocated well-conducted friendly and medical societies, the Post Office Savings Bank, and co-operative associations, including building societies, as being well adapted to improve the social condition of the labourer, by leading to the formation of more provident habits, the want of which is too often the great source of evil in relation to the labouring classes.

Sir Willoughby Jones, in defending Norfolk from the charges made by Canon Girdlestone, stated that he had just paid his harvest wages, which amounted to £7 in cash for each man, which was earned in fourteen days, and added 3s. per week to the ordinary earnings of 13s. per week, besides overtime and task work being paid at the rate of 15s.

per week. He contrasted those earnings with the wages paid to carpenters and bricklayers in country places, the former receiving but 18s. and the latter 20s. per week, although one had to find expensive tools, and the other was unable to work in frosty weather, while the agricultural labourer was mostly employed throughout the winter; and he contended that the real evil consisted in the existence of so many beer shops, which prevented agricultural labourers from being a thriving, prosperous, and improving class.

Dr Hodson shewed that Canon Girdlestone's propositions would destroy that independence which he professed to contend for, and traced, in some measure, the present condition of the agricultural labourer in England to class legislation, and to the law of settlement. That there is a silver lining to the cloud of the agricultural labourer's social sky was shewn by Professor Leone Levi, who described the labour of the agriculturist as healthy compared with that of certain trades. The working men of Sheffield might earn £2 to £3 a week, but their lives were shortened by the nature of the work; and, taking a broad view of the subject, he did not think that wages paid to labourers in rural districts were unfairly low.

Mr H. E. Blyth, speaking as a Norfolk farmer, protested against the application of

Canon Girdlestone's illustrations to the condition of the agricultural labourer of Norfolk. He was sorry to say, indeed, that fifty years' experience as a master, that labourers set less value on character than formerly, and that masters were less strict as to the character of those whom they employed. The agricultural population was not progressing as it ought to do, either in a moral, social, or economical point of view, but he attributed this to the example set by those above them.

A resolution proposed by Mr Webster was ultimately carried. It was to the effect that with a view to give a practical turn to the discussion, a committee, consisting of the Rev. Canon Girdlestone, Mr Corrance, M.P., Sir John Bowring, Professor Levi, Mr S. Breame, and himself (Mr Webster), with power to add to their number, should be appointed, and requested to consider whether any steps should be taken to improve the condition of the agricultural labourer, and to report to the next meeting of the Association, which will be held at Exeter. Canon Girdlestone will then be fighting his battle on his own ground, and from what fell from the Rev. Mr Brereton, in defence of Devonshire landlords and Devonshire farmers, it looks as if the Rev. Canon will have some difficulty in maintaining his position.

## The Farm.

### MANURING FOR GREEN CROPS.

THERE is an old Scottish adage, and a true one, that "muck is the mither o' the meal kist." To the ears of many of our readers this proverb may not fall with the same significance as it does in Scotland, where the "meal kist" may, without stretching a parallel, vie almost with the roast beef of old England in supplying the bone and muscle of her sons. And we feel assured that the penates of the Roman matron of old were not worshipped with a greater reverence than the "meal kist" is by the thrifty housewife of the north. According to our proverb the meal kist is the child and muck is the parent. We propose to give our views on the preparation of, and application of farm-yard manure—the essential for all good husbandry. Since the introduction of guano and other artificial manures far greater facilities have been given for enlarging the breadth of land under green crop, and also of adding very much to the bulk of the cereal, and thereby increasing the manurial resources for next crop. On many farms, where railways have opened up an easy means both for supply and marketing of produce, the quantity of manure must be very largely increased, when compared with former days, when these farms were entirely self-supporting, and it required years to recover from a failure either in the turnip or cereal crop. On most farms in East Lothian (large as the quantity is), nearly the whole of the farm-yard manure is applied to the potato crop, for experience has taught farmers that large crops of every variety of turnips can be grown with artificial manures alone; potatoes cannot be raised with success unless good farm-yard dung is applied as the foundation for the crop. There may be exceptions to this rule—where pasture has lain for

some years, or even one year or two years, and oil-cake and turnips fed on the field, good potatoes may be raised with artificials alone. On some farms this system of husbandry is the best. The land is thoroughly cleaned after having lain in pasture, by taking a green crop; wheat follows the potatoes, and a crop of oats can be grown after the wheat, instead of coming immediately after the grass. Most leases have a clause forbidding two consecutive white crops; but that clause was very properly introduced long ago, when guano, sulphate of ammonia or nitrate of soda were unknown, and the high farming of the present day was but a dream. We propose to offer a few remarks on the comparative advantages of autumn application of dung on the stubble, as compared with dung given in the drill in spring. First of all, we would state that on farms where a large breadth of potatoes is grown, stubble manuring is a necessity; but in our experience we should not recommend one acre more to be manured in autumn than is absolutely necessary in order to have the work well forward in spring. There is a common saying, that doctors differ, but they cannot differ more in their opinions than farmers, who most invariably give flat contradiction to each other on most practical subjects. Nothing could illustrate this better than the evidence given in the law courts of Edinburgh, on an important agricultural law case some two years ago. Many farmers assert that the best crops of potatoes are grown after stubble manuring, and we admit this result may be possible, from some peculiarity of the season, the quality of the manure applied in the autumn, or the nature of the soil. But if any farmer will carefully repeat the same

experiment over a series of years (say ten), we most unhesitatingly say that nine times at least he will find the drill-manured potatoes the best. In a very dry season like the present, it yields a large increase of moisture, in a cold wet spring it prevents *cut sets* of potatoes from rotting by excess of cold moisture. We have made the experiment repeatedly on a large scale, and invariably found the drill-manured potatoes the best. The manure applied in autumn is frequently much better than manure made in winter, especially if the season has been wet. The manured stubble is generally first ploughed, and ploughed when the land is dry (an immense advantage for drill-husbandry in spring), and the manure being ploughed into the soil keeps the land open and porous, which, during a cold wet winter, must benefit the soil; but for all these advantages experience has taught us that drill-manuring is best. Potatoes are not benefited by having the manure too well made; but it should all be *middened and turned, and, to prevent too rapid or too much decay, salt should be sprinkled over every course as the heap is being turned, and both the top and sides covered at least 6 inches with soil* to keep in the ammonia, and prevent the drying winds in spring making the heaps too dry. The manure applied on the stubble should also be middened before being put on the land. When there is not sufficient time for this, the manure can be thrown up in a heap from the carts. This process hastens fermentation, and it can be applied in a few days. Where a large breadth of stubble is manured there is no harm done by the manure being allowed to lie for weeks without being ploughed in, but it cannot be too soon spread, and so little damage is sustained by the manure being exposed on the surface, after repeated trials, we are rather disposed to consider it an advantage. Some farmers assert that drill-manuring is disadvantageous for the wheat crop, because you cannot *bury dung too deep*. The deep cultivation will benefit the land. But will it stand to reason to suppose that manure ap-

plied in the drill (which certainly shews a little on the surface after the potatoes are lifted), will not still be of the same or possibly greater benefit? It is ploughed in by the seed furrow for the wheat; it has been perhaps six months less time in the soil, and must be there with even a greater stimulating influence than manure which has lain in the soil all the previous winter. In the writer's experience he never could trace any distinct variation in the wheat crop after drill or stubble manuring. The seed furrow should always be made across the drills, in order to spread the manure and obliterate their track. Lest we should be misunderstood, we repeat that autumn-manuring of stubbles is a necessary and admirable system of farm management. The aim of our paper is directed more to give an opinion on which system will grow the best crop. We have given a few of the reasons why it is quite possible that occasionally autumn-manured land may give the best crop. One cause we omitted to state. The stubble-manured land is always first planted, and in most seasons the first planted Regent potatoes are best. However, it is impossible to lay down any rules, as the variations of seasons makes perfect accuracy of judgment, or perhaps rather a bigoted opinion, *and the determination to stick to or uphold one system*—one of those errors that farmers, equally with those in all professions or trades, would do well to guard against. Let us do all in our power to assist those scientific agricultural chemists which our age has produced, by careful field practice, and we have no doubt the agricultural resources of our soil will be increased many fold, and the expense of high farming very much lessened. Nothing in visible creation is more generous than the soil or more truthful—*what a tale is told by a spilt guano bag*—and it is only by putting plenty in we can expect a plentiful return, remembering always the golden rule of Scripture, applicable alike to the natural as to the spiritual world—“For whatsoever a man soweth that shall he also reap.”



## ON THE STORING OF ROOT CROPS.

TO many of our readers the above title will be suggestive of many considerations, and of thoughts not by any means pleasant. For seldom have the farmers been called upon to enter a season, the labours of which, at all times important and demanding the utmost care, are this year rendered more pressing from the prospects before them of being able to meet with difficulty, if to meet at all, the demands which their stock will make upon them for their usual root food; which their fields have not yielded, or if yielded, only in a miserably small proportion. The labour of storing the roots will, on many a farm this year, be reduced to a minimum, for the painfully prosaic reason that the roots are not there in usual abundance. Still, if the labour for this reason is less, the care with which the labour is performed is demanded all the more. Waste through labour carelessly performed or altogether neglected, is at all times to be avoided, but a little waste may be sustained without being materially felt in times of plenty, when the fields are rich with their stores of roots; but in times like those through which we are passing, and will still have to pass, every waste is a loss which cannot possibly be replaced, and becomes a matter of the most pressing moment, to be averted or avoided if possible. These times are a realization of the proverb, "Hobson's choice," for it is not this root, or some other root, but it is this or none, so completely, in some instances, do farmers find themselves thrown upon one kind of feeding root only as a resource, and of that only in minimum of weight.

All the more necessary, therefore, is it for the farmer to see that he can make the most of what he has, by storing them up in the best mode, and to see, moreover, that that mode is carried out in the best way; for a plan may be a good one, and yet it may be carelessly realized. Good work must go

along with good design if perfection is required.

Although scarcely what may be called a stock-feeding root—taking at least not quite the high place in the estimation of the stock-feeders as the turnip or the mangold—still, as the potato is a most important root, viewed in many aspects, and as it comes naturally under the care of the farmer, the first amongst the root crops of the farm, we shall direct attention to a few points connected with its harvesting and storing.

Potatoes are taken up by three methods, none of which need take up our attention for any space, as our remarks, as will be seen from the title, are to be most closely connected with the storing of roots. The three methods are, the hand-fork or graip; the "brander" attached to an ordinary plough body, from which the mould-board has been removed; and third, by a potato-digging machine. Where admissible, hand labour is unquestionably the *best*, if it is *conscientiously* done; for potato *gathering*—we use the last word advisedly, to distinguish it from the effects of careless working, which is potato *leaving*—is, like turnip thinning, a matter not merely mechanical, but is one requiring the exercise of some mind and judicious care. It should be remembered, that if all the potatoes are not removed from the soil, that the future plants from such potatoes will be simply weeds amongst the crop which follow—we say weeds, if that definition of a "weed" is the right one, which says, that "a weed is any plant in the wrong place." Manual labour is, however, not at all times—properly speaking not often admissible—hence one or other of the two methods already alluded to have to be employed. As between the merits of the two, the plough with its brander or the potato-digging machine, we do not here propose to enter.

When the potatoes are got out, and spread

to dry on the surface of the soil, let it be remembered that the drying is all that is needed. It is an altogether erroneous notion to suppose that potatoes are improved in condition by being suffered to lie bleaching in the sun. Recent researches have shewn that the action of *light* is a most prejudicial one. We have only to think of its photographic influence to know that there must be some effect which it produces upon objects long subjected to it. What next? the reader may exclaim—"Photography and potatoes." Yet it is nevertheless true, that the light which produces a picture produces a change upon vegetable matter subjected to it, when vegetable matter has been removed from its normal condition. The subject is one of vast importance, and has not yet been sufficiently investigated. Enough has been done, however, to shew that exposing potatoes long to light does bring about a change in the constitution of the tuber which greatly reduces its feeding value. After the potatoes are *dried*, let all expedition be used to get them stored away in the condition best calculated to maintain their feeding value for the longest possible period. What, then, are these conditions? Potatoes are usually stored away in pits in the open field. The site of these pits must, therefore, be such that the damp will be reduced to a minimum—all superfluous water being at once drained away. Further, the position of the pits on the site must be such that their surfaces will receive the maximum amount of sun-light and air. These will be best secured by placing the length of the pits in the direction of north and south, and if the ground on which they are placed slopes in that direction so much the better. Great care must be taken to cut pretty deep trenches all round the pits so as to catch the water draining from the soil, and this should be led away as rapidly as possible by a drain or trench cut, leading to the nearest ditch or outlet. If the soil or site of the pit is free from moisture, as of sand or gravel, a trench the full length of the pit, and breadth of ditto—the latter say from 7 to 8 feet—may be cut to the depth of 9 to 12 inches; but if the soil is damp, or likely to be so, then the

cutting of the trench may be dispensed with, and the potatoes laid at once on the surface of the soil.

The potatoes to be "pitted" should be *carefully examined*, so as to get rid of all unsound roots. We are aware that some even object to this course being taken, on the ground that it involves time and labour, and therefore expense. A right consideration, however, of the circumstances will shew that this style of doing things, or rather the not doing them, is really "penny wise and pound foolish." The presence of one unsound or diseased tuber may infect a whole pitful of sound tubers, and cause an infinitely greater loss than might be *apparently* sustained by the expense of carefully looking over the whole crop as it is taken up to get rid of the unsound ones, and to prevent their being taken to the pit and stored up there with the sound ones.

The potatoes being laid on the soil, so as to form a heap when finished—some 30 inches in height, and 2½ feet to 3 feet in breadth at its lowest part, and of any desired length—the next process is to carefully cover the whole upper surface over with straw. This layer should be pretty thick, and be carefully laid so as to be as uniform as possible. We have said that the pits should have a trench cut all round the pits; the earth from this trench is to be made available in covering the potatoes in the pit. In doing this, proceed by marking off the inner side of the trench at least a foot distant from the outer edge of the layer of potatoes lying on the soil before they are covered with straw. Then gradually cut the trench along this line of the desired breadth and depth. As the soil, in doing this, is taken up, lay it, in the first instance, on the outer edge of the straw covering, making the soil as fine as possible, and beating it down with the spade, the point to be aimed at being the "sealing," as it may be called, of the joint between the lower and outer edge of the pit and its covering, and the ground upon which it rests. The closer this joint is the more completely will the frost and cold be prevented from entering. The lower part of the pit cover-

ing being thus made, the earth from the trenches is then carefully laid all round, and this is done in layer after layer until the whole pit is covered with soil, then the surface throughout is well beaten down and smoothed with the spade. Before, however, finally finishing the ridge of the pit, holes should be left at intervals, and filled in with straw; these act as ventilators to enable the emanations which proceed from the potatoes being passed off. These only come off from the potatoes for some days after being pitted. When the temperature has lowered, and the emanations have ceased, the straw may be taken out of the holes, and these filled up with soil and carefully finished off with the spade, which completes the operation.

We have so far glanced at the leading points connected with the storing of potatoes. Much of what have been said will apply more or less directly to the storing of turnips and mangolds, which form the mainstay of the stock-feeder. One point, however, we have not touched upon, which concerns all roots alike, and has certainly a very special bearing upon turnips and mangolds—namely, that it is highly important that they should be taken out of the soil before they are injured by frost. Many, although quite convinced that they are injured by frost, still think that the loss thus brought about is less than the greater gain secured by allowing them to remain longer in the ground, and thus to attain to a larger size. Now, the truth is, that so great is the deteriorating influence of frost upon the feeding value of roots, that no extra growth obtained by allowing them to remain in the soil for a longer time can compensate for it. Further, the effect of frost, more especially if followed by hot suns, is such as renders the roots peculiarly liable to decay. Still further, it should be remembered that no great growth can possibly take place at that period of the year when frosts are likely to take place, and when vegetation as a rule ceases. But however much the farmer may be disposed to run the risk of loss in his turnip crop, by subjecting it to frosts—

and we do not here lose sight of the fact that some varieties of turnips stand frost better than others, and indeed very well—he knows, or ought to know, that he cannot afford to run any risk with the mangold crop. Should it unfortunately be caught in a frost, and this frost give way, the taking up of the crop must be delayed until the vegetation has a chance of being again renewed. This renewal of vegetation, if it takes place, will do away with, or tend to do away with, much of the deteriorating influences of the frost. This anxiety, however, of the farmer, to save the mangold crop from the effect of frost, should not make him lose sight of the importance of allowing the crop to arrive at maturity, which is indicated by the leaves turning yellow. As soon as this indication is given, no time should be lost in getting up the crop; and in this crop, as in respect of the turnips, it should be borne in mind that every advantage should be taken of dry weather. The injury done alike to the crop which is being taken up, and to the land which is to bear the succeeding crop, by working on it in wet weather, treading and poaching the soil, is very great, and should by all means be avoided. The mangold roots may be taken up by the hand, but the labour of lifting will be much eased by the use of a skeleton plough, or plough without the mould-board, which run along the under side of the rows, will loosen the soil and enable the roots to be very easily lifted up. The best way to strip the leaves is to break, not cut, them off. Where cutting is adopted, there is a great likelihood of wounding the root, which is bad. The heaps should be made in the most convenient part, and the whole labour so arranged that the carts are kept regularly going to and from them. The width of the heaps will depend upon the season; if the weather is favourable and the roots dry when got in, the width may be from 8 to 9 feet, and the height when finished off, some 4 or 5 feet. As the heap approaches completeness, the roots should be more carefully arranged, so as to leave as smooth an exterior as possible. The covering of straw

is first put on, the straw being drawn out as for thatching, and the straw when finished secured by earth, or by straw ropes secured at the ends to slanting pins or stakes. As the object in covering the pits is to keep out the frost, not to exclude damp in moderate quantities, or the air, both of which are beneficial, the one to prevent decay, the other to prevent the roots from shrivelling up through lack of moisture, it is obvious that the best covering is that which is pervious to moisture and air, and yet a good non-conductor. Well thatched straw appears therefore to answer the conditions of a good covering. If the pits are earthed up, the earthing should not be finished till the first evaporation be completed—a portion at the top being left unearthed for this purpose. It is the practice of some to finish this first left portion with an open space of a foot wide or so on each side of the heap, keeping this open till the frosts fairly set in, when the parts are earthed up, and the whole finally secured for the winter. Should the winter frosts prove unusually severe, it will be wise economy to cover the pits with an extra covering of straw or brushwood. We believe that brushwood will be as effectual, if not more so than straw. It is surprising what an effect brushwood has in mitigating the effects of frost on the surface of the soil or grass land. In building up the roots, if of the globe species, a little brushwood put in here and there will help the making of the heap in good shape, and prevent them from rolling out. And this reminds us that in storing potatoes good results will arise from pitting them along with layers of good dry sand. This will help them to keep sound, by frequently preventing an unsound root from lying in contact with another, or others that may be sound. We are not sure but what sand placed in the heaps, both of mangolds and turnips, would also be very beneficial. We all know what an excellent material dry sand is in which to store carrots.

In lifting mangolds and turnips it is a very

usual practice to cut off the small roots, and also to take off the adhering soil—neither of these should be done. Just as in stripping the leaves, it is necessary to be careful not to cut or wound the crown of the root; so it is necessary not to cut off the tap roots, and for the very same reason, all wounds in the root tend to hasten its decay. So also is the benefit of keeping on such soil as adheres to the roots when they are taken up. This being present in the heap tends also to maintain their sound condition, acting much in the same way as the sand already alluded to.

As it is not the province of this paper to enter into the points connected with the feeding qualities of roots, we say nothing here as to whether it is the best way to feed cattle with the leaves, or so much of them as can be consumed when in a fresh condition, or to give the roots in the condition in which they come from the pit, with such soil as may be adhering to them. On both those points much has been said *pro* and *con*; and as to what has been said and what we may ourselves say upon them, we leave to those papers upon the science of cattle feeding which we propose from time to time to give in the pages of this journal. We conclude the present brief paper by here drawing attention to the fact that much economy of time and labour is said to be secured, and a higher nutritive value obtained in the roots by giving up the practice of storing them outside in pits, and substituting for it that of storing them in out-houses, carefully placed and sheltered. In many seasons those who have adopted the plan find that no complete covering, such as we have above described, is required, and that in the severest frosts a slight covering of straw is all that is necessary. And another great advantage of the plan is said to be that it affords opportunities of examining the roots, and of getting rid of from time to time all unsound ones which may appear amongst those so stored up.



## MEAT-MAKING.

WE have now arrived at what may be called the second transitional period of the year, in the business of meat-making. The first occurs when the supply of winter-fed stock is nearly exhausted, and the scene of operations is changed from the stalls and boxes of the farmstead to the open pasture fields. The resources of the latter are now drawing to a close for a season, and we have to prepare for in-door work, and a change of system. While the pastures remain in full vigour, meat-making is usually the result of a series of natural agencies, but art is called into constant requisition in the stall, and skill exercises a decided influence on success. Not that we mean to say that in summer grazing skill is unnecessary, or that the animals may be left, as it were, in a state of nature. It is true that the practice which prevails in many instances might lead us to suppose that such is the case, but if so, these instances are not to be taken as exemplifying the best and most profitable system of summer grazing.

In winter feeding, live stock are entirely dependent on man. The animals are confined, and cannot range for themselves in search of food. Everything must be carried to them, and given by the hands of those who are in attendance upon them. Even the manner in which they are confined, whether tied in stalls, or shut up in boxes, or allowed the comparative freedom of an open yard, is a matter of special arrangement. They are entirely under the control of man, dependent upon him for every mouthful, and and it is his art which selects their food and prescribes the manner in which it is given to them. Notwithstanding this,

“That art

Which you say adds to nature, is an art  
Which Nature makes — —  
The art itself is Nature.”

The food given, and all the details are founded on natural principles, when the art of meat-making is properly and systematically conducted; and any departure from those principles is certain to cause unsuccessfulness and disappointment as the natural results.

Many persons who contributed largely in past years to the meat supplies of the nation, will be prevented from doing so at this time from the scarcity of material, so far as that is usually provided by the produce of their own farms. We have a scarcity of roots, the grand foundation of meat-making in this country during the winter and spring months; and along with scarcity there is also want of quality, or lack of a sufficient degree of nutritiousness in those roots which have been grown this season. All this will tell on the production of meat, and its “manufacture” will be a more expensive operation than usual. That “standing menace to the vegetarians,” as the far-famed M<sup>c</sup>Combie is epigrammatically styled by “The Druid,” tells us that in preparing cattle for winter feeding, everything depends on their being put up early, and he reckons that “a week’s house-feeding in August, September, and October, is as good as three weeks in the dead of winter.” This, we need scarcely say, is very different from the practice followed by many who engage in feeding cattle for the butcher. They defer putting up the beasts as long as possible; while anything like a decent bite is to be got on the pasture the cattle are kept out, with, perhaps, the help of a few early turnips thrown down on the grass to pick at. But the Nestor of Aberdeenshire cattle feeders emphatically says, that if he did not take his beasts up in time he “could pay no rent at all,” and this is his experience after having “for many years fed from three hundred to four hundred head of cattle,” so

that others need not hesitate to follow his example, and, literally, "take a leaf out of his book."

Mr M'Combie begins to put the cattle into the yards from the 1st to the middle of August, "drafting first the largest cattle intended for the Christmas market." So great are the effects of stormy weather during autumn on cattle, that he has found a difference of £5 a-head between cattle put up on the 1st of September and others put up exactly a month later, although the animals originally formed one lot, equal in all respects, and those left out were kept "on fine land and beautiful grass." Mr M'Combie prefers yards for his cattle during the months of August, September, and October, but after that time they are tied up in the stall, which he considers the best mode of housing, at least where many cattle are kept. While in the yards the cattle are fed on tares, "which must be three parts ripe before being cut," and he mixes the tares when they are sown with a third of white peas and a third of oats. Fresh clover is also given as a mixture along with the tares, &c., and a proportion of early-sown yellow Aberdeen turnips succeed the tares and clover. Those cattle which are intended for the great Christmas market get each, by the first of November, an allowance of from 2 lb. to 4 lb. of cake daily, which, in a week or two, is increased to at least 4 lb. per day, along with "a feed of bruised oats or barley," and this is continued until the cattle leave for the Christmas market. Along with the cake turnips, of course, are given, Aberdeen yellows first, and latterly swedes. Mr M'Combie is utterly opposed to the excessive use of cake and corn, which some rely on as the chief means of fattening cattle for the butcher. He maintains that if cattle are forced upon cake and corn over two or three months it will be found an unprofitable waste of time and money, and that "to give unlimited quantities for years, and to say it will pay is preposterous." Let cattle have cake and corn for six weeks or two months before they are sent to the fat market, and the owners will benefit thereby, more especially, as Mr

M'Combie says, in the case of "commercial cattle and for commercial purposes," by which he means those beasts which are intended as "meat for the million;" and at the same time cattle which will remunerate their feeder, leaving, under ordinary circumstances, from 25s. to 30s. a month to pay for their keep, &c. Grass, turnips, and straw or hay, Mr M'Combie considers the best and "only healthy food;" the others he only looks upon as auxiliaries, valuable, indeed, in times of scarcity, and to give what he calls "the finishing dip" to fat cattle.

Such are some of the deductions drawn from the lengthened and wide experience of one whose name is "a household word" in all that appertains to the "manufacture" of meat. There is one point, however, on which he very justly lays great stress—namely, the qualifications of the men who are placed in charge of beasts which are being fattened for the butcher. A man may do many things about a farm without having any special liking for his work, but cattle must be the hobby of those who tend them, if we are to expect success. If, as Mr M'Combie says, "an inexperienced man amongst a lot of feeding cattle must be a great loss to his employer," an experienced man should be highly prized. "Good cattlemen are invaluable," and he shews wherein their value consists when he adds, "they must not only know what to give the cattle, but the great secret is to know *what not to give them.*" All these are facts which many do not recognize in their practice, and hence the complaints which we have heard from some of the unprofitableness of feeding cattle during winter for the butcher. Those who so complain are not, however, usually fond of trying to acquire additional knowledge on the subject. Having once formed their conclusions they are quite content to abide by them as indisputable. But what says "Tillyfour?"—"Like everything else, the proper management of the animals cannot be learned in a day. For myself, I can only say that, long as I have traded in cattle, have studied their treatment, have considered their

symmetry, I am learning something new every other day." Just so; and if he had acted otherwise—if he had rested satisfied with first-formed, and, therefore, often hastily-formed opinions—he would never have been heard of, nor would he ever have had the honour of entertaining at his hospitable board

the Queen of England, attracted by the fame of his wonderful herds, and his well-earned reputation as a producer of that which maketh the heart of every Englishman glad, and his face to shine—"the roast-beef of old England."

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## PORTRAITS OF DOMESTICATED CATTLE.

### NO. 2.—"BOLIVAR," A SHORTHORNED BULL.

WE have great pleasure in giving a portrait of Bolivar, which may justly be considered the crack shorthorn bull of this season. He was bred by Mr Joseph Meadows, Thornville, Wexford, and his first appearance in public was made at the last Spring Show of the Royal Dublin Society, which was held this year during the second week after Easter. He was at that time just a year old, but possessed great substance for his age. On that occasion he won the first prize in the yearling bull class, in which there were no less than 108 animals of the same age entered, many of them being of a very good description. The Towneley, or *Irish Farmers' Gazette* Plate, value £105, was also awarded at that time to Bolivar, as the best of all the prize animals of any age, sex, or breed in the cattle sections exhibited at the show.

His next appearance was at the Leicester Show of the Royal Agricultural Society of England, held last July—Mr Meadows thus being the first Irish breeder of shorthorns who has competed on English ground. It may appear strange why Irish breeders have been hitherto averse to show in England, knowing the high character of the shorthorns possessed by many of them; and some may perhaps be inclined to attribute their seeming unwillingness to that bashfulness which is the national characteristic of Irishmen; but the fact is, they train for their great Easter Show, and as, for the most part, they either sell or hire at that time, it is rarely the case that any of their crack bulls are in a fit state for bring-

ing out three months later at a Royal Show in July. Their bulls are at work, and hence it is that the shorthorn classes of the Irish Royal Autumn Shows fall generally so far short of the display in Dublin at the April Spring meetings.

At Leicester, Bolivar sustained his early honours, having been put first in the yearling bull class, which numbered twenty-three entries, being a very superior class, and the propriety of the award was universally allowed, not a few going even the length of saying he was the best animal in the yard.

Bolivar was not exhibited at the Yorkshire meeting, but Mr Brierly, Rhodes House, Lancashire, who had purchased him soon after the Leicester show, for 300 guineas, brought him out at the show of the Keighley Society, August 21, where, amongst other first class bulls, he had to compete against Mr Jonathan Peel's Knight of Knowlmere, a bull which is nearly five years old, and which had been second in the aged class at Leicester, to Mr Booth's Commander-in-Chief, beating Commander-in-Chief, however, when shewn subsequently at the Wetherby meeting of the Yorkshire Society. Our reporter of the Keighley Show stated that "the fight was evidently between Mr Brierly's bull and Mr Peel's, but it was neither a very long one, nor a very severe one. After a fair allowance of time for inspection by the judges, the roan received the card, and Bolivar was thus declared to be better than the bull that beat Commander-in-Chief at Wetherby."



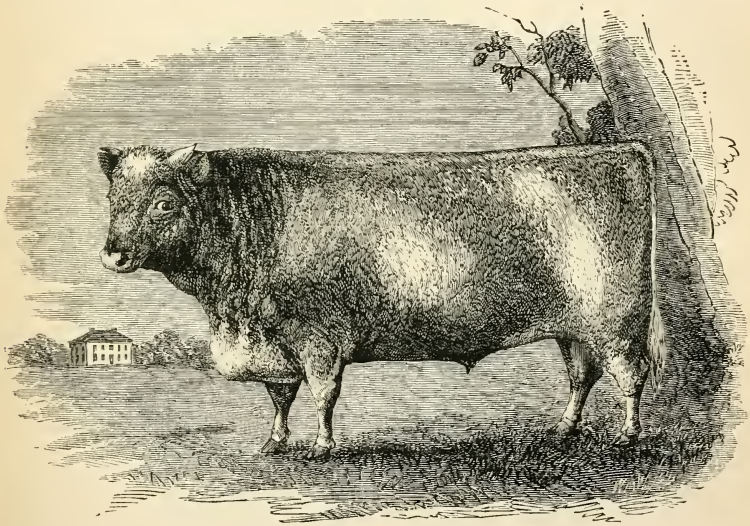
At the show of the Halifax and Calder Vale Society, which was held at Halifax on the 29th Aug., Bolivar was not only first in the yearling class, but carried off the Vice-President's Cup as the best male shorthorn exhibited.

The last appearance of Bolivar was at the show of the Manchester and Liverpool Society, held at Southport on the 1st September. At Southport he had to contend, amongst others in the yearling class, with Mr Lynn's Grand Sultan, a son of Prizeman (24870); Lady Pigot's Rosolio, the second prize yearling bull at Leicester; Mr Dickinson's Buxton,

a long symmetrical frame, exquisite quality of flesh, and a rare coat of rich, mossy hair. During the early part of the year, and until after the Leicester show, the roan colour of his coat had a peculiar dingy appearance, but that has now given place to a new one of the richest blooming roan hue.

His pedigree, which we subjoin, shews that he is chiefly of Booth and Mason blood:—

BOLIVAR, roan, calved 5th April 1867; bred by Joseph Meadows, Thornville, Wexford; sire, First Fiddle (19749), dam (Blossom 5th) by Duke of Bed-



“BOLIVAR,” BRED BY MR JOSEPH MEADOWS, THORNVILLE, WEXFORD.

by roth Grand Duke, from a Lord Oxford dam; and Mr Peel's Baron Beust, by Knight of Knowlmere, from a dam by Prince Imperial—all formidable rivals. Bolivar, however, again got the first place, and, as stated by our reporter of the show, “deservedly.”

Bolivar's points are a capital style of head,

ford, (11378), g d (Blossom 2nd) by Suffolk (9694), g g d (Blossom) by Napoleon (2349), g g d (Bloom) by Satellite (1420),—by Farmer (251),—by Cato (119),—by Charles (127),—by St John (572),—by Chilton (136),—(Nymph) by White Bull (421),—(Lily) by Favourite (252),—Miss Lax) by Dalton Duke (180),—(Lady Maynard) by R. Alcock's bull (19),—by Smith's bull (608, —by Jolly's bull (337).



## NORFOLK FARMING.

NORFOLK affords an admirable illustration of what the patient industry of man is capable of accomplishing, even under great natural disadvantages. Not more than fifty years ago large tracts in that part of England were only fit to support rabbits, or, when cultivated, to produce merely poor crops of rye. This has all become changed, and those semi-sterile tracts are now converted into a rich corn- and meat-producing country, through the influence of capital judiciously expended, and of patient perseverance in a system of farm management well calculated to promote a steady increase in the fertility of the soil. To other districts, possessing much greater natural advantages, Norfolk has long since set an example which has been followed in many instances with good effect; but there still remain not a few portions of the British Islands which even yet may derive from Norfolk lessons of encouragement, and incitements to agricultural progress, which is still but imperfectly developed in those parts of the kingdom to which we refer. Norfolk graziers have not rich meadow and pasture lands to fall back upon, and meat production by them is the result of a large expenditure in artificial manures and artificial feeding stuffs. Yet, in spite of these drawbacks, which to many would appear insurmountable, the metropolis, that great consumer of all kinds of agricultural produce, derives, during a considerable part of the year, a large proportion of its supplies of meat from the once sterile rye-and-rabbit producing lands of Norfolk.

The four-course rotation of cropping originated in Norfolk, and is still, as Mr Read informs us, rigidly adhered to in the majority of farms. "No better rotation has yet been devised for friable soils of fair quality than

the well-known four-field or Norfolk system." Such is the opinion expressed of it by that eminent agricultural authority, Mr John Wilson, Edington Mains, and it has the advantage of permitting the introduction of several variations into its details without interfering with the principles upon which it is based. When rigidly adhered to for a long series of years it has, no doubt, its disadvantages, among which is a tendency of the straw to lodge, and the failure of certain crops from too frequent repetition. Rankness in a growing crop of barley is a serious matter when heavy rains cause it to go down, for not only is the yield affected thereby, but the quality of the grain becomes so much deteriorated that it is rendered unfit for malting purposes, which is the great object of its cultivation. Such complaints, however, are not peculiar to Norfolk; they exist more or less wherever the land is in high condition and closely cultivated. This subject formed part of a discussion by the Central Farmers Club, which took place in 1859, and Mr Owen Wallis, of Northamptonshire, who opened the discussion by reading a most suggestive paper, stated that in his experience the barley crop, when grown in the four-course rotation, had fallen off nearly one-third in quantity, while the quality had also become inferior, although the land was in a much higher condition than formerly. Instead of being strong and reedy in the straw, standing up until ripe, it is now no sooner a few inches high than it tumbles about in all directions; and though in appearance a great crop, it was in reality nothing but a lot of soft, weak straw, and about two-thirds of a crop of inferior corn. The remedy suggested was precisely that which Mr Read informs us is followed in some instances in Norfolk, and which we saw followed before the subject

was discussed by the Central Club—namely, to take two cereal crops in succession after the manured and fed-off root crop; and when barley is put as the second of these crops, the result is a superior yield in respect both of quantity and quality. Again, when the land becomes clover-sick, vetches and other varieties of forage crops are introduced so as to lengthen the intervals between the periods when clover is grown, which tends materially to prevent loss from such sickness. Turnips are also shewing signs of a similar ailment, arising from too frequent repetition, and as Mr Read points out, as observed in Norfolk, “the same dressing of manure fails to produce the same weight of roots as it did twenty-five years ago.” The substitution of mangolds for turnips—not for the purpose of setting turnips aside altogether, but in order to render that crop less frequently repeated—has been of great service; but there are districts where the climate does not suit the cultivation of mangolds, and yet where the turnips are feeling the effects of too frequent repetition, and in such cases the deterioration experienced in the crop becomes of even greater importance than it possesses when circumstances favour the substitution for it of another valuable root crop. We attach much weight, from our own experience of the results, to deeper cultivation of the soil than had been formerly the rule in such cases. At the same time, it is very desirable that agricultural chemists should devote a large share of their attention to the best means of guarding against such deterioration, and also in order to discover some mode of stiffening the straw of growing crops on land in high condition. The application of salt to the land, we know, has, in general, the effect of rendering the straw much less liable to lodge, but it is not equally efficacious in all circumstances, and it may be possible, as Mr Read suggests, that some chemical manure—soluble silica, for instance—may be discovered, or made specially useful for this purpose.

Not the least important part of Mr Read’s

paper is the concluding, or what he calls “the somewhat speculative portion,” with which he wound up his remarks. This refers to “the chief hindrances to the progress of Norfolk agriculture,” and he sums up “the almost unanimous reply” of the numerous correspondents to whom he had applied for information, under four heads:—“Insecurity of tenant’s capital; the Malt-tax; over-preservation of ground game; and the increase of diseases among our stock.” Those “hindrances to the progress of agriculture” are not, however, peculiar to Norfolk, but are felt more or less in nearly all parts of the United Kingdom. It is worthy of remark with reference “to the vexed question of game,” that none of his correspondents “complain of the Game-laws, and none of winged game. It is all one and the same cry, “the over-preservation of ground game,” or hares and rabbits. In this complaint others will unite with Mr Read’s correspondents, but if, says he, “a farmer with his eyes open likes to hire a cheaply rented game farm, I don’t suppose, however much we may pity his want of sense, or grieve over circumstances which may have forced him to this refuge of the destitute, or greatly as some may deprecate the questionable use the owner makes of his land, that there is much for farmers or the public to complain of.” There is surely great justice in these remarks, but it is not unfrequent to find “a farmer with his eyes open” taking a farm of the kind described, and then coming forward to claim public sympathy on account of the loss to which he is thereby subjected.

That “healthy stock means, in ordinary seasons, cheap meat,” is the sum and substance of Mr Read’s remarks on the last-mentioned “hindrance to agricultural progress”—namely, “the increase of diseases among our stock,” a fact, which, although self-evident, does not appear to have been understood by the factious and obstructive party who succeeded in throwing out the Metropolitan Foreign Cattle Market Bill last session of Parliament. It is to be hoped, however, that ere long justice will be done to the public in the matter.

There is abundant evidence to show that we are not safe for a single day, and surely such a condition is not for the interests of the community.

The following is the paper on *The Recent Improvements in Norfolk Farming*, read by C. S. Read, M.P., before the recent meeting of the British Association:—

GENERAL VIEW OF THE SUBJECT.

It is quite impossible within the limits of a paper to do more than glance at some of the chief improvements of Norfolk Agriculture during the last quarter of a century.

To mention all or go into the details of the greatest changes would occupy the space usually allotted to an agricultural essay. It will therefore be my desire to record only the most marked changes which have recently influenced the farming of Norfolk. In doing so I must advert to many improvements which are common to the kingdom at large. I hope I shall not be accused of a desire to confine the credit of such progression to the county of Norfolk. But the general tenor of these remarks will be to shew that Norfolk farming, which took such a vigorous start, and maintained such a prominent position during the early part of this century, has not lost ground during the past twenty-five years, though some other counties may have overtaken and perhaps outstripped us in the race.

In 1804 Arthur Young wrote his voluminous report for the old Board of Agriculture. Some eight years previously Kent also made a survey; but these eight years were memorable in the annals of British agriculture, for during that period Thomas William Coke commenced his career as a Norfolk farmer.

The first Lord Townsend had, thirty years before that period, introduced the culture of the turnip into Norfolk, and commenced a better system of agriculture. But it was reserved for the great Coke of Holkham to mature that system and fully develop the capabilities of our barren county. And however much it may be the fashion to exalt our recent progression, yet all Norfolk men feel that many of their recent improvements originated with their great patrons, and perfect as may be the superstructure of their agriculture now, the chief credit is due to those who prepared so solid a foundation for the building.

Forty years rolled by, and our National Society asked for a report of what had been done since the days of Arthur Young and Mr Coke. Well was that call responded to. Much was to be recorded: the progress, the hindrances, the inns and outs, the ups and downs of Norfolk agriculture during that time could not be summed up in a few words. They filled a large octavo volume, and filled it well. Strange to tell, the man who was the theme of Arthur Young's

report was still the burden of Bacon's song. A life of active usefulness, which was in its full vigour when Young wrote, just closed in time for Bacon, as it were, to sing its elegy. Gracefully and truthfully was it rendered; a simple but eloquent record of a great man's deeds.

Time is comparatively young since the days of the last report, but no similar space of time was ever more momentous to the farming interest. Externally there has been Irish famine, the free importation of corn and cattle, the influx of American and Australian gold and the Russian war, to say nothing of several monetary panics. Internally, agriculture has experienced the potato disease, the new epidemics among cattle, the small-pox of the sheep, the ruinous agricultural prices from 1849 to 1853, the rise and progress of new artificial manures, the greater development of the giant power of steam, the cattle plague visitation, the wretched crops of 1865, 1866, and 1867; and lastly, the unprecedented drought of the present year.

However important the minor accessories, the abolition of protective duties on agricultural produce must ever be regarded as the great event of this epoch. Different may be the opinions of the fairness and completeness of a measure which repealed the import duty on wheat but retained the malt-tax on barley, yet all will agree that one good was achieved; it has put the farmer in a much better position with the public and his fellow producers. Regarded as the favourite child of Government, his protective garb of many colours was a source of envy and jealousy to the rest of the community, but he was suddenly exposed to the competition of the whole world, deprived of his protective shield, without being relieved of an ounce of that weight of taxation with which in his palmy days he had been saddled.

It can readily be imagined that a corn-producing county like Norfolk would suffer severely in the early days of Free-trade. It manufactures a large quantity of meat, but it is not from the natural produce of the soil; it is nearly all raised by artificial means, and the real profit is always looked for in augmented corn crops. The Norfolk farmer had no meat stock, cheese, or butter to dispose of, these have all along kept up their prices pretty well; all his produce was wonderfully depreciated, and he could not materially lessen the cost of production. His rent was a fixed sum, and the seven years' average made the tithes higher than they had been in higher times. He knew it would not do to buy less manure or keep less stock, and he had not the heart to reduce the labourers' wages to the full extent the prices warranted. Without claiming any special merit for the farmers of this county, it is no exaggeration to say that they bore their losses with as much patience as any of their brethren, and accommodated themselves to the altered state of things by rigidly economizing their expenses and applying themselves with more than ordinary assiduity and ability to the cultivation of their farms.

I must remember that I am not addressing a body

of Norfolk farmers, but a literary and scientific assembly, whose knowledge of agriculture is principally confined to its theory, and who have probably but a slight acquaintance with the general practice and local customs of Norfolk farming. It may therefore be necessary to say that the soil of the county varies greatly, and that while in some parts of the east and north there are districts that are naturally fertile, there are large tracts to the south and west which are so thin and poor that fifty years ago they grew nothing but rye and rabbits, but which are now so changed by the judicious expenditure of capital that literally "fleecey flocks the hills adorn, and valleys smile with wavy corn." It is in these districts that the greatest improvements have been made, it was so in the days of Arthur Young, it was so when Mr Bacon wrote his report, and it is now so.

In West Norfolk we find large farms and long leases. In the East smaller estates and yearly holdings. In the West there are open fields and thin soil; in the East, small enclosures, much hedgerow timber, and a soil more or less fertile. The one is the country for sheep, the other for stall-fed cattle; one requires an extravagant expenditure of artificial food and manures to maintain the productive powers of the land; and the other requires little more than the oil-cake and other purchased food which are given to winter grazed oxen to keep the farm in excellent condition.

And here an observation should be made as a sort of qualification to the above statement.

In talking of the agriculture of East and West Norfolk, no one supposes that the electoral division of the Reform Bill of 1832 drew any sort of line between one description of farming and another; neither must it be inferred that there are not in the East individual farmers as enterprising and successful—and perhaps more so—than any in the West, and there are also some landowners equally liberal as the great and good ones of the Western Division, nor that all the soil of the East district is superior to that of West Norfolk; but taken as a whole these distinctions do exist, and when applied in a general manner will not convey an impression materially incorrect.

#### LIVE STOCK IN NORFOLK.

It is impossible from the statistical returns supplied by the Board of Trade to give an idea of the number of cattle that are grazed in Norfolk. These returns are made in July, when the farmer has just cleared his yard of the winter-fed cattle, and having so little pasture he does not buy in many more lean stock till late in the autumn.

The numbers returned in 1866 and 1867 correspond pretty nearly with those collected by Sir J. Walsham in 1854, but when it is stated that more than half or upwards of 60,000 of that number are composed of cows and yearling stock, it will be at once seen that the great mass of grazing cattle are practically excluded. I could add much to the interest of these

statistics if the returns of live stock were occasionally made in the winter. It would show the amount of summer and winter grazing that is peculiar to different districts, and I believe that if our returns were made in *January*, the number of our cattle would be *doubled*. A larger quantity of younger steers are kept than formerly and are grazed at a very early age. Polled Scots have almost disappeared from our yards, and a very large proportion of the Norfolk-fed cattle come direct from Ireland. Norfolk must ever be more of a grazing than a feeding county, but we have a few herds of improved shorthorns in various parts of the county. The Devons that lingered in the west so long after their introduction at Holkham have almost vanished, even from our show-yards, but as a set-off against the loss of the Devons, we have to commemorate a grand revival of the polled Norfolks as a numerous and distinct breed. The old-fashioned *gay* Home-breds are not recognised as the true stamp of the improved Norfolks, for the latter are a blood-red, and while horns and slugs are studiously avoided, and milking properties well cared-for, they possess a uniformity of character, style, and make that would do credit to many of our established breeds.

In consequence of the high price of store stock an effort has been made to rear calves sent, when a few days old, from the dairy districts, but I do not apprehend that it will be extensively practised, as it will be found cheaper in a county so destitute of milk to buy yearling steers that have been raised on the natural pastures of the Emerald Isle. The custom of giving grazing, but especially young stock, pulped or shredded roots mixed with equal quantities of straw or hay chaff has prevailed of late, and will be resorted to this winter where there happens to be any roots for the cattle. A large admixture of linseed cake, and more recently of cotton cake, and all sorts of meal is given to grazing stock, and frequently in too large proportions, for it is impossible for the stomach of a bullock to assimilate 7 or 8 lb. of linseed cake and half a peck of meal. Even the improved value of the manure by no means compensates for this loss, as cheaper fertilizers can be supplied in the shape of guano and other ammoniacal dressings.

Although flocks of sheep have undoubtedly increased in some parts of the county, especially within the last two years, it does not appear that the numbers on the whole have materially altered. More ewes may be kept in some districts but in many well-farmed tracts of West Norfolk, where there is no sheep walk, breeding flocks have been dispensed with, as there is great difficulty to provide green food in the spring, and the reservation of turnips for the flock told prejudicially upon the late-sown corn crops which followed. The chief sheepstock on such farms are the lambs that are bought in the summer from some neighbouring farmer and are sent fat to the London market when twelve or thirteen months old. These sheep are mostly supplied with sliced swedes *ad libitum*, receiving at the same time hay, chaff, and oilcake, and sometimes a little



corn. Since visitation of the cattle plague sheep have been bred and kept on lands in East Norfolk which were formerly considered unsuitable for sheep. A great demand for all sorts of sheep, but particularly ewes, two or three years ago, caused a wonderful rise in the value of this stock, but the increased number of lambs that are produced, and the appalling drought we have just passed through, have reduced the price of lambs to a lower range than has been known for more than twenty years.

The chief alteration that has taken place in the sheep stock of this county results from the introduction of the so-called Oxford Downs. The medium-woolled sheep are most useful animals, but every half-bred mongrel passes by the name of an Oxford or Shropshire Down.

Half-bred flocks are now far too common in the county. It requires a great deal of care and selection to preserve any uniformity in the produce, and we cannot be too thankful that some of our noblemen and leading agriculturists still adhere to the Southdowns and other pure breeds. Though our Leicesters of twenty-five years ago have recently been christened Cotswolds or Longwools, I believe they are the best style of sheep for producing a genuine half-bred lamb upon which the supply of Norfolk mutton must mainly depend.

The Norfolk pig is the same lanky, long-nosed, flat-sided brute it ever was, notwithstanding the enterprising efforts of a few of our leading breeders to improve the porcine stock of our county.

Pigs are generally bred by small farmers with whom the sow that will produce the largest family and afford a bountiful supply of milk is much more thought of than the quality of the progeny she rears. The young pigs are sold to the larger occupiers for shackling their stubbles or straw-yards and are generally resold as store pigs, comparatively few being fattened by them. In olden time when corn was all thrashed by the flail more pigs were kept in the bullock yards than now, and the same remark may apply to poultry. The restless pigs disturb the quiet slumbers of the drowsy oxen, and the cocks and hens are sure to make free with the choicest morsels of meal and cake, as they find so few stray grains of corn to pick up. The poultry has certainly improved of late years, though I cannot think the gaunt and lanky Cochins produced any benefit, but the establishment of improved breeds by many enthusiastic amateurs has left good marks in many neighbourhoods.

The fruits of the liberal prizes offered by our Agricultural Society are beginning to be felt in the restoration of our cobs and cart horses to the proud position they once held. The Norfolk cart horse is never what is termed a fashionable animal, having few distinctive or attractive features, but he was a clean-legged, quick-stepping, hardy horse, well adapted for the light tillage of our Norfolk soil. Years of neglect and an indiscriminate admixture of Suffolk blood, have rendered our Norfolk cart horse still more of a non-

descript; but there are many teams of these useful and most serviceable animals that contrast well with the petty Suffolk in a show-yard, and would work them to death if exposed to all the labour and hard keeping of an ordinary farm-yard.

The old stamp of Norfolk cob has not been quite regained, but the long entries of good trotting nags and bold stepping ponies at our recent shows give good grounds for believing that a great improvement is taking place in this class of stock.

#### CROPS GROWN IN NORFOLK.

There can be no doubt that the yield of wheat in Norfolk has greatly increased during the past twenty-five years. From only one part of the county have my correspondents intimated that there is but little change. This comes from some of the best land in Norfolk, when great crops of wheat were common fully fifty years ago. The repetition of wheat on these soils may be more frequent, but the yield does not seem to have perceptibly increased. And until we discover some chemical manure—some soluble silica for instance—that will strengthen the straw in moist seasons and enable it to bear a large and fuller ear, any increase of yield in these fertile districts must remain in abeyance, for already the greatest loss is incurred from the crop lodging at an early period of its growth, and the more the crop is forced the more this tendency of the straw to go down increases. Thin and early sowing, with a thorough consolidation of the land, may in a measure alleviate this increasing difficulty, but once let the chemist show us how to stiffen the straw of our cereals and then the produce, for aught we know, may be doubled unless they should be smitten with blight and mildew—diseases which so frequently attack over-stimulated crops. On the thin chalks and light lands of Norfolk, the yield and extent of wheat is increased. Twenty-five years ago it was considered that 26 to 28 bushels per acre was the full average yield of wheat for the county. In 1854 Sir J. Walsham estimated it at 30 bushels, and I think we may now put it at 32 bushels or 4 qrs. per acre, but this is fully 4 bushels an acre over the average of the last four years—including, of course, the present harvest. The extraordinary difference of the yield of wheat on moderately light land farms, in dry or moist seasons, has been furnished me by more than one large occupier. I will not give the details, but simply state that the produce has occasionally nearly reached twelve coombs per acre, and has frequently been less than five, and one year barley reached three coombs, while the money return has been in a good season fifteen guineas per acre, and in a very bad one little over £3.

The yield of barley is not perceptibly augmented: the estimated produce in 1854 was put at over 38 bushels per acre, and that, I am sure, is fully up to the average yield of the last ten years. No doubt a larger extent is grown, but, as to the increase per acre, the same unfortunate tendency of the straw to lodge hinders, even in a greater degree than in wheat, the

efforts of the husbandman to grow more barley. If the crop in a rank, green, and rapidly-growing state should be laid flat by a heavy storm of rain, not only is the yield considerably reduced, but the quality of the grain is so seriously injured as to be totally unfit for malting purposes, and the next year's seeds are destroyed. Many years ago the yield of barley appeared to have reached its maximum in Norfolk. Sheep, eating a large quantity of cake and corn, consumed chief part of the turnips upon the land, and as much straw as could stand, and sometimes rather more, was produced in favourable years. But on the heavy lands, and indeed on all soils, the practice of sowing barley much earlier than formerly has helped to stiffen the straw and improve the sample. A vast extent of barley on the clay soils, and on other medium and well-farmed lands, is now planted, when practicable, in February, and by this means far better samples of grain are produced, and land that was considered naturally unkind for barley, will in dry seasons make this produce the largest crops of the best barley. Although a considerable amount of wheat is grown after mangold wurtzel and early turnips, yet the extent of barley is more than compensated by the gradually increasing acreage of this grain that is sown upon wheat stubbles.

I have this year, with a dressing of 1 cwt. of guano and 2 cwt. of superphosphate, grown on a wheat stubble that had been dug 12 inches deep with the steam cultivator in the autumn, the best crop of barley I ever produced, the land being now perfectly clean, and in the best possible condition for next year's root crop. And I see no reason why this extra white straw crop need frighten any land agent, provided always the farms is in a high state of cultivation.

Oats are but little grown, the quantity remaining about the same. The extent of beans and peas varies much with the season. When the small seeds have all perished, as is the case this year, a much larger growth of pulse next spring may be expected in Norfolk. Rye, that was once the staple grain product of our county, is now grown only on the hottest gravels and the lightest sands. Wherever the land can by any possibility grow wheat, that grain is now substituted for rye.

The total acreage of the root crop has not at all increased, but a much smaller breadth of white turnips and a corresponding larger extent of mangolds and swedes is grown. The increase of weight per acre is supposed to be twenty per cent., but this is obtained at a vast outlay of artificial manures. Some good farmers reserve the whole of the farm-yard manure for the wheat, growing their roots exclusively by artificial means, the dressing costing from 30s. to £3 and £4, per acre. The Northumberland or ridge system is still the favourite way of growing roots in Norfolk, but in our arid climate a return to the old flat work may possibly be desirable.

Hay is certainly a poorer crop in Norfolk than formerly; this arises chiefly from the failure of the

red clover, but the extended cultivation of the sainfoin on all lands that have a calcareous subsoil makes some amends for the loss of the clover.

In some districts the system of cropping has been materially altered, but in the great majority of farms the old Norfolk four-course rotation is rigidly adhered to. Where the five and six course prevailed twenty-five years ago there the greatest alteration has taken place, but on the Holkham estate, that home of the four course, an extra corn crop after the wheat is somewhat general. I might mention two or three farms that at the time of Mr Bacon's report, were cultivated on the five course, two years being in grass, which are now altered to one year's grass, and followed by two consecutive corn crops. The produce per acre of these farms appears to be quite as abundant as ever; but the expenditure in artificial food and manure has increased fourfold. It does seem unreasonable, with all the advantages of modern science, that the farmer should be tied down to the same covenants as were supposed to be necessary, and certainly were useful, at the end of the last century.

Already the constant repetition of the same crop is acting prejudicially to the Norfolk farmer. Clover sickness is a common complaint, and no chemist can tell us what it is that the clover extracts from the land which our manures do not return to it; nor have they suggested any treatment which has in the slightest degree mitigated the evil. It is feared that turnips are shewing signs of a similar ailment; anyhow, it is certain that the same dressing of manure fails to produce the same weight of roots as it did twenty-five years ago.

This opens up the whole question of artificial manures. The use of these fertilizers may be still in their infancy, but they have enormously increased of late years. Superphosphates were almost unknown at the time of the last report; bones, rape-cake, and the newly introduced guano, being almost the only artificial manures used. These are still the most reliable of our accessory manures; but superphosphate is now generally employed for the production of roots. The discovery of coprolites has supplied an immense quantity of new raw material for the manufacturer of phosphatic manures. Although some samples may be well and scientifically prepared, I fear the ignorance or selfishness of many manufacturers causes them to vend a very inferior article. No one can estimate the alarming extent to which farmers are victimized in this respect.

I have had two samples of superphosphate made by two different firms, both of good local reputation, analysed, and the chemical report assured me that the manure for which I paid six pounds was not worth three pounds ten per ton. I have also lately seen an analysis of some cheap guano sold at seven to ten pounds per ton which was pronounced dear at thirty shillings. It is not till farmers will all purchase their manures by analysis, that any general improvement in these auxiliary fertilizers can be hoped for.

## MACHINERY AND LABOURERS' WAGES.

When Mr Bacon wrote, steam thrashing-machines were considered a novelty, now there is scarcely a horse machine or flail in the county, the whole of the thrashing being done by steam. Recently a few steam ploughs have found their way into our county, but they are not likely to make much progress in the cultivation of light land unless the cost can be reduced. Reaping and mowing machines have become very general within the last ten years, and the prejudice that once existed against the introduction of these and similar machines seems fortunately dying out amongst the labouring classes. And so it ought, for all farm machinery lightens the labourer's excessive toil, and there are not a sufficient number of hands to perform all the work of the farm at the proper seasons by the old-fashioned means. But it is a curious fact, supported by the unanimous testimony of all my correspondents, that notwithstanding all this machinery, the increase of the expenditure for manual labour, on arable land, ranges from 15 to 20 per cent., and is generally as much as *the rent of the farm*, varying from 25s. to 35s. an acre, and in my own case exceeds 40s.

The wages of the agricultural labourer have also in the same time been raised by nearly two shillings per week, and it is quite certain they will not perform the same amount of work on this increased pay. This is easily proved by comparing the price of piece-work with what it was a few years ago, but as the agricultural labourer has already formed the subject of two separate papers, I will not venture any further remarks on the subject, beyond expressing my thanks to you, Mr President, for the sound and practical advice you offered in summing up the discussion on Saturday. You stated, sir, that in your opinion one great reason for the unsatisfactory condition of the labouring population was their ignorance of *political economy*, and the chief hope you had of any improvement was their being taught the ground work of this great science. In that I most cordially agree, for I protest against the partial application of scientific theories to agriculture. Hitherto political science has been applied only so far as it favours the consumer. You have exposed our agricultural produce to the competition of the cheap labour of the world, and to successfully hold our own, we must have cheap labour too. In my small way I have done what I can to improve the condition of the agricultural labourer; and though I am ignorant of science, I believe my ideas are closely allied to sound political economy. I contend that the price of labour must in a great measure depend on supply and demand. In seasons of great mercantile activity our young labourers migrate by scores and hundreds to the north and to London, without the aid of any registration societies, for our great employers of labour have agents all over the country always looking out for strong active hands. Even our old labourers are not ignorant of the rate of wages paid elsewhere, but they know that high

wages invariably mean longer hours, more work, and expensive living. Political economy would also tell the agricultural labourers that the way to raise their condition is not by combining together to do as little work as they can in a day, but to improve the quality of their work, and so earn more wages. But to tell us farmers that we must give more wages in order to make the men do more work is about as reasonable for me to go to a merchant and complain of his oil-cake being exceedingly bad, and when he says that is the best he can afford at the price, I should, in order to encourage him to supply a better article, give him 5s. per ton more for his adulterated cake than I could buy it for elsewhere. I believe that every young agricultural labourer has the means of acquiring the most perfect independence, but he must learn to rely on his own industry, skill, and frugality, and not upon charity, an easy going master, or the parish, for his support.

## LEASES, RENTS, ETC.

Leases have not increased. There may be a few more agreements for twelve or sixteen years, determinable every fourth year, but I fear that the great bulk of the land in East Norfolk, and indeed in many parts of the West also, is held from year to year, subject only to a six months' notice to quit. There is also no recognised system of tenant-right, which is common in Lincolnshire and in some other parts of England, but on a few estates some liberal clauses are inserted in the agreement, securing to the out-going tenant certain payment for his unexhausted improvements. There are several estates which are farmed by the same families for generations without any sort of agreement, and on those estates the rents seldom vary. The farms are in excellent order, money is invested by the tenant as if he had the longest lease, and the most excellent understanding and the most perfect harmony prevail between the owner and occupier of the soil. It is indeed delightful that this mutual confidence should exist; it is the natural pride of some of our aristocracy and those who farm under them, but however well founded and laudable this feeling may be, the death of either party may quite alter it, and to say the least of it, it is an unbusiness-like way of letting land.

The rent of land has risen during the past twenty-five years from 10 to 20 per cent. in the West, and from 5 to 15 in the East division of the county. The tithes that were not commuted in 1843 have since been apportioned, and thus one great hindrance to improved farming and a constant source of ill-feeling between the parson and the farmer has been got rid of. The assessment of the county to the old property or great war tax was £1,439,977; in 1843 the sum was £1,945,558; and last year it amounted, upon schedule A, to £2,395,362. The county rate assessment is £1,991,676. Poor's-rates do not seem to vary much. Some years previous to Mr Bacon's report it was common for these rates to reach £350,000, but they



averaged in the seven years, ending 1857, only £227,582. They are again on the increase, for the poor's-rates, with the receipts in aid thereof, were last year £245,661. The county and police rates in 1842 were only £16,200; in 1857 they had risen to £27,247; and last year the county receipts amounted to £40,342. Of this sum nearly £13,000 was raised by the police rate, £14,000 by a general county rate, the rest came from Government and other sources, leaving a balance of £3895 in hand.

There can be no doubt that the question of county rates, and indeed all local taxation will early come under the notice of the new Parliament. It is a question so large, so absorbing, and so important, that I must be content with simply mentioning it here, but I may, in passing, observe that this great increase of county expenditure in Norfolk is not attributable to any neglect of magisterial oversight, but rather to the new burdens which Parliament continually heaps upon the real property of the kingdom. And it should also be remarked that almost the whole of this increase is borne by the clergy and tenantry rather than the land-owners. The increase is so gradual, so imperceptible, that no tenant can calculate it when he hires a farm. So there is no difference made in the rent, and any increase of the rates falls upon the tenant, while for similar reasons any saving, which is indeed of rare occurrence, finds its way into the occupier's pocket.

#### GENERAL REMARKS.

The drought of this year is one of the heaviest visitations which has ever befallen the agriculture of Norfolk. Happily, we grow a full average crop of wheat, the loams, clays, and fen lands making up for the deficiency of the sands, gravels, and thin chalks. But there is only half a barley crop, and not more than a similar return of other spring corn and pulse. Hay is very light and next year's grass seeds are burnt clean up. But the greatest blow to the Norfolk farmer remains untold, it is the loss of his root crop. For this nothing can compensate. It is not simply the value of his turnips, but as roots are the foundation of his course of cropping there is the prospective deterioration of his round of cereals till turnips come again.

In no other county in England have such great results been accomplished by the application of the calcareous substrata to the surface soil. Farmers seem to have hoped that liberal doses of artificial manure would have prevented the necessity of expensive coats of clay, marl, &c. But they have failed to produce the good chemical effects of these dressings, and, of course, do not consolidate and improve the texture of the land in a similar way. Under-draining is not much needed, but where recently attempted has been executed better and at a greater depth than formerly. Sometimes the landlord does all the draining and charges the tenant 5 per cent. on the outlay, but more generally the owner finds the pipes and the tenant the labour. Farm buildings were always pretty

good, and still maintain their superiority, but in a county where so little rain falls, and there is plenty of straw, covered yards are not much cared for. Great changes have taken place in the fences, especially in West Norfolk. Formerly the white thorn fences were 10 or 12 feet high, but they are now reduced to about 4 feet, and are kept carefully trimmed. Fields have been made larger by the removal of useless fences, and much hedge-row timber has been grubbed on the Holkham and other large estates, but a still further improvement in this direction is needed in many parts of Norfolk.

Railways have greatly accelerated agricultural progress. Thirty years ago no part of the country was more inaccessible than Norfolk. Now we are fairly supplied with trunk and branch lines, and every portion of the county, save the N.E. district, has been benefited by railroads. Perhaps the farmers of the west are rather more gainers than those of the east, who had always such excellent and cheap water carriage at their command. But I think I am fully justified in stating my conviction that no part of England is so wretchedly served by railroads as East Anglia—the Great Eastern being by universal consent the dearest and worst railway out of London. However great the benefits which railroads have conferred upon Norfolk agriculture (and I am not unmindful of them), the wretched mismanagement of the whole system has been the means of administering those benefits in truly homœopathic doses.

#### AGRICULTURAL STATISTICS OF NORFOLK.

Through the courtesy of the Board of Trade, I am enabled to bring down the agricultural statistics of our county to the present year. We have also in Norfolk the advantage of an early attempt to obtain these returns, as Sir John Walsham in '54 collected some very reliable figures as to the number of our stock, and the acreage of our crops; and even a return of horses, which timid Governments have never since attempted; I can, therefore, furnish authentic returns for four years—viz., those of 1854 and 1866, 1867, and 1868.

#### RETURN OF LIVE STOCK IN NORFOLK.

	1854.	1866.	1867.	1868.
		(In March)		
Total cattle...	99,000	92,000	103,000	122,000
Cows, &c. ....	25,000	24,000	27,000	27,000
Other cattle—				
Over two-years-old	59	39,000	40,000	59,000
Under two-years-old	15	28,000	34,000	35,000
Total sheep and lambs..	841,000	596,000	776,000	847,000
Old sheep. ...	468,000	405,000	454,000	506,000
Lambs.....	373,000	191,000	321,000	341,000
Pigs.....	99,000	115,000	144,000	92,000



	CROPS.			
	1854.	1866.	1867.	1868.
Corn crops of				
all kinds ...	1,442	449,000	455,000	455,000
Wheat .....	202,000	189,000	195,000	203,000
Barley .....	173,000	186,000	191,000	181,000
Oats .....	35,000	34,000	32,000	33,000
Green crops of				
all kinds ...	1,881	904,000	200,000	190,000
Potatoes .....	1,000	5,000	5,000	6,000
Turnips, &c. ...	161,000	134,000	144,000	142,000
Mangolds ...	16,000	34,000	35,000	29,000
Bare fallow ...	10,000	8,000	8,000	12,000
Clovers, &c. ...	171,000	147,000	163,000	120,000
Permanent pas- ture (exclu- sive of heath land) .....	192,000	208,000	214,000	211,000

Extent of the county, 1,354,301 acres. Population, in 1867, estimated at 430,319.

It would appear from a glance at the live stock returns, that our cattle are happily increasing, and we have perhaps recovered the usual amount of our summer stock previous to the outbreak of the cattle plague. The sheep, though 70,000 more than last year, are still hardly in excess of the returns of 1854. Pigs were so dear in 1866 in consequence of the cattle plague and high price of sheep, that they rapidly increased; but in 1868, the low prices of last year have told upon them, and their numbers have fallen off by nearly one-third—viz., 42,000. We may reasonably hope that these returns now exhibit a trustworthy exactness, as the total acreage of corn is within a fraction the same this year as last. Wheat has increased something over 4 per cent., and this small addition will probably astonish those newspaper writers who have stated that a third more land was planted with this grain. If we take the increased breadth at 5 per cent. over the whole of England, that will be about 160,000 acres, and 32 bushels per acre, will give a yield which will supply the country with ten or twelve days' bread. Barley is reduced in a somewhat greater ratio than wheat is increased, and the falling off in mangolds, turnips, &c., is owing to the peculiarly dry season, but at the present moment, instead of 140,000 acres of turnips, as stated in the statistics, we fear that the same weight of roots is frequently grown on 20,000. What has caused the artificial grasses to fall off at 43,000 is a mystery; I will venture to predict that the extent will be further curtailed next year.

In 1854 Sir John Walsham stated that the counties of Norfolk and Suffolk produced 267,000 acres more wheat and barley than the whole of Scotland, and also computed that Norfolk alone grew 1,290,373 more bushels of wheat than all the land north of the Tweed. But compare the extent of wheat now with that grown ten years ago. In 1857 the acreage of wheat in Scotland was 243,240 acres; last year it had decreased more than one-half, and had fallen to 110,609 acres, or 85,000 acres less than we grew in

the landlord fixes upon to raise the rent (except when cereals in Ireland, but this great falling off of wheat is larger in Scotland than Ireland. Scotland is rightly held up as an example to the farmers of England, and in this respect we should do well to follow her, for she finds that wheat growing will not answer at the prices current a few years ago; so she drops it and sticks more than ever to oats which suit her cold soil and damp climate. It is a pleasing fact that very few Norfolk farmers now object to making these annual returns. I, however, question their ultimate use beyond strictly statistical purposes. The yearly variations in the acreage of crops will not cause anything like the difference in the amount of wheat grown, as a week's rain or a night's blight, and I do not believe that estimates of the yield of the growing crops, even if given by the farmers, can ever be thoroughly relied upon. My own impression is, that after the accuracy of the present returns has been tested for a short series of years, agricultural statistics need only be collected triennially, septennially, or at any other given interval, to be, in fact, in a sort of stock and crop census, and might then be made compulsory.

#### HINDRANCES TO AGRICULTURAL PROGRESS.

We now come to the somewhat speculative portion of this paper, but still it is one without which the inquiry would be incomplete, and it is that from which we may hope to glean the greatest benefit for the future. I concluded the list of questions to my correspondents with the request that they would name what they considered "the chief hindrances to the progress of Norfolk agriculture." One contended that a great evil was the bad qualities of artificial manures; others were of opinion that increasing expenses and poor and fluctuating returns militated against the employment of capital. A smaller number suggested that the increase of local and general taxation fell with crushing severity upon the occupiers of the soil; and a body of influential agriculturists emphatically declared that "the increasing wages of the labourer and the decreasing amount of work done in a day by the general run of them," would be the chief hindrance; but the almost unanimous reply may be summed up under four heads: *insecurity of tenants' capital—the malt-tax—over-preservation of ground game—and the increase of diseases among our stock.*

#### INSECURITY OF TENANT'S CAPITAL.

It is worthy of note, that in complaining of insecurity of tenants' capital, no mention is made of the law of *distress*—a subject which, under the queer term, "hypothec," creates such a strong feeling amongst the farmers of Scotland. Norfolk tenants wish to preserve all the existing rights of the owners of the soil; they only want some legal protection for their own property. As a Norfolk man I much prefer the security of a lease, and every landlord who wishes permanently to improve his rent-roll, would do well to grant them. Let a yearly tenancy be ever so cheap, the time that

Norfolk. We hear a vast deal of the decrease of the seeking a new tenant) is always unfortunate. If prices are good, crops are bad; if meat is dear, stock are unhealthy; even should all things be prosperous, the tenant hopes that the landlord will not take "advantage of" him for another year. But, at the end of a lease, the tenant naturally expects a fresh arrangement, which usually means an advance of rent; and, if the increase is a moderate one, he cheerfully pays it, and enters upon a fresh lease with the determination to use his skill, energy, and capital, not only in getting his own living, but in still further improving his landlord's estate.

If landlords object to grant leases (and I freely confess it is not advisable to do so *indiscriminately*), at least there should be compensation for unexhausted improvements. Most persons connected with the land are terribly frightened when the term *tenant-right* is breathed, and they say it might be made a means of extortion, and the landlords would be plundered right and left. But is it so where tenant-right is the custom of the country? Look at Lincolnshire. There are no leases on the wolds of that county, which is as well farmed as West Norfolk, but there is an equitable system of tenant-right which answers admirably, so that when a tenant quits his farm he is paid for the unexhausted improvements he leaves behind him. I was talking the other day to a Lincolnshire landlord, and he seemed surprised that the system did not exist in other counties; he said he had never paid a penny for tenant-right himself; it was always a question between out-going and in-coming tenant, and the landlord knew nothing about it save in the exceptional case of buildings and other such like permanent improvements.

#### THE MALT-TAX.

A word or two about the Malt-tax. We are met with this sort of argument: "prices are higher, the acreage of barley increases—leave well alone." To this we reply, free trade has taught us that we can grow barley better than any other country in the world; it is our *speciality* in grain; almost the whole world can produce wheat, better wheat than we can. Norfolk is not like Ireland and Scotland. We cannot reduce our tillage and increase our grass, and so decrease our expenses, and employ only half the labourers. We in this dry climate, and on these poor soils, must grow grain, and we must have a rotation of crops, and if only one sort of corn really pays, we can produce on our arable land more meat than if it were all pasture, and grow all the corn besides, which must be a benefit to the country. And if the chief part of the world can grow wheat, and only a portion of it produce prime barley, if there was perfect free trade, there is no reason why the price of barley should not equal that of wheat. But even those who admit the injustice of exposing the British farmer to the competition of the whole world, and taxing his barley 60 per cent. in the first stage of its manufacture, say, "We can't spare

the six millions the Malt-tax brings in." The greater the tax the greater the injustice, and surely Parliament might at least apply the true principle of all taxation, by levying the duty on the manufactured article and not on the barley, directly it is wetted for malting.

#### GAME.

Now to the vexed question of game. Mark, none of my correspondents complain of the *Game-laws*, and none of *winged game*. It is all one and the same cry, the *over-preservation of ground game*. There can't be too many partridges, and even pheasants do comparatively little harm, but no man can farm against hares and rabbits, and no abatement of rent can compensate him for the loss of his crops. If a farmer, with his eyes open, likes to hire a cheaply-rented game farm, I don't suppose, however much we may pity his want of sense, or grieve over circumstances which may have forced him to this refuge of the destitute, or greatly as some may deprecate the questionable use the owner makes of his land, that there is very much for farmers or the public to complain of. But when land is let at its full value, and then stocked with running game, or if hares and rabbits greatly increase during the continuance of the lease or tenancy, then, and it is no use mincing words, such game preservation, whether practised by the most mighty prince or the smallest squire, is a wrong and a robbery.

#### DISEASES AMONG LIVE-STOCK.

The last cause of complaint is by no means, and at no time, the least, and it is at the present moment particularly forcible. The losses of stock from new diseases during the past twenty-five years, have been most appalling, and when they are fairly estimated, at once account for the enhanced price of meat. No mention is made in the report of forty-three of pleuropneumonia, or foot-and-mouth disease. It will be remembered that the free importation of foreign cattle commenced in 1842, and shortly after that date the two diseases I have mentioned found their way into Norfolk, and continued with varying severity to ravage our herds and flocks, till they were almost extirpated by the cattle plague restrictions. There can be no doubt that pleuro and this epizootic epidemic are foreign diseases. They have been known in Holland and France from time immemorial, and though we have no evidence of the actual introduction of either of these contagious disorders into this country, we know that soon after the general admission of foreign stock, both became prevalent here; and we who have attempted to graze foreign cattle, are aware, to our cost, how singularly subject Dutch cattle are to pleuropneumonia.

Small-pox in sheep prevailed to a frightful extent in Norfolk in 1848, and we were badly hit by the cattle plague in 1865. That latter visitation was manfully met in Norfolk, and though five or six thousand head of cattle were destroyed, few, if any, cases of individual ruin followed. We started at the outbreak of

the disease the "Norfolk Cattle Plague Association," and collected, by rate and subscription, upwards of £26,000. The observance of the orders in Council were enforced on all the members, every effort was made to stamp out the plague, and though not completely successful, it was confined within reasonable limits. After paying two-thirds of all the losses, we have now a balance of £14,000 invested in the Funds to meet a fresh outbreak, or any similar agricultural calamity.

The cattle plague has taught us many a lesson. Amongst the chief is this : that, by bold and decisive measures, we have not only got rid of this pest, but we have well nigh eradicated those other foreign diseases that for a quarter of a century have found a home in this country. The stoppage of the importation of all stock not intended for immediate slaughter, and confining fat cattle to the ports of debarkation, and the restriction and regulation of the sale and transit of our own stock, have accomplished this, and never were our cattle and sheep more healthy than they have been for the last two years. True, we have our old complaints and local disorders to afflict us, and we may expect plenty of disease amongst our young sheep this autumn, but our stock are in a singularly good state of preservation, and we believe that the only way to keep them so is to stop a further introduction of cattle plague, pleuro-pneumonia, small-pox, foot-and-mouth disease and scab, by the establishment of waterside markets for the slaughter of all foreign stock. The public ought to know that *healthy stock* means, in ordinary seasons, *cheap meat*, and, as the foreigner at present only sends us one-twelfth of the cattle and one-twenty-fourth of the sheep that are slaughtered in the United Kingdom, it is the direct interest of the consumer to keep our home stock free from disease. Statistics prove that more British cattle have died from foreign disorders than have been imported from abroad, but

when we ask for the adoption of the very best plan for keeping out these diseases, we are charged with seeking renewed protection by the exclusion of foreign meat.

This one subject of the sale, transit, and slaughter of stock, would occupy more time than is allotted (even by special indulgence) to my paper, so I must bring these crude remarks abruptly to a conclusion, and I will sum up my whole case in a few words which, although written ten years ago, are still more applicable at the present time. "The Norfolk farmers delight in the idea of producing large supplies of grain and meat for the increasing multitude, but their business object in manufacturing these necessaries is not to feed the public but to make farming pay. At reasonable rates this high farming will answer with very low prices of grain common four years ago, or great mortality amongst stock, it cannot. All the leading agriculturists of the county who have been consulted, declare that farming requires more capital than care ; but the profits on the money invested are much smaller than formerly. Farmers' expenses increase, and though, of course, their receipts are also more, they have not yet increased in the same proportion. There can be very little doubt of the truth of this conclusion that improved farming means, in other words, the judicious application of more capital to the cultivation of the soil ; and as the broad acres of old England cannot be made broader, it is the duty of every British yeoman to make them more productive ; but he wants, like other producers, to live by his occupation and expects to be paid for his time and his capital. If the nation require the farmer to produce more of the necessaries of life, every obstacle which now hinders improved agriculture should be removed, and every facility afforded for the security of that capital which the tenantry must now, more than ever, embark in the cultivation of their farms."

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### THE DEFICIENCY OF PLANTS IN SPRING-SOWN GRASS SEEDS.

AN East Lothian correspondent writes as follows on this important subject :—"The very dry summer of 1868, accompanied as it has been by many days of tropical sunshine, has caused a partial failure of the young grass. There is a want both of clover and rye-grass. Early sown grass seeds look well enough. The young plants having got a deepish root before the dry weather set in, and being shaded from the scorching rays of the sun by a well advanced cereal crop, a number of fields already show a strong and vigorous looking blade. Late sown fields, on the other hand, appeared both blanky and thin when the grain crop was being cut ; we

were under the impression the young grass had completely died out, as scarcely a vestige of a plant appeared, and those looked sickly and weak ; however, the rains have caused vast improvement, and in most fields the young grass will recover. Where it is very thin we would recommend *Trifolium incarnatum*, mixed with Italian rye-grass, to replace the deficiency. *Trifolium incarnatum* is an annual, indigenous to the soil of Italy and the south of France. It grows considerably taller than red clover, has oblong cylindrical spikes of a dark crimson. It is sown in large quantities on the stubbles in the south of England, immediately after harvest, and in preparation of

the soil a single dressing with the common harrow before sowing the seed; and it is harrowed in with the chain harrow, which has the effect of making the surface fine, and shakes clear of the soil all stubble refuse. Trifolium is cut in spring for horses or cattle; it grows a very heavy crop; is a week or ten days earlier than ordinary cutting grass, and English farmers value it highly for horses. Some farmers go the length of saying that trifolium alone for horses is equal to ordinary cutting grass with oats. Of course *we are not bound to believe this*, but the writer was told so by the farmer who recommended him to grow it. Now, the question is, will Trifolium incarnatum suit our climate? We most unhesitatingly say that it will, having grown it four consecutive years with success. It is a great advantage getting it early in to allow the young plants to have some vigour before winter. This season being so early is peculiarly favourable for trying trifolium in Scotland, and no time should be lost in getting it in. When trifolium is sown to cut in spring, 14 lb., mixed with 3 pecks winter barley, should be sown per imperial acre. 1½ cwt. guano, mixed with ½ cwt. bone meal, should be sown in the stubble, harrow it in, sow the trifolium, and give another dressing either with the chain or ordinary harrow, and then roll with the press wheel roller. We are told that frost kills it down. All I can say is, that it has grown well for four consecutive seasons. The quantity required per acre to thicken or replace young grass must be regulated by the deficiency in the other. It is best to err on the safe side, and not sow too little. The expense per acre is small, for although trifolium, owing to the great demand, has risen fully double its last year's price, it still can be bought for something like 7d.

per lb. We would recommend, wherever a field is blanky, to sow it all over at the rate of 10 lb. per acre, with a little Italian rye-grass. The harrowing required to cover the seed will not damage the young grass, but rather improve it; but we would recommend it to be rolled immediately, if a favourable tid can be got. There is another very useful substitute for grass in spring—viz., winter tares. They can be sown now, and invariably cut a week sooner than grass. Some farmers object to them, as they say they lose the turnip crop, the tares never being cut in time to give the turnip crop a chance of being a good one. We have seen very good turnips after winter tares, and a good crop of winter tares may be more valuable than the turnip crop, coming in as they do at a time when green food is not to be procured. Winter barley is better for mixing with tares than rye. The rye becomes soon too wiry and hard. Two bushels tares, mixed with 2 pecks winter barley, should seed an acre, put in with the drill to allow the tares to be hoed in spring. Care should be taken to procure the earliest variety, which is known in the south as the *Racer* tare. This may be a local or provincial name, but it is chosen, we suppose, to indicate a *speedy* grower.

Two cwt. guano and one cwt. bone meal or bone ash superphosphate should be sown with the seed, and they may be made to cut a fortnight earlier by top-dressing in spring, but it is necessary to give manure with the seed to force them on. They will succeed well soon any time in September, but the sooner the better. The price is high, being from 10s. to 12s. per bushel. Winter tares should be rolled immediately after being sown, and care should be taken to get a guarantee for the seed being fresh. In the writer's experience, new seed will braird faster than old seed.

CATTLE FEEDING STUFFS.

[Concluded from page 345.]

WHEATMEAL scarcely ought to be classed as a feeding stuff for stock; it is seldom that it can be purchased at a price to allow of it thus being used. When it can be had at a favourable price it should be largely employed for feeding; it is valuable as a food for all kinds of stock. A few years ago, when the price of wheat was very low, several farmers used it to a considerable extent; amongst others, Mr Hudson, who speaks highly of it as food for cattle. Some who experimented with it considered that 1 lb. of the meal was as valuable for feeding as 1 lb. of linseed cake. However, no trustworthy experiments were made to test the comparative values of the two foods. The teachings of chemistry are rather at variance with this opinion. Analysis shews that for

feeding purposes 1 lb. of this meal is much less valuable than 1 lb. of good linseed cake. The following is an analysis of an average sample:—

	Per cent.
Water .....	16.00
a Nitrogenous compounds.....	12.31
Starch, sugar, gum, &c. ....	66.41
Woody fibre.....	2.75
b Ash .....	2.53
	-----
	100.00
a Containing nitrogen.....	1.96
b Do. Phosphoric acid.....	0.68
Do. Potash.....	0.56



Commercial wheatmeal is frequently only a mixture of inferior flour and bran or sharps. Being very difficult to keep, it is often offered in a very bad condition; from overheating it gets sour and musty, and greatly deteriorated in value. It is not often adulterated; if there are any suspicions of the sample not being pure, the microscope will be found useful in detecting the husks of any seed which has been mixed with the wheat. It is a good plan to take half an ounce of the meal, place it in a glass, pour over it four or five ounces of clear water, and keep stirring the mixture for five minutes; after allowing this to settle for a minute or two the liquid containing the floating particles should be carefully poured into another vessel, fresh water should again be added to the glass containing the sediment, and the process repeated until the water comes off quite clear. The residue may then be examined for sand, carbonate of lime, plaster of Paris, &c. The floating particles in the water poured off may be collected on a blotting-paper filter, and examined with a microscope for sawdust, the husks of seeds, &c.

*Barleymeal* is largely used for feeding all kinds of stock. It is not so valuable as wheatmeal, contains less flesh-forming matters, and a much larger proportion of indigestible woody fibre. It contains a large percentage of heat-giving materials, and is well suited for fattening animals. For fattening pigs it is very valuable; it has been found that seven pounds of this meal will add nearly one and a quarter pound to the live weight of a pig. To cattle in the last stage of the fattening process we have known as much as 18 lb. per head daily given. We do not, however, believe that it is economical to give such a large quantity; the food cannot be all assimilated. Excepting under very unusual circumstances, it is not profitable to give more than one-third this amount. *Barleymeal* is best given along with bean or peameal; for fattening beasts of sixty imperial stones, a mixture of 5 lb. of the former, with 3 lb. of one of the latter, will be found to produce satisfactory results. The following is an analysis of a good sample of *barleymeal* :—

	Per cent.
Moisture.....	14.15
Starch, gum, sugar, &c.....	60.26
Woody fibre.....	11.58
I. Nitrogenous compounds.....	10.84
Ash.....	3.17
	-----
	100.00
	-----
I. Containing nitrogen.....	1.73

Barley dust is frequently mixed with the meal; this dust is the refuse obtained in the manufacture of pot or pearl barley, if the latter it is nearly as good as the meal itself. The refuse of the pot barley manufacture is, however, very inferior, contains a large per-

centage of indigestible woody fibre, and its addition to the meal must be looked upon as an adulteration. *Barleymeal* may be examined for adulterations in the same manner as we suggested for the examination of wheatmeal. If it is supposed to contain sand in any quantity, the amount can easily be ascertained by burning one hundred grains in a platinum capsule; the ash should not weigh more than four or five grains, and greater part should be dissolved on the addition of dilute hydrochloric acid.

*Oatmeal*, as generally manufactured, is seldom employed for feeding stock. When it can be purchased at a reasonable price, it will be found highly advantageous to employ it in addition to some other food. In manufacturing ordinary commercial oatmeal the oats are invariably kiln-dried, and the outer husks removed before being ground. We thus obtain a meal which contains from fifteen to twenty per cent. less of woody fibre and moisture than if the oats were ground without undergoing these processes. The following is an analysis of oatmeal made from oats in their natural state :—

	Per cent.
Moisture.....	12.80
a Nitrogenous compounds.....	12.72
Starch, sugar, gum, &c.....	55.50
Woody fibre.....	14.80
Ash.....	4.18
	-----
	100.00
	-----
a Containing nitrogen.....	2.03

There is a smaller quantity of moisture in this sample than is found in the whole oat, possibly this is due to evaporation during grinding; there is a larger quantity of flesh-forming matters and a smaller quantity of fat-forming materials than is usually found in a meal made from oats in their natural state. This meal should be much more largely employed in feeding. There cannot be the least doubt but that meal thus manufactured is much superior to oats simply bruised. At the present price of oats, such meal might be made at £11 or £12 per ton, while the ordinary commercial oatmeal cannot be purchased under £18. Allowing for the smaller quantity of moisture and woody fibre the latter contains, it is fifteen or twenty per cent. dearer than the former for feeding purposes. For old horses, this meal, along with bran, is very suitable. Three or four pound per day given to dairy cattle will be found to increase the quantity and improve the quality of the milk; it should be given in the form of a mash, along with bran or sharps.

*Rye-meal* is much more largely used on the Continent than in this country for feeding purposes. The grain of rye approaches nearest to that of wheat in the quantity of gluten it contains; it is also

rich in sugar, and is, when fresh, quite sweet tasted. The following is an analysis of ryemeal :—

The following is an analysis of this refuse pea dust, viz. :—

	Per cent.
Moisture .....	13.00
Nitrogenous compounds .....	13.83
Starch, sugar, &c. ....	61.14
Woody fibre .....	10.29
Ash .....	1.74
	<hr/>
	100.00

	Per cent.
Water .....	9.36
Oil .....	2.82
a Nitrogenous compounds .....	9.00
Starch, sugar, gum, &c. ....	41.49
Woody fibre .....	33.58
b Ash .....	3.75
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	100.00

This meal is valuable for all kinds of stock. It is used to a considerable extent in Germany for feeding pigs. Coarsely ground and mixed with other meals, it is used in some countries for making bread for horses. In the north of England a mixture of this meal with wheatmeal is often met with under the name of meslin. When the price will allow this will be found valuable for stock-feeding purposes. Ryemeal should be given along with coarsely ground meal of some other kind.

Beanmeal and peameal are so much alike in composition that we may take them together. An average sample gives the following analysis :—

	Per cent.
Moisture .....	12.12
Nitrogenous compounds.....	23.72
Starch, gum, &c.....	49.16
Woody fibre.....	9.81
Ash.....	4.19
	<hr/>
	100.00

This is a very concentrated food ; it contains nearly twice as much flesh-forming matters as any of the meals we have described. For sustaining the vigour of animals under severe exertion this food is peculiarly suited. It is very useful for mixing with starch foods, or food deficient in nitrogenous matters. For feeding animals it is best thus mixed, as if too much of this meal is given alone the flesh of the animal thus fattened is hard and not so palatable as if fattened on a mixture of meals. Besides, if the animal is supplied with too large a quantity of this food its digestion becomes impaired, and a large proportion of the food is passed off unassimilated. It being so very astringent, is best given along with some other food having opposite tendencies. Three lb. of this meal along with 3 lb. of linseed meal, for animals of 60 imperial stones, is the favourite food of some feeders. To all kinds of stock bean or peameal may be given with profit. It should, however, as we have already stated, be always mixed with some meal rich in fatty matters. In some districts a species of peameal is obtained, composed of the refuse matters of the split pea manufactory, where it can be purchased at a fair price. Farmers will find it well worth their attention. It contains a good deal of woody fibre ; but in other respects is not deficient in the material which constitute a good feeding material.

As peas are kiln-dried before being split, the refuse matter contains only a small proportion of water. This dust is an economical food when given to stock, properly mixed with other food.

Linseed meal is largely used for feeding calves, but is seldom employed for feeding older animals. When boiled and distributed through bulky dry food, such as hay or straw-chaff, in the form of mucilage, it produces good results. A few years ago, being very short of roots for feeding, we employed linseed meal to a considerable extent. We gave about two pounds per head daily to fattening cattle. The meal was boiled and made into a jelly ; this was then poured over the dry food, consisting of maize meal, beanmeal, &c., and the whole mixed through a mass composed of hay-chaff and pulped turnips. At various times compounds, containing a large proportion of linseed meal, have been suggested for feeding animals instead of oil-cake. Amongst the most strenuous advocates of these compounds was Mr Warner, of Norfolk. From page 162 of his pamphlet "On the Use of Flax Seed" we take the following :—

"When selected, which they were by lot, the six beasts to be fed on compound weighed 602 stones, and those to be fed on oil-cake 590 stones. When fat, the live weight of the former was 625 stones ; of the latter, 705 stones, being a difference of 8 stone (the 12 stone overweight at the time being deducted) in favour of those fed on compound. But it was in the dead weight of each lot that the greatest difference was shewn, the compound-fed yielding 44 stone 9 lb. of meat more than those fed on oil-cake ; but, taking the bone, fat, and hides, the difference in favour of the former was 50 stones 6 lb., or 38 stones 6 lb., deducting the 12 stone original extra weight. While there is an increase of produce, there is a considerable decrease in expense between those fed on the compound and on oil-cake. The latter consumed a much larger quantity of turnips than the former, and the cost of the compound was only £19, 6s. 1½d., whilst that of the oil-cake was £21, 14s. 9d." Again, "with regard to the cattle compound, unquestionably its superiority centres in the linseed meal. Without the use of linseed meal, the attempt profitably to fatten cattle upon grain or pulse

would be unavailing." The large amount of experience gained since Mr Warner wrote has thoroughly established the correctness of his views on the utility of those compounds. It is to be regretted that farmers are not even yet alive to the great importance of making up proper feeding compounds. They recognise the value of manures suited to the wants of the plants they cultivate—have their wheat manures, turnip manures, &c.—but seldom think of adapting the ingredients of a food to the necessities of the animals they desire to feed.

An average sample of linseed meal gives the following analysis :—

	Per cent.
Moisture.....	6.38
Oil.....	32.10
Nitrogenous compounds.....	25.16
Heat-producing matters.....	31.58
Mineral matters.....	4.78
	<hr/>
	100.00

Linseed meal may profitably form an ingredient in the food of all kinds of farm stock.

*Maize meal*, containing a large amount of heat-giving matters, is valuable for fattening animals. It is especially adapted for mixing with meal rich in flesh-forming matters, such as pea or beanmeal. Sometimes it is used mixed with oatmeal; when thus mixed it is considered that the oatmeal is less heating. Animals fed exclusively on this meal get rapidly fat, but the substance of which the cells or cellular tissue, in which the fat is deposited, is composed not being supplied in sufficient amount by this meal, the fat of animals so fed is always soft and flabby. Maize meal contains a large proportion of fatty matters, while wheatmeal contains only about 2 per cent.; this meal frequently yields 6 per cent. The following is an analysis of this meal :—

	Per cent.
Moisture.....	14.96
Oil.....	6.50
Nitrogenous compounds.....	11.27
Starch, sugar, mucilage, &c. ...	60.98
Woody fibre.....	5.02
Mineral matters.....	1.27
	<hr/>
	100.00

*Rice meal* or rice dust is the refuse in preparing rice for market. Its composition is very irregular, sometimes it is very valuable and contains as much fatty matters as the best oatmeal, whilst at other times it is worthless rubbish, consisting of little else than indigestible woody fibre. Rice dust has been much recommended; it is possible it may have formerly contained a much larger proportion of starch, &c.; as now met with, however, it is seldom worth the

farmer's attention. A sample gave the following analysis :—

	Per cent.
Moisture.....	12.019
Woody fibre and mineral matters	46.500
Starch, gum, &c.....	25.524
Nitrogenous compounds.....	6.687
Fatty matters.....	5.610
Sel mineral matters.....	3.660
	<hr/>
	100.000

*Palm-nut meal* is the refuse obtained in the manufacture of palm-nut oil. It has only recently been introduced as a feeding material, but so rapidly has its use extended that the supply is not now equal to the demand. The price has risen fully 100 per cent. We have seen it largely employed in feeding sheep and cattle with most satisfactory results. To dairy cattle we have given it with great success. We found 3 lb. per head per day, along with 3 lb. of a mixture composed of equal parts of bean and barleymeal, produce a very large increase in the quality and yield of the milk. The following sample was analysed in Dr Voelcker's laboratory soon after public attention was called to this meal :—

	Per cent.
Moisture.....	7.49
Oil.....	26.57
Nitrogenous compounds.....	15.75
Sugar, gum, &c.....	37.89
Mineral matters.....	3.90
Woody fibre.....	8.40
	<hr/>
	100.00

We believe recent analysis do not shew such a large proportion of oil; but even if this is reduced to one-half the meal is still valuable for feeding purposes.

*Miller's ofal*, consisting of bran, sharps, and boxings, have long been employed in feeding. The proportion of fatty matters in and immediately under the husk of the grains of corn is generally much greater than in the substance of the corn itself. Professor Johnstone found the pollard of wheat to yield more than twice as much oil as the fine flour obtained from the same sample of grain. The four portions separated by the miller in a sample of wheat grown in the neighbourhood of Durham gave of oil :—

	Per cent.
Fine flour.....	1.5
Pollard or sharps.....	2.4
Boxings.....	3.6
Bran.....	3.3

Country millers only separate their wheaten flour into four parts, but in London and Paris five or six qualities are manufactured. Professor Johnstone, in his "Agricultural Chemistry," p. 728, says—"Three

lots of good English wheat, ground at Mr Robson's mill in Durham, gave per cent. respectively :—

	No. 1.	No. 2.	No. 3.
Fine flour .....	74.2	75.1	77.9
Boxings .....	9.0	8.3	6.1
Sharps .....	5.8	6.6	5.6
Bran .....	7.8	7.0	6.9
Waste.....	3.2	3.0	3.5
	100.0	100.0	100.0 <sup>7</sup>

Bran is valuable for all kinds of stock, particularly horses. Its price, however, is often much above its feeding value, owing to the large demand for manufacturing purposes. As bran is less liable to spoil than sharps, it is more generally preferred by horse feeders. A sample of bran gave the following analysis :—

	Per cent.
Moisture.....	12.86
Nitrogenous compounds .....	13.88
Starch, sugar, &c.....	55.56
Woody fibre .....	11.50
Mineral matters .....	6.20
	100.00

Sharps or pollards are the finer particles of the husk ; they contain less woody fibre, and can generally be purchased at more reasonable price than bran ; for most purposes pollards, although not so rich in oil, is as good as bran. Boxings is a sort of "seconds flour," and is best adapted for cattle and pig feeding. Bran, as we have already observed, is generally preferred for horses ; but there is no objection to mixing the bran, sharps, and boxings together, indeed, thus mixed we should prefer them for horses.

*Malt screenings* are the roots of barley developed and removed during the malting process. They possess considerable feeding value, and are well suited for feeding dairy cattle. For sheep they have been

largely employed with good results. An analysis gives the following results :—

	Per cent.
Moisture .....	7.30
Nitrogenous compounds .....	22.58
Starch, sugar, &c.....	45.68
Woody fibre .....	17.56
Ash .....	6.88
	100.00

*Brewers' grains*, where they can be obtained near at hand, are well worth the attention of the farmer. As they generally contain nearly seventy-five per cent. of water, they will not pay for a heavy carriage. They are largely used in the feeding of dairy cattle in the neighbourhood of the metropolis. It is customary in the southern counties to contract with the brewer for so many quarters per week during the whole year. During summer farmers often find a difficulty in consuming them, and either employ them for manure, or pack them into tanks in the ground. In these tanks the grains are well trodden down, and the whole covered with earth ; thus secured they will keep a long time in capital order. If forty or fifty per cent. of the water can be removed from grains they may profitably be carried into the country long distances by rail. The following is an analysis of brewers' grains :—

	Per cent.
Moisture.....	75.56
Nitrogenous compounds.....	3.48
Starch, &c.....	14.65
Woody fibre.....	5.46
Mineral matter.....	.85
	100.00

We have used grains along with pulped roots and hay-chaff, for both store and fattening animals, and were well satisfied with the results. We have also used them with satisfactory results, mixed with malt screenings, for sheep. At first we experienced some difficulty in getting them to consume the mixture, but, by mixing a little finely broken cake along with it, succeeded admirably.—*W. R. R.*

### RAILWAY CATTLE TRAFFIC IN AMERICA.

THE following statement has been supplied by a correspondent, who justly regards it as a step in the right direction. At the same time, we may remark that although the regulations made by the State of Massachusetts may suit the cattle traffic of America, similar regulations could not be carried into effect in this country. The mere fact that the cattle are required to be unloaded, and the lots belonging to different owners mixed, or kept separate at considerable expense and

trouble, is in itself an insuperable objection, setting aside the delay to which the trains would be subjected. What is required is facility for giving water and food without unloading the cattle, and without detention to the trains, and this, as we have repeatedly shewn, is supplied by Reid's cattle waggons. As those waggons have now been adopted by the Atlantic and Great Western Railway Company, one of the principal lines in the United States, it will be found that the sub-



joined regulations, useful as they are to a certain extent, will be entirely superseded :—

“Last May the State Legislature of Massachusetts passed an Act for ‘The more effectual Prevention of Cruelty to Animals,’ the 5th section of which enacts as follows :—‘No railroad company in this State, in the carrying and transportation of cattle, sheep, swine, or other animals, shall confine the same in cars for a longer period than twenty-eight consecutive hours, unless delayed by storm, or other accidental causes, without unloading for rest, water, and feeding, for a period of at least five consecutive hours. In

estimating such confinement, the time animals have been confined without such rest on connecting roads, from which they are received, shall be computed ; it being the intention of this Act to prevent their continuous confinement beyond twenty-eight hours, except upon contingencies hereinbefore stated.” The following section gives the railroad company a right of lien for the expenses of “the care and feed of animals so rested,” and exempts from claims for damages for detention.

Not only the company, but the “owner, consignee, or person in charge” is liable in respect of every violation of this law to a penalty of \$100.

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### HOW THE AMERICANS DEAL WITH CATTLE DISEASE.\*

THERE is a subject not of a political but of a purely agricultural character, for which I care much more than I care to ring the changes on political cries. It is practical. The United States, which acts always as our pioneer on the political highway, has just furnished us with a practical example of the manner of dealing with the cattle plague, to which it is easy to point a moral. The disease which has been ravaging that great continent during the present summer was similar in all essential points to the cattle plague which ravaged this country. Its highly contagious nature, the great rapidity of its spread, its fatal character, and the speediness of death in almost every instance, will be recognised at once as facts of our own experience. That disease is indigenous in Texas, just as the *Rinderpest* has its home on the steppes of Russia. From Texas it travelled in an incredibly short space of time to New York, and even to Canada. Do not think of the United States as a country the size of Great Britain or of France. The disease had to travel from Texas further than the distance from the steppes of Russia to London. Yet there is no doubt that it did travel that great distance. Our Consul at Chicago states in a despatch that the disease followed the track of cattle from Texas, and that cattle on the prairies which grazed over their track were infected and died. It was thus that the disease was introduced into the state of Illinois. A despatch from the Secretary of State for Illinois (the Hon. Sharon Tyn-dale) confirms this account. Some Illinois cattle were subsequently conveyed to Pittsburg, in Pennsylvania, and other cattle went thence into the State of New York. These cattle unfortunately had contracted infection, so that, according to intelligence from New York, dated the 28th of July, whole herds

were swept away, and the State of New York was thrown into a sort of panic. Other cattle carried the disease from Illinois into Indiana, and thence to Chicago. A despatch from the British Consul at Buffalo, in Canada, informs us that the disease had broken out in that country in consequence of a drove of apparently healthy cattle having been sent by the Great Western Railway from Illinois to that province. These cattle were not Texan cattle, but they had unfortunately pastured where some Texan cattle had been. The American disease and the *Rinderpest* with which we are acquainted are therefore similar in every important respect. It is thus a question of interest for us to see what remedies were found successful in America. In Illinois the disease was stopped by the wholesale slaughter of infected cattle, and by enforcing a very stringent law against importation. The law of the State of Illinois is very short, and is to this purport : No one may own, or even have on his premises, any Texan or Cherokee cattle. The punishment for delinquency amounts to \$1000 fine and a year's imprisonment ; besides which the owners of other cattle can institute an action for damages against an offender. In the State of Kansas there is a similar law. The States of Missouri and Ohio prevented large droves of cattle which had collected on their borders from entering their territory. This issued in conflicts between the drovers and the authorities, and a proclamation from the governor enjoining the belligerents to keep the peace. In the States of New Jersey and Pennsylvania there was the same wholesale slaughter, and by order of the local government the importation of cattle into those States was also prohibited. Besides all this the local authorities have power to stop and examine cattle on the railways. By virtue of this power several herds were slaughtered at various stations between the Western States and New York. At Chicago, where they all converge, the authorities were not satisfied with the stringent

\* From a speech delivered at the Annual Dinner of the Huntingdonshire Agricultural Society, by Lord Robert Montagu.

laws in the surrounding States; they were not content with the examination of other local authorities, but they enforced a rigid quarantine outside the town on all cattle which arrived *in transitu*. In Canada an order in Council was passed altogether prohibiting the importation of any cattle from the United States. The measures which were adopted in America were more severe than any remedies which have been devised in this country. The effect of them was that the importation of cattle into New York was entirely cut off, so that the supply was reduced by one-half; yet the Americans thought lightly of this in comparison with the greater evil which they might have incurred by greater laxity. The imitators of American manners, however, and the worshippers of American opinions, oppose our attempts at milder legislation here. They seem to have forgotten the calamity which we felt so acutely. They blandly express a hope that the cattle plague will not come again, and refuse to take the precautions to which every other country has been constrained to resort. And on what grounds do they act? They fear lest the price of meat may be raised. Have they forgotten the enormous losses which the country suffered two years ago, and which it may any year suffer again? Afraid of expending one farthing per pound, they would expose us to periodical losses of 100,000 head of cattle. The Americans are too acute to argue thus; and yet their condition would excuse them, for they have to guard against an inland supply from their own land. They cannot slaughter at the ports and send the meat inland as we can, yet they think it

worth-while to stop the supply altogether. With us a separate market at every port of landing will suffice, and the supply of dead meat will not be lessened. Nothing less than this will suffice, for the cattle plague defies extemporaneous measures, its approach is so secret and so sudden. It is smuggled in by the blood of a live and apparently healthy animal, or even by the wool of a sheep. But we are told to trust to the regulations of other States. On this proposal we have received a curious commentary from Holland. You are aware that in consequence of the prevalence of sheep-pox in the whole of the north of Germany, we passed an order against the importation of sheep. On the 10th of September a despatch was sent from the Hague, which states that "first-class veterinary surgeons have been instructed to be careful that only healthy sheep should be embarked at Rotterdam for Great Britain. His Majesty's Government hopes by this measure that all apprehensions existing in England of the consequences which might ensue from the importation of Netherlands sheep into the United Kingdom may be completely allayed." On the 16th the steamer *Batavia* arrived in Rotterdam with 318 sheep, which the Dutch thought we might safely allow to proceed into the interior. They were examined, and found to be infected with sheep-pox. This alone shews, I think, the necessity for a separate market. I confess that I am more anxious about this, and about my own hobby for increasing the productiveness of the land by husbanding the sewage, than I am for most of the political nostrums of the day.

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### PROTECTION AGAINST FRAUDULENT MANURES.

MR GILLART, of Wynyard Park, drew attention to this subject at a recent meeting of the North Durham Chamber of Agriculture. He said:—There were two ways of dealing with the question. One was by bringing prominently before the minds of farmers the great practical advantages which the application of chemistry to the cultivation of the soil was calculated to bring about. This was to be achieved by employing practical chemists to give lectures in the towns and villages of the district in which the Chamber was established. This, however, would be a costly mode of introducing the subject, and one which at present the Chamber would scarcely be justified in incurring. Another and very practical mode of giving to farmers the benefits of chemical science would be to institute arrangements for the analysis of artificial manures. The chemical constituents of artificial manures were not sufficiently understood by those who purchased them, and much loss and disappointment frequently arose from the want

of this knowledge. Very often farmers were tempted to buy cheap or rather low-priced manures, and the crops not turning out what they anticipated, they became discouraged, and perhaps in future were led to depreciate and undervalue all artificial manures. This was a double mistake; it was an error in the first instance to purchase without a knowledge of its chemical constituents a manure apparently cheap, but really dear, and it was wrong to suppose that all artificial manures were equally unreliable. There were in the market some excellent artificial manures, and there were others which were downright impositions. Unfortunately, the least informed and the poorest farmers were generally the victims of those who manufactured and sold these worthless preparations. The better class of farmers, from their more extended knowledge and information, were able to take care of themselves; but the small farmers were those who chiefly suffered by spurious preparations, such as those to which he referred. He could mention

numerous cases where men had been imposed upon, but he would adduce a single instance by way of illustration. A person wanted a respectable dealer in guano to supply him with the best Peruvian for £12, 10s. He stated that he could not do so, that the article could not be bought in the market under £13, and if he was not satisfied he could try somebody else. The farmer purchased a lower priced article, but he was very much dissatisfied with the results, and on a sample of his purchase being afterwards analyzed, it was found not to be genuine, and was not worth more than £8. In fact, he had been imposed upon by a spurious article; he lost his money in the first instance by paying a high price for a poor article, and in the second by the inferiority of his crop. Discouragements such as these, and want of knowledge as to the causes from whence the failures proceeded, naturally excited a prejudice against artificial manures, and in the end there was a very serious check on the progress of agriculture. In a poor county like Durham, where the land was not naturally very productive, artificial manures were particularly requisite, and it was of the more importance therefore that they should have confidence in what they purchased. Many people, unfortunately, from want of due thought, bought from parties of no standing whatever; and then, getting disappointed, they became less and less enterprising, and poor farms got poorer still. It was of immense benefit to know what were the right ingredients to apply to land. The dissemination of knowledge on the principles of chemistry as applicable to agriculture could perhaps be the most successfully effected by lectures, but there could be no question that analyses such as he suggested would be of great practical utility. Perhaps they could not go so far at present as to undertake the analysis of soils, but he thought they might, for a very moderate outlay, undertake to employ an analytical chemist to test the fertilizing properties of artificial manures. In the present day, in farming, as in all other businesses, competition was very strong, and farmers could ill afford to waste their money in the purchase of stuff which was of no value. Should the Chamber, after the subject had been fully considered, appoint a chemist to conduct analyses such as he referred to, no doubt it would be of great service to farmers and to agriculture in general.

Mr T. WEARMOUTH said he hardly thought the Chamber should be at the cost of protecting those who were so foolish as to expend their money in these low-priced manures. If they went to a respectable agent they would get an analysis, and a guarantee that the manure supplied should be like the sample. He was surprised that men should be so foolish as to purchase low-priced blood manures, and the mere sweepings and dirt which were sold for artificial manures now-a-days. If they went to a good man for guano, and to another for bones, they would get a good article without an analysis. Cockle-shells and oyster-shells were very largely mixed with some of these manures, and

he had for years thrown away £20 a-year in purchasing such rubbish for genuine manure. He had given up the oyster-shells now, for he found that guano and half-inch bones were far more profitable. A lot of the artificial manure now sold was dirty rubbish, against which common sense should guard them. They wanted no protection against such stuff as that.

Mr HOLMES: It appears you required it when you bought oyster-shells.

Mr GILLART said it was against the practices of men who had not established reputations as manure-dealers that it was so desirable to guard the poor man. By plausible pretences they imposed upon poor farmers who had no means of testing the value of the articles in which they dealt. The object of an association like the North Durham Chamber of Agriculture should be to encourage dealers who sold the best manures, and those who sold the worst they should endeavour to wipe out. If farmers had the means of testing the qualities of manures by the aid of an experienced chemist, dishonest dealers would be deterred from practices so dishonourable as those referred to.

The CHAIRMAN said the subject introduced by Mr Gillart was one of very considerable importance. The great difficulty was to get a certain class of farmers to understand the difference between low-priced and cheap articles. They were apt to think more about saving, as they thought, a few shillings, than they were about buying a first rate article, the purity of which was known. They don't think that the value of a manure consists in the ingredients of it, and they will thus buy a low-priced rather than a superior article. The best way, of course, was to have a fair sample from the bulk, and to have it analyzed before it was tried. A great many parties, however, did not think of purchasing their manure before they wanted to use it, and there was not then time to analyze it. The only protection against fraud in such cases was to deal with large and honourable firms, whose interest it was to supply the best article they possibly could. Their profits depended upon shewing that their manure was better than their neighbours'. It would be a good plan to get farmers to retain samples of their manures, so that actions could be brought against parties who sold manures which were comparatively worthless. In Scotland penalties had been recovered from parties who had sold useless compounds for manures. The man lost his whole crop of turnips, and he recovered substantial damages.

Mr WEARMOUTH said the price of Peruvian guano was so well known, that anybody purchasing an article for less than that sum must know it was not pure.

Mr JOHN FURNEIS said they all knew the price of good Peruvian guano, but there were other artificial manures manufactured which in some measure came into competition with it, and encouragement of those who made good manures of this description might bring down the price of guano. Their object should be not only to put down those who sold an inferior article, but to encourage those who produced a good one.



Mr WATSON said if the benefits of analysis, such as had been recommended, were confined to the members of their association, he thought Mr Gillart's project could be carried out. The idea was a very practical one, and much good might be effected. An instance came before him not long ago, in the way of business, where a farmer near Lanchester bought some guano or artificial manure, which was represented to be of very excellent quality. He tried it, and it turned out to be almost worthless. Fortunately, he retained a sample from the bulk, and he (Mr Watson), on being consulted on the subject, sent the sample to an eminent chemist in Newcastle for analysis. That analysis he would bring with him to the next meeting of the Chamber. He might state, however, that the analysis fully confirmed the farmer's suspicions that he had been imposed upon, inasmuch as he had received for

£10, 10s. a ton an article the outside value of which was £3, 10s. a ton. If that Chamber could protect its members from such impositions, he was sure that it would confer a very great practical benefit; and he thought Mr Gillart was entitled to their thanks for having brought such a very proper subject before the meeting.

Mr HOLMES said he and Mr George Crofton once had a joint investment in an "economical" manure, and it was so economical that neither of them ever got a turnip.

Mr GILLART hoped the time had not been expended uselessly in discussing a subject which he had introduced without sufficient notice; but he thought it would be better to reserve for future consideration the steps which the Chamber would take in reference to it.

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### THE SEWAGE QUESTION.

"A FIFESHIRE FARMER" writes as follows in the *North British Daily Mail* on this subject, with reference to the proposed utilization of the sewage of Glasgow:—

SIR,—In your valuable paper of 27th ult. I find a report by the celebrated engineers, Messrs Bateman & Bazalgette, on the disposal of the sewage of Glasgow. With so complete machinery as is proposed through piping, tunneling, and pumping, for disposing of the sewage at the enormous cost of nearly a million and a-half of money, one would have expected an equally detailed report as to the construction of premises and machinery for converting the sewage into the condition essential for becoming a universal manure, giving profitable returns for such an outlay, instead of terminating in the irrigation of a few thousand acres. However esteemed this report may be by the Town Council and enterprising citizens of Glasgow, from the place and circumstances in which they are led to view it, let them only leave the field of theoretical discussion for our farms and the meadows proposed to be irrigated, and they must, from this point of view, along with every enlightened and enterprising agriculturist, be persuaded to regard the scheme, however skillful and costly, as but tending to waste that valuable ammonia of which the whole country is so much in want. Let the Town Council reflect upon the able lecture delivered twelve months ago, by Professor Anderson before the committee of the Highland and Agricultural Society in Glasgow, when they will be reminded of the ultimately unavoidable deficiency of ammonia for agricultural purposes from the gradual and inevitable exhaustion of our present sources of supply, "when within another generation it will," he says, "become a serious ques-

tion." In confirmation of the Professor's statements the agents of the Peruvian Government have announced a rise of 10s. per ton in the price of Peruvian guano, and it is anticipated that a further rise of 10s. will take place in January. Under such an anticipation the agriculturists of this country must certainly with great interest await the steps of the Town Council of Glasgow in disposing of the sewage of their city, and must earnestly hope that, with such a fact before them, whatever steps they take in disposing of the sewage, all care will be taken of that valuable manurial ingredient which their sewage holds in solution, so richly, indeed, that it might become no secondary substitute for Peruvian guano. It is a well-established principle in agriculture that certain elements in the soil are necessary for the proper nourishment of a plant, and the regular succession of that plant so exhausts the land that if the element is not returned the soil would become ultimately sterile. Where, then, must this element come from, and to whom must the farmer look with reasonable expectation for this supply but in the city of a half million consumers of his productions. The farmers of our country have as good a right to interdict this wholesale destruction of so valuable a manure, as the citizens of Glasgow would have to interfere were the agriculturists combining for the purpose of turning the entire lands out of cultivation into deer forests. Does not the solution of the manure question lie in the operations of the Councils of Glasgow and similar cities, if rightly directed? The scheme of Messrs Bateman & Bazalgette cannot meet the demand. At the enormous cost of nearly a million and a-half of money the town of Glasgow may be delivered of its pollution and unwholesome odours, but beyond a few privileged



farmers alongside, and a few thousand acres for irrigation, at best producing only an article for local consumption, to the entire neglect of an exhausted country. The ammonia within a fractional percentage will be wasted, whereas the interest of this estimated expenditure might be made equally to deliver the town from the sewage nuisance, in constructing machinery for converting it into a dried *poudrette* or guano condition, which, by proper appliance throughout the length and breadth of the land, might produce crops of every description for the million at a price with which no foreigner could compete. Town and country must reciprocate on this momentous question.

With a natural and obvious reciprocity and honest dealing with our mother earth our fearful apprehensions of dearth of manure and of costly food would vanish. As an humble agriculturist I send these sentiments, expressing in my homely way the mind and feeling of not a few of the industrious sons of the soil, in order that the very important question now before the Council of your city may not be disposed of otherwise than by their becoming alike the benefactors of both town and country, and by cleansing their town of its pollution, and saving their country from the exhaustion of its soil.

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### GEMS FROM THE REPORT OF A SHEEP SHOW.

A CORRESPONDENT of the *Dublin Freeman* has supplied that journal with the following gems, which he selected from a report in one of the Dublin dailies, of the Sheep Show recently held in that city. It is a pity that the name of the journal in which they first appeared is not given, but the subjoined extracts bear a great resemblance to a Report of a Royal Agricultural Show which we once met with in the *Irish Times*, in which the reporter enlarged in a similarly lucid style on what he was pleased to call "the eventful events of the past week." Here are the latest examples, which we recommend to the notice of all reporters of similar exhibitions, merely remarking, however, that it would require a good supply of "Kinahan's LL" to enable one to come up to the mark:—

"1. Root crop cultivation received such an impetus from such exhibitions that the models of the tiny roots then grown, contrast so diminutive with the creditable samples now being yearly staged within its walls that the most superficial observer can at once perceive the *magnitude of the comparison*.

"2. The old Irish cow, whose tediousness to fatten or mature, and whose *usefulness*, in a pecuniary sense, to the owner was comparatively *worthless*, has been now *substituted* by those valuable animals of improved breeds which any casual observer cannot fail in discerning throughout the farmeries of the country.

"3. The subject of sheep breeding in Ireland has recently assumed a very *undivided state of opinion*.

"4. The most important feature in connexion with the exhibition just being held is that *breeders* and admirers of sheep, of all shape and lineage, *have been placed in such proximity* that a rare opportunity is thus afforded to all, to see placed within the precincts of the agricultural hall all descriptions of sheep of the different sorts.

"5. Every attempt to *improve* and perpetuate a *more improved* or judicious class of the bovine tribe was most *transparent* throughout the day. Graziers, exporters, importers, and the general farming community, seemed alike anxious to possess themselves of exchange, or hire out the *services* of their celebrated ram *sheep-walks* as suited the country."

## The Garden.

### GARDENING AT SEA-SIDE WATERING PLACES.

AT the present period of the year, when flower, fruit, and vegetable exhibitions are being held in almost every city, town, and village, the inhabitants of most of our popular marine bathing places, although exposed to the cutting sea-breezes, which stunt their surrounding vegetation, and forbid them the enjoyment of sylvan shade from the hot and glaring summer sunshine, yet seem to vie with more weather-favoured communities in their manifestation of gardening zeal, by holding horticultural fêtes before their autumn visitants depart for the season to their inland homes. Many of the competitors at these exhibitions are no doubt from neighbouring places, where the blasting influences of the sea winds do not reach their crops; but still greater numbers, and more especially those of the amateur and cottager classes, have to contend less or more with the baneful loaded 'sea-blasts' saline spray. Hence, in drawing up the prize schedules, more attention should be paid to offering liberal awards for such articles as are naturally or peculiarly suited for cultivation in sea-side localities, and this would not only be dealing graciously with an important portion of the members and competitors, but it would impart a characteristic feature to the exhibitions which would render them peculiarly attractive to those temporary residents who are expected to contribute, at least their entrance-money, in support of the show, and whose enjoyments it is the general interest of the local inhabitants to promote.

We have been led into making these remarks in consequence of being present at a horticultural show recently held at Portobello, in Scotland, the chief bathing-place of the citizens of Edinburgh, from which it is about three miles distant, where we saw

much that was excellent, and even meritorious, in the flowers, fruit, and vegetables that were displayed, but nothing within the show-rooms to indicate that the exhibition was being held in proximity to the Scottish capital. Gratified we certainly were at noticing on the prize tickets the names of at least four neighbouring farmers, who had outstripped their landlords' gardeners in dahlias, geraniums, cockscombs, lobelias, &c. The general arrangement and management of the show was excellent; but we should like to have seen all, or most of the following, together with other sea and sea-side vegetable productions, which we recommend to the attention of future schedule-makers.

In what may be termed the floral department, prizes might have been offered for the best kept and stocked sea-fronting gardens and flower plots; for the best dozen pots of pan-grown specimens of flowering plants; for the best six ornamental or strikingly peculiar foliated plants; for the best six pots of grasses—all being either natives of, or suitable for growing on the sea-side; for the best foliated three plants of the garden beet; for the best three varieties of the Sicilian beet, now more highly esteemed for ornamental than useful foliage (one plant each), both from the open ground, and growing in pots; for the best plant of the tree or sea-side mallow; for the best and most tastefully-arranged collection of ivy leaves, say three of each sort, grown upon sea-facing walls; for the best foliated branches, under 3 feet in length, of twelve trees or shrubs grown where fully exposed to sea winds; and for the best aquarium of marine algæ under, and for the same over, 10 cubic feet in size.

In the fruit department there may be

nothing of strictly sea-side origin, excepting some kinds of the wild brambles or black berries, which grow almost as well, and fruit as abundantly among briars and sloe-thorns, on rocky shores, as they do on inland banks or in field hedges; and all of which deserve much more cultural care than has yet been anywhere bestowed upon them. But it would be of immense benefit to many, were means taken through local horticultural societies, or otherwise, to ascertain what varieties of our hardy fruits were most suitable for growing in sea-side localities, and especially in the predominating descriptions of sea-side soils; where, for instance, some kinds of strawberries will thrive well, while others will scarcely exist. And the same remark is applicable, in a somewhat modified degree, to gooseberries, currants, apples, pears, and stone fruits.

Among culinary vegetables, the cabbage family, beet, sea-kale, and asparagus, are in their original state strictly sea-side inhabiting plants, and their different varieties should consequently be fully represented at all coast horticultural shows. The two last are no doubt unfit for table use in autumn, but even then their good cultivation might be shewn by the appearance of full-grown plants. Few articles, even at a flower show, will surpass in beauty and elegance fine stalks of asparagus, loaded with their scarlet berries; and, were prizes offered for these, we might soon see considerably improved varieties of this most valuable ornamental as well as culinary plant in general cultivation; for its great diversity of growth is most marked when the plants have attained to full size, and not at the period of its usefulness when the younger shoots shew almost nothing in their appearance, whereby one variety or sub-variety can be distinguished from another. In addition to the above-named, there are several really useful sea-side vegetables which have been almost entirely neglected by British cultivators, notwithstanding that in their native localities they have been eagerly sought after and highly appreciated. First among these stands that most excellent of pickle and salad plants, the true samphire (*Crithmum*

*maritimum*), which might be grown to as great perfection in a neat garden rockery as it naturally does on the dizzy sea-cliffs, where—

“Half way down

Hangs one who gathers samphire; dreadful trade.”

Then there is the golden samphire (*Limbarda Crithmoides*), which is used in a similar manner with the last, and is so essentially marine as to be occasionally found in situations where it is covered by sea-tides. Next, the marsh samphire (*Salicornia herbacea*), which is a common inhabitant of salt marshes, and is also used like the last two. The wild sea-beet (*Beta maritima*), makes a good salad, and is an excellent substitute for spinach, as is also the sea-orache (*Atriplex littoralis*) which is common on most of our sea coasts. The scurvygrass (*Cochlearia officinalis*), and the star of the earth (*Plantago coronopus*), form more delicate and tender salads when cultivated, than when gathered on exposed coasts, and are frequently grown in some continental countries for this purpose. The seeds of the sea pea (*Lathyrus pisiformis*), a rather pretty perennial, have been used as substitutes for garden peas, and might be similarly improved under cultivation. And the sea lovage (*Ligusticum scoticum*), like the garden lovage, is used as an ingredient in salads and as a pot herb. Prizes might also be offered for the best cultivated plants of that essentially sea-side plant the true Caper, which, when grown in seaward localities, is much harder than is generally believed; and for that remarkably hardy variety of it which grows naturally on the rocky shores of the Crimea, where “once in some few years it happens that there comes a fortnight or so of Russian cold, of such a degree that if a man touches metal with an uncovered hand the skin adheres.”

Sea-side plants, such as the samphires before mentioned, and the edible sea-weeds, and even home-grown caper buds, in a manufactured or prepared state, would form excellent adjuncts at horticultural shows in coast localities, as would also herbariums of coast plants and marine algæ, more especially the latter, the preparation and preservation of which would not only form a delight-

ful and instructive pastime, but, forming as they do the most beautiful as well as intricate and interesting specimens furnished by the vegetable kingdom, their after inspection, as well as exhibition to friends, would become pleasing occupations in leisure hours. Ladies, when at sea-side residences, might find an agreeable change from sewing, knitting, crochet, and other light work by imitating those of antient Tyre, in dying fine

linen and like articles of dress with the imitable purple of the very common white whelk (*Purpura lapellus*), in destroying which they would be contributing to the removal of the worst enemies of that highly useful of shell fish, the common mussel; and the beautiful floral or other fancy designs which might be produced in this manner would certainly not be out of place when exhibited at a sea-side flower show.

### OUT-DOOR PRESERVATION OF TENDER PLANTS IN WINTER.

AT the present period of the year, when flower-beds are still gaily decorated with tender and half-hardy bedded-out plants, many cottagers, villa residents, and others who have not greenhouse accommodation at their command, find their floricultural enjoyments much marred by the consideration that some frosty morning will soon deprive their most cherished favourites of their loveliness, and that all must shortly perish under the biting frosts and chilling blasts of winter, leaving the ground to be refilled next season with young plants of whatever kinds can be culled from the over-abounding stores of more fortunate friends, or purchased from plant dealers. No great hardship this last, some may be disposed to argue, as, for the requirements of small establishments, bedding plants can generally be purchased in spring cheaper than they can be wintered; but those who argue in this manner do not take into consideration, or make allowance for, the pleasing occasional recreations associated with in-door plant management in winter. At present, however, we have only to do with those to whom such recreations are denied, and who may yet wish to preserve some of their cherished favourites, and to grow them to greater sizes than they can attain to in a single season.

From among tender plants, to which outdoor protection may, in general, be successfully applied in our climate, we may exclude geraniums, verbenas, heliotropes, petunias,

and a few others of less note; to which such protection is only applicable in mild winters, approximating in temperature to the last, when, in many places, some of the hardier varieties of all these stood out without any protection whatever. But even after these are discarded, there remains many which may be effectually protected, with but little trouble and expense, and which, when so preserved, will amply recompense any care which may have been thus bestowed, by their increased size, and the consequent highly augmented display of their flowers. We do not mean to insinuate or deny that the outdoor protection of tender plants in winter is either altogether neglected or not pretty well understood; but there is good ground for believing that it is not sufficiently practised, and that it is too frequently applied in such a slovenly and unsightly manner as to be simply obnoxious, if not disgusting, to winter residents who have the least pretensions to gardening taste. "Protect the roots by litter, and the tops by straw, mats, or evergreen branches," is the stereotyped Gardener's Kalendar instructions for preserving tenderish plants out of doors; and the littery mess employed, while objectionably unsightly in itself, is generally rendered more than doubly so in consequence of being scattered abroad by birds, winds, or otherwise, while the top appliances of straw or mats, however tightly and tidily tied, invariably offend the eye, which experiences but



little relief when turned to a close, besom-like, bound-up bunch of enveloping evergreens. Litter of all kinds, unless concealed, is objectionable in flower gardens, and should not be tolerated even in the most obscure parts of the kitchen garden. Some descriptions of it are, however, highly useful for root protection of flowers, and of these the best is Sphagnum or other moss, which has been sufficiently dried to destroy all intermixed weeds; next are the dried or dryish chopped or broken down tops of that common fern, or rather braken, the *Pteris aquilina*; and after it come the leaves of forest trees, but more especially those of the beech and the oak, then dryish half-decomposed tree leaves—rough stable and byre dung being only admissible when none of these others can be had. Before applying litter of any kind the surface earth should be made to slope gently from the base of the plant, and be firmly tramped; then 3 or 4 inches deep of tramped litter will generally suffice, which may extend outwards from 18 to 36 inches, according to the size of the plant; and the whole should be covered by good grassy turf, with its surfaces also sloping outwards, so as to prevent the lodgment of rain water, and any spaces left about the neck of the plant should be filled in with finely-broken charcoal, reduced coal cinders, or rough sand. But in the event of turf being unattainable, spruce or silver fir branches may be spread over the litter, of sufficient thickness to cover and secure the latter, keeping, of course, their natural face up. Then the top protection may be applied by, in the first place, driving in a strong stake, to which the plant should (supposing it to be deciduous) be pretty closely fastened; next, a covering of dry ferns, matting, or straw, concealing the whole by neatly disposed evergreens with the points inclining outwards in a natural-like manner, in place of being tightly bound in. In some instances the internal enveloping offers, straw, or matting may be dispensed with, and evergreens only used, of which none are more suitable than branches of the common spruce, in consequence of its leaves dropping gradually as the season advances in spring, so that they are generally all fallen by the time when

the branches should be taken away. Any other kinds, of evergreens may, however, be employed, and if a good variety of pines and other conifers, laurels, hollies, &c., having their lower ends stuck into the earth, are tastefully applied, the whole may be made to present the pleasing appearance of a well-arranged winter garden. Evergreens require a somewhat different adaptation of their coverings, inasmuch as any close enveloping should only be applied to their stems and the bare parts of their branches, while the evergreen branch covering should be such as to admit of light reaching to the foliage, and the whole might have an extra supplementary portable covering for being applied only in hard frosty weather.

Tender and half-hardy plants, which can be thus wintered out of doors, may be classified as follows:—

1. Bulbous plants.
2. Deciduous herbaceous and sub-shrubby plants.
3. Evergreen herbaceous and sub-shrubby plants.
4. Deciduous shrubs.
5. Evergreen shrubs.

1st, Tenderish bulbs—such as the Japan lilies, *Tigridias*, *Ixias*, &c.—may be grown in beds sloping to both sides, and covered over with litter and turf, as before described, taking care that the rows of bulbs are carefully marked, so that an inch or two of turf may be cut out along the sides of each, when the bulbs begin to push, and a little earth filled into the spaces. The remainder of the turf may lie till its growth becomes too coarse; or even longer if it is neatly mown.

2d, Tender deciduous, herbaceous, and sub-shrubby plants—of which the tall lobelias (*Lobelia cardinalis*, *L. fulgens*, *L. splendens*, and their now numerous varieties), several of the *Salvias*, &c., are good representatives—may be protected in the same manner as the last, but when their young shoots begin to push in spring, it may, in most cases, be advisable to remove a portion of the litter along with those of the turf, then top-dress the surface with fresh soil, and protect the young points from snails and slugs, which are often worse

destroyers of these late vegetating plants than the frost is.

3d, Tender evergreen herbaceous and sub-shrubby plants, such as the *Cineraria maritima*, *Centaurea ragusina*, the so-called shrubby *calceolarias*, &c., require more stem and top than root protection, so that a narrow turf laid around them, and filling in between the stems with rough sand or charcoal, after all decayed or decaying leaves and leaf stems have been carefully removed, is only requisite. Then a circle of evergreens should be stuck in pretty thickly around, and extending at least 6 inches above the top of the plant, but so as to leave it somewhat exposed; and, as a greater security from wind, these branches should be tied near their tops to a strong willow withy, or wire hoop.

4th, Tender deciduous shrubs, including most of the fuschias, many of the finest tea-scented roses, the old-sweet scented verbena, hydrangeas, &c., are well adapted for the root and top mode of protection previously described; but in the case of the hydrangeas, as their flower buds are formed on the extremities of the stronger shoots, these should be more carefully defended than those of the other kinds named, and at the same time kept more apart or less crowded, by having dry ferns or the like placed between them; and it is especially desirable that their branches, and particularly their upper ends, be kept dry.

5th, Tender evergreen shrubs, such as myrtles, *Eugenias*, camellias, some of the rhododendrons, &c., have been already alluded to. When grown on walls these are not unfrequently closely enveloped in mats, or their foliage otherwise excluded from light

and air, by which it is as effectually destroyed as if it had been exposed to the hardest frosts. In such situations protection from hot spring sunshine is as essential as from frost; and a covering of well-secured open branches is far more suitable than one of mats, or, if the latter are used, it should only be temporarily and in extreme cases, when they would be much improved both in appearance and usefulness by having evergreens laced over their outer surfaces.

There is yet another class of tender plants used in bedding-out, which those who have no winter accommodation for growing them may perpetuate by seeds, such as the blue and other dwarf lobelias, the finest varieties of Indian cresses, *mimuluses*, herbaceous *calceolarias*, &c., which, if sown in a cool glass frame, or even in the open border in early spring, will produce a fine display of autumn bloom.

But where is all this turf to be got? and how is it to be disposed of after it is no longer needed for plant protection? are questions which will occur to many. A numerous class of flower growers will have little if any difficulty in procuring turf, the quantity of which requisite for a moderate sized place will not be nearly so great as may at first sight appear; and when no longer required it is easily disposed of in the compost heap, where, if intermixed with cow dung, it will form in the first season an excellent medium for the growth of vegetable marrows, gourds, hardy cucumbers, and New Zealand spinach, while afterwards it will assume the form of turfy loam, which no garden should be without, and with which few are ever over supplied.

## GARDEN ARCHITECTURE.

## III.—WINDOW AND BALCONY GARDENS.

HOW to keep plants in perfect health in living-rooms, has long been known, by everybody who has tried the experiment, to be a problem very difficult to solve. Where there are greenhouses and frames, and a regular gardener is kept, or where a London florist is paid to supply, it is easy to keep up a brilliant show the greater part of the year, by changing the plants every week ; but this is

length of time, to human beings. How, then, are people to enjoy the sight of plants in their drawing-rooms? For my own part, nothing gives me more pleasure than to see plants in flower as I sit at my desk ; and my taste in this respect is by no means uncommon. In fact, I think that people in general enjoy plants more in their living-rooms than in any other place ; and if the same plants continue

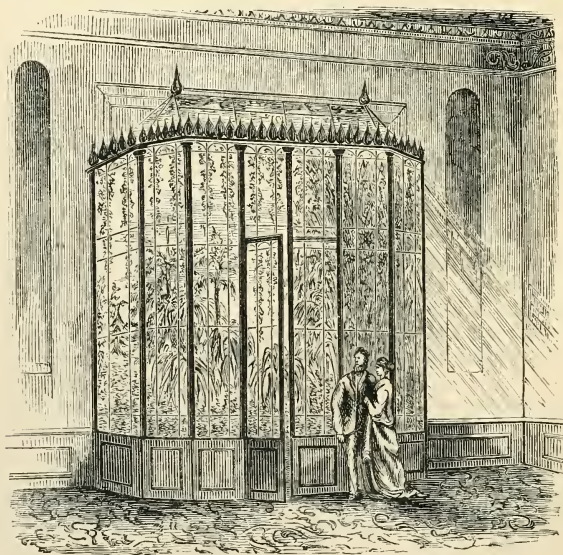


Fig. 1.

cutting the Gordian knot instead of untying it, and does not throw any light on the real difficulties of the case. There can be no doubt that the air of a room, warm and dry enough to be comfortable for human beings, is not suitable to plants ; while, on the other hand, the air of a conservatory or greenhouse, when the plants are growing vigorously, would not be particularly agreeable, for any

with them any length of time, they learn to take an interest in the opening of every bud, and the developement of every leaf, as Saintine did in his *Picciola*.

A mode has been contrived to permit persons to enjoy the pleasure of having plants in their living-rooms, by placing them in Ward's glass cases ; but the glass soon becomes green and obscure, and as the case must not be

opened, the plants lose half their interest. The plan now recommended to those who wish to enjoy the pleasure of seeing plants thrive in their living-rooms, is to have a large glass case (see fig. 1), placed in front of a window, and projecting into the room,

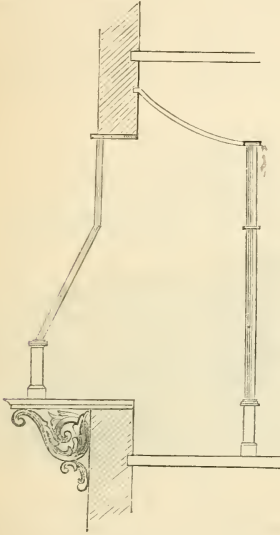


Fig. 2.

with a door opening into it, so that it could be entered from the room. The floor of this greenhouse, or plant-cabinet, should be made of wood, a little higher than the floor of the room; so that, if it should be wished, it could be removed without injuring the house. The whole of the upper part of the case, projecting into the room, should be glazed, but

to the height of about two feet it should be of wainscot, to correspond with the panelling round the room. This panelling is lined within the cabinet with leaden troughs, communicating with each other, and having a slight declination towards another trough lower than the rest, and near the balcony outside the window, and so contrived that any water, draining from the pots or boxes containing the plants, may run off into the lower trough, which should not have any flowerpots in it, unless they contain aquatic or marsh plants. In these troughs should be placed wooden or slate boxes, filled with earth, in which climbing plants are placed, alternately with camellias, orange-trees, or other flowering shrubs, so as to be seen from the room. The lower half of the window, behind the glass case, should be taken out of its frame, and the balcony covered with glass as shewn in fig. 2; and this glass should open in several places, so that fresh air may be admitted at pleasure; and the glass-door of the cabinet in the room should be made to fit closely, so that the dry air from the living-room may be excluded when necessary.

The mode of arranging the plants in a plant-cabinet of this kind must depend upon the taste of its possessor. A very pretty effect is produced by training the small-leaved ivy up a slight trellis placed just within the glass that projects into the room, and having plants with showy-coloured flowers placed at intervals, so as to be seen from the room among the ivy, the light from the window behind giving the plants placed close to the glass the effect of transparency.

#### IV.—RUSTIC BRIDGES.

There are many places in this country where a little sparkling stream runs through a deep romantic glen, and where a bridge of brick and mortar, or even stone, would look wretchedly out of place; and yet where it is almost necessary to have some mode of passing from one rock to another. In such situations, nothing can be

more appropriate than a rustic bridge, such as that shewn on next page, which can be made by any village carpenter who can contrive to put wooden planks firmly together, while the materials for the decorative part will be found in the woods on the estate.

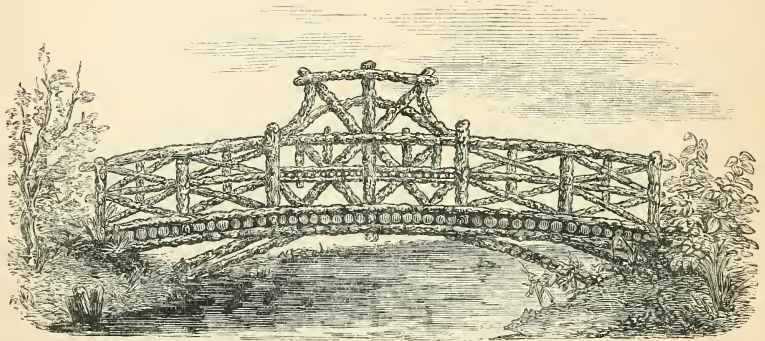
The principal thing to be attended to in making a bridge of this kind is, to make it,



as the carpenters say, "stronger than strong enough;" and care should be taken to give it sufficient abutments on each side, observing, however, that they are entirely concealed by ivy and other creeping plants, as well as by shrubs. The rustic work should be made of pieces of wood with the bark on, which may be varnished to prevent the bark peeling off, a dead, dull-looking varnish being used, as a shining appearance would materially

fully arranged; the ivy might be mixed with the Virginian creeper, both plants being grown on the banks from which the bridge springs, and being carried along the railings so as partially to shade the whole bridge.

If preferred, the planks which form the foot-path of the bridge may be disguised by laying short pieces of wood, of equal lengths, across them, like what the Americans call "corduroy roads;" but this is unpleasant to



injure the effect of the bridge. In the bridge shewn there is an elevated part just in the centre, but this may be omitted if not liked; or a seat may be placed on the bridge at that part, and ivy trained on a frame over it, so as to hang down and form a kind of rustic arbour. Of course this would only be appropriate where the view of the bridge was particularly fine, and the ivy and frame-work would require to be very skilfully and taste-

walk on, and gives a feeling of insecurity to the foot-passenger. It must be observed that a rustic bridge of the kind described is most suitable in wild romantic scenery, and that when used over a quiet stream, it should not be near, or even in sight of the house. In such cases, particularly if the house chance to be an Italian villa, with stone terraces, and other architectural ornaments, the bridges should certainly be of stone.

## GROWTH OF YUCCAS IN THE NORTH.

IN the gardens here under my charge, a very good plant of the *Yucca gloriosa* *superba* began to send up a flower stem in the month of June last, and was in fine flower in July and beginning of August. The plant was foliaged close to the ground, and the stem, which measured about 8 feet in height, was densely covered with flowers. This plant was by no means the best in the gardens. About the middle of August two more began to send up flower stems, which are now upwards of 9 feet in height, and shewing flowers on their side branches, but are by no means near their full stature. A week later two more plants of the same species began shewing their stems, and are following the other two very rapidly, being now 6 feet high; and about a fortnight since a fifth one commenced to shoot up, so that if the weather be favourable for them flowering, they will be a splendid sight in a few weeks, and will be worthy of having a protection raised about them to shelter them from autumnal blasts of wind, rain, and cold nights. The first four of these have dark brownish stems and branch sheaths, while those of the fifth, which I take to be the

true *Y. gloriosa*, are creamy-white. There is also a plant of *Yucca glaucescens* sending up its flower stem, but this species does not appear to attain to near the size of the others; and its stem is of a light red colour, quite different in appearance from them. Five of these plants will be in flower about the same time, for although two be a little further in advance, they will not be near done flowering when the others have commenced. The plants are all very strong except the last mentioned, which is of less size. I have had long experience in growing *Yuccas*, and find that they require very rich soil, with plenty of manure to grow robust, handsome plants. The only winter protection requisite is to gather and tie the leaves close up to prevent snow or sleet freezing in the heart of the plants and rotting them. After flowering they will send suckers from their roots or sides, which may be carefully removed, and if well cultivated they may flower in a few years afterwards. Independent of the flowering, they are magnificent looking plants for conspicuous places in a flower or kitchen garden.—*P. Loney, Fingask Castle, Perth.*

## PRESERVATION OF CABBAGES FROM CATERPILLARS.

ALMOST every year the cabbage caterpillar (*P. pieris*) causes considerable loss to gardeners and cultivators by eating a great part of the cabbages. I have even seen whole beds of this precious vegetable entirely lost. People who have described this insect have set forth in journals many ways, more or less excellent, of destroying the butterfly and its caterpillars; but I think that to attain that end there are no means more efficacious and more simple than that which the housekeepers of my locality have used for several years. They plant the cabbages in the proximity of a hemp-field, or rather sow some feet with hemp at little distances in the midst of the cabbages. The butterfly seems to have such an aversion to the strong odour of this plant that it leaves the garden, and never lays its eggs but at a distance from the hemp. If this plant is scattered in every corner of the garden, one will never see a caterpillar on the cabbages.

This proceeding, of which the efficiency is well tried, is a discovery owing to chance. A cultivator had remarked that there never were any caterpillars on a cabbage when it was planted near a field of hemp, while the pot herbs situated elsewhere were perfectly ravaged. Hence the idea of sowing hemp seeds at stated distances in the gardens, and which has had most excellent results. The odour of the broom affects the cabbage butterfly in a similar manner, and one can preserve cabbages and vegetables in a similar manner from their attacks, by placing green branches of the broom in the kitchen garden; but these branches dry rapidly and soon lose all smell: it is then necessary to replace them by fresh ones. Hemp, on the contrary, exhales its scent all the summer, and the few feet sown in a garden does not in the least injure the vegetables, but themselves become enormous, and give into the bargain their produce in seeds and hemp, which constitutes another advantage.—*X. Thiriat.*

## Rambles by Road, River, and Rail.

### A TOUR IN THE WEST OF SCOTLAND.

#### BUCHANAN HOUSE.

[Concluded from page 379.]

THIS modern baronial residence covers quite an acre in extent. From its elevated position, and the natural acclivity of the ground, it is well adapted for terracing; at least the two sides of the square, where picturesque beauty is and ought to be, the principal object in view. Where *convenience* is the most cardinal point to be considered, seeing that the principal entrance and the kitchen and kindred apartments are situated in proper positions in the corresponding sides of the square, the ground is level. Purely architectural display, without a proper regard for fitness, convenience, and comfort towards domestic arrangements is very objectionable indeed. Here both points have evidently been carefully studied, and if there be anything at all which the captious critic would pick at it is in the deficiency of breadth of the platform of these terraces. A little more scope, on either side of the spacious gravel walks that runs parallel with the building would very much enhance the general effect, the more particularly when we look to the circular and parallelogram beds that are introduced, with a due regard to geometrical rules, in the grassy ground work. These masses of colour, filled as they were with parterre plants, lightened up the green sward, and an admirable reinforcement was called into play into some of the more spacious panels in the shape of great rustic baskets, about 14 feet in diameter, with corresponding arched bows, clothed with moss and climbers of sorts, adorning them with gay flowers and elegant foliage, while plants of parti-coloured foliage, and others with flowers, decked the interior. Looking to the immediate foreground, there is an

ample field of beauty for an ambitious eye to dwell upon; for there is first the rich and formal style of decorative gardening, as represented by three sets of terraces, then a liberal infusion of choice conifers, then delightful park scenery on a level of some 60 or 70 feet lower; and in the background there is that beautiful classical scenery, sufficiently touched upon in a former chapter; only we are reminded that we failed to notice Inch Calliaich, which, when translated, signifies the "island of old women," situated at the base of the Lomond hills.

Wending our way towards the garden, we pass through a coniferous grove, in which *Picea pinsapo*, *P. Cephalonica*, quite 14 feet high, with great bristling laterals, abound, indicative of much luxuriance. *Wellingtonias* also thrive here, so do the *Cupressus Nutkaensis*, a splendid species, the *C. Lawsoniana*, along with many of the common cypresses, in single file, which seem to have found a home on this estate peculiarly agreeable to them. Nor must we omit to note the growing qualities and the decorative value of *Picea grandis* and *P. nobilis*. Both are of that majestic habit that claim for them a place in any demesne, and both seem less fickle than many of their compeers. Associated with these, to give variety and attraction throughout the season, are various of the berberries. *Mahonia aquifolium* is not the least important, looking to the profusion and beauty of its fruit, and the glossy fine ornamental character of its foliage. When to this we have to add the Japanese *Aucubas*, which, beautiful at all times, have, now that their wedded position has been restored, the additional

attraction of a most interesting up-growing family, one can easily conceive the variety of features that is being introduced into the lawns and pleasure-grounds of this noble family. The fine specimen trees, both round-headed and those that assume a somewhat pyramidal habit, have been preserved carefully in all salient spots, and look dignified, overshadowing many of the suffruticose race. Continuing our course over a very well-kept walk of a serpentine character, and emerging through a leafy canopy, we all of a sudden confront the gardens.

Before passing on to the walled gardens there is a charming flower-garden recently remodelled, and, in fact, restored and largely extended from the adjoining copsewood, by Mr Connon. This is a delightful retreat, and leaves an impression upon the visitor of the most favourable kind. There is nothing elaborate about its formation; it is exactly suited for a quiet educated taste. There is material in it for an uninterrupted display of flowers, and then what with the closely-shaven lawn, and the variety of form of the many shrubs and plants that have found, some a permanent and some a temporary home, it is quite captivating and insinuating in its influences. Of course there are abundant masses of verbenas, pelargoniums, calceolarias, lobelias, and such other gaudy plants, as seem to have satiated the eye of the public; but when such material as that is corrected by specimens of choice conifers, by masses of rhododendrons, by Ghent and other azaleas, by a selection of choice American shrubs, and by collections of heaths, so that the effect, though brilliant, is nicely toned down, and not out of harmony with the adjacent scenery. To keep up the line of beauty Mr Connon has planted the two principal borders in the centre of the kitchen garden upon the ribbon system of decorative gardening. The long lines are certainly effectively backed up by a nice assortment of apples on espaliers, which are now in excellent bearing order. In front of these are lines of the pale blue ageratum, the bright lemon-coloured calceolaria amplexicaulis, a scarlet form of pelargonium, the variegated

Alyssum, the fine soft Purple King verbena, the effective and best of all the variegated zonal pelargoniums, golden chain, and a most effective broad line of lobelia, which, notwithstanding the drought that prevailed, was beautiful beyond its fellows.

Returning to these espaliers for apple-cultivation, we observed that five wires had been extended at equal distances, and fastened with staples on proper supports. The yield from this multiple cordon will be something tangible; and supposing the practice of cultivation is antient as our gardens are, it is delightful to see it again attended to. A thorough renovation of the trees in the garden is contemplated and carried out with a proper regard for supply in the one instance, and, as opportunity offers, with a somewhat limited staff in the other. All the apples planted are grafted on Paradise stocks, and they give promise of an early fruitfulness, accompanied with a desirable degree of stamina and vigour. Some capital samples of Stirling Castle, Lord Suffield, Duchess of Oldenberg, Hawthornden, and many of the pippins, were apparent in walking round. So aged are some of the trees in this garden as to have trunks like a moderate-sized forest specimen, and some of the more gigantic of them have been utilized for the make-up of Gothic arches to train climbers upon. The wall-fruit shewed a fair crop on select trees—the plums, as represented by Green Gage, Lawson's Golden Gage, Golden Drop, and Kirk's Seedling, being particularly good in quality.

The forcing houses comprise such standard sorts as Hamburgh and Muscat grapes, yielding good crops. Apricots refuse to succeed out of doors generally in the West of Scotland, but there was a plentiful supply at Buchanan, in an orchard-house, where standards were planted, and surface dressed every year. The range of peach houses is 120 feet long, and contained an excellent crop of very good fruit, Royal George, Noblesse, and Late Admirable, were great in size, and the yield, from the space, far above a full crop, while Violette Hative and Elruge nectarines were equally grand in quality. As an



auxiliary to this range were some large vineries, which had been originally pine stoves, but looking to some of the vines they must have been planted at the beginning of the century, being quite 18 inches in circumference. Such vines as these yield large crops of fruit, not remarkable either for size of berry or bunch, but the flavour is particularly rich and of a high vinous aroma.

Plants for dining-room decoration purposes were very plentiful. It seems to be an object of the first importance the getting up and maintaining a varied collection. Mr Connon has an immense multitude of youngsters growing vigorously for this sort of work, and it seems to be somewhat puzzling how he can get up, and store through the winter, sufficient plants to provide at "bedding-out" time some thirty or forty thousand, and at the same time have so fine a lot for the decoration of the table, the entrance-hall, and the drawing-room. He appears, however, to trust to young plants, and when they have served their annual duty to despatch them to the rubbish heap, only laying the discarded ones under contribution for cuttings. The various species and varieties of coleus form capital material, so does *Tillandsia zebrina*, old Mangles's is variegated pelargonium, the variegated honeysuckle, lobelia, saxifrages of sorts, the variegated dactylis, dracoenas, the useful *Centradenia rosea*, gesneras, caladiums, alocasias, begonias, ferns, and chiefly plants remarkable for fine or variegated foliage. Such things as most of the foregoing are easily replaced by cuttings, and they serve indoor purposes far better than a lot of nondescript flowering plants. If death or weakness overtake any of those named the loss is trifling, and such therefore ought to be the material, that our readers interested, should look after and provide.

But there is a right and a wrong way of doing things. A tawdry assortment of plants, however well cultivated, looks hideous, and how often do we see plant-houses, and show-tents, and plant collections open to the meaning that such an extravagant adjective bears! A good eye and a cultivated taste only can approach a sight of the kind with reluctance. An entrance-hall even, generally a very incompatible site for the introduction of plants, can be improved by a careful selection of articles, and a nice way of setting them off. Mr Connon does this sort of thing admirably. He provides three different sets of wire baskets, has them filled with light and elegant material, some shooting up, and some in graceful wreathing folds depending, in all the gay colours which such an array of foliage, from diversified plants described above, produces. These are all established in the plant and other service houses, and, when transferred to the places allotted them indoors, are suspended tier above tier, at equal distances, each set of three being quite a picture; and the lesser and lesser concentric rays of colour adding powerfully to the effect.

The gardens, as a whole, have undergone within these last half-dozen years a very marked change, and it does Mr Connon much credit the general superintendence of them. The woods and plantations are also well kept, the trees being as a rule most valuable both for effect and for timber purposes. Due regard is evidently manifested for the protection of game, if we look to the quantities of pheasant boxes in sheltered localities, and to the quantities of copse preserved throughout the plantations. To give some idea of the extent of woods, there are no less than 20 miles of road all under keeping in the forestry department.

## A RAMBLE THROUGH ROXBURGH AND SELKIRK.

ON the 10th September we commenced a five days' ramble through portions of Roxburgh and Selkirk-shires, by inspecting the vegetation about some of the waste places and rubbish-heaps at Galashiels, where much of the refuse matter is deposited, which is found in the wool that is imported for supplying the extensive manufactories of Tweeds and other woollen stuffs, in that thriving and rapidly-rising border burgh. This refuse is extracted from the wool by means of very ingeniously constructed costly machinery, and is largely composed of the seed vessels and seeds of exotic pasture plants and weeds, which, by their adhesive incorporation with the wool, often detract as much as thirty per cent. from its value. Paramount among these deteriorating seed vessels are the "burs," or spirally-twisted pods of the spiny-podded section of the extensive genus *Medicago*, which, in its more harmless sections, include the cultivated lucerne, *M. sativa*, and the common yellow clover, *M. lupulina*. These spiny-podded medicks are represented in our annual flower borders by the hedgehog plant, *M. intertexta*, less cultivated now, however, than formerly; and belonging to their section. George Don has described in his "Gardeners' Dictionary" about fifty species, besides varieties, of which three or four are natives of Britain, being found somewhat rarely in sandy and gravelly pastures, and chiefly near the sea, in the southern English counties. Many grow naturally throughout southern Europe and northern Africa. They enter largely into the herbage of the pastoral districts of extra-tropical South America, and their burs are too prevalent in wools from the Cape, Australia, and New Zealand, although none of the species are included in Hooker's "Flora" of the latter. It is just possible that the importation of foul pasture seeds, and carelessness or injudicious doings on the part of cultivators, is allowing their introduction and spread there, as well as in other climates favourable for their propagation; and this is the more likely to happen from their yellow clover-like herbage being agreeable and fattening foods for all kinds of live stock, while most of the kinds are also possessed of considerable drought-resisting properties. In warm climates their seeds rapidly vegetate, and the plants speedily develop into an exuberant growth

on the occurrence of rain, after pasture-effacing tracts of dry weather. Some have expressed fears lest the importation of these medick burs in the wool may lead to the troublesome presence of at least the earlier maturing kinds in British pastures; and we have been amused at hearing woollen manufacturers blaming farmers for using manures or compost in which they may have been mixed, as if their destruction by burning in engine furnaces or otherwise was not more especially under factory than farm control. We have, however, no great fears on this score, as it is only in warm seasons that even the earliest kinds perfect their first formed seeds with us; and the plants are not naturally adapted for contending with the thick grassy swards of our pasture lands. In confirmation of this, we may mention that plants of several of these medicks, which grew in the average-temperated season of last year, in a very favourable exposure, at Glenmayne, near Galashiels, and some of which spread over widths of 2 to 3 feet, produced scarcely any ripened seeds, although their stems were thickly covered with green bur pods. And nowhere in the vicinity of the mill-waste heaps could we discover any plants among the pastures. About 1840, some potato fields, in the vicinity of Kendal, which had been manured with wool cleanings, were so thickly covered with various medicks, of which we then received specimens for naming, that the potato plants were in some places almost concealed by them; and the growers became not a little alarmed at the importation of these new and seemingly formidable weeds, which were, however, easily got under, and have caused little or no further trouble. In the waste deposit near the Messrs Cochrane's mill, at Netherdale, we found seven species of those spiny-podded medicks, among which were *Medicago muricata*, *M. maculata*, *M. murex*, *M. minima*, and *M. laciniata*. There were also a number of grasses, not natives of the district, among which a perennial meadow grass bore otherwise a considerable resemblance to the very common annual one, *Poa annua*; *Polygonum monspeliensis*, and another species; a broad-leaved upright growing, and a dwarf-spreading finger grass; a very strong growing broad-foiled grass, not in flower; two or three annual species of *Agrostis*, a barley-grass, &c.—some of which were too much

over-ripened, and others not sufficiently advanced to allow of ascertaining their names. There were also several kinds of Chenopodeae, the spiny bur-dock—*Xanthium spinosum*, and a number of others. The study of these "wool-weeds" is well deserving of attention from botanists, who may have opportunities of inspecting them from time to time; and the local horticultural society might impart a good deal of interesting emulation among the mill-workers by offering them premiums for plants grown from the wool-imported seeds.

Abbotsford, of all places in Britain, is perhaps that which is most resorted to by tourists. In this district, says an eminent border author, "grandeur is combined with beauty and fertility," which well deserved panegyric has its counterpart on the Melrose road, within a few hundred yards of the seat of the mighty minstrel, where strangers cannot help forming a poor idea of Scottish agriculture, on passing between two pasture fields, which, for poverty and mismanagement, have, we should hope, no parallel in the country—many strong "green-growing rushes" testifying in some parts to the total neglect of drainage, while throughout the rest a thick inter-spersion of uncut barren-headed thistles, shews the unpardonable neglect of scythe work, as well as the sterility of the land, in not being able to produce even thistle seed. What a relief to look up from such a surface of waste and want to the green slopes of the magnificent Eildon Hills on the one side, and beyond the Tweed on the other, to the evidences of honourable prosperity, presented by the rising mansions and demesnes of Galam manufacturers, on the commanding slopes of Glenmayne, Netherby, and King's Knowes. The splendid silver firs and other trees which, further onward, form the judiciously-thinned and well-underwooded plantations on both sides of the highway, as well as the upstretching and hill-crowning belts, were all planted by Sir Walter Scott, and testify to his great taste in landscape gardening, as well as to the skilful care bestowed upon them by his successors. Perhaps, had he lived till the trees attained to effective sizes, he would have grouped some of the upper portions, and broken up the formal belt outlines in others; but, seeing that this was not permitted in his days, few will be inclined to dispute the propriety of retaining the whole as formed and left by their gifted designer.

In the hedgerow at Faldonside, the pleasing effect of purple beech, when occasionally interspersed, among other road-side trees, is well exemplified. And here also is exhibited the

superiority of dwarf ornamental trees, such as laburnum, hawthorn, mountain ash, &c., over the taller forest trees, in road and field hedgerows, combining, as they do, ornament with sufficient shelter, while, unlike the latter, they neither harm the roads, hedges, nor field crops by either drip or shade. Here the breaking and storing of road metal is still done in heaps upon the roadside, instead of in recessed depots—a highly reprehensible practice, especially when it is adopted on such a narrow road, darkened in most places by high overhanging plantations. Turning off to Lindean Station, which is situated at the lower end of one of the finest haughs on Ettrick, an opportunity is afforded of observing the mistaken economy of parsimonious railway directors, who, instead of providing comfortable accommodation for passengers, have furnished them with only scanty deal defences against wind and rain; surrounded by the thick, rampant, unrestricted growth of seeding thistles, nettles, and other vile weeds; instead of neatly-kept flower plots, and well-cultivated garden ground.

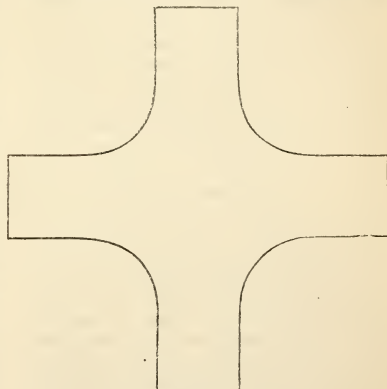
Among the rich pasture parks and well cultivated fields at Bridgelands, near Selkirk, two divisions were cropped with early-sown rape, some of which was coming into flower, and on which flocks of well-bred sheep were enjoying a plentiful and seemingly highly relished repast. Another considerable field of later sown rape on the south bank of the Ettrick, opposite the Duke of Buccleuch's hunting residence of Bowhill, was being eaten down in like manner, and, if not too barely bitten-in now, this last is likely to afford excellent spring feed for breeding ewes. Such examples of successful rape culture are deserving of being widely followed by Scotch farmers; and if its value had been better understood by them, there would now be many well-clothed fields of it, in place of black and bare land, throughout wide districts in which the turnip crop has failed. And had many taken advantage of the late almost unprecedentedly early season, by sowing rape after the removal of their earliest corn crops, there would now be prospects of abundant autumn and spring feeding for bestial, where much anxiety presently exists as to how the interval between the present and the next grass season is to be met.

A drive through the grounds at Bowhill only afforded an opportunity of admiring the general management and keeping of the arable and pasture lands, roads, fences, woodlands, ornamental waters, and what is technically known as the kept ground. In the latter, the abundance

and healthy growth of the commoner rhododendrons shewed the suitability of the soil and climate for these showiest of flowering shrubs, as well as best of underwood plants; and afforded some cause for regret at not observing a more profuse introduction, at least in prominent places, of the finer bright crimsons and other distinctly coloured hybrid varieties. Beside the mansion is a considerable extent of flower-garden, in which the compartments are intricately outlined and embroidered with dwarf box-wood, after the style which was much in vogue during the earlier half of the last century, and which, when well executed, has still much to recommend it, where the expense of labour in formation and keeping is not grudged. Flowers for table and room decoration are here in much demand during the autumn, winter, and early spring, and Mr Mathieson, who has long held the responsible situation of superintendent, in shewing us through the different houses, particularized one with a northern exposure, which he finds remarkably serviceable for the long preservation of plants in bloom. In a somewhat extensive ribbon border, we were particularly struck with a long back row of an old favourite, the *Fumaria lutea* of Linnaeus, but now better known under the name of *Corydalis lutea*. It was partly shaded from the afternoon sun by an upright pailing, and from end to end was a dense mass about fifteen inches in height by a like width, and profusely covered with its bright yellow flowers, rising above its graceful and delicate fern-like foliage, the former rivalling yellow calceolarias in colour, while they are much more freely produced in wet weather, appearing till the end of autumn when unchecked by hard frost, and even occasionally blooming throughout mild winters; added to which property, the plant is quite hardy, and easily propagated by either division, cuttings, or seeds.

Crossing the watershed between the basins of the Ettrick and Teviot, by the road leading to Ashkirk, which here attains an extreme altitude of 1105 feet, and looking in a westerly direction from the higher grounds, a plantation in the shape of a huge cross is seen on the farm of Castleside, near the top of Wollburn, the four extreme ends of which measure each about two and a-half imperial chains in width, and it contains 3.532 acres. The following figure represents the exact form of this plantation; and there is another from two to three miles distant at Roughside Hill, near the Hawick road, of similar form and dimensions, its area being 3.559 acres, and both are on the estate of Ashkirk, belonging to — Cochrane,

Esq. By shepherds in the surrounding district they are looked upon as model plantations for sheltering sheep, affording as they do ample protection from whatever direction storms may blow. Some may be inclined to think that having a stell in the centre of each, with curved entrances, so that the winds could not sweep through, would be an improvement, but it is questionable if any advantages that would be derived therefrom would compensate for the additional requisite cost of fences and gates. We visited the first of these, and found it composed of Scotch fir, spruce, and larch, about twenty-five years of age. The larches had suffered severely by canker blistering, from an adverse season some years since, but many were recovering, while others had entirely succumbed, and the whole formed



Castleside Plantation for Sheep Shelter.

a close mass through which we found it impossible to penetrate, many of the trees having been planted within 18 inches of each other at first, and the great majority at not more than 3 feet apart, while no thinning seemed to have been done, save the cutting out of some of the larches, for rendering the surrounding diseased turf dyke fencible. This mass of trees was thickly tenanted by wood pigeons, while the enclosing turf dyke was converted into a perfect rabbit warren, and the adjacent ground, which had been moorland pasture till within the last few years, was occupied with a healthy crop of excellent yellow turnips, the mere sight of which would have delighted, or perhaps created feelings of envy in any low country farmer. For purposes of



shelter this plantation is now at its best, and from the hitherto neglect of thinning, and the absence of suitable hardwoods, its rapid deterioration may be looked for, unless remedial measures are shortly adopted. The first of which should be the erection of a stone dyke, at least two yards outside of the present existing rabbit-riddled turf one, which should then be levelled down, and the space between the new dyke and the old trees filled in with thorns, beech, and mountain ash, together with a few common planes, oaks, and ash trees; taking care, before planting them, that the rabbits are thoroughly extirpated, and a slight thinning made among the old trees.

On the sides of the public road between Wollrig and Woll we examined a station, formerly discovered by us, for that interesting and excellent grass, the *Festuca loliacea*, and found it thickly interspersed among other grasses over a considerable space, between altitudes of 760 and 780 feet, the highest recorded for it in Britain. We failed, however, to discover a single fertile seed in any of its matured spikes, nor did we observe any of the other grasses to which the parentage of this supposed hybrid species is attributed. The altitude of Woll entrance gate, as marked in the Ordnance maps, is 714 feet, and from it the carriage road rises by a gentle ascent to the residence of the proprietor, George C. Ainslie, Esq., near which we measured a fine old specimen of the willow, fern, or variable-leaved beech (*Fagus sylvatica heterophylla* of Loudon), and found its stem to be 3 feet 1 inch in circumference, at 2 feet above the ground; the spread of its branches 25 feet, and its height 22 feet. Near to it is a fine specimen of the common red-fruited spindle tree (*Euonymus europæus*), loaded with its ripening berries, shewing how well adapted this singularly handsome small tree, and its varieties, are suited for growing at high altitudes, either in the open or as underwood; the circumference of its stem at 1 foot up was 3 feet 4 inches; diameter of branches, 20 feet; and its height, 21 feet. On the lawn in front of the house, stands a healthy old walnut tree, the stem of which, at 3 feet up is 8 feet 1 inch round, while the greatest spread of its branches is 63 feet, and height about 42 feet. Not far from the last, on a steep sloping bank, stands a vigorous plant of the sugar maple (*Acer saccharinum*), many terminal shoots on which, of the past season's growth, are from 12 to 18 inches in length; at a foot from the ground it is 3 feet 9½ inches in circumference; and just above this it divides into two

limbs, the larger of which, at 3 feet from the surface, is 2 feet 7½ inches, and the smaller 2 feet and ½ an inch in girth; while its spread of branches is 32½ feet, and its height is 30 feet—a standing proof that this valuable sugar-producing American tree, from which the bird-eye maple wood is also derived, is more suitable for the climate of Britain than is generally believed. The last of these old trees which we will now notice is a fine park specimen of the English maple (*Acer campestre*), the height of which is 42 feet, while its thickly-branched regularly-spread head has a diameter of 69 feet, and its trunk, which is 7 feet in height to the lowest branches, measures 8 feet 4 inches in circumference at 3 feet from the ground—dimensions rarely exceeded by this species, even when growing in the most fertile districts of England. Mr Ainslie, who purchased the estate of Woll some years since, has planted a very extensive collection of conifers, comprising most of the newest introductions from Japan and elsewhere—those kinds likely to be most useful as forest trees, being planted in considerable numbers, and that in different soils and exposures, so as fully to test their properties. And he is introducing throughout his plantations large quantities of woodland herbaceous flowers, rhododendrons, and numerous other ornamental and useful plants suitable for underwood and game-cover, among which are a number sent from N.-W. America by Mr Robert Brown, when collector there for the Edinburgh British Columbia Botanical Association; and we particularly remarked the small blackish-fruited Canadian gooseberry (*Ribes oxycanthoides* of Linnæus), some young plants of which were thickly covered with berries about the size of black currants, which, being fully ripe, were very juicy, and of an agreeable flavour, somewhat resembling that of the common blaeberry, but more acidulated, and seemingly well suited for either dessert, preserving, or cooking. In the garden are two hedges, each 84 yards in length, of the purple-leaved Barberry, separating between the culinary crops and the flower borders of a central walk, and surpassing by the finer form and livelier purple colour of their foliage both the best purple-leaved beet, and *Perilla Nankinensis*; while they have the advantage of requiring no winter protection, and by pruning they may be retained of any size between 18 inches and 6 or 8 feet of height and width. The American Mother apple succeeds remarkably well in the orchard-house here, and some fruit of it, which we tasted, resembled in texture and flavour a fine wall-grown specimen of that old

favourite the Margill, compared further with which it is a much hardier and freer grower, as well as a more abundant and certain bearer.

Of two young specimens of that rather rare fungus (the large puff-ball, *Bovista gigantea* of Linnæus, and the *Lycoperdon giganteum* of more recent authors), which were growing together in the avenue, we had the satisfaction of partaking somewhat largely at dinner, they having been cooked as recommended by "A Rural D.D." in *The Farmer* of Aug. 23, 1865, and can bear testimony to its being "a delicious dish. Sliced and seasoned with butter and salt, and fried in a pan, no French omelette is half so good in richness and delicacy of flavour." What a pity that prejudice should debar the use of young puff balls, as well as many other excellent and nutritious fungi, while only a little careful observation is all that is needed to distinguish between them and the comparatively few that are really deleterious. But it is not to arboriculturists and horticulturists alone that Woll presents much that is interesting. For farming, as the proprietor does the whole estate, besides a large farm at his native place in East Lothian, his agricultural doings are equally, if not still more interesting and important. Prominent among these is the draining, breaking up, and cropping of out-lying moorlands, as well as the improving of more inland arable ground, with the view of laying down the whole or nearly the whole with superior permanent pasture. On a portion of the former, where oats scarcely ripened last year, he this season cut Sherriff's Early Fellow Oat from the 20th to the 24th of August, and had all stacked by the 5th of September. That other new oat, Sherriff's Fine Fellow, was only a few days later, and while he considers the first to be much earlier than any of the earliest old varieties, he looks upon both as being great acquisitions for growing in high late districts. Two of the more inland divisions are this year sown out with mixed grass-seeds; and that the young plants should have the advantage of shelter and shade without being deprived of their due nutriment by accompanying corn crops, a slight mixture of barley was added, with the view of its being eaten down when green. This is, however, found to be a mistake, as the plants shot too rapidly into ear, and the awns are so annoying to the sheep that they reject both stems and ears, so that for this purpose oats will be substituted for barley in future. And, as shewing the remarkable earliness of the past season, we may mention that a 10-acre field, averaging fully 800 feet in altitude, which was sown with tares slightly mixed with

oats, and intended for being eaten off by sheep, exhibited such an abundant and well-ripened crop in August that they were cut and stacked for seed.

In going from Woll to Minto on the 14th we noticed only two fields of corn in course of being cut, and as both were finished before evening that date may be taken for the conclusion of reaping in that usually very late district. Several old belts and clumps of plantation, seen from the public road, and which had evidently been intended for shelter, exhibited the common error of planting only the summits or ridges for this purpose, whereby the wind is allowed to sweep through under the branches when the trees grow up, and the plantation shade is cast too far over the adjoining lands. To avoid which it is better to run the upper fence a little under the highest ground, and the opposite one considerably lower, so that the shade is shortened, and effectual shelter from wind is provided by the branches of the lower placed trees, forming a protecting mass, opposite and under the bare stems of the highest ones. On banks by the roadside at Hassendean we observed a profuse growth of that excellent, but in Scotland entirely neglected spinaceous plant, the Good King Henry, *tota bona*, fat hen, or perennial spinach (*Chenopodium bonus-Henricus*), which, from being only found about ruins and old inhabited places, is looked upon by some as a doubtful native, at least of North Britain, being considered as only the offspring of cultivation in past ages, when its usefulness as an early spring and summer culinary vegetable was better known and appreciated. How the wives and bairns rushed to their doors, staring and wondering at seeing a carriage stop near the village school, and one get out with spud in hand, to grub up and appropriate what they looked upon as only "midden dökens." Doubtless their Border reiving forefathers better knew the uses and worth of these now neglected and despised weeds. Arriving at Minto, we proceeded to the grand and romantic crags, where Dickson of Hassendean, in the early part of this century, found the rare *Asplenium alternifolium*, better known among modern fern growers by the less appropriate name of *A. germanicum*; and although it has occasionally been found there since—Professor Balfour and his class obtaining a specimen or two within the last two years—we could not discover a single plant. A common opinion prevails that the *A. alternifolium* is a hybrid or mule between the *A. septentrionale* and the *A. ruta muraria*, but while we saw many plants of

the former, not a single one of the latter was observed on any of the Minto crags. Leaving which we had a pleasant walk through the grounds and gardens, and particularly admired many unusually fine old larch, silver fir, spruce, beech, hemlock spruce, and other trees, some of the two first of which were pointed out by the Earl of Minto's intelligent forester, Mr J. Ballantine, as being above 100 feet in height, and of these, as well as others, we hope to be furnished with particular dimensions. The kitchen garden here, although in fair condition as to crops and keeping, is in a too low and damp situation, as well as too closely surrounded by high trees; and the same may be said of the arboretum, which, however, contains some excellent specimens of the leading conifers. The only regret that one can have at visiting this fine place is that of seeing it entirely over-run with rabbits, the mischievous effects of which are everywhere apparent, from the closely eaten-in plants of the *Asplenium septentrionale*, wherever they can be reached by them on the craig cliffs, to some of the rarer larger specimens of conifers in the arboretum. May these pests of vegetation be visited with swift and sure destruction.

In regard to the field crops throughout the district visited, wheat, wherever it is grown, is this year an unprecedentedly bulky and excellent crop; barley fully an average in quantity, and above that in quality; oats are deficient in some of the lower and dryer districts, but in the higher parts they are bulky and of unusual excellency. Turnips have, with very trifling exceptions, braided well, and on the whole are likely to be at least an average yield, although suffering in the lower parts along the banks of the Tweed, Ettrick, and Yarrow, with mildew, which will be partly remedied by the recent heavy rainfalls; and potatoes were, at the time of our visit, everywhere free from disease, although complaints were common of their assuming a second growth. In a low part of a field near Hassendean, fully an acre was completely blackened in the foliage by frost, and in several other low waterside fields they had suffered from the same cause, but to a less extent. On the 15th stubbles were everywhere cleared, except on about half-a-dozen of fields in the parish of Ashkirk, and on the higher ground between it and Hawick.

## Plantations and Hedges.

### ON THE SUPPLY OF TIMBER FROM SWEDEN AND NORWAY.

BY ANDREW MURRAY, F.L.S.

IF our statesmen have done wisely in making inquiry into the supply of coal in this country, and the length of time it is likely to last at the present rate of consumption, similar inquiries into the amount and probable duration of their supply of wood would seem to be not less called for on the part of the governments of Sweden and Norway.

Those who have not looked into the subject have little idea of the rate at which this vital product of these countries is disappearing from the Scandinavian hills. I had occasion, not long since, to examine some statistics of the exports of timber from these countries, and I was so struck with their extent, and the rapidity of their increase, that I felt convinced that a serious question of exhaustion of supply must lie behind, and took means to obtain more complete and accurate information on the subject from the countries themselves. This I have now received from Sweden, and, although still very imperfect, it seems of sufficient importance to justify my drawing the attention of the public to the present position and probable future of the timber supply of the north of Europe.

I had been under the impression that the Governments of these countries not only had, by the sagacity of their ancestors, been provided with laws whereby to protect the country from its own improvidence, but that their alarm had been excited by the amount of the recent exports, and that they were, in consequence, enforcing these protective and prohibitive regulations.

Mr Laing, in his "Residence in Norway," says that in Sweden and Norway, more especially in the former, successive Govern-

ments have enacted laws restricting the free use of his own forests by the proprietor. He is, according to him, only allowed to fell a certain quantity of timber each year, and in the more northern districts of Norway (Norrland and Finmark), where the wood grows of a diminutive size, and in limited quantity, it has been thought necessary to preserve it entirely for the use of the inhabitants, and its exportation is entirely prohibited.

I find, however, that in this I was in error, and that the means of protection, which on the faith of this I had supposed to exist, are practically without effect. The information I have received in answer to my inquiries on this subject is as follows:—

"There are no *special* laws regulating the amount of wood which private individuals may cut down on their own estate, applicable to the whole country. The only law of that kind relates to the woods belonging to the settlers (*nybygger*) in Norrland, about which I will speak directly. Still we find in *Sveriege Rike's* law, now in force, the following (B. B. cap. 10. sec. 8)—'Ratepayer (*skattebonde*) may use his private wood for household use and sale, but so sparingly, that the wood is not destroyed, and his home-farm (*hemmariet*) not spoiled. He is bound to take first what is blown down by the wind, dry trees, sprigs and stabs for fuel before he fells green trees. If it should be discovered that the ratepayer misuses his liberty he shall be fined  $\text{§}10$ .' There is, however, not one instance where this law has been called into action, when a ratepayer has misused his private wood.

"With reference to the settlers (*nybygger*) in Norrland, it is stated that they are allowed to take of the settlement wood



(nybyggeskog) for household use without pointing out (utsyning) or special permission; but if he will sell something from the settlement wood, then the inspector of the settlement (nybyggetjöstman) points out the timber (wirke) for sale, which can be taken out without damaging the wood. This law is in force for all present settlements, *even after they are paying rates.*"

So much for the actual law, and on inquiring whether the Government were taking any, or what steps to arrest a too great diswooding of the country, I have received the following reply:—

"This question concerns of course the private woods, as the commons (allmanua) once for all are protected against destruction. Referring to the former, the Government has not resolved, and cannot even enact without the approbation of the Diet (Riksdag) any special law for protecting the woods, as this is done by the owner of the wood himself. No proposition of this kind has been in question. The only thing the Government can do is to protect the wood against damage from *any other person*. In this case the new penalty law contains severe resolutions—viz., fine of \$1000, or six months' imprisonment. In case of very aggravating circumstances the punishment can be one year's penal servitude. On the contrary, the Government has taken another way for securing at least the inevitable household want of wood for the plain districts, which have no woods. The Government buys, with the money of the State, exhausted private fields in order to cultivate woods, and thus form new crown woods (Kronskog). This has certainly not been done on any considerable scale, but it is at all events a prudent way, and ought therefore to be extended by-and-bye. Certainly it is in the *present* circumstances the only thing which can be done to prevent the destruction of the woods."

It would thus appear that there is no practical check on the diswooding of the country. It is left to each proprietor to act as he pleases, according to his own sense of what is right and beneficial to himself and posterity. Now, we have the universal experience of the

past, that when the advantage of a man's posterity, or even his own future advantage, comes in competition with his present interest, he will always prefer the latter. Even when his regard for his future advantage is strengthened by the infliction of penal consequences if he neglects it, the present is still too strong for the future. The instances are abundant of the utter impotence of all attempts to restrain by legislation the action of private individuals in felling wood upon their own property. In France there is a long series of Royal ordinances and decrees of Parliament, having for their purpose to prevent the wasteful economy of private forests, but wherever the proprietor found his advantage in disregarding them they were of non-effect. He could always contrive to clear his woods whatever might be done to prevent him. It was a mere question of time. Some of our readers may remember the case of a nobleman in our own country, who, hopelessly embarrassed, with a receiver drawing his rents, and interdicted by the next heir from cutting down the timber, yet managed to subsist upon the windfalls which took place among the splendid trees which adorned his domain. Do what his heir might to prevent it, whenever he was driven to extremity some accident was sure to happen to one or more of the mighty monarchs of the forest. So in old times in France, imprudent cuttings and abuses of the right of pasturage always sufficed to destroy a forest in spite of all regulations to the contrary. There the only remedy was found to be the transfer of the forests to the State. In Algeria, indeed, another remedy has been found. Mr Cosson,\* in speaking of the cedars in Algeria, tells us that the numerous debris of the cedars which are to be found on the mountains indicate that their range has already been notably lowered by the depredations of the Arabs and abuse of the privilege of pasturage. He recommends the absolute interdiction of that right, and the repression of all disorders, by severe regulations enforced by military

\* "Cosson Rapport sur un Voyage Botanique en Algerie," &c., in *Annal. Scienc. Nat.*, 4, iv., p. 67.

authority, and states that where already tried in Algeria the plan has been found most effectual.

Neither of these remedies has been, nor probably could be, had recourse to in Sweden or Norway; and in their absence, or in the absence of some substitute, the diswooding of the country will, we fear, not be long postponed. Indeed, it would seem to have begun already. English capitalists and English sportsmen have begun to purchase estates and farms there, and their interest in the future prosperity of Sweden and its timber, if more enlightened, is at least less direct than that of the old proprietors, who lived from year's end to year's end on their own homestead. English timber merchants, too, have begun to take leases of great tracts, for the very purpose of cutting down the timber, and their interest, of course, extends no further than the duration of their lease. Various symptoms of the progress of the calamity we dread may be pointed to. It was stated in the Swedish catalogue of the 1862 Exhibition that originally shingles for roofing houses there, were made of fir (*Abies excelsa*), but the scarcity of fir had now caused the wood of *Pinus sylvestris* to be used instead. Our Consul at Christiania, in 1860, reported that great complaints had lately been raised against the injudicious system followed of late years, of cutting down indiscriminately young trees for conversion into pit props for the northern ports. To such an extent had the felling of small timber been carried, that the State had deemed it expedient to nominate a commission for the purpose of reporting upon the present condition of the forests of the country, and their capability to sustain their present annual amount of export. Considerable State forest lands have been brought under the control of public inspectors, with a view to their better management. Our Consul at Götha, writing in 1863, stated that the supplies of wood continue to exhibit a decrease of heavy sizes, and prove the steady progress towards a gradual exhaustion of the forests which supply the saw-mills in that part of the country.

The timber used in building in Norway is

also smaller than it was wont to be in old times. Mr Laing, in his "Residence in Norway," says:—"In building houses in Norway, timber is used of a size far exceeding the dimensions we generally suppose its trees to attain. There is a log in this old house which is three feet on each square side, and retains that size for at least twenty-five feet of length. In all the houses, especially those of very old date, the logs are as large as the Memel or American timbers usually brought to England. I understand that the impediments in the rivers prevent the floating down of such lengths of great timber to the coast."<sup>\*</sup>

But nothing speaks so strongly as the statistics of the exportations to which we have above referred. The following is a summary of these, for the greatest part of the present century, as complete as my data will allow. I have to thank my friend, Mr P. L. Simmond's (who is more familiar with that kind of work) for his assistance in picking out these statistics, viz. :—

EXPORTS OF TIMBER FROM NORWAY.

Years.	Loads of 50 Cubic Feet.	Lasts of Two Tons.
1797	.....	22,341
1799	.....	86,574
1805	.....	151,000
1815	.....	172,000
1819	.....	170,800
1824	.....	186,700
1829	.....	177,700
1834	.....	205,600
1838	.....	241,500
1842	.....	256,900
Years.	Loads of 50 Cubic Feet.	
1835	564,430	
1836	582,047	
1837	571,105	
1838	603,922	
1839	680,517	
1840	666,497	
1841	666,858	
1842	—	} no data.
1843	—	
1844	—	
1845	—	
1846	677,825	
1847	—	
1848	434,744	

\* "Laing's Residence in Norway, 1856," p. 62.

Years.	Loads of 50 Cubic Feet.	Lasts of Two Tons.
1853	—	248,402
1854	—	292,767
1855	—	295,023
1856	—	304,529
1857	—	304,144
1858	721,024	294,440
1859	724,822	314,349
1860	778,058	—
1861	872,500	—
1862	890,000	—
1863	950,000	379,538
1864	—	403,566

SWEDEN.

Wood of all kinds Exported.

Years.	Lasts.
1815 to 1819 average	161,000
1820 ,, 1824 ,,	171,000
1825 ,, 1829 ,,	191,000
1830	195,000
1831	172,000
1832	181,000
1833	209,000
1834	208,000
1835	226,000
1836	234,000
1837	232,000
1838	242,000
1839	272,000
1840	266,000

Years.	Bulks, Masts, &c., of Fir.	Deals. Doz.
1840	195,914	526,176
1841	212,797	529,255
1842	222,930	463,387
1843	189,853	498,051
1844	223,402	545,613
1845	295,477	725,593
1846	506,272	769,769
1847	489,352	682,426

Years.	Deals and Planks of Fir and Pine. Doz.	Beams, Rafters, Masts and Spars. No.
1851	865,533	429,600
1853	915,171	586,902
1854	1,075,389	685,305
1855	1,753,306	555,015
1856	1,816,541	640,337
1857	1,129,385	703,092
1858	978,345	615,719
1859	1,353,813	653,089
1860	*1,390,172	620,406
1861	1,478,393	702,000
1862	1,603,869	890,720
1863	1,747,950	883,397

The same rate of increase is visible in

\* Besides about 100,000 dozen of sawn planks, &c., annually shipped.

the imports into the United Kingdom from Sweden and Norway, viz. :-

UNITED KINGDOM.

Loads of Timber not sawn or split imported from Sweden and Norway.

Years.	Loads.
1854	186,134
1855	151,547
1856	147,343
1857	172,101
1858	152,702
1859	192,877
1860	—
1861	233,992
1862	270,082
1863	279,519
1864	336,964
1865	336,457
1866 (six months).....	196,794

It will readily be understood that one explanation of this large increase is due to the alteration on timber duties, so that Norway and Sweden have been enabled to encroach on the Canadian trade. Sweden now falls little short of that colony in her shipments of timber into England, and the removal of the duties may, instead of an evil, prove a blessing to Canada by restraining the excessive denudation of timber which would otherwise have taken place.

In 1864 the importations into England were from Canada, 2,938,300 standard; from Sweden, 2,644,500; from Russia, 1,904,900; from Norway, 1,504,500; and from other countries, 123,800; a total of 9,120,000. Thus Sweden with Norway supplies to her over four-ninths of her deals, and over one-half more than her own equally endowed province of Canada.

My Swedish correspondent seems to think that the supply from Sweden had probably reached a maximum in 1863 and 1864 (his latest dates), but the statistics in the foregoing pages scarcely support this view. The report of fir from both Sweden and Norway in 1865 being 336,457, while that in the first half of 1866 (my latest date) was 196,794, or actually at the rate of one-eighth higher; but even were it otherwise there would be little consolation for the Swedes in that, unless it was due to their own self-control or pro-

spective regulations, and not (which it really was) a diminished demand from this country.

harbours in Norrland which they have not been able to sell."

On that point our correspondent writes :—

"Till 1863 the export of wooden wares from Sweden was rising, as well of beams as of planks and boards. For the last years I have no reports. I scarcely believe that there has been any considerable decrease. However, the export of wooden wares may, at least for a period, have reached a maximum, and then be forced to diminish, for already a couple of years ago, the principal foreign import harbours for wooden wares were filled, and it is a known thing that there are many magazines of sawn dressed timber at the

It is difficult to avoid the conclusion, from the largeness of the quantity thus supplied, its rapid increase, and the fact that the dimensions of the timber supplied are gradually decreasing, that Sweden has been encroaching on the capital stock of her timber and not living upon its interest. It would seem a politic proceeding on our part to consider how this will hereafter affect ourselves, and whether it would not be wise to provide against the contingent dearth of timber to which our children may be exposed by planting more ourselves at home.

[To be continued.]

*STUDIES OF THE BARK OF TREES.*

2. THE OAK.

THE bark of the Oak has the same character all over except on the small smooth twigs. It is closely and longitudi-

tions. These are nearly as broad as the spaces between them—that is, the ridges and furrows are nearly of equal breadth. They

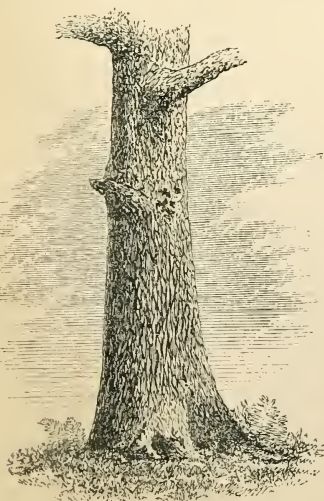


Fig. 2. The Oak.

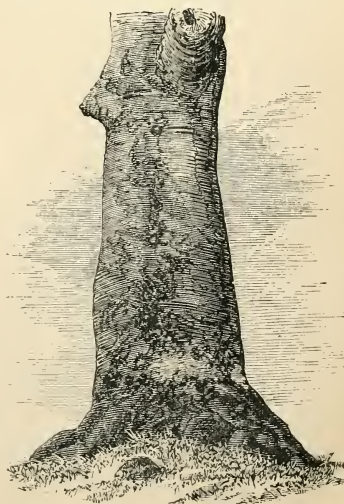


Fig. 3. The Beech.

nally furrowed, and the only difference is, that the smaller the branch the finer the corruga-

are slightly sinuated, and come to a point at every little distance; the ridges are not flat



at the top, but wedge-shaped; the furrows are conversely shaped, being deepest at the bottom. The woodcut shews the trunk of an old oak in Windsor Park, said to be 400 years old, and known as Queen Anne's Oak.

### 3. BEECH.

The smooth bark of the Beech needs little illustration. It always reminds us of a too tight-fitting bodice: all the wrinkles are transverse, and it looks as if it were on the point of bursting. Its grey colour, deepened in parts by the weather stains, is very effective in a picture. Unlike the Birch, which, although silvery in youth, becomes rugged and

deeply corrugated in age, it retains the same character to extreme old age, although then the trunk assumes all sorts of humps, bosses, and protuberances: the only alteration is, that it loses the light—we can hardly say silvery hue of its youth—but the aluminum sort of dull grey of its earlier years. The woodcut is a study of a tree in Windsor Forest, known as Queen Adelaide's Beech. Its circumference, within 3 feet of the ground, is 8 feet 6 inches. The figure shews the character of a moderately-sized stem, and its picturesque appearance is not diminished by its having been mangled by the pruning-knife.

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## ON PRUNING AND THINNING FOREST TREES.

### SECOND ARTICLE.

WITH the view of supporting our statement, that pruning is injurious, we have turned up a Report made on the subject by the Commissioners of Woods and Forests in 1856, and have also made some inquiry of timber merchants as to the relative value of timber which has been pruned, and of timber which has not been so treated.

We shall now submit to the reader a short statement of the opinions and facts we have gathered from these sources. To make a connected story of it, however, we may, in the first place, remind the reader that previously to 1851 the management of the Royal Woods and Forests was conjoined with that of Woods and Buildings in one department. In that year a division was made by Parliament, and the Board of Land Revenues and Woods and Forests were constituted a separate establishment, under a chief commissioner and two what may be called working commissioners, between whom the labour of the department was to be divided. The Right Hon. T. F. Kennedy and the Hon. Charles Gore were then appointed the two commissioners, and to Mr Kennedy fell the

management of the whole of the Royal forests excepting Windsor. He set to work vigorously, apparently under the mistaken impression that the Woods and Forests were an Augean stable of corruption and mismanagement which it was his mission to clear away. With this preconception it is not surprising that he speedily embroiled himself with all the officials. He got Mr Brown down from Arniston to examine the forests, got no end of reports from him upon them—the general burden of which was that everything was wrong, and that new plans, which he recommended, should be adopted instead. Mr Kennedy adopted these, and commenced a mode of management which filled the minds of many who were conversant with the subject with the gravest alarm for the future of the Royal Forests. The result was that he raised such a general storm against his administration that he was compelled to give way, and surrendered his appointment before he had filled it eighteen months.

In the Report of the Commissioners of Woods and Forests in 1856, they speak in strong terms of the "ruinous effects" (p. 86) of the system which was adopted in 1852,

and state that they had come to the conclusion to put an end to it, as operating "most injuriously to the interests of the Royal Forests." They reported that timber, "which, in 1852, Mr Brown recommended should be grubbed up and replanted, on the ground that the trees then standing could never become good navy timber," had supplied as much as 92 per cent. of timber to the navy instead of only 31 in 1852 out of the fall, and had been pronounced to be of first-rate quality.

With regard to points on which they had any doubt, the Commissioners referred the subject to skilled persons for their opinion; and it is from one of the Reports so obtained that we have procured the information regarding the advantages and disadvantages of pruning which we now propose to submit to the reader. In the Report of 1856 the Commissioners state (p. 87)—"As the question with regard to pruning oak trees is one upon which differences of opinion exist, and as the system of pruning dead branches had been recommended to Mr Kennedy by Mr Brown, but was subsequently reported against by the three surveyors (Mr Matthews, Mr Murton, and Mr Menzies) employed by direction of the Lords of the Treasury to inquire into the state of the management of the New Forest, in their Report of the 1st August 1854, and as pruning of any kind was directly opposed to the system which had always been pursued in the management of the Royal Forests, Mr Gore considered it expedient to obtain the best opinions upon the subject, and he thought that the quarter from which he could derive the soundest information would be from the timber merchants and others who had acquired the greatest practical experience in the purchase and conversion of oak timber in the oak-growing districts of England. Mr Clutton was requested to make inquiries from such persons, and a form of questions was drawn up and submitted to them. The questions and the answers received, to the number of twenty-nine, will be found in Appendices Nos. 2 and 3, and a Report from Mr Clutton dated 18th April 1855, whose attention had been directed to this sub-

ject by a letter addressed to him by Mr Gore; and it will be seen that the result of the inquiry confirms the opinion of the referees, *that no branch, either sound or decayed, should be removed from an oak tree on any pretence whatever.*"

We shall first notice Mr Clutton's Report, which is a model of clearness and sound sense. Mr Clutton has been for a long time Surveyor of the Royal Woods and Forests in England, an office which combines the duties of the Scotch factor or commissioner with those of the surveyor. From having filled this office for so long, there are few men who have a greater knowledge of the management and growth of all kinds of timber, but more especially of oak; and it is unnecessary to say that we attach the greatest weight to any opinion that he may have expressed on the subject.

After alluding to a previous Report, in which he had stated generally that no bough, whether dead or alive, should be cut from an oak tree, he proceeds to discuss the question in various phases. He says (Report, p. 3)—"The manner in which oaks are affected by dead boughs may be considered under three heads, viz. :—

"1. On young trees under forty years of age.

"2. On growing trees having acquired a size to be called timber.

"On large or matured timber oaks.

"For the removal of these branches no mechanical means are necessary, nor should any be resorted to under any circumstances. The sap-wood, as it is formed, gradually tightens round the base of the dying bough until the branch is quite rotten, and drops off when the sap-wood extends its growth over the place; and so perfect is the process by which the dead bough thus leaves the parent stem that no appearance, either externally or internally, remains of a bough ever having grown upon the bole of the tree; but if the dead branches are removed by cutting, their base becomes rapidly covered with sap-wood, and the tree will be permanently defective.

"I have thought it necessary to be explicit as regards the result of natural decay in

branches, because I observe, in the extract which you forwarded to me, that the referees state that when a process such as I have described takes place at the base of a decaying branch, the 'defective spot is detected' when the tree is ultimately opened; whereas the fact is, that in oak trees grown in coppices, like those to which I have referred, and upon soils adapted to their growth, no spot or indication whatever is found in the stems of the loss of branches which have fallen from natural decay during the early periods of the growth of trees.

"In the second stage of growing timber the process is much the same. The bough being larger, the decay is much more gradual; but if the dying boughs are left entirely to themselves they will drop off without injury to the trees, and, with few exceptions, without leaving a trace in the bole; whereas, if they are cut off, the sap-wood closes over the dead stump, and the trees become defective, and to a greater extent than in the first stage. The effect of closing or sealing up the stump appears to be to cause rapid decay; whereas, if left to nature, the tree appears to close tightly with new wood round the base of the bough, so as to force off, by slow degrees, the decaying limb.

"In the above two stages of the tree's growth, the dead boughs do not always indicate that the tree is not in a thriving state, but rather that it is casting such boughs as are not necessary for the maintenance of the plant in a healthy and profitable state. But in the third stage, in the case of matured timber, dead boughs or horns indicate that the tree is ripe and fit to be cut, and after the tree has many such horns it seldom makes rapid growth, although this will depend much upon the nature of the soil, as a tree upon the best oak-growing soils will for many years continue to grow and remain sound long after the horns shew themselves; but upon inferior soils the decay of the butt commences soon after the tree has many dead boughs upon its top."

He next discusses some collateral questions as to the time when the tree should be cut down, how long it is safe to leave it after

snags appear, &c., which we need not consider here, as they do not directly bear on the subject of pruning. We may merely quote one sentence which incidentally alludes to the process by which decay is hastened or retarded:—"It does not follow, because the occurrence of these boughs is one of the first symptoms of maturity and of the commencement of decline, that a dead bough will necessarily, under such circumstances, injure a tree if suffered to remain; on the contrary, it is found that the sap-wood tightens round the base of the bough, and prevents the entrance of water into the tree; but if the bough is cut off, the tree has not at this period sufficient power to cover the vacant space with fresh sap-wood, and the space speedily becomes a hole in which the rain lodges, and passes thence into the very heart of the tree, causing decay to proceed at a very rapid rate."

These are Mr Clutton's views. Let us now see what are those of the 29 timber merchants, sawyers, and timber managers consulted.

The queries put to these gentlemen were the following, viz. :—"1. Is it necessary for the proper and sound growth of an oak tree that it should be pruned at any period of its growth, either of live or dead boughs?

"2. Is it expedient that dead boughs should be pruned from growing oak trees, or is the sound growth of a tree best promoted by allowing nature to prune off such boughs as in due course become unnecessary for the support of the tree?

"3. What should be the effect upon the soundness of matured timber, if the large dead boughs or horns (as they are provincially called) are cut off, so that the dead stump may be covered with new sap-wood?

"4. Is it expedient for the sound growth of oak timber that any boughs should be snag-pruned; and if, in your opinion, snag-pruning is injurious to the sound growth of the timber, should the boughs so having been snag-pruned at any subsequent period be cut close to the trunk, so that the sap-wood may grow over and cover the dead stump?

"5. In replying to these questions, it is expected that the experience of the person in

the management, sale, or conversion of oak wood may be stated."

The answers to the last query shew that all those whose opinion is asked are men of great experience, having been engaged in dealing with timber for 20, 30, 40, and even 70 years. To quote the whole of the replies would be to occupy unnecessary space. With few exceptions they emphatically denounce the practice of pruning as injurious to the growth of the tree and the quality of the timber. It will be sufficient to give a few of the answers as samples of the rest:—Thomas Langton, timber merchant, Lambeth, "the largest merchant of oak timber in the south of England," with forty years' experience, says—"Let nature carry out its own work; never trim a tree."—"The invariable effort of trimming is to make all timber so treated unsound upon conversion."

Thomas Child, timber merchant, Sherfold, Sussex, "a large merchant and converter," also with forty years' experience, considers that "the tree is often injured by pruning the dead boughs." To query 3 he replies—"In the conversion of matured timber I have generally found on the removal of the covering of the new sap that the part from whence the horns had been cut off had become (if not completely in a rotten state) so much discoloured as to render the tree unfit for the use of the Royal navy."

Wm. Stenning, timber merchant, Godstone, Surrey, "a large converter," "considers the soundness of an oak best promoted by allowing nature to prune off the branches," and is "decidedly of opinion that it is not necessary to prune, and have found in converting of timber that it invariably proves more defective when the boughs have been cut close to the trunk, and the sap-wood or bark has grown over."

Mr Murray Marshall, a large timber merchant at Godalming, Surrey, says—"It is quite unnecessary to cut off or remove any branches." He "considers the removal of large dead boughs to be very injurious to the soundness of the tree, and therefore much reducing it in value, as it is always found out on converting or sawing the tree up to the

purpose for which it should be applied. When boughs are cut from growing timber the wet will lodge upon the soft sap-wood, and cause first the sap to rot rapidly, and ultimately much injure the heart or spine wood of the tree. The injuries caused by boughing timber, generally run down the trunk or towards the roots, and incline to the centre of the tree, rendering it unfit for the purpose to which it otherwise would be applied."

William Read, senior (forty-seven years' experience)—"It is unnecessary and decidedly injurious to prune an oak tree at any period of its growth, either of live or dead boughs, after its removal from the nursery ground." "It is highly inexpedient that dead boughs should be pruned from growing oak trees, as the sound growth of a tree is best promoted by allowing nature to prune off such boughs as in due course become unnecessary for the support of the tree." "The effect upon the soundness of matured timber, if the large dead boughs are cut off, so that the dead stump may be covered with new sap-wood, is that whenever the dead boughs are so cut off close to the trunk, and in the course of time the wounds healed over with new sap-wood, a defect in every case is sure to take place; and the longer the trees so pruned are allowed to stand the more defective they will be when felled and converted." "It is very inexpedient for the sound growth of oak timber that any snag-pruning at all should take place; and in my opinion snag-pruning is most injurious to the sound growth of the timber."

Henry Lawrence, carpenter, Shipley, Sussex (twenty-five years' experience)—"Oak timber requires no pruning at any time of its growth." "Snag-pruning is only something better than close pruning, as the injury is longer taking place."

John Wood, Banstead, Surrey, (thirty years' experience)—"Allow nature to take its course. It is at all times injurious to prune timber in any manner."

Frederick Muggeridge, Dorking (twenty-five years' experience)—"It is not necessary to prune at any period of its growth."

Richard Chitty, Dorking (seventy years' experience)—"It is not necessary to prune at



all; pruning causes defects. It is much better to allow a tree to take its natural course."

James Jupp, Millhurst, Sussex, sawyer (fourteen years' experience)—"There is no good done by pruning oak timber." "When dead boughs waste away by nature, it is much better for the timber than if they were cut off." "If large dead boughs are cut off, and the place become covered with new sap, it is sure to cause an unsound place in the tree."

Henry Lidbetter, Millhurst, Sussex, sawyer (sawyer and hewer for the last sixty years)—"Oak timber does best when no boughs are cut off." "It is best to let dead boughs drop off themselves; if they are cut off it is sure to cause the timber to be faulty." "Timber is always found to be unsound when boughs are cut off and covered with new sap."

Thomas Ratley, carpenter and timber merchant, West Grimstead, Sussex (thirty-five years' experience)—"I think it ought not to be pruned, but let nature take its course."

But it is unnecessary to multiply quotations of the same opinion. On an analysis of the opinions of the whole twenty-nine experts, we find that twenty-one give their opinion absolutely and unconditionally against pruning; four either directly or by implication indicate an approval of pruning in the nursery or when the tree is quite young, but not later; two qualify their opinion as not intended to apply to ornamental timber; thus James Webb, land agent, Worcester (with twenty-two years' experience) says—"I consider that pruning is not necessary, and that it should be confined to ornamental timber and to branches of recent growth;" at the same time he adds—"I consider that the sound growth of a tree is best promoted by allowing nature to prune off such boughs as become unnecessary." One gives an opinion in favour of pruning off dead branches, and one in favour of pruning off both living and dead branches in the young trees—viz., Thomas Geere, timber merchant, Stratford, Essex (who is the only one who omits to specify the extent of his experience). He says—"It is necessary for the proper growth to prune or rub off the live young shoots round the stem

or trunk up to the crutch or first bough, otherwise suckers and dead boughs." "I think it quite necessary to cut off dead boughs within 6 inches from the trunk very smooth; if allowed to remain on, the wind or storms will break them off in a ragged state, and allow the wet to get into the body of the tree, and in time kill the tree"—opinions which are opposed to those of everyone else consulted, as well as to the principles on which they form their conclusion.

We have thus given a perfectly fair *resumé* of the replies to the queries put to the men selected as having most experience and being best qualified to speak on the subject; and, although we may not have succeeded in convincing those who may be too wedded to their own opinions to be capable of changing, we hope we have made it clear to the impartial reader that dead branches ought not to be pruned off, and that when they are so pruned off they injure the timber.

We promised also to endeavour to ascertain the difference of price between boughed oak timber and oak timber which had not been boughed. Here is the reply we have received from Mr Murray Marshall, an eminent timber merchant who converts largely: "I should not in any case give within 33 per cent. of the value of timber that had been boughed as compared with its value unboughed. The risk in converting boughed timber is fully 33 per cent., to say nothing of the loss of the bark in oak timber.

"The principle of boughing is very bad; and when it has been done carelessly, and has been cupped or grown over, it is very difficult to tell the effect it may have on the soundness and utility of the timber when cut down and converted. Timber merchants generally look on boughed timber with much suspicion.

"The only pruning I have ever seen practised to advantage is in growing hop-poles—planting very thick indeed, and pruning them to draw them to an artificial height in a short time, as length is required rather than stamina."

There can be no better proof of the injury

done to the timber by the process of removing dead boughs than this test of its relative value in the market. Our arguments may be all wrong, but the sensitive barometer of prices shews that whatever be the case with the arguments, our practice at least is right.

The evidence which we have adduced, it will be observed, has been chiefly, if not entirely, confined to oak trees; but the same principle that applies to the oak applies to others. The oak has not a different organization from the beech or the elm: Nature treats all alike. We imagine that this will be admitted. Should, however, anyone maintain that the oak requires different treatment from other trees, and that the results drawn from it are peculiar to itself, and not applicable to other trees, we apprehend it will be for those

who say so to point out in what the difference consists, and to explain the grounds on which it rests.

The only difference which we recognize in forest trees in relation to the point we have had under consideration, is the difference between deciduous and coniferous trees; and so far as pruning is concerned, it will scarcely be disputed that if it is inapplicable and injurious to the former, it must be ten times more so to the latter, seeing that, from their branches being so much more regular and so rarely replaced, to remove them once is to remove them for ever, there being no hope of young shoots again appearing to supply their place; unless, indeed, in the case of a very few exceptional species, such as the Deodar.

## The Dairy and Poultry Yard.

### NOTES ON THE VARIOUS BREEDS OF POULTRY.

BY "THE HENWIFE."

#### IV. THE HAMBURGH BREEDS.

THE Hamburg is a lovely bird, elegant in form, and very graceful in movement; it may be called "everlasting layer," as it lays (unless when in moult) almost every day, but the eggs are small. There are several varieties—gold and silver pencilled and gold and silver spangled, &c. All have the same characteristics, and each colour has its admirers. The Hamburgs do not sit, as a rule; but when they have a free wild range, and are never shut in, they can and do rear their broods like other fowls. They are robust in constitution, and seldom to be seen out of condition. I recommend the breed to the mere fancier, for they are safe birds to exhibit; size is never considered, provided the colour and points are good, and the breed true to colour.

#### GOLD AND SILVER PENCILLED.

The points of the cock are as follows:—

*Comb*—Double; set square on the head, and not overhanging the eyes or beak; no hollow in the centre; covered over with small points, with a distinct peak at the back inclining upwards.

*Deaf ear*—Not pendent, but fitting close to the face; of medium size; round and even on the surface.

*Wings*—Ample; points carried rather low.

*Tail*—Full, expanded; sickle feathers well curved.

*Thighs*—Short, neat.

*Legs*—Slender; rather short; very neat and taper.

*Carriage*—Upright; strutting graceful and restless.

The points of the hen are as follows:—

*Comb*—Same shape as that of the cock, but very much less.

*Deaf ear*—Small, and not pendent; rounded in lower part.

*Wings*—Ample; carried neatly to the body.

*Tail*—Full, expanded, and well carried.

*Thighs*—Short and neat.

*Legs*—Very slender, and taper.

*Carriage*—Graceful and restless.

#### GOLD PENCILLED.

The points of the cock are the following:—

*Comb, face, and wattles*—Bright red.

*Deaf ear*—Pure opaque white, free from red.

*Head and hackles*—Clear reddish bay.

*Back and saddle*—Rich deep bay.

*Bow of wing*—Do.

*Shoulder and wing coverts*—Do.

*Flight feathers*—Reddish bay on the outside web, black on the inside web.

*Secondaries*—Reddish bay on the outside web; the inside web pencilled across with broad black marks, each feather ending with a black spot.

*Breast and thighs*—Reddish bay.

*Tail*—Black.

*Sickle feathers*—Black down the middle of the feather, the entire length edged with bronze.

*Tail coverts*—Do.

*Legs*—Slaty blue.

The points of the hen are as follows:—

*Comb, face, and wattles*—Red.

*Deaf ear*—Opaque white, free from red.

*Head and neck*—Clear golden bay.

*Remainder of plumage*—Do., free from

either lacing or mousing, each feather (including tail) pencilled across with black.

*Legs*—Blue.

The same standard will apply to the silver pencilled Hamburgs, substituting a clear silvery white ground for a golden one—the silver cock to be as free from yellow tinge as possible. Combs falling over to one side, red deaf ears, and legs any colour except blue, are decided disqualifications.

The spangled Hamburgs, both gold and silver, are in *form* identical with the pencilled varieties. The points of excellence aimed at are the distinctness and size of the black spots at the points of the feathers, and the clearness of the ground colour whether gold or silver. The hens in a pen should match as nearly as possible in size of markings and depths of colour.

#### GOLDEN SPANGLED.

The points of the cock are the following :—

*Comb, face, and wattles*—Red.

*Deaf ear*—Opaque white.

*Head*—Deep reddish bay.

*Hackle*—Deep golden bay, each feather striped down the centre with rich green black, well defined and not clouded.

*Breast*—Golden bay, free from massing, streaking, or lacing, each feather ending with a round, large, rich black moon or spangle, the moons increasing in size in proportion to the size of feather.

*Thighs and under-part of body*—Do.

*Back*—Deep reddish bay distinctly spangled with metallic black, the texture of the feather giving the spangle a starred or ragged appearance.

*Shoulder coverts*—Do.

*Saddle*—Rich reddish golden bay, each feather striped down the centre with metallic black.

*Wing bow*—Golden bay, distinctly spangled with black.

*Wing bars*—The greater and less wing coverts clear reddish golden bay, free from lacing, each feather ending with a large, round, green black spangle, forming two distinct parallel black metallic bars across the wing.

*Wing primaries*—Bay, ending with black spot.

*Wing secondaries*—Do.

*Tail*—Black.

*Sickle feathers*—Rich green black.

*Tail coverts*—Do.

*Legs*—Slaty blue.

The points of the hen are the following :—

*Comb, face, wattles*—Rich bright red.

*Deaf ear*—Opaque white.

*Head*—Golden bay, tipped with black.

*Neck*—Do., each feather distinctly striped down the centre with black, the colours not mixing.

*Breast*—Golden bay, free from massing, each feather ending with a large black moon, the moons increasing in proportion to size of feather.

*Thighs and under parts of body*—Do.

*Back and shoulders*—Clear golden bay, free from lacing, each feather tipped with black moon.

*Wing bow*—Do.

*Wing bars*—Greater and lesser wing coverts golden, being tipped with black moon, forming two distinct parallel green black bars across the wing.

*Wing primaries*—Golden bay, ending with black moon.

*Wing secondaries*—Golden bay, ending with green black half-moon or crescent-shaped spangle, termed by the Hamburg fanciers of Lancashire “lacing on the top of the wing above the flight.”

*Tail*—Black.

*Tail coverts*—Golden bay, free from massing, each feather ending with a rich green black spangle.

*Legs*—Slate colour.

#### SILVER PENCILLED.

The same standard will apply to the silver-spangled Hamburgs, substituting a clear silvery white ground for a golden one—the silver cock as free as possible from yellow tinge.

#### BLACK.

The black Hamburg is a pretty fowl, and more suited for a town life, where there is much smoke, than the more delicately coloured varieties. The plumage should be very rich



glossy metallic black; the *deafear* white (pure opaque), the *face* bright red, perfectly free from white; the *comb* and *wattles* also red, and the *legs* dark leaden blue. Hamburgs are so hardy that they may be hatched early in the season for table use. Though small, it is an exceedingly good bird, of delicate flavour; and the pullets are very precocious layers. Size not being a qualification for exhibition, it is unnecessary for that purpose

to hatch them sooner than April. They assume quickly their full plumage. The cockerels very soon take upon themselves airs of importance, and seem to consider they are masters of the poultry-yard. The Hamburgs, of all varieties, are so singularly beautiful, they are just the breed to be kept as pets. They eat little, require no care, and keep themselves in good plumage eleven months out of the twelve.

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### POULTRY SHOWS.—WEIGHING SHOW FOWLS.

BY "THE HENWIFE."

(Concluded from page 392.)

I SHOULD have thought that the process of weighing was sufficiently understood, but since my last article (on preparing pens of birds for exhibition) I have had numerous applications for information on the subject. It is absolutely necessary to ascertain the weight of all fowls intended either for exhibition or sale, and the eye cannot be trusted to judge of weight—the steelyard infallibly discloses the truth. Seeming size is nothing; it frequently is all feather. The weighing apparatus I consider the best, because the simplest and least expensive, is an upright bar of wood or iron inserted into a firm flat stand. The balance passes through this upright bar, and is hung from it by an S hook. There are similar hooks at each end of the balance for the weights and basket. This latter must be suspended by cords, and be of sufficient size to contain a goose or turkey, or even a couple of them. The weight of the basket must be ascertained, so as not to be included (as is far too often the case) in the weight of the fowl. I trust the directions I have thus given may be found useful; if not sufficiently clear, I shall gladly reply to any questions. We are now fairly into autumn, with its chilly evenings and mornings, and as our young stock is still abundant, and much of it just hatching out of the shell, very careful treatment becomes imperative. The last meal should be given at five

o'clock, and the coops shut up soon after, to be opened again at six in the morning. Feed often and well. Keep the hen entirely confined to the coop, and choose sunny spots for the runs. There is much less fear now of overcrowding—our numbers are fewer; indeed, only those chickens intended for table use or market should now be hatched. Turkeys, if not fully fledged, suffer severely from cold and damp, and although much tempted by the abundance of eggs and evident desire of the hen to incubate, I do not advise any being set; far better give the turkey some hardy fowl's or duck's eggs to hatch. She will cover twenty-one with ease, and have a fair chance of rearing her flock. It is useful now to mix a little pepper in the soft food of the chickens—powdered pimento does as well, and is cheaper; and Indian corn, both ground and whole, may safely be given to all the stock poultry. Young turkeys sometimes refuse it, but by degrees they begin to relish it, and at last prefer it to all other grain. It should also be thrown into the feeding vessels appropriated to geese and ducks, mixed with oats and other grain. At this season, all that is necessary is to supply the poultry with an abundance of warmth-giving food. They have not yet recovered from their moult, and though this is a natural process of annual occurrence, it must be treated almost as a disease in our high-bred, early-hatched birds. With

these it is even dangerous, so great is the drain on the system. A stimulating, nutritive diet with dry housing, are the best, and I may say only cures. If these do not suffice, nothing will help them through this trial to delicate constitutions. In a state of nature birds moult during warm weather, and just when their food is most plentiful; hence we only imitate nature herself when we supply our artificially-reared pets with extra food and comforts at this time. Geese and ducks are so hardy, they forage well at all times for themselves, and the young ones should now be in perfection for the table. When the corn is off the ground poultry may be turned out to the stubble, and there find much food

which would otherwise be wasted. The exercise and change of ground is most beneficial, and while the birds are enjoying their ramble their yards may be dug and cleaned up better than can be done when they are all hovering about. Eggs should be becoming plentiful, as the pullets early hatched will now lay.

The first eggs are generally small, but they improve in size with age, and soon we shall be able to send even our prize bird's eggs to market, so slight is the danger of their being set in wintry weather. Just now, I advise that all spare eggs should be put into the pickling jar, or, if preferred, into tin boxes.

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### THE HENWIFE'S KALENDAR FOR NOVEMBER.

**S**HOULD the hen-house be heated by flues, care must be taken to keep the temperature as nearly uniform as possible. Let biting draughts of wintry air be excluded, let the roof be perfectly water-tight, so that no dripping rain be allowed to enter; few things are more injurious to fowls than damp. When the hen-house is not heated by artificial means, it is well that the fowls, which in summer have been distributed into different houses, should now be put into one; the heat they communicate to one another enables them the better to resist the winter's cold. It is miserable to see a mere sprinkling of fowls on the perches in winter; but a well-filled hen-house gives an idea of warmth and comfort even in the severest weather. The hen-house must be well aired every day, thoroughly swept also, and then sprinkled over with sand or ashes or fine gravel. Sand has been objected to on the ground that it encourages the growth of fleas, an enemy against which the henwife has always to be on her guard, and in place of it sawdust has been recommended as being more conducive to cleanliness. This may be correct; saw-

dust has undoubtedly many good properties, but we have always used sand, and never saw any reason to think it harboured vermin, as our fowls were remarkably free from that pest of their existence. Besides rendering the floor more easily cleaned, it is useful for other purposes; the small stones found in it are picked up by the fowls, and assist greatly in the digestion of their food; and if, besides being sprinkled on the floor, it be also put in a heap in a corner of the hen-house, it will serve to clean their feathers, and remove any vermin that may attach to them. In passing, however, we may say that wherever the dust-bath be placed, and whether of sand, or ashes, or earth, it must be regularly changed, at least once a week, on the same principle that induces one to take clean water for the purposes of ablution. The henwife must not repine at her baskets being comparatively empty, as they probably will be. To induce her common hens to lay a few weeks more, she may continue to feed them with warm food, as previously directed, and she must not forget to place within their reach a quantity of limy rubbish, such as old mortar. The

hen requires this for the formation of shells, and if this material be not supplied, she cannot produce perfect eggs. Should there be a deficiency of lime, oyster-shells can be procured, burnt in the fire, then powdered down, or even broken into small pieces. The hen manages wonderfully to break them down for herself. The limy rubbish may advantageously be scattered all about their yard, and it *should* be mixed in their dust-bath, for when performing their dry ablutions, if we may be allowed the expression, they are also busily

employed in laying in material for the production of eggs, their outer covering at least.

At this season it will be advisable to confine turkeys in coops, as they will not fatten if allowed to roam at large. They may have the same food as the hens, with the addition of curdled milk.

In anticipation of the hatching season, and in order to secure the breed of chickens that may be wanted, it will be found the safest plan to remove all the cocks except those from which you mean to breed.

## The Naturalist.

### THE VEGETABLE PRODUCTIONS OF ABYSSINIA.

BY W. B. HEMSLEY, FORMERLY ASSISTANT IN THE HERBARIUM OF THE ROYAL GARDENS, KEW.

(Concluded from page 493.)

TWO species of Coniferæ are indigenous—viz., *Podocarpus elongata* and *Juniperus procera*. The latter is called "Zadd," and is one of the largest trees in the country, yielding a hard and durable timber, much sought after for building purposes.

Willows, or Salicineæ, so familiar to us, are not unknown to the Abyssinian, there being three species (*Salix axillaris*, *S. cyathipoda*, and *S. octandra*) on the mountains. One species of *Gale* (*Myrica salicifolia*) grows in the mountainous districts; it is, unlike ours, a tree of 30 to 40 feet in height. The most important and conspicuous Euphorbiaceæ are the species of *Euphorbia* itself, which, in some sterile districts, forms the principal feature of the landscape. These are mostly fleshy-stemmed, leafless, or with very small leaves, spiny species, much resembling Cacti; and some of them attain the dimensions of large trees. When cut or bruised, these *Euphorbias* exude an enormous quantity of an exceedingly acrid juice. *E. Abyssinica*, the "Kolqual," is employed for purposes of construction, and rags dipped in its juice are rolled up for torches. I must here quote a few lines from Bruce:—

"In that memorable day, when leaving the Larubar, or low flat parched country which forms the sea coast of Abyssinia, and turning westward, we came to the foot of that stupendous mountain, Taranta, which we were to pass in order to enter into the high land, we saw the whole side of that prodigious mountain covered from top to bottom with this beautiful tree. The fruit was ripe, and being carried on the top of the branches, the trees that stood thick together appeared to be clothed with a cloth or veil of the most vivid crimson colour."

Although his description and plates were against him, Bruce contended that this tree could not be a species of *Euphorbia*.

*E. Petitiana*, and *E. Schimperiana*, are sometimes employed medicinally, mixed with "Cussoo" (*Brayera*), to augment their activity. *Urtica sinensis*, a stinging-nettle, is cooked and eaten as a vegetable in Abyssinia, as our common one sometimes is in this country.

Trees of the Moraceæ, or fig family, are abundant; sixteen species of *Ficus* alone have been reported. *F. Sycomorus* is a native of the low country between the Red Sea and the mountains of Abyssinia, where, Bruce tells us, he saw a number of very fine old trees. The fruit of this, as also of *F. Vallis* and *F. pseudo-carica*, is eaten. According to Messrs Fecet and Galinier, the inner bark of *F. panifica* is eaten by the natives, and tastes somewhat like bread.

Proteaceæ, a South African and Australian family, is represented by one species of *Protea* and one of *Leucospermum*. Amongst the few Polygonaceæ, is a Dock, *Rumex Abyssinicus*, or Mok-moks, the root of which is macerated and mixed with butter to prevent the latter from becoming rancid. It is largely employed, and imparts, it is said, no bad flavour to the butter. The singular genus of Bignoniaceæ *Kigelia* is spread over a great part of tropical Africa, and one species, called by the natives Meder-Deur, is met with in Abyssinia. It forms a large tree, and is a very conspicuous object from the long pendulous racemes of crimson flowers and woody seed-pods, the peduncles being from four to six feet long. This is said to possess aphro-



disiacal properties of a most extraordinary nature.

The bark of the young branches of a *Stereospermum*, a member of the same family as the last, is rolled on sticks, and when dry made into flutes.

There are several plants belonging to the Dog-banes, or Apocynæ, indigenous in Abyssinia. The fruits of *Carissa edulis* and *C. tomentosa* are eaten. *Asclepiadæ*, numerous in Africa, especially the tuberous-rooted species of Southern Africa, furnish one or two edible roots. The boiled tubers of *Ceropegia Vignaldiana* resemble Jerusalem artichokes; and those of a *Gomphocarpus* are also eaten when peeled and boiled.

*Solanaceæ* are plentiful. Several varieties of tobacco are cultivated; and *Capsicum conoides* is grown in considerable quantities, and used as pepper. It possesses an aromatic pungency in a high degree, and a very small quantity is required to season a dish. If taken too freely it irritates the stomach and intestines, and induces dysentery. *Solanum marginatum* is made use of in tanning leather, and the fruit of another species is employed as a cathartic.

A jasmine, *Jasminum floribundum*, has intensely bitter leaves, which are used as an anthelmintic. The large family of the *Compositæ* is well represented in Abyssinia; but the species are not so numerous as might have been expected. The aromatic leaves of *Dichrocephala latifolia* are used as a spice.

*Carthamus tinctorius* is cultivated, and an oil extracted from its seeds. *Myrsinaceæ* are few. The fruit of a species of *Myrsine* is mixed with barley, and given to mules and asses, and that of *Mæsa lanceolata* is regarded as vermifugal. *Cordia* Abyssinia, *Coriariaceæ*, should be mentioned. Bruce informs us that all the towns are planted with them. Every house in Gondar has two or three planted around it. The flowers are conspicuous, white in colour, and very profuse, so that in the flowering season the towns are exceedingly gay and pleasant.

*Rubiaceæ* and *Cinchonaceæ* are numerous, and many of them very beautiful, and interesting. The most important is the coffee bush,

*Coffea Arabica*, a native of the south-western part of Abyssinia, and commonly cultivated. It was, however, first known to Europeans from Arabia, hence the specific name; but it has since been ascertained that it was originally introduced into that country by the Arabs, and cultivated in Yemen, whence was derived all the coffee used for upwards of two centuries. It is asserted that the custom of drinking coffee was first practised by the Abyssinians, by whom it has been cultivated from time immemorial, and was introduced into Arabia in the fifteenth century.

Two or three species of *Strychnos* are indigenous; and the fruits are manufactured into snuff boxes. *Tupa Rhynchopetalum* (see figure given at p. 90 of the present volume), a *Lobeliaceous* plant, called Djibarra, is extremely venomous; the smoke of its wood, if inhaled, causes vomiting; and even its atmosphere is said to be fatal. Seeds of this plant, mixed with butter, have the power of facilitating parturition. Another plant of this family, *Cyphia glandulifera*, has farinaceous tubers, which are eaten by the poor people.

About thirty species of *Umbellifera* are recorded from Abyssinia, some of which are remarkable in the family on account of their shrubby or arborescent character. One, *Steganotænia*, attains a height of twenty to thirty feet, with a solid ligneous trunk.

*Cucurbitaceæ* are rare in a wild state. Cucumbers are cultivated and eaten.

*Passifloreæ* are comparatively scarce in Abyssinia, but on the western side of the continent, and in the south, there are several genera not hitherto discovered in any other part of the world, some of which probably will be found by future explorers in Abyssinia. They are, *Tryphostemma*, *Basantanthe*, *Smeathmannia*, *Bartonia*, *Crossostemma*, *Machadoa*, *Acharia*, and *Ceratiocycos*.

*Leguminosæ* are abundant, cultivated and wild, and many of them are of great beauty. Thorny gum-producing *Acacias*, *Mimosas*, and *Indigoferas* are common. Indigo is obtained from the *Indigofera argentea*, and the powdered fruit of a *Nulletia* is a fish poison. A valuable vermifuge is yielded by *Albizzia*

anthelmintica, which has been successfully employed in various parts of Europe since 1846. It is known under the names of *Mus-sena* and *Besenna*. The pulverised bark is the part administered, which is taken in oil, honey, or preserve. It is said to be even more efficacious than *Cussoo* (*Brayera*). It kills the *tænia*, and facilitates its decomposition, so that it is the easier expelled. Moquin Tandon says, that in small doses it causes neither purging nor griping, but in too strong doses it acts as a cathartic, and may even become dangerous. To the *Rosaceæ* belongs *Brayera anthelmintica*, the *Cussoo*, or *Cabotz*, of Abyssinia, another vermifuge, formerly supposed to be the most powerful in the world. Upon the authority of Brayer, a French physician, after whom it was named, two or three doses of the infusion are sufficient to cure the most obstinate cases of *tænia*. It has also been successfully employed in Europe.

This is figured under the name of *Banksia Abyssinica* by Bruce, who devotes a long article to it, wherein he tells us that it is one of the most beautiful as well as most useful trees growing in the Abyssinian high lands. "The Abyssinians of both sexes and all ages," he says, "are subject to a terrible disease. Every individual once a month evacuates a large quantity of worms called *ascarides*, and the method of promoting these evacuations is by imparting a handful of dry *Cussoo* flowers in about two quarts of bouza or teff beer, which is taken by the sufferer."

This disease Bruce ascribes to their eating raw meat, for he observed that the *Mahomedans*, who eat no uncooked meat, were free from it. Another plant of this family, *Rubus apetalus*, has, like our blackberry, an edible fruit.

*Ampelidæ*, or Vines. There are three or four native species, and *Vitis vinifera* has been introduced, and is cultivated. The large fleshy kernel of *Spondias Birrea* (*Anacardiaceæ*) is eaten; and the fruit of *Schmidelia Africana* (*Sapindaceæ*) is employed as an anthelmintic. When the fruit is dry it is peeled, mixed with flour, and converted into a kind of paste, which is eaten. Of the *Bursereæ* or *Balsam* trees, there are several species

found in Abyssinia. Myrrh is the product of *Balsamodendron myrrha*, a small shrub found on the sea-coast, and balm of *B. Opobalsamum*. The latter is also found in Arabia. *Olibanum*, it is supposed, is yielded by *Boswellia papyrifera*, but this is still doubtful. This tree, however, is one of the most remarkable in the country, where it is named *Makker*. It furnishes a transparent resin, used as incense, and the bark is used to write upon. *Quartin-Dillon* and *Schimper* employed layers of this bark to pack their dried plants in which they sent to Europe. *Brucea anti-dysenterica* (*Simarubæ*), possesses properties similar to those of *Quassia*, a member of the same family. This shrub, Bruce informs us, is spread over the greater part of Abyssinia, growing on the sides of valleys. He used it himself for dysentery, and it cured him after all other remedies had failed. The root is the part utilized; this is powdered, and taken in doses of about a teaspoonful in camels' milk. Several other species of this genus have since been discovered in various parts of the world.

*Rhamnaceæ* are abundantly represented by *Zizyphus*, *Rhamnus*, &c. The species of *Zizyphus* are extremely common shrubs, growing in all soils; but, in poor ground the leaves are smaller, and the spiry stipules very strongly developed. The fruit of *Z. jujube* and other species are eaten. "Ghesh" is a species of *Rhamnus*, whose leaves are employed in the preparation of beer. The bitter fruits of *Rhamnus Staddo* are also used in the same way which, as well as the leaves of *R. pauciflorus*, are said to accelerate fermentation, and at the same time to impart an agreeable bitterness to the beer. Gunpowder is manufactured from the wood of *Celastrus serratus* (*Celastraceæ*). Plate 49 of "Bruce's Travels" represents the fruit of *Sterculia*, which he erroneously states to be that of the tree figured in the preceding plate, which is probably *Meliaceous*, or *Anacardiaceous*. That portrayed on plate 48 is probably the one referred to as being the tree which the Abyssinians believe to be the tree that bears frankincense, and we are told that it does produce a gum much resembling it.

Malvaceæ are numerous. One of the most remarkable and interesting is the gigantic tree, *Adansoni digitata*, or *Dina*, the Baobab of Western Africa, belonging to the tribe Bombaceæ. This abounds in all the low valleys of the interior, especially in the valleys of the Tacagzze, where it attains enormous dimensions. The diameter of its trunk is out of all proportion to the height of the tree, being from twenty to thirty feet, with a height of fifty to sixty feet. The wood is soft and spongy, and of no particular value; but the bark is utilized in various ways, such as cord- and net-making, and in the manufacture of cloths, &c. There is only one other species known, *A. Gregorii*, a native of N. E. Australia.

Cotton is frequently seen in cultivated ground; but I have not been able to ascer-

tain whether it is made use of by the natives, though most likely it is to a certain extent. Dwarf prickly shrubs of *Zygophylleæ* and *Capparideæ* are common on sandy soil and volcanic hills. *Menispermaceæ* and *Anonaceæ* present nothing particularly worthy of notice, which brings us to the end of our epitome.

From the foregoing notes and extracts a tolerable idea of the flora of Abyssinia may be formed; but in a sketch, necessarily short and fragmentary, much of interest has been omitted. The details of the preparation of vegetable substances either for food or medicine, and for the manufacture of various articles, would have occupied too much space in a paper devoted to the general aspect of things.

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#### DESTRUCTION OF SMALL BIRDS.

AT a recent meeting of the East Lothian Agricultural Club, Mr Scot-Skirving read a paper on "Small Birds in connexion with Agriculture." In introducing the subject, he said that with regard to the small birds of the farm there was very great difference of opinion. In France, some time ago, the people had waged such an exterminating war against them that the caterpillars had increased enormously, and in consequence the blossom of the fruit was very much destroyed—so much so, that it had been found necessary to introduce the small birds again into those districts where they had been rooted out. He did not think they were going to fall into that error. He knew there were many gentlemen in the county who liked the sparrows, but they congregated during the period approaching the harvest when the oats were in the milk, and going from one ear to another did a vast amount of injury. He calculated that he almost lost  $2\frac{1}{2}$  acres of his farm in that way. He was aware that the sparrows did some good to the fruit in the garden by picking the green fly, but that fly could be got very readily away, and he thought it would be admitted that the sparrows did a great deal of injury to

the gooseberry buds. He also believed that crows did a great deal of mischief, more than was generally known, because they made their ravages during the whole year, and they also incurred a great expense in consequence of watching. As to the wood pigeons, it was well known that they did a vast amount of harm, and he thought they should wage as great a war as possible against the wood pigeons, who were most destructive animals. In regard to the rook, he thought it did more good than harm; but he thought care should be taken not to allow its numbers to become too great in any one place. He had examined rooks in all parts of the year, and had always found insects in their stomachs. After remarking on the great good done to agriculture by such birds as starlings, plovers, and gulls, he said that although sparrows did some harm, yet as their food consisted principally of insects they must also do great good.

An animated discussion followed the reading of the paper; but the speakers, while differing in the amount of good and evil done to agriculture by various birds, all concurred in the mischievous nature of the wood pigeon.

## Hunting, Fishing, and Shooting.

### AN ELEPHANT ADVENTURE.

IN a previous page of the present volume (p. 110) there appeared an article on Elephant Hunting in Abyssinia. The following account of an encounter with a bull elephant, as related by Mr Chapman in his "Travels in the Interior of South Africa," is agreeably exciting:—

"At length I found myself in an extensive mogonono field, swarming with elephants in every direction, crushing down the bushes with a sound resembling the roaring of waves. Not knowing in which direction to turn, I climbed a mokala (camel-thorn) tree, of which there were a few about, and which seemed to be the standing-place of numerous elephants every day. On reaching the top of this tree, I found myself surrounded by elephants, mostly cows, in every direction, in groups closer than I ever dreamt of. My position not being very enviable, I sat in breathless suspense observing the movements of the numbers of gigantic animals round me on every side. At the distance of about 120 yards to the eastward of my position, I soon discovered the old bull which I had followed, surrounded by a group of about a dozen cows, caressing and fondling him; some of them dashing him with water from their trunks, others with sand. Those elephants below his wind, probably scenting his blood, lifted their trunks, and after smelling a moment, gradually moved off. The elephants below me were working their trunks about, but made no effort to move out of the bush in which they probably considered themselves concealed; while groups, in other directions, that seemed to have got over the alarm caused by the reports of our guns, were moving slowly, followed by their calves, breaking down the branches, and pulling up young shoots and grubbing roots, which they strewed before their young with an air of the most maternal solicitude. A shot fired on the outskirts by my servant, Abraham, drove a troop towards my position, and another and another shot seemed to be bringing masses of cow elephants from every direction round me; but to my great relief, as if actuated by one impulse, the foremost began to move into two parallel files, one on each side of me."—(vol. i., p. 154.)

Mr Chapman in the following adventure

shows a remarkable degree of coolness, courage, and perseverance:—

"The troop, finding their prostrate fellow deaf to their entreaties, moved on, and I soon followed, but was repeatedly driven back by a worthless old hag of a cow (elephant), who, with the air of a vixen, would not allow me to come near the troop; and I found it was necessary to kill her first, if I wished to get at the rest. So dashing towards them she turned upon me just as I had dismounted, uttering a fearful cry. This was a desperate move; it sealed her fate, though mine seemed in greater jeopardy. My horse, terrified at the elephant's thrilling cry, pulled the reins out of my hand, and left me on the open plain, staring death in the face, without any cover to flee to. At this critical moment, I despaired of life; but presence of mind, together with unusual firmness, were now vouchsafed to me. I felt I had but one chance for life, and that I now held in my hand. Now for courage and a steady shot. It was the courage of despair, and it was Providence that directed my aim. I awaited the furious animal's approach, with my gun at my shoulder; but my hand shook so violently that I could take no sure aim, and I felt reluctant to pull the trigger.

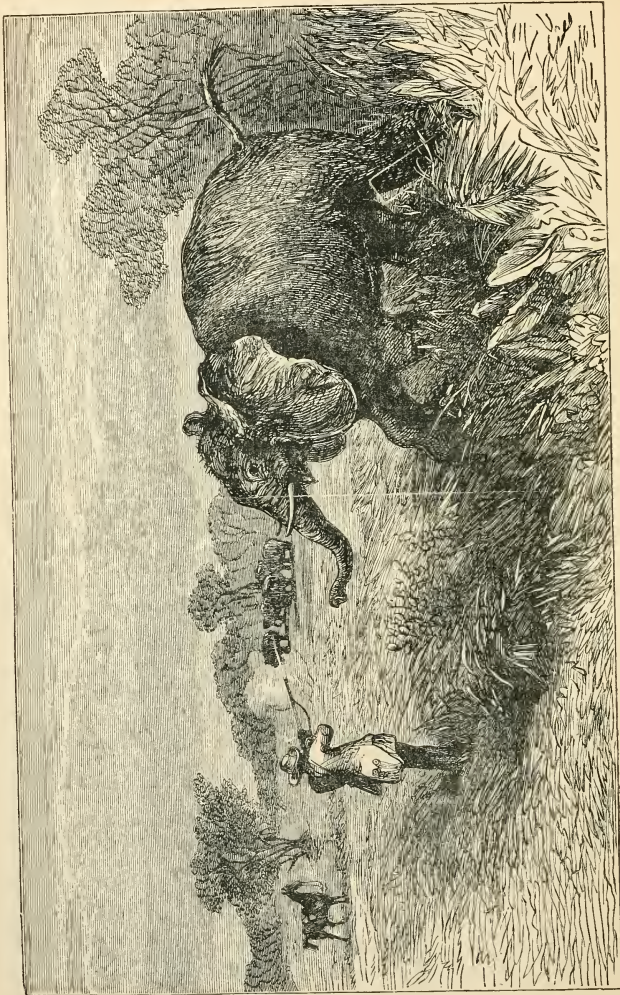
"Still the enemy approached with outstretched trunk; her loud trumpeting had ceased, but she uttered a series of short-fetched grunts, which sounded in my ears like an exclamation of triumph at having her enemy in her power—a victim she would grasp in another moment with her powerful trunk, and crush to atoms with her ponderous feet. At this juncture, she happened to lower her trunk from before her; and the slight movement leaving her forehead exposed, I instantly took advantage of it, and a bullet from my rifle crashed right into the centre of her skull, and she came down with overwhelming violence at the distance of seven paces from the spot where I was planted. But if before I had been sustained by Providence, and, indeed, I felt that something beyond my physical power had saved me, I now lost all my fortitude, and stood for a moment perfectly agast, trembling, and most horribly bewildered.

"But, now, again recovering myself, and inspired by the first law of nature, to lose no time in retreating from a possible death-struggle with my now prostrate foe, I ran to my horse, standing at the distance of 200 yards, and cocking his ears in amazement at the fray.



I then reloaded, and began to speculate on the prudence of following the rest of the troop."—(vol. i, p. 84.)

their powers of doing mischief after appearing to be mortally wounded, unless they have uttered their



ENCOUNTER WITH AN ELEPHANT.—See p. 206.

“It is worth mentioning, by way of caution to South African hunters, that most elephants recover death-groan. I have known them to fall four or five times, as if dying, and then rise again.”—(vol. i, p. 89.)

Mr Chapman instances the fact that the lion, although plentiful and daring in some places, must be rapidly diminishing in numbers, for notwithstanding all his advantages he only killed seven during all the years of his wanderings. In some parts the natives do not kill lions, regarding these animals as hunters of game which they turn to their own account. On the other hand, the lions sometimes look upon the natives from the same stand-point of their own advantage, treating villages of them as private preserves of game. The writer gives an instance of this in the district where he found them most numerous :—

“In parting with my cattle, I requested Awraal to permit me to send them on to the extreme eastern boundary of his country, at Elephants’ Klof, but he dissuaded me from this project, assuring me that the lions had of late become so daring that no human being could live there. The Damaras and bushmen who had escaped their ferocity had been obliged to remove to a district north-east of this place. The cowardice shewn by these poor people had of late made the lions so bold that nothing but human flesh seemed to satisfy them, nor did their huts, fires, and fences afford them the slightest protection. Some of Awraal’s people, who were returning the other day from a giraffe hunt, were assailed by a troop of these daring animals in open daylight. The lions sprang upon the pack-oxen, who ran wildly about under the weight of their rough jockeys, plunging madly until fortunately

they had disencumbered themselves of their bundles of meat as well as their rude riders; the lions contenting themselves, after having a few shots fired at them, with the meat they had seized. Another party of these hunters the same day came upon the carcase of a Damara recently killed and partly eaten, and every night this same party were kept awake or had to make circular fires around them, leaving their dogs to fight off the brutes until daylight. So changeable and uncertain is the character of the lion that in some districts by daylight he is timid as a mouse, and will scarce venture to attack man even by stealth and by night; but when he comes upon a famished or mean-spirited race, he keeps near a village and treats its inhabitants as though they were his flock of cattle, killing them as hunger urges. A hungry lion is a most daring animal; there is nothing that he will not dare in broad daylight and in the most impudent manner, driving you off from your own game, or following you up in open ground under every disadvantage to himself. But such cases are rare, and they are generally either driven to it by hunger, past success, or a keen relish for human above all other flesh. The general disposition of a lion, like that of all other animals, is to avoid man, and the districts which he haunts in South Africa being as yet abundantly stocked with game, man seldom becomes his victim.”—(vol. i., p. 420.) “The natives, too, assert that lions and all other beasts of prey are more daring when the men are away from their houses and villages, which they soon smell out.”—(vol. ii., p. 303.)

We heartily commend Mr Chapman’s volumes to the notice of naturalists as well as to all lovers of the chase.

## The Country Gentlewoman.

### ON THE THEORY AND PRACTICE OF COOKERY.\*

BY DR LETHBY.

#### SECTION I.—TREATMENT OF FOODS.

IN the treatment of vegetable foods it is important to remember that all corky and woody tissues, as the skins of fruits, tubers, and cereals, are quite indigestible, and that in consequence of their irritating action they hurry food through the alimentary canal, and so occasion waste. It is necessary, therefore, that all such tissues should be removed as completely as possible.

When it is required to obtain the *starchy* or *farinaceous matters* of vegetables, one or other of the following processes is followed:—

(a) The material is pulped or crushed, and diffused through a considerable volume of cold water. It is then strained and allowed to stand until the farina or starch subsides.

(b) Or it is allowed to pass into a state of putrefactive decomposition, whereby the albuminous matter, as the gluten, &c., decay, and leave the starch untouched.

(c) Or it is subjected to the action of a weak alkaline solution, generally of caustic soda, which dissolves the gluten, and allows the starch to subside. The gluten thus dissolved may be again recovered by neutralizing the alkaline solution with acid, and collecting the precipitated gluten, as in the process of Durand and others.

#### MEAL AND FLOUR.

In the treatment of the ground meal of wheat and other grain, the bran and coarser kinds of flour are separated by sieves of different degrees of fineness, and in this manner about eight or nine varieties of product are obtained, as

*biscuit flour, best or fine households, seconds, tails, fine sharps or middlings, coarse sharps, fine pollard, coarse pollard, and long bran.* The proportions of these from ordinary brown meal will vary according to circumstances; but processes have been invented, as by M. Mège Mouries, M. D'Arblay, and others, whereby the yield of fine flour is increased to 86 or even to 88 per cent. of the grain, and by which the quantity of gluten is also regulated.

When the flour is rich in gluten, as in the case of the hard wheats of Sicily, Russia, Sardinia, and Egypt, they are well suited for the manufacture of certain granular powders and dried pastes, which are known as *Semola, Semolina, Soujee, Mannacroup, Maccaroni, Vermicelli, and Cagliari paste.* The last three are generally imported from Naples or Genoa, where they are made from a highly glutinous wheaten flour, by kneading it into a thin dough or tenacious paste, and then forcing it through holes or slits in a metallic plate. In this way the several varieties of *pipe, celery, and ribbon maccaroni* are obtained; and the fancy forms of it, called *Cagliari paste*, which are in the shape of stars, rings, Maltese crosses, &c., are produced by stamps. All these varieties of raw wheaten paste are cooked by boiling or baking, and are associated with soup or beef-tea, or milk, or are mixed with eggs, cheese, &c.

The best variety of flour for bread is that which contains less gluten than the preceding, as from 8 to 10 per cent. of it instead of from 12 to 14 or 15. Dantzic flour, and soft Spanish, as well as the American called Genessee, are the best examples of it, and are highly esteemed by bakers on account of

\* One of the Cantor Lectures delivered before the Society of Arts.



the fine quality of bread which is procurable from them; the richer varieties of hard glutinous wheat being used only to impart strength to weak and inferior descriptions of flour.

BREAD—YEAST, ITS PROPERTIES, USES, AND SUBSTITUTES.

*Bread*, which is the most important preparation of flour, owes its value as an article of diet to a good and equable vesiculation of the dough, the vesiculation being effected by the diffusion of small bubbles of carbonic acid gas throughout its substance; and, as this vesiculation can only take place in a proper manner when the gluten of the flour is in sufficient quantity, and of good quality, it is, to some extent, a test of the goodness of the meal. Those flours which contain too little gluten, or gluten which is deficient of strength, cannot be vesiculated into bread. This is the case with almost every description of flour, excepting that of wheat and rye.

The most common, and also the most antient method of vesiculating bread is by fermentation; and the process is not very different from what it was in very early times, when we were told that "a little leaven leaveneth the whole lump." Yeast of some sort—as brewers' yeast; or patent yeast, prepared from infusion of malt and hops; or German yeast, which is the solid residue of the yeast produced by the fermentation of rye for making Hollands; or bakers' yeast, which is made from potatoes and flour; or leaven, which is old dough in a state of fermentation, is mixed with the flour or dough, which soon begins to ferment by the action of the yeast fungus (*micoderma cerevisiæ*) on the sugar of the flour. Carbonic acid is thus produced; and by being diffused through the substance of the dough it vesiculates it, and causes it to rise or swell. The most usual practice with the baker is somewhat as follows:—A special ferment is prepared from mealy potatoes (technically called *fruit*) by boiling them in water, mashing them, and allowing them to cool to a temperature of about 80° of Fahrenheit. Yeast is then added to them, together with a little flour to hasten the fermentation.

In three or four hours, at a proper temperature (as from 80° to 90° Fah.), the whole mass is generally in a state of active fermentation, with a sort of cauliflower-head. It is then diluted with water and strained, and is mixed with sufficient flour to make a rather thin dough, which in about five hours rises to a fine *sponge*. This is again diluted with water containing salt, and is worked with the necessary quantity of flour into dough, and allowed to stand for two or three hours, when it rises, and is in a fit condition to be baked into loaves.

It can hardly be said that the potatoes are an adulteration in this case, for they do not ever amount to more than 6 lb. of a sack of flour, which makes about 380 lb. of bread, or 94 4-lb. loaves. The salt is added to the extent of about 4 lb. or more to a sack of flour, the proportions being regulated according to circumstances, for the object of it is to improve the quality of the loaf as regards whiteness, firmness, and flavour.

There is, no doubt, a slight loss of nutritive matters by this mode of vesiculation, for a small portion of the sugar of the flour is converted into alcohol and carbonic acid, but the quantity is so inconsiderable as to be undeserving of notice. The advantage of the process, however, is that it is an excellent test of the quality of the flour; for weak flour, or flour that has been injured by germination, or by keeping, will not stand the action of yeast, but will be either ropy, or sticky, or heavy, when baked into bread.

Another method of vesiculation is to generate carbonic acid in the dough by the action of an acid on bicarbonate of soda. Dr Whiting's process, which was patented in 1836, was to mix the carbonate of soda with the flour, and then to act on it with a proper proportion of muriatic acid added to the water. He used from 350 to 500 grains of carbonate of soda to 7 lb. of flour, and to this he added 2¾ pints of water charged with from 420 to 560 grains of muriatic acid. Other proportions are used by bakers who make unfermented bread; but in all cases the proportions should be such as to form common salt (which is the product of the action



of muriatic acid on carbonate of soda)—the carbonic acid being liberated in the substance of the dough. Care should be taken that the muriatic acid is pure, for that found in commerce is generally highly charged with arsenic.

In 1845, another acid was patented instead of muriatic—namely, tartaric; and the various preparations called *baking-powders*, *custard-powders*, *egg-powders*, &c., are nothing but mixtures of tartaric acid and carbonate of soda, with a little farinaceous matter, the common proportions being 1 part of tartaric acid, 2 of carbonate of soda, and 4 of potato-flour or other dry starch, with a little turmeric powder to give it a rich yellow tint. When this is mixed with flour and wetted, it effervesces, as in the case of a common seidlitz powder, and so diffuses the carbonic acid through the dough.

Very lately, Mr M'Dougall has proposed the use of phosphoric acid, as a more natural constituent of food than the preceding, and this, with an alkaline carbonate, forms the preparation which is known as *phosphatic yeast*.

A third process, which is now extensively used in the vesiculation of bread, is that of Dr Daughlish, and by which the bread called *aerated* bread is obtained. It consists in the addition of a solution of carbonic acid in water to flour under pressure. The mixture is made in a closed air-tight vessel, in which the dough is well kneaded by machinery, and directly the outlet of the vessel is opened, and the pressure thus removed, the gas escapes from the water, as in the case of an uncorked bottle of soda-water, and expands into little bubbles within the substance of the dough. By its expansion, also, it forces itself out of the mixing-chamber, and rises into a spongy dough.

#### BREAD-MAKING BY MACHINERY.

In all cases, however, where carbonic acid is generated within the dough by other processes than fermentation, the dough must be baked immediately or it will fall, and the loaf be heavy. Various contrivances have been suggested for helping the process of kneading,

which is laborious, and sometimes not altogether cleanly work. Mr Stevens' hand-machine appears to accomplish this very well. It is in use in the Holborn Union, where about 5633 lb. of bread are made every week by one man and two boys; and they contrive to make ninety-six 4-lb. loaves out of every sack of flour (280 lb.). The materials used on the average of a whole year being as follows:—

#### PROPORTIONS PER WEEK.

Flour.....	4129 lb.	} Which produce 5633 lb. of bread, or 1408 4-lb. quartern loaves.
Cones .....	140 "	
Potatoes .....	168 "	
Salt .....	68 "	
Malt .....	13 "	
Hops.....	1½,	
	4519½	

The potatoes, the malt, and the hops, are for the purpose of making the yeast or ferment for the bread.

#### HOW TO MAKE GOOD BREAD.

But, by whatever process bread is made, it is necessary to observe certain precautions to ensure the production of a good loaf.

1st, The flour should be from sound grain, sufficiently rich in good gluten.

2d, The yeast should be sweet, and should shew a lively action in the sponge.

3d, The dough should be well kneaded to ensure the thorough diffusion of the gas, and to give toughness to the gluten.

4th, The salt should be used in such proportion as to regulate the fermentation, and give firmness to the gluten, whiteness to the bread, and a good flavour.

5th, The baking should be so managed as to ensure the thorough heating of the loaf to the temperature of at least 212° of Fahrenheit, in order that the insoluble starch may be changed by the heat into soluble dextrine; and the crust should be light-coloured and thin. This is best effected when loaves are baked singly, as on the Continent, and not in batches as with us; for in the last case the top and bottom crusts are thick and hard, and are frequently scorched, while the interior of the loaf is doughy and under-done.

Specimens of the different kinds of bread

of England and the Continent are upon the table, and you will notice the dark colour of the *rye-bread* of Europe. I am indebted for these illustrations to the kindness of Mr Twining, who has liberally placed the valuable collection of foods in his museum at our disposal. Here, also, is a sample of rye-bread supplied by Mr William Ray Smee, who, in the interest of the poor, has had it made according to the formula of the Board of Agriculture of 1795. It consists of one part of rice and four parts of rye ground together, and sifted in the usual manner. The meal is then made into dough with yeast, and when fermented is baked in the form of long rolls. The bread is very dark, like all rye-bread, and has a close texture, but it is agreeable to the palate, and is very nutritious. The great recommendation to it is its cheapness, for it can be made at less than a penny a pound, and is therefore a very suitable bread for the poor.

#### HOW BARLEY-MEAL, OATMEAL, INDIAN MEAL SHOULD BE BAKED.

Those flours which do not contain sufficient gluten of the proper quality for fermentation or vesiculation, as barley-meal, oatmeal, Indian meal, and the flour of peas and lentils, are best cooked by baking them in the form of cakes or biscuits—a practice which is as antient as the time of the Patriarchs, when, during the Passover, they were commanded to eat unleavened bread. The chief food of the common people of Rome was a heavy kind of unleavened bread, like the present *polenta* of the Italians, which is made of Indian meal and cheese. As in former times, biscuits and unfermented cakes are made from meal or flour mixed with water and baked; but the texture of the substance is close, and it is not easy of digestion unless it is thoroughly disintegrated. When biscuits are lightened by means of eggs and sugar, with a little butter, they are much more digestible; and they are still more so when they are vesiculated and puffed up by means of a small quantity of carbonate of ammonia, as in the case of *cracknells* and *Victoria biscuits*.

#### FOOD FOR INFANTS.

The so-called *farinaceous foods* for infants are only baked flour, sometimes sweetened with sugar. The flour must be baked until it acquires a light-brown colour, the temperature being about 400° or 450° of Fahrenheit. The granules of starch are then disintegrated, and converted into a soluble substance named *dextrine*, which, by a further process of cooking or boiling, as in making pap, forms, when properly sweetened, a very excellent food for children. *Tops* and *bottoms* owe their value to the same circumstance—namely, that the farinaceous matter which is so indigestible with infants is broken up by baking into soluble dextrine.

#### ARROWROOT AND OTHER MEALS.

All varieties of meals and arrowroots are easily cooked by stirring them into boiling water or boiling milk until they have the consistence of gruel or hasty pudding, and then boiling for a few minutes. In the case of Indian-meal, rice, split-peas, lentils, and haricots, the boiling should be continued for a considerable time, and the whole grain should be previously steeped in water for many hours, for the starch and cellulose of these vegetables are not digestible unless they are thoroughly disintegrated by cooking. It may be said, indeed, that all vegetables with dense tissues require prolonged boiling to cook them, for cellulose is not capable of digestion by man unless it is broken up by the action of heat; even starch is likely to pass through the alimentary canal unchanged if it be not rendered soluble by fermentation or cooking. It is an important question, whether, in utilizing starchy foods, it may not be advantageous to help their transformation by allowing the grain to germinate to some extent, as in the process of malting, when the starch is changed into sugar. Mr Lawes has examined this question, and has concluded from his experiments on stock that in the case of pigs and bullocks the fattening effect of the grain is not increased; but it may be different with the human stomach, where the transformation power is not nearly so active as with lower animals. Here, in fact, is an

example of it:—The food which Liebig recommends for infants is a preparation of malt with wheaten flour and milk, to which a little bicarbonate of potash has been added; and the reputation of it in Germany as an article of diet for children is considerable.

#### LIEBIG'S FOOD FOR INFANTS.

The preparation is made by mixing one ounce of wheaten flour with ten ounces of milk, and boiling for three or four minutes, then removing it from the fire and allowing it to cool to about 90°. One ounce of malt-powder previously mixed with 15 grains of bicarbonate of potash and two ounces of water are then stirred into it, and the vessel being covered, is allowed to stand for an hour and a half at a temperature of from 100° to 150° Fahrenheit. It is then put once more upon the fire and gently boiled for a few minutes. Lastly, it is carefully strained to remove any particles of husk, and then it is fit for the child's food. The composition of the food, according to Dr Liebig, is as follows:—

Foods.	Plastic matter.	Carbonaceous matter.
	oz.	oz.
10 oz. milk .....	0·40	1·00
1 oz. wheat-flour ...	0·14	0·74
1 oz. malt-flour .....	0·07	0·58
	—	—
	0·61	2·32

The relation of the plastic to the carbonaceous being as 1 to 3·8, which is the right proportion for the food of children.

The effect of the malt-flour is to transform the starch into glucose, and thus the mixture gets thinner and sweeter as it stands; and the bicarbonate of potash is added to facilitate the change, and to neutralize the acid constituents of the flour and malt.

Liebig's extract of malt is another such preparation for a quick assimilation of starchy matters.

#### FERMENTATION OF VEGETABLES.

*Vegetable substances are occasionally fermented*, either for the purpose of increasing the relative amount of glutinous matter, or for the purpose of rendering them acid. Potatoes, for example, as well as barley,

wheat, and rye, leave a residuum after fermentation, which contains more gluten than the original substance, in consequence of the transformation of sugar and starch into alcohol; and although the residuum is coarse, and is hardly suited for human consumption, yet it is an excellent food for cattle: in fact, in Germany it is often eaten by the poor.

When the process is carried still further, and the mass acquires an acid property in consequence of the formation of acetic, butyric, and lactic acids, various sour preparations are obtained, which are no doubt useful in assisting the digestion of other foods. The antient Romans had many such fermented substances which were not unlike the *sauerkraut* of the Germans. This, as you know, is made from the leaves of cabbages, gathered generally in autumn, and from which the stem and mid-rib are removed. They are cut up into thin slices, and are placed in a tub or vat, alternately with layers of salt, until the vessel is full. It is then subjected to pressure, and allowed to stand for five or six weeks (according to the temperature); the lactic fermentation is thus set up, and the mass becomes sour. It is cooked by stewing it in its own liquor with bacon, pork, or other fat meat; and certain condiments, as dill or carraway, are added to improve its flavour. In Prussia, and in many parts of Germany, there is a similar preparation of fermented beans; and in Holland and the South of Europe, cucumbers are fermented. We also have our pickled vegetables, in which acetic acid takes the place of lactic acid. All these preparations are no doubt aids to digestion, especially when the fibre of meat is tough, and contains tendon, or hardened cellular tissue. This is especially so with salted meat, and, therefore, a little pickle is always a good and palatable addition to cold boiled beef.

#### TEA AND COFFEE.

Vegetable substances, as *tea*, *coffee*, *maté*, *cocoa*, &c., the infusions of which are used as beverages, are prepared for commerce in nearly the same manner. When taken from the tree, and while in a fresh condition, they

are allowed to undergo a moderate kind of fermentation, and they are then dried and roasted. In the case of tea, the roasting operation is performed during the process of drying and curling, by heating the leaves upon wire-sieves held over a charcoal fire, but cocoa and coffee are roasted in metallic cylinders, which are kept revolving over a clear fire—coffee being roasted until it is partially charred, and has lost from 14 to 20 per cent. in weight. By this means the aroma, or volatile oil, is in each case produced; and there is also an empyreumatic change in the astringent acids, the sugar, the gum, and the starch, whereby extractive matters, varying in amount and quality, according to the degree of heat, are formed. Shrader has examined the subject in respect of coffee, and has ascertained that the following are the proportions of the several constituents in raw and roasted coffee:—

	Raw Coffee.	Roasted Coffee.
Peculiar coffee principle .....	17.58	12.50
Gum and mucilage .....	3.64	10.42
Fatty matter and resin .....	0.93	2.08
Extractive.....	0.62	4.80
Woody tissues and cellulose ...	66.66	68.75
Mixture, &c. ....	10.57	1.45
	100.00	100.00

Infusions of tea and coffee should be made with boiling water, but they should never afterwards be boiled, for the aromatic principle is very volatile, and would be thus lost; besides which, a decoction of tea or coffee is disagreeably bitter on account of the solution of the coarse forms of extractive matter. Soft water also extracts these matters, and, therefore, appears to give a stronger infusion than moderately hard waters, but it is always at a sacrifice of delicate flavour. Excellent tea is made in London with water of 14° or 15° of original hardness, and of about 5° when boiled. This was a subject of investigation by the Government Chemical Commission (Professors Graham, Miller, and Hofmann), who were appointed in 1851 to inquire into the chemical quality of the water supply of London; and they reported that in their experiments they found that tea made from the boiled London water

of 5° of hardness, could not generally be distinguished from tea made with water of 2½° only, although a delicate palate would recognise a slightly increased bitterness without any enhancement of flavour in the latter. It would seem, indeed, that moderately hard water makes the best flavoured tea, provided it is allowed to stand upon the tea sufficiently long. In the case of the Greenwich pensioners the tea was made from water of 2.4° of hardness before boiling, and 18.6° after; but the infusion was maintained for half an hour, by surrounding the vessel with a steam case; and thus an excellently flavoured tea was obtained. The Commissioners, indeed, truly remark, that “where any great loss of strength of tea infusion has been observed in passing from a soft water to a harder, it may be probably referred to the circumstance that the mode of infusing it has not been properly adapted to the hard water; and then there is doubtless some waste of tea.” Lake waters have been a good deal extolled on account of their softness and supposed fitness for making tea, solely because they happen to produce a deep-coloured solution, which conveys a false notion of strength; but in reality, flavour is always sacrificed for the mere look of the thing, there being no increase of physiological or dietetical property. The Chinese, who are very good authorities on this subject, never use either very soft or very hard waters, for their rule is to take the water of a running stream — “best from the hill side, and next from a river.” We may conclude, therefore, that water of from 4° to 7° of hardness, after being boiled, is best suited for infusions of tea and coffee; for such water dissolves the aromatic and physiological constituents without extracting the disagreeable bitter principles. In the case of coffee, in fact, a little acid, as a portion of lemon juice, improves the flavour, notwithstanding that it adds to the hardness of the infusion. Experimentally it is found that infusions of tea and coffee are strong enough when the former contains 0.6 per cent. of extracted matter, and the latter 3 per cent., so that a moderate-sized cup (5 oz.) should contain about 13



grains of extract of tea, or 66 grains of coffee. These proportions will be obtained when 263 grains of tea (about two and a-half teaspoonfuls), or 2 oz. of freshly roasted coffee are infused in a pint of boiling water; and the amounts of the several constituents dissolved are about as follows:—

Constituents.	Tea, grs.	Coffee, grs.
Nitrogenous matters .....	17'2	44'0
Fatty matter .....	...	3'0
Gum, sugar, and extractive .....	31'7	103'2
Mineral matters .....	9'1	22'8
Total extracted.....	58'0	173'0

So that tea yields to a pint of fresh water about 22 per cent. of its weight, and coffee about 20 per cent. Lehmann found that only 15½ per cent. of tea was dissolved by water; whereas, Sir Humphrey Davy estimated it at 3½ per cent. No doubt the quality of the water as well as that of the tea affects the results, for distilled water will extract from 40 to 44 per cent. of black tea, and nearly 50 per cent. of green; but for all this, about 22 per cent. is a good average.

Tea is generally measured into the tea-pot by the spoonful, and Dr Edward Smith has made a curious inquiry into the average weights of a spoonful of different kinds of tea. The results are here shewn:—

#### WEIGHT OF A SPOONFUL OF TEA.

Black Teas.		Green Teas.	
	Grs.		Grs.
Oolong.....	39	Hyson.....	66
Congou (inferior)..	52	Twankay .....	70
Flowery Pekoe....	62	Fine Imperial ...	90
Souchong.....	70	Scented Caper ...	103
Congou (fine) .....	87	Fine Gunpowder.	123

From which it would seem that from three to seven teaspoonfuls of black tea, or from two to four of green, are required for a pint of infusion of the strength already given.

#### COCOA—ITS VARIETIES.

*Cocoa* is best made by boiling the mixture

for a little while, for it nearly always contains a large proportion of starchy matter, which has been added to dilute the rich fat of the cocoa. Indeed cocoa contains so much butter or solid fat (from 48 to 50 per cent.), that it is necessary to reduce it with some easily digestible substance, as starch, lentil powder, carageen moss, Iceland moss, sugar, &c.—hence the various preparations of it called *granulated cocoa*, *soluble cocoa*, *chocolate*, &c., the processes for making which I will briefly describe. When the berry is roasted and is cold, it is passed through a machine called a “kibbling-mill,” which deprives it of its husk, and of the thin skin which surrounds the kernal or nib. If the nibs thus cleaned are ground in proper mills, they form the variety of cocoa called *flaked cocoa*, but if other preparations are to be made, the nibs are ground between heated rollers or otherwise, until they form a smooth paste, when the diluting substances are mixed with it and are thoroughly incorporated. If *soluble cocoa* is to be made, the diluting material is sugar with some kind of arrowroot, as *tous-les-mois*, *maranta*, *curcuma*, &c. If *chocolate* is required, the diluting material is sugar only, with some flavouring agent, as vanilla; and if fancy preparations, as *carageen moss cocoa*, *Iceland moss cocoa*, *lentil cocoa*, &c., are required, then these several substances are incorporated. *Granulated cocoa* is a preparation of cocoa, with sugar and starch, so ground as to form a coarse powder, in which the particles of broken cocoa are covered with a layer of sugar and starch. It is obvious that whenever the mixture consists of starch or other farinaceous substance, the solution of the cocoa preparation must be boiled; but when sugar has been used, as in chocolate, which is the most antient preparation of it, the combination is such as to require no culinary treatment, or, at most, the action of boiling water or boiling milk.

## ON DRYING AND PRESERVING SEA-WEEDS.

IN the present age, when so many of our readers resort annually to the sea-side, and spend hours among the rocks on the pebbly beach, or wandering over the smooth sands, we deem that a few words on the subject of the collection and preservation of those beautiful marine productions—sea-weeds—may not be unacceptable.

As we gaze into the pools which the sea forms on some rocky coast, or look down into the depths of the waves while sailing over their surface, we cannot but be struck by the beautiful, the luxuriant, and the delicate forms of vegetation which we see there gracefully grouped together, or waving and floating with each motion of the element in which they exist.

We need not inform sea-weed gatherers that it is not on fine summer or autumnal

rush over the surface of the ocean, lashing it to fury, and fierce waves dash upon the rocks and tumble boiling on the beach; then, as the tide recedes, should the gleaner go to work,



Fig. 1. *Sertularia operculata*. (Sea Hair.)

days, when "not a breath disturbs the deep serene," that they may hope to find many treasures, but when heavy clouds cast their sombre tint on the waters, when gusty winds



[Fig. 2. *Plocamium coccineum*. (The Landscape Weed.)

seeking in all the hollows and round all the obstacles likely to catch and retain the floating harvest. Time should not be allowed for sun, rain, or the air to fade and alter the weeds, but endeavour to snatch them fresh as they come from their briny home, and when obtained, the sooner they are "floated out" the better. The following is the process:—

Throw the collected sea-weeds into a basin of fresh water, into which salt, in the proportion of a teaspoonful to a quart, has been infused. Cut pieces of writing-paper, or thin Bristol-board, to the size required for the book or portfolio about to be formed; take a quire of blotting-paper and cut that up into rather larger pieces than the others, and allow at least eight portions of blotting-paper to every one of writing-paper. Have a soup-plate or

dish half full of fresh water; take one specimen at a time from the basin and immerse it in this water, then take a piece of writing-paper and slide it under the weed, gradually bringing it up closer and closer to this latter with one hand, while with a camel-hair pencil in the other you float the weed out, and diffuse it so as to shew almost every portion of it; now raise the paper gently out of the water, and gradually slant it so as to drain off the superabundant moisture; if any portions of the weed do not lie smoothly or gracefully, dip a finger in the water, and let fall a drop or two on the offending portion, and again gently touch it with the brush; we need not say that with some of the finer and more delicate specimens, patience is exceedingly requisite, as the filaments cling and heap together, and often require the aid of a needle to separate them properly, and repeated dropping of water to float them into an easy and natural position. When this is satisfactorily achieved, lay the paper on five or six pieces of blotting-paper, stretch a piece of old mull or clear-muslin over the specimen, and then put four or five more pieces of blotting-paper on it, and then a heavy weight or pile of folios; several specimens may be put one on

the specimen in the *least degree*. In about three days, if the weather is favourable (not damp), the specimen will be perfectly dry and ready for insertion into the book; it will retain its colour for years, and is in a manner incorporated with the paper on which it lies. To those however, who may not have time or



Fig. 4. *Sertularia abietina* (Sea Fir).



Fig. 3. *Nitophyllum oscellatum*.

the other, if from ten to a dozen thicknesses of blotting-paper are laid between each. Leave it thus for twenty-four hours, and then very carefully remove the weight and take away the blotting-paper and muslin and dry it or replace it by fresh, taking care not to disturb

patience to wait the natural course of drying, we may mention that a heavy heated flat-iron pressed on the folds of blotting-paper, forms a more expeditious means of getting rid of the moisture, and, if carefully managed, impairs the hue of the specimen but little. We must remark that the method of proceeding above described is applicable only to the thin, fine, and delicate weeds, as the Landscape weed (*Plocamium coccineum*, fig. 2), the Dock-leaved or blood-coloured *Fucus* (*Delessaria sanguinea*), the varieties of the *Nitophyllum* (fig. 3), the Scarlet *Dasya* (*Dasya coccinea*), Sea-hair (*Sertularia operculata*, fig. 1), and such like.

The varieties of *Dulse*, of *Desmarestia*, of large mosses, and of *Laminaria*, must be soaked first in salt and water, then dried in a towel, laid out on a table or board, and every portion of that which is to be the under side passed over with a camel-hair pencil dipped in a solution of gum-dragon; the gummied side must then be applied to the paper destined for the specimen, and the after pro-

cess is the same. The Sea-fir (*Sertularia Abietina*, fig. 4) will answer well, treated in this manner.

Some of the larger and heavier kinds, again, may be affixed to the card-board by narrow bands of paper, gummed across their branches, or strips of card-board inserted into incisions

in the main piece. An infusion of gum-mastic in spirits of turpentine, forms an excellent wash for some of the large coarse specimens of *Algeæ*, and give them a bright fresh appearance; it must not be applied, however, until they are perfectly dry and fixed.

### ON THE PHILOSOPHY OF BLUEING AND STARCHING LINEN.

IT is often worth while to think upon and discuss those things which are apparently of small importance. The laws of nature apply to small as well as to large operation, and the explanation of phenomenon of great importance may frequently be found in the investigation of trifling occurrences.

Mr Ruskin, should this meet his eye, would no doubt smile, while he would acknowledge the truth of the statement, that the same natural principles, by the observance of which the great Turner (who he asserts was the only artist who ever did paint water true to nature), obtained his effects, include the one by which a washerwoman makes a bosom assume a whiteness of snowy purity.

All tints are heightened by transmitted light. No artificial pigments or dyes whatever can approach the glory of the prismatic colours; but if artificial colours are laid upon a transparent surface, and light permitted to pass through them, the effect of transmitted light will at once be seen. The stained windows of churches are good illustrations of the increased beauty of colour by the transmission of light.

The effect of transparency may however be produced in some degree by artificial means. Light in passing through transparent substances is more or less separated into its primary colours by differences in thickness and density, and the form of the surface. Moreover the colour of the transparent body itself has effect in the absorption of other colours, so that light rarely passes through transparent bodies unchanged. It took a long time to discover a

means by which the dispersion of light, when it passes through the lenses of optical instruments, could be obviated, so that the image presented to the eye should exhibit the colours of the object inspected by their aid. It is obvious, then, that if a tint be added to a colour so delicately that the impression produced by it does not change the original tint essentially, something of the effect produced by the transmission of light will be attained. The less of admixture with other colours any tint possesses, the more easily will light be transmitted through it, or perhaps it would be proper to say, that unless the mixture be so perfectly compounded that a distinct new tint is produced without a muddy crude appearance, the transmission of light will be more or less interfered with. This perfect blending is what is called by artists purity of tint. It is seen in perfection everywhere in nature, in the clouds, in water, in flowers, leaves, and fruit.

An absolute white has a dead, dreary appearance, caused by the utter absence of the effect of transparency. It is, therefore, rarely used in ornamental work unless it be so placed as to be enriched by delicate reflections from adjacent objects. What is generally called a pure white has more or less of a very delicate yellow, green, or blue tint, the absence of which would be very sensibly felt, although its presence, as a tint, is scarcely perceived. This is why *blueing* is used in the starching of linen, though we venture to say that the reason for it has rarely been thought of sufficient importance to repay analysis.



## FASHIONS FOR THE MONTH.

AS a very novel costume I will quote a toilette worn at Deauville by the Countess d'Al. A *jupon* of sky-blue Mexican cloth (silk and wool). At the bottom of the *jupon* a volant to match, surmounted by bouilloné round the volant, and on each side the bouilloné small ruche of azure taffeta. Abeille skirt, relieved behind and also on the sides, so as to resemble two wings of a bee; ruche of blue decoupé taffeta trimming the skirt, and bows of the same on the sides.

Bodice open, *en cœur*, with Valenciennes lace, with gathers in it. Large sash of sky-blue taffeta, with very short ends fringed on the stuff.

Medallion consisting of an antique cameo, encircled with massive gold, suspended from the neck by azure velvet.

Watteau chapeau in white straw, trimmed all round by a flat ruche of black taffeta, embroidered with small lace; cluster of princess rosebuds at the side.

The Létorière chapeaux are covered all over with curly feathers, with the velvet edges of the same colour as the feathers, and on the sides a train of small flowers. This is charming in grey or blue, with agrafe of vine leaves with white or pale mauve rose.

L'Andalou, black with edging of velvet, crowned with black feathers and aigrette, suited wonderfully well to brunettes.

Robe of *crêpon* (double shaded tan and Bismark brown), trimmed with a *chicorée* of the same coloured taffeta. At the bottom large volant, ornamented at the top and bottom by a ruche of taffeta. The bodice is cut flat, plain, and high, with small ruche at the shoulders, and bottom of the sleeves also flat. Full mantlet forming a *pelerine* round behind, long flaps, and rounded in front. The mantlet has a *chicorée* ruche round the flaps and towards the sash, to which there is added a black lace. On the middle of each flap is set a cockade of black *chicorée* ruche. The same ruche round the neck. Bonnet of black straw, encircled by a band of black velvet,

accompanied by a small diadem of daisies, with black buds in the middle. The daisies are continued at a regular distance on a barbe of black lace, which is fastened on the neck by an imitation daisy.

Rose of azure foulard, with bodice, or more often small *cosaque*, the *basques* of which are rounded and descend on each side of the skirt, ornamented with pointed denticulations and fringe, with round edge formed in small tassels. The back of this *cosaque* resembles a mantlet vest in white alpaca, which may be white piqué instead. It is encircled with small denticulations, which are lost in the slope, and descended the whole length of the side in front; the front being also in white alpaca, and long ends of the sash, also in white alpaca, edged with lace, which is terminated in a triangle by a fringe to match that at the bottom of the *basque*, which ends are fastened at the top by a bow with Greek plaits set in the form of a fan, and separated by a flat agrafe, ornamented by four buttons.

Toque of white straw, ornamented with garlands of blue campanulas, and two short puffs of blue blond behind.

*Jupon* of light water-green taffeta, ornamented at the bottom by a very high ruche à la vielle, fastened on each side by a small gauze of green silk. Camargo tunic of black taffeta, with a large puff behind. Under the puff, in the middle, is a knot of black taffeta embroidered with green. The tunic is open in front, *en tablier*, and is rounded behind. It is ornamented at the bottom by a roll of green taffeta and a resille fringe of *passementerie* mingled with jet, and at last by a flounce of black guipure. The bodice which is sown to the Camargo is quite flat, the sleeves ornamented in the bottom by a high plait. *Fichu Marie Antoinette*, forming two plaits behind, fastened at the waist by a knot with ends in black taffeta, embroidered with green. The *fichu* is open in front, and its points fastened in the sash. The skirt of green taffeta is in the ordinary proportions of wha

is called round half-length skirt. The flounce is plaited above, and shows its reverse all round.

Robe of raw Tussor foulard. Jupon ornamented in the bottom by cerise velvet passed through the hem of the foulard. Upper skirt trimmed with same velvet, and a fringe of cerise silk at the edge. It must be observed that the skirt is much shorter in front. Bodice with round basque, forming a basquine, serrated at the waist by a sash of raw foulard embroidered with taffeta. The bodice is cut straight under the seams below the arms, and in consequence forms several plaits at the waist. It is ornamented with cerise velvet passed in the hem. Flat sleeves, trimmed at the top and bottom by the same velvet. Cerise velvet on the neck, sewn under the small collar of the dress. Few details are necessary for the cutting out of this costume, because the small *cosaque* gathered under the sash is very simple. It has no small side, but a decided centre under the arm suffices to diminish the excess of plaits at the waist.

The skirt is of the ordinary cut, such as I have before described for the green robe, which has only one flounce at least. The second skirt is of the same cut, and shorter all round, and solely ornamented by the fringe.

Bonnet of Coburg straw, ornamented with black velvet and garland of red roses.

Young ladies' toilette. Jupon of blue and white striped sultana. Tunic of white alpaca, décolletée squarely, ornamented with azure lace and small braid, with a small dahlia of white alpaca, embroidered with azure blue. The tunic is buttoned straight in front, with short sleeves with *guimpe* underneath in muslin, with flat plaits and small piped *ruche* round the neck. Round white chapeau, ornamented with sky-blue velvet. Round the *calotte* small bow of blue velvet. Blue boots, with mother-of-pearl buttons.

Robe of mauve taffeta, first round skirt, half-length, ornamented in the bottom by a bias-piece to match, set between two rows of satin lozenges, each ornamented with three long pearls set across the lozenges. Second

skirt of a darker mauve, ornamented in the bottom by a row of lozenges, and trimmed with a heavy silk fringe with *passementerie* top. This skirt rises with large plaits behind, and is lost under the basque tunic of the body, which forms behind a large bell plait, and two others on each side of the first, which are draped by degrees, and forming a half-length tunic in front, rounded and joining the bottom of the second skirt. Flat sleeves, and ornamented near the cuffs by a large flat *ruche*, the middle of which is fastened so as to form a cuff à la veille. The sash, round and plain, is fastened behind by a bow of different shades which compose the toilette.

Robe of flame-coloured faille. First skirt with a train trimmed with a volant mounted with large plait, having underneath a *bouilloné* to match, and small *ruche* of black lace for top. Rising tunic, without sleeves, in black grenadine edged with a volant to match, the top of which is fixed by a very small piece of black taffeta, embroidered with black satin; the tunic, rounded in front, forms at the bottom of the sides rounded parts, relieved by bows of black grenadine, and forms a rather long and ample puff behind. The bodice is ornamented with slopes of a volant of grenadine, fastened by a bias of taffeta to match with the trimming of the tunic, with the same bias round the neck. Underneath, high bodice, with flat sleeves of flame-coloured faille, terminated by a double-headed plait. Round sash, fastened on the side by a bow.

Round robe in black faille, with high volant mounted in piping in violet faille; flat bodice of round cut, and flat sleeves. Mancini mantlet in violet faille, edged with small piped volant. The mantlet is with reverse, and open *en cœur* on the chest, the ends square and passed in the sash, rounded behind and retained in the sash, with long Hungarian sleeves edged with the same piped volant, terminating this charming toilette.

Chemisette in embroidered muslin and Valenciennes, ornamented by a small jabot; sleeves to match. Head-dress relieved in front with small coronet of muscat grapes of rose colour.

## Miscellanea.

### TO PREVENT DECAY OF WINES.

The decomposition of wine may be arrested without the addition of any drug or deleterious compound. The plan is to heat the wine that is fermenting to about 130°, this causes the destruction of the ferments, which fall as a powder to the bottom of the cask, or vessel; after which the fluid becomes clear and palatable. This may answer for malt liquors, but we cannot speak on this point with certainty.

### AGEING WINES.

This may also be effected without the addition of any foreign substance, by keeping the wine for a few days at a temperature of 100 deg. This causes increased chemical action of the ferments, and speedily ages the wine.

### A GOOD CEMENT.

Gutta percha dissolved in chloroform, so as to make a fluid of the consistency of honey, produces a good cement. When spread it will dry in a few moments, but it can be softened by heating. Small patches of leather can be cemented on boots by its use in such a manner as to almost defy detection, and some shoemakers employ it with great success for this purpose. It is water-proof, resisting all the elements but heat.

### GERANIUM LEAVES.

It is not generally known that the leaves of the geranium are an excellent application for cuts, where the skin is rubbed off, and other wounds of that kind. One or two leaves must be bruised and applied to the part, and the wound will be cicatrized in a very short time.

### EFFICACY OF ONIONS.

A writer says:—"We are troubled often with severe colds, the result of colds of long standing, which may turn to consumption or premature death. Hard coughs cause sleepless nights by constant irritation of the throat, and a strong effort to throw off offensive matter from the lungs. The remedy proposed has often been tried, and is simply to take into the stomach before retiring for the night a piece of raw onion after chewing. This esculent in an uncooked state is very heating, and collects the water from the lungs and throat, causing immediate relief to the patient."—*Washington Chronicle*.

### DOG BITES.

The veterinary surgeons are proving very satisfactorily in the *Times* that a dog's bite is just as dangerous at one time of the year as at another, and may occasionally produce tetanus, like any other bad wound, whether the dog be "mad" or not. Mr Coote gives an example of a bite which caused death from tetanus six weeks later, though the dog did not go mad, but fed as usual, and shewed no further symptoms of excitement. Probably a haggled wound from a nail would have just the same effects. Whence the inference that Sir R. Mayne is doing very right to have all the dogs muzzled—not only now, but throughout the year: a perfectly logical conclusion, at which Sir R. Mayne will probably exult greatly—but what a prospect for our dogs! Lest their bite should have the same effect that a scratch with a pin might have on a person in ill-health, they may be condemned to wretchedness all the year round! A diseased cat bit two persons and a horse the other day in Paris. The *Spectator* suggests, therefore, that Sir Richard Mayne should issue a general order for the universal muzzling of metropolitan cats.

### A NEW LOCK.

If electricity, in its wild and natural state, be to a man a furious and fitful enemy, it is, when tamed and domesticated, a patient slave, an obsequious agent. For each of the hundred freaks that it plays in the one condition, there can be set off some useful service that it performs in the other. The last electrical novelty is a really safe and burglar-proof lock, one which raises an alarm by ringing a bell or otherwise, if any key but the lawful one is inserted in it, or if any attempt is made to pick or to force it. The principle of the contrivance can be easily understood. Wires from a battery, with a bell in their course, are led into the lock, and whenever a piece of metal is thrust into the keyhole, a circuit is completed by which a current is sent to agitate the bell. If one of the tumblers alone be raised the bell also sounds. The master-key does not raise any alarm because it is covered with an insulating compound which prevents the establishment of the metallic connexions requisite for the passage of the current to the bell, and likewise, because it lifts all the tumblers at once. We have heard of tell-tale locks, but these betray tampering only after the mischief is done; here is a protector that cries, "Stop thief!" in good time.—*Once-a-Week*.

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COUNTRY GENTLEMAN'S MAGAZINE

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DECEMBER 1868

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*SHELTER AS A MEANS OF IMPROVING ESTATES.*

THE attention of our readers has no doubt often been directed to the importance of shelter, not only in relation to live-stock, but also to cultivated crops, pastures, and even human beings. Nor must it be supposed that we only require shelter to protect stock against cold. It is also necessary to shield grazing animals from the scorching heat of the sun; for, although in these islands we have a greater number of cold and cool days than of very hot weather, still we have sufficient experience of the latter to render some shelter from its effects desirable in the case of animals pastured in the fields. Sheep require such shelter quite as much as cattle, and any doubts on the subject will at once be removed, when it is observed how sheep as well as cattle seek the shade of such trees as are in the pastures, during the mid-day heat. For summer purposes a simple shed placed in some convenient part of the field, and, if possible, near water, is all that is necessary. The materials may be of the cheapest kind; rough posts, covered with any inexpensive material which can be conveniently obtained. We have seen sheds of the kind covered with the branches of spruce, fir, and, in fact, any kind of small brushwood, or even whins, and the shelter afforded was quite as good as if the shed had cost ten times the amount in its construction.

In the *Country Gentleman's Magazine* for November (page 473), a diagram was given,

showing the form of plantations made on farms in the mountainous part of the south of Scotland, for the purpose of affording shelter to sheep during stormy weather. All who have had experience in sheep farming on high-lying pastures, will readily testify to the benefit gained by having such protection at command, and it is therefore surprising that it is not more generally adopted. In many hilly pasture districts nothing of the kind is to be seen, although no valid reason can be assigned for the neglect of it. As the existence of shelter of this kind on hill farms adds to their value, proprietors should make a point of causing proper plantations to be placed in suitable positions, when hill sheep farms fall out of lease, or during the currency of a lease, should the occupying tenant offer no objections, which we scarcely think would be the case. Even arable farms have a much snugger and warmer look imparted to them by well designed plantations, and the idea of warmth thereby conveyed, exercises a certain amount of influence on those who look at a farm with the intention of offering for it.

The existence or absence of shelter in the case of pasture or cultivated crops, where shelter is desirable, is easily detected by the appearance of pastures or growing crops. Where plantations have been formed, on a proper principle, in districts which are naturally bleak, the grasses or crops which obtain the benefit of the shelter are forward in their growth, and are much more luxuriant



than plants of a similar kind, which are not equally protected, although the natural qualities of the soil, and the system of cultivation pursued may not be materially different. Even the existence of a good stone wall, or a well-grown hedge, will make a considerable difference in this respect, and we have seen crops growing luxuriantly within an enclosure, while those outside were stunted and worthless; the distinction arising, not from any difference in the soil or culture, but simply from the fact that in one case the crops were sheltered, while in the other they were exposed to bleak winds. The grasses grown under shelter are also strong, of good kinds, and nourishing, but those which are not protected are short, coarse, and of little value. By means of draining and shelter it is in our power to make a climate, and thus we find pastures and crops grown at a comparatively high but well sheltered elevation, bulky, productive, and early, while in a lower but open and bleak locality, they are scanty and poor. The late Mr Thackeray was certainly not an agricultural writer, but in his "Sketch-Book of Ireland," there is a passage which supplies a good illustration of the point we are discussing. "On the road from Cork to Bantry," he says, "the character of the landscape is for the most part bare and sad, except here and there in the neighbourhood of towns, where the people have taken a fancy to plant, and where nature has helped them, as it almost always will in this country.

*If we saw a field with a good hedge to it, we were sure to see a good crop inside; but many a field was there that had neither hedge nor crop."*

But illustrations of this kind are to be found in almost all parts of the country, and there are few who have not experienced a grateful change after travelling over a low, but quite unsheltered district, under a biting north or east wind, on ascending into a higher country, where plantations screened the road, and caused a very sensible alteration in the temperature, and consequently in the comfort under which the journey was performed. To say that the value of shelter is unknown, would be saying too much, but it is nevertheless true that in many districts it is evidently not appreciated as it deserves. Other modes of ameliorating the natural state of soil and climate have received due attention, and been undoubtedly productive of vast benefit to the country, but it is not unusual to find that the advantages expected from such modes of improvement have not been fully realized, which may be traced to the fact that they have not been preceded by or accompanied with that which is calculated to give them due effect—namely, shelter from biting, bleak winds. With this addition, draining, trenching, liming, manuring, &c., become much more effective; let it be neglected, and those important means of improvement are frequently deprived of more than half their value.

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### BURNING ON RAILWAY BANKS.

THE clouds of flame and smoke on burning railway banks and adjoining grounds, as well as the fire-wasted appearance which they everywhere presented during the past almost unprecedentedly dry summer, until quenched, and again rendered verdurous by the Lammas floods, will long be remembered by railway travellers. Owners of fields and plantations adjacent to railways are not likely soon to forget the con-

stant anxiety which they then experienced, lest their pastures, or grain crops, and growing timber should become a prey to that prevailing and erratic fire-plague, the numerous sources of which were emitted from locomotive engine furnaces, and the records of their devastating spread filled large portions of the daily newspapers, to the truth of which, testimony is still borne by numerous existing remnants of burnt railway hedges, as

well as by many more or less extensive tracts of fire-stricken, withered, and stem-blackened trees. Had not the rains come so opportunely as they did, or just before the grain crops attained to burning dryness, it is difficult to conceive the amount of further national loss which might have emanated from uncontrolled recklessness in railway fire management. The rains, however, did come just in time to prevent this much-dreaded calamity, and such a dry season as the last may not again occur for many years. Therefore, many seemingly feel disposed to allow railway companies to have their own way in the matter of fire-raising, seeing, as they too hastily conclude, that much injury does not arise to others from their being so privileged; and when it does arise they should be ready, and are, no doubt, always willing, to pay for damages so caused; also, that they have now become so uncontrollably powerful that it is advisable to avoid all possible legal interference with them. Those who thus argue, however, cannot have taken the trouble to estimate the damages which, even in an ordinary season, is caused to crops, and more especially to plantations by fires of railway origin, which amount to almost a prohibition against planting either for profit, ornament, or shelter near railways. Nor can they be cognizant of the difficulties which are thrown in the way of claimants for damages; first, by the total denial of liability, on the ground that the engines have been fitted up as required by statute; next, that they have statutory running powers, which, if complied with, exempts them from all liabilities, just as an authorized dealer in combustibles and other inflammable materials, or the owner of a wood-yard is not liable for the destruction of his neighbour's property when caused by an accidental explosion, or fire-rising in his own; and when driven from this line of defence, they fall back as a last resource upon the denial of the fire having originated through their means, unless witnesses can be produced who actually saw it emitted from their engine, and observed the kindling therefrom to take place; no easy thing to do, seeing that anyone who saw such a thing

happen would be justly censurable for not stamping out the fire before it got time to take hold and spread.

In America, where forest conflagrations are much dreaded in consequence of the awfully destructive and uncontrollable magnitude to which they are apt to attain, railway engines are fitted up with very effectual, although rather inelegant huge spark-catching funnels; and although it might not be advisable to compel our railway companies to adopt a similar contrivance, yet it is surely within the sphere of just legislative interference to compel them to fit up funnels which will emit only smoke and dust, or dust-like sparks, and to have furnace-fittings which will not allow of live cinders above half-an-inch or an inch in diameter to pass through, and that only between the lines of rails, without becoming spread abroad, as is now done with both funnel and under-ejected cinders, many of which are lumps of several inches in diameter.

In Belgium and other parts of the Continent, railway banks are cropped and cultivated in a manner that never fails to call forth the admiration of British travellers, which is usually expressed in combination with regrets that a similar practice is not prevalent at home. But, although even to hope for its adoption might imply the expectation of too much from our railway companies, yet motives of safety and economy, might induce them to adopt a far more fire-resisting as well as remunerative mode of cropping and management than they now practise, which may be summed up as consisting of—Inattention to the surface-soiling of the banks when they are made; sowing them with improper seed mixtures; the total neglect of after cultivation and manuring; unwarrantable delay and neglect in cutting such crops as are grown; and the unskilful management of the crops after they are cut. Each of which heads of mismanagement we proceed to notice in detail as follows:—

1. The inattention to the surface-soiling of railway banks when originally formed has ever been a sin of omission, chargeable against our railway engineers and their employers. How many thousands of acres of good pro-

ductive soil has been recklessly buried throughout Great Britain in embankments, and wasted in, as well as under, spoil heaps, where it can never be recovered, will never be known; and in relation to this wilful waste it would seem as if in the present depressed state of the railway market, shareholders were experiencing the verification of the old prophetic proverb, "Waste not, want not." Whereas, had all the original surface-soil been carefully preserved, and relaid over the slopes in combination with judicious drainage, much excellent food-producing land for the support of man and beast would have been restored to the country; and our railway banks, instead of exhibiting the appearance of weedy wastes, would have been converted into scenes of fertility and beauty.

2. Sowing with improper seed mixtures has, so to speak, intensified the bad results of imperfect soil-surfacing, by producing a vegetation comparatively worthless in itself, and at the same time calculated to feed and spread fire with rapidity. In the early days of railway formation furze or whins were frequently sown on the banks, but their facility in taking fire soon led to their entire abandonment; and although among common native plants the natural grasses stand next to whins in the possession of these dangerous fire-spreading properties, the most unsuitable of these, in mixture with the commonly cultivated clovers, are almost exclusively sown for imparting a verdant covering to the ill-prepared bank surfaces. In the earlier sunny days of spring, before the withered foggage of the natural grasses becomes overpowered by the growth of their young leaves, it is highly fire-catching, and also in droughty summers, when it becomes withered and dry, although clovers and other dicotyledonous plants still retain their greenness and freshness unimpaired. White fibrous-rooted grasses, which have little hold of the ground, such as the common ryegrass, become also dried up much sooner than those deep-rooted sorts, like the creeping soft-grass (*Holcus mollis*), yet all are bad, and should have no place in railway bank seed mixtures; for even casual observers must have noticed

how the spreading of withered grass-devouring flames, have been checked and turned aside on reaching a patch of red, white, or yellow clover, bird's-foot trefoil, yarrow, and even such weeds as the perennial nettle, perennial field thistle, and many others. Hence, for banks, when the surface-soiling has been so imperfectly performed as not to admit of regular rotation cultivation, perennial red clover should be permanently sown where the soil is tolerably good and sufficiently dry; white, yellow, and hybrid clovers, where it is somewhat inferior; the common bird's-foot trefoil, yarrow, and the milk vetch, in high and dry places; the greater bird's-foot trefoil in wet or marshy parts; and, if we look at the natural verdure by railway sides, in the chalky districts of England, sainfoin, lucerne, burnet, and even the yellow melilot, or spiked shamrock, recommend themselves for dry calcareous soils, and most of these may be advantageously sown in mixtures, although all the requisites for their successful growth may not be present. Owners of railways adjoining plantations would therefore do well to discourage the growth of natural grasses in them, by substituting mixtures of the above mentioned plants, or planting others having like fire-resisting properties.

3. The total neglect of after-cultivation and manuring is far from being excusable, even although the surface-soiling may have been insufficiently applied. Wherever the soil is capable of growing any of the above mentioned useful plants, they will be greatly improved, in the first place, by the eradication of all rampant-growing weeds, such as ragwort, thistles of different kinds, docks, and others, before they commence to flower, by which the hurtful spreading of their seeds over the banks and adjoining fields or ground will be prevented; and next, their increase in growth will always much more than repay the proper application of suitable portable manures.

4. The over delay in cutting such crops as are grown on railway banks is a great cause of fire-spreading; and even within the precincts of populous towns, losses and alarm by fire were not unfrequent in course of the past summer, and great as well as long-con-

tinued anxiety was experienced by many owners of valuable property lest the dried and neglected grass and weed-covered railway banks should catch fire and spread it to their adjoining premises; a state of things for which there can be no semblance of an excuse, and which, as it is easily prevented, should never be tolerated either in town or country. Nor does this charge of over delay in cutting bear reference to the first crop only; for cutting of the aftermath, even where it is sufficiently bulky to render this remunerative, is often delayed till too late, or not done at all; whereas all foggage, and more especially where it is grassy, should be closely shaven about the middle of October, when its growth is nearly completed, and, by thus removing the old foliage, would effectually prevent the prevalent burning of railway banks in early spring.

5. The unskilful management of the crops after they are cut. The utmost safety against fire can only be ensured by removing the crop in a green state, or before making it into hay; but as this cannot always be effected, the least possible delay should exist between the cutting and clean gathering of it into small detached hay-cocks, and these again into larger ones, placed as much out of the reach of burning cinders as possible, but only suffered to remain there till sufficiently dry for their final removal, and being made into small hay-stacks. In place of this treatment, the too common practice is to allow the crop to dry in swathes, which then easily catch fire, and spread it rapidly in whatever directions they lie. Again, gathering such dry swathes together is often so carelessly done, that a sufficient quantity to catch and spread fire is left on the ground; and when made into hay-cocks they are often situated too near to the rails, and allowed to remain in this dangerous proximity much longer than is needed to dry them sufficiently for final removal.

In conclusion, we shall only notice another means by which we are persuaded railway fires are oftener originated than is generally believed. In pre-railway days we had frequently to travel on one of the best equipped four-in-hand stage coaches, which was driven by a Jehu of the right sort, who had acquired the knack of jerking the long lash of his whip so effectually and yet softly round the neck of roadside barn fowls or ducks, as to allow of his lifting and swinging them gently over his head, to be relieved by the guard or any of the top passengers, who, on letting them down again, enjoyed the strangely bewildered appearance which they exhibited after having thus returned from their involuntary ariel flight. This piece of whip dexterity coachey justified on the plea that it did the fowls no harm, but rather taught them to keep out of harm's way for the future, while it afforded a passing amusement to the outside passengers when he had any, and when he had none it relieved the tediously monotonous existence of himself and the guard. Railway station attendants, who are compelled to pass frequent intervals in listless idleness, also occasionally urge the excuse of the necessity of excitement to counteract this tedious monotony, when remonstrated with for passing in needlessly close proximity to advancing trains, and performing other dangerous feats for which there may be no existing necessity. And seeing that the occupations of both railway engine drivers and their firemen are not less tiresomely monotonous than those of coachmen, guards, and station attendants, they may also claim the necessity for a little exciting amusement when they indulge, as we have seen them, in the thoughtless pastime of ejecting live coals upon patches of withered herbage, and hay-cocks—looking back as they sped on their way to see whether a little curling wreath of smoke gave indication of their having hit the mark.



*PROFITABLE EMPLOYMENT OF AGRICULTURAL MACHINERY.*

SUCCESS in farming, as in most other departments of industry, depends quite as much upon the way in which the routine work of the farm is carried on, as upon the soundness of the principles on which the system is based. In many districts, however, there is a great and a growing scarcity of agricultural labourers, and in all, higher wages amongst that class, so that the heavy labourage and other expenses form subjects of just complaint amongst arable farmers. The only remedy in the emergency is to supplement manual labour with improved implements and other machinery. The familiar adage, that "necessity is the mother of invention," has been and is being amply verified in the production of implements and machinery for the farm; for, with the scarcity of manual labourers, we have not only machinery to fill their room or do with diminished numbers, but by it all the requirements of modern farming are met in a great degree to save labour expenses, and thus to facilitate and cheapen production, and to elevate the position of the labourer. The extensive use of agricultural machinery within late years, if it has not radically altered the character of our British farming, has at least given it a position as a manufacture which it did not previously occupy.

The object of this paper is to give the writer's experience with machinery in the working of farms, in the hope that to some at least it may prove equally interesting, if not quite so important, as weightier subjects on the theory and practice of agriculture. We have frequently heard a want of such experience expressed, which led us to make memoranda of our ordinary farm work as it proceeded.

## HAY-MAKING.

On the farm under the management of the writer, the extent cut for hay annually is about 300 imperial acres. Previous to 1862 this acreage had to be cut with the scythe, and for many years it was found that there

was a growing scarcity of men to do the work. The mowing was let to a party or parties of men, at from 2s. 6d. to 7s. per imperial acre. The latter price was exceptional, but occasionally paid, when the crop was heavy and trodden down by game, which frequently happens, as the greater portion of the above acreage is old grass land in a nobleman's park, where game is not only strictly preserved, but propagated both naturally and artificially. Besides the increasing expense, sufficient hands could not be got to overtake the mowing of the grass when in the proper state for cutting. In 1862, two of Burgess & Key's combined reaping and mowing machines were bought, and with these we cut the crop in one-fourth of the time previously taken to do it by manual labour. The machines, too, cut much closer than the scythe, securing more hay, and what is often considered to be the most nutritive part of it—viz., towards the root. The closer it is cut the readier the aftermath or foggage comes away, as moss and other vegetable matter, which often formed a sort of carpet under and beyond the reach of the scythe, is either taken clean off or broken up to the freer action of the atmosphere and rains. We contrive to cut our grass as nearly as possible when in the bloom. At this stage it is considered that the greater proportion of the different grasses are then in their most nutritive state when made into hay. With the view of overtaking the work when the crop is in this stage of ripeness, we put the two machines on to double shift, each shift being eight hours. We have four pair of horses, set apart for the mowing, and work them in relays of 4 hours each, beginning at four o'clock A.M., and finishing at 8 P.M. Our average work is 6 acres per 8 hours with the single reaper, or 24 acres per day *in toto*. We do not consider this as anything extraordinary, but when we take into account the comparative unevenness of the surface, and the weight of the crop (averaging better than 2 tons of

hay per acre), we have every reason to be satisfied with it as regular farm work. There is one man in charge of each machine, besides the driver of the pair of horses, and by remaining in charge for the sixteen hours he receives double his ordinary pay, or 5s. per day. The four pair of horses are under their regular drivers, who at this season work eight hours instead of nine, their regular day's work, but who, on account of mistiming, receive their usual pay.

The cost of cutting the 6 acres we may estimate at—One man in charge of machine, 2s. 6d.; one man with pair of horses, 8s.; one girl with rake to clear away at turnings, 1od.; beer for men, 6d.; oil for machine, 2d.—total, 12s., or at a cost of 2s. per acre, against 4s. on the average of years by manual labour. In cutting the crop last year only one of the machines had a single breakage, which, however, was easily repaired by the farm blacksmith. They are always kept in good order, our practice being to overhaul them and put them into perfect repair at the end of each season.

We have not charged anything for tear and wear or depreciation of machines, for the superiority of the work done by them, and the greater quantity of hay got, as compared with manual labour, more than covers any expense in keeping them up. They have now been six seasons at work, and are quite as efficient as when they came from the maker's hands, although they have cut in that time about 1800 acres of grass and 600 acres of corn.

We use Boby's and Howard's hay-tedders, and keep them working almost close up to the mowing machines, our object being to get the hay put into cocks without too much exposure to the sun or rain. When sufficiently dry to be put up into larger cocks or pikes (small ricks), the cocks are drawn together by a pair of horses yoked to a hay-sweep. When fit to carry we build the hay into stacks of about 80 and 100 tons. The larger the stacks the better is the quality of the hay, if it only be in a condition to keep from fermenting too much, as less surface is exposed to the weather, and the hay is nicely

compressed, and cuts out firm, with a fine colour and flavour.

In our northern and variable climate we cannot make hay so expeditiously as our neighbours of the southern counties, but the despatch of the work while the sun shines is all the more necessary. In assisting with the stacking a very important implement, and one which deserves to be brought into greater notice, has, of late years, been introduced—namely, Wright's elevator or hay-stacking machine, by which about eight men can be dispensed with at the stack's side as compared with the old plan of manual labour. It was our custom, formerly, so soon as the height of the stack got beyond the reach of a man from the ground, to have two ladders standing against each stack, with two or three men (according to the height of the stack from the ground) standing upon them, the one above the other, while at the bottom of each ladder there were four men handing the loaded forks, which were sent up only in single file and in succession to the builders on the stack. By the machine spoken of, however, a two-horse load of hay can be put upon the stack at any height in about three or four minutes, while our hands are two men with light steel forks to load the machine, and four women to put forward the hay, which is pushed off the carts as they arrive in succession. It may be asked why not fork the hay from the carts to the stack, and when the stack gets beyond reach to use a portable stage, and fork it on to it? The answer is, that this method would detain the carts in the yard, and less hay would consequently be carried in a given time. An extra outlay in wages at this important time is only a secondary consideration compared to the securing of the crop when the weather is fine. We drive the machine by horse-power, consequently there is the horse, and the boy additional who acts as driver. To make a comparative estimate of the saving effected, under the former method of manual labour, we had fourteen men at 2s. 6d. each per day, £1, 15s.; while under the latter we have two men at 2s. 6d., 5s.; four women at 1od., 3s. 4d.; one boy with horse, 5s.—total, 13s.

4d., or a saving of £1, 1s. 8d., or rather more than eight men at 2s. 6d. per day.

Moreover, a much greater quantity of hay can be stacked in one day with the regular hands on the farm than formerly by an additional force of manual labourers. The machine itself is an endless net, revolving round gullies or sheathes at top and bottom, and it delivers the hay in a continuous stream upon the stack. It is supported at the top by a pole or ladder, which stands in the middle of the stack. It is easily arranged for work, is portable, and can without difficulty be taken by a single horse to any part of the farm. It can be worked by hand, horse, or steam power, but we prefer the horse-gin, as there is always more or less danger from fire by having a steam-engine in the proximity of hay or straw. The horse-gin is furnished by the same maker for the express purpose of driving this machine, although it can be put to other purposes. On one of our farms we have it driving a turnip-pulper during the winter months. It is also portable and simple, though somewhat novel in construction. The two—viz., the elevator and horse-gin—may be considered as one implement or machine, and one of the best yet introduced to the farm; and the greatest credit is reflected on the maker, Mr Wright of Boston, Lincolnshire. The cost of the elevator is £35, and the horse gin £22, making in all £57, the interest on which, at 5 per cent., would be £2, 17s., whereas the actual saving of £1, 1s. 8d. per day, calculating that we stacked ten days at the rate of 60 tons per day, would give a saving of £10, 16s. 8d., or nearly 20 per cent. on the outlay. Figures, however, are scarcely the legitimate criterion by which to judge the merits of such a machine as the above, as the diminution of the hands at stacking adds to the carrying force, and time is gained which is invaluable in such work. Altogether, the work can be done much quicker with the regular workers employed on the farm than formerly with a number of extra hands at higher wages. We have frequently had all our hay nicely secured before almost any of our neighbours; but our good fortune was in

a great measure due to the assistance of machinery.

#### HARVESTING OF CORN CROPS.

So much valuable experience having of late years been given to the public, of the benefits of machinery in the harvest field, we think it superfluous to say almost anything under this head. The saving effected by the reaping machine in cutting grain approximates pretty closely to what we have stated in reference to the cutting of our hay crop—viz., a reduction of one-half the cost as compared with manual labour, although almost every district will shew some variation in the results attained. This is accounted for by the difference in the facility of getting good labourers (reapers), and the difference of the crops as to weight and bulk. Many of the grain crops, from their lodged and twisted condition, often defy any attempts to reap them satisfactorily with machinery; but, as a rule, the reaping machine is now quite as indispensable to the farm as the plough.

#### TILLAGE OPERATIONS.

*Turnip Culture.*—So soon as the land intended to be ploughed is cleared of the corn after harvest, the steam-plough (Fowler's) is set to work, and generally first on the stronger clays. The land is broken up with the two-furrow plough to a depth of from 12 to 15 inches, and, when partially dried, worked with the steam harrow. The common plough, drawn by horses, then ridges up the land in drills of about 30 inches in width, so as to expose a large surface to the winter's frost. When left in this state it is in a nice and mellow condition in spring, and by being then worked with the steam-cultivator the pulverized soil is never turned down.

In preparing for the sowing of the turnips in May, the horse-ploughs drill up the land afresh, and the manure is laid in the drills. The artificial manures are sown with Reeve's patent manure-distributor, which sows three drills at a time, and much more equally and efficiently than can be done by the hand. It is in every sense an efficient labour-

saving machine, for, with a horse and boy, it can be made to supply the place of eight or ten women.

The summer work amongst the turnips differs little if anything from that generally practised. We find that they cannot easily get too much work between the drills with the various horse-hoes or scarifiers. In the autumn the turnips are pulled and taken clean off the land excepting the tops, which are generally ploughed in as manure. To fold sheep on our cold clays and poach them does an irreparable injury. If, by reason of previous rains, the land is too soft to carry the carts in leading off the crop, the roots are run off to the gate or headlands with a portable railway. This adds to the expense of lifting the crop, but it is more than counter-balanced by avoiding injury to the land, which is generally seeded in the month of November with wheat. So great is the injury done to clay land by injudicious carting upon it, that the bad effects are very visible in some instances over a longer period than a rotation of five years.

But to return to the steam-plough, its value was very apparent to the most casual observer in the droughty autumn of 1865. In that year, after all harvest operations were concluded, the stubbles were so hard and dry that many farmers were compelled to wait for rain before they could be ploughed by horses, whereas we got to work at once with the steam-plough, and had a large breadth broken up in the most efficient manner, and the result was equally apparent in the crop of turnips—double the weight per acre on similar land in the neighbourhood ploughed with horses.

*Laying Down Land to Permanent Pasture.*  
—A large breadth of the strongest clays have been sown away to permanent pasture without an accompanying grain crop, and in preparing the land the steam-plough has been of the greatest service. Our practice is to take an oat stubble, and drain it thoroughly, the depth and distance of the drains being respectively 4 feet deep and 18 feet apart. It is then broken up with the steam-plough, and afterwards subjected to a summer-fallowing,

during which time it is cultivated with the steam-plough, cultivator, and harrows, and when thoroughly pulverized it receives a heavy liming. The lime is covered in with the diggers, or cultivators, or both; and when it is thoroughly intermixed with the soil, the field is left in this state over the winter. In the month of April the mixture of grasses is sown, the land receiving at the same time a good top-dressing of rape dust. No department of farm and estate management has excited our admiration more than the results attained by this system.

*The Cost of Steam-Ploughing.*—Not having kept any account or journal of the work done by the steam-plough generally, we are not able to give a correct estimate of its cost in detail. On several occasions, however, we have made calculations of the cost of ploughing different fields, as well as carefully measured each day's work, and made an estimate accordingly. One instance taken from the writer's note-book, dated 31st March 1863, will suffice:—"Estimated cost of ploughing field, No. 10 on the plan, measuring 11 acres 1 rood 36 poles, not including removals, = 4s. 10d. per imperial acre. Estimated cost of ploughing the above field *including* removals, a distance from another farm of about three miles, but not including removal hence, which we would propose to debit to the field whither next removed, = 6s. 3d. per acre."

The highest day's work (nine hours per day) performed in this field was 4½ acres, or at a cost of about 4s. 6d. per acre. We estimate the cost thus:—Engineman, one day, 3s.; ploughman do., 2s. 6d.; anchorman do., 2s. 4d.; two porter boys at 1s. each, 2s.; boy, with horse and water cart, 4s.; coals or coke, say 3s.; oil, 1s.; interest on capital, say 6d. per acre, 2s. 3d.; total, £1, 0s. 1d.; or about 4s. 6d. per imperial acre.

The wages stated have all been increased fully 1s. per week for men since 1863. The above was work done with the two-furrow plough. We have had many instances where the work has cost a good deal more per acre, and in some a good deal less, but the above we consider a fair average under favourable circumstances as to situation and



form of field. The cost of such work is, however, not the proof of its worth, but the heavy crops which follow it afford the best argument in its favour. The anchor has since been laid aside, and a second engine introduced, the result of which is an increase in the extent of each day's work, and greater facility in ploughing angular corners of fields.

OTHER MACHINES, ETC.

*Blake's Patent Stone-Breaker.* — Having fixed steam machinery on all the farms in our occupation, the only work which we have for the steam-plough engine, when it cannot be employed upon the land, is to drive Blake's patent stone-breaking machine, but we cannot report much more than two or three trials of its efficiency. These trials, however, were in every way very satisfactory. The price paid for breaking stones for six or seven miles of roads or drives through the park was formerly from 2s. 3d. to 2s. 6d. per cubic yard, while with this machine from four to five cubic yards can be broken in the hour. The sum paid annually for breaking stones on the estate, for the park and farm roads, would on the average of years exceed £50, while with this machine that sum will be reduced by at least one-half. The cost of the machine is £180, and taking into account the expense of working it, tear and wear, and other contingencies, the return on the outlay we fully expect to exceed 10 per cent. per annum.

With our fixed steam-engines we thrash our grain, pump water, grind corn for the feeding stock, as well as break and grind the various feeding cakes. One of our farms, situated within an easy distance from a railway station, is made the store for corn required for upwards of 600 horses and ponies employed upon the estate, chiefly in the mines. The corn for these horses is all bruised by machinery. When brought from the station, the bags are drawn up to the granary by a simple but clever hoist, formed by two sheaths or wheels, which are supported by a small triangular frame to the wall, the one sheath being a few inches from the ground, and the other above the door

head, where the grain is taken in. A large rope works on these sheaths, drawn by a horse, and the bags are sent up as fast as three or four men can take them in. The oats being frequently *ex ship*, there is a greater or less quantity of dust and refuse in them. They are emptied into a spout, which takes them to a winnowing machine, where they are cleared of the dust. An elevator lifts them as they come from the fanners, and empties them into the brusier, after passing through which they are ready for being sent off to the various pits, &c. The winnowing machine, elevator, and bruiser, are all driven simultaneously by the steam-engine.

*Bone Mill.* — On the farm under the management of the writer there is also a bone-mill, driven by steam power, with which we grind annually about £1000 worth of bones. We only apply the half-inch bones to the lighter class of soils, their action being too slow to be profitable on our clays.

*Turnip Pulper and Chaff-Cutter.* — Two more machines demand a passing notice, as valuable economisers of the food of stock—viz., the turnip pulper and chaff-cutter. The one is, in a manner, the necessary adjunct of the other. By an admixture of pulped roots and cut straw we can, with a stock of about sixty cattle, effect a saving of about 100 tons of roots in the six months, while the stock thrives at least equally well as on sliced roots. Cut hay or straw we find to be invaluable, too, for our sheep. We give an admixture of cut hay and straw to our farm horses, but we cannot say that we are so successful in getting them to eat it as with our other stock.

It would be easy to extend this article by a reference to other machines and implements of the farm, very efficient in their place, but we have confined our remarks to those which we deemed most worthy of notice, so far as our experience with them goes. The number of implements manufactured for the farm are now unlimited, and not a few of them are useful. One cannot enter a show-yard without being struck with the fact, that it requires great judgment and tact to make a selection of the really valuable out of the

chaotic mass. On many estates and farms large sums of money have been thrown away on implements and machinery which have proved an encumbrance, and worse than useless. There are, doubtless, some of this description on almost every farm, but the numerous trials of implements and machinery

under the auspices of the Royal Agricultural Society of England and other associations, coupled with the experience of practical men on their own farms, now widely diffused by the agricultural press, tend in a great measure to obviate the adoption of any but those of tried merit.

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### SHELTER IN RELATION TO LIVE STOCK.

IN the remarks on feeding cattle for the butcher, which appeared in this magazine for November (p. 434), under the title of "Meat-making," we noticed the practice followed by Mr M'Combie of taking up his beasts early from grass, deeming "a week's house-feeding in August, September, and October as good as three weeks in the dead of winter," and shewing that exposure to stormy weather during autumn had the effect of making a difference of £5 a-head between those which had been put up early and others of the same lot left out a month longer on the pastures. This opens up, the question of shelter and its effects, which are not confined merely to live-stock, but extend to cultivated crops, pastures, and we may even add to human beings, as noticed at page 513.

It is now a well-recognised fact that shelter is an economizer of food; and this arises from the fact that animals exposed to cold waste the elements of respiration, or fat production, derived from their food, in keeping up the natural heat of their bodies. Let them have sufficient shelter to obviate the necessity for this dissipation of animal fuel, as it may be called, and the excess goes to the production of fat. "Peeling the flesh off the bones," is a common and very expressive description of the result when animals are exposed to cold drenching rains during the latter part of the year. The "condition" which was acquired during the heat of summer becomes wasted when an extra demand is made upon it in order to maintain the natural heat of the body, and thus those who are careless as to sheltering the cattle at that

season, when shelter becomes necessary, are practically engaged in pulling down with one hand what they had carefully and expensively built up with the other.

The merits of the case have been very clearly stated by Mr John Wilson, Edington Mains, in the following terms:—"But another source of far more serious waste of food than was imagined has been recently discovered, or, at least, more satisfactorily explained than heretofore. It is now ascertained that of the food consumed by warm-blooded animals, a considerable portion is expended in maintaining the natural heat of their bodies; which is, in fact, to be regarded as so much fuel which is dissipated by a process strictly analogous to combustion, and the fat, accumulated under certain circumstances, as a store of this fuel laid up for future emergencies. This being understood, it is at once apparent that if fattening cattle are exposed to a low temperature, either their progress must be retarded, or a great additional expenditure of food incurred. Farmers have long been aware that cattle fatten fastest when kept dry and moderately warm, and they account for this, vaguely, by saying that they are most *comfortable* in such circumstances. But modern science has taught us that it is in this respect with animals as with steam-engine boilers; prevent radiation of heat from the latter by a sheathing of some non-conducting substance, and you get more steam from less fuel; protect the former by suitable clothing or housing—that is to say, keep in their animal heat—and they will eat less and yet lay on more fat."

An apt illustration of the justness of these remarks will be found in the results of an experiment made by the late Lord Ducie at Whitfield, which, although perhaps known to some of our readers, may not be familiar to all. One hundred sheep were placed in a shed, and ate 21 lb. of swedes each per day; another hundred were placed in the open air, and ate 25 lb. of swedes per day, yet, at the end of a certain period, the sheep which were protected, although they had a fifth less food, weighed 3 lb. a-head more than the unprotected sheep. The reason is very obvious; the exposed sheep expended a large proportion of their food in keeping up their animal heat, which was rendered unnecessary in the case of those which were under shelter. There was thus a gain in the increased weight of the animals, and also in the saving of a fifth part of the food, which is a consideration of no small moment at a season of the year when food is, for the most part, scarce. Shelter, therefore, by affording warmth to the animals, is directly advantageous, and decidedly economical, so that it ought to be one of the first points attended to in the management of live stock from birth until their final departure to the fat market.

And, although it may, in some respects, be rather out of place, we would desire to notice what we consider a very reprehensible practice—namely, that of shearing fat sheep at an unusually early period in spring, previous to being sent to market. This practice is followed, perhaps, more in the case of the London market than any other, and we see sheep denuded of their warm fleeces, and exposed to the bitter blasts of early spring, from a desire on the part of their owners to reap what they suppose a double advantage, in having the fleece to dispose of as well as the animals from which the wool was taken. But the advantage is very doubtful. Comparatively short as the time is during which the unfortunate animals are exposed to the cold, it is sufficient to have a depreciating effect on their value as meat, and

as the butcher takes the state of the skin and its covering of wool into consideration when making his purchase, he of course gives much less for a sheep “out of the wool” than he would do for the same if left unshorn; so that, altogether, it is, as we have said, very doubtful if the early shearing of fat sheep puts anything in the owner's pocket. Viewed in another light, it is cruelty to the animals when they are deprived of their natural covering at a time when its warmth is still necessary for their comfort.

To resume, we ask, are the principles which have been laid down as essential to the prevention of waste of food duly attended to in the general management of live stock throughout the kingdom? There are districts, no doubt, where we find little to desire with reference to this point, but in very many instances this is not the case. Not only are young beasts kept out all winter in the pastures, without any shelter save that of a ragged fence, and without any additional food as a help to what they may pick up, unless in very stormy weather—that is, during a long tract of snow and frost, when some middling hay is given to them, mostly thrown down on the ground; but we also find dairy cows, heavy in-calf, exposed to precisely similar treatment. And when, as in other parts, the cattle are enclosed in yards, it is but too frequently the case that the yards are without shelter sheds of any description, and the poor animals are condemned to wade through a mass of wet filth up to their knees, and pick up a living from the not too liberally supplied straw racks with which those yards are furnished. Barley straw and water is but poor feeding for stock, but even barley straw and water would be of more service if consumed by the animals in dry warm sheds. We may boast of our advancement as agriculturists, but so long as such practices as those we have described continue to exist in any part of the country, we should at least boast with moderation.

## TENURE OF LAND.

BY MR JOHN DUNN OF MAESTEG.

LITERALLY rendered, "tenure" means "the manner or condition under which tenements are holden;" and a "tenement" means "anything held by a tenant." Whether, therefore, we approach the subject from the landlord or tenant's side of the question, it is plain that to either it must have an importance and significance greatly superior to any question of detail in carrying on any operation in practical farming.

On a theme so inviting, and having so wide a bearing on the agriculture of our common country, it were easy for an accomplished essayist to dwell in glowing language, and to portray in vivid colours a picture of what the broad page of Britain might be, were its agriculture conducted under the circumstances believed by the writer to be most favourable for its development.

I, however, have claim to no such ability, and therefore it is that those (if any such there be), who have come here this evening in the expectation of enjoying an intellectual treat, will have to go away disappointed. My object will have been sufficiently accomplished, if I succeed in placing before you the subject selected in a plain and practical manner; and give food for thought, and matter for discussion. Nor is it a new or novel subject which is to be brought under notice. All land is held on some kind of condition, and has been ever so, though manifold are the variations, and apparently arbitrary distinctions, under which the tenant farmer holds and cultivates.

Doubtless, in the days of chivalry, the cultivator of the soil was looked on by his landlord as a property; and hence it may be that the historian may be able to trace, even down to our own days, links of that chain of feudal dependence which then existed in pristine vigour. But the relation of landlord and tenant has changed since then, and with it, it is hoped, advantage to both.

## RELATIONS BETWEEN LANDLORD AND TENANT.

The landlord no longer looks on his tenant as a "born thrall," nor does the tenant deem it part of his duty to exchange at the bidding of another (albeit his superior in social position), his ploughshare for a sword. The relation is founded on a different foundation from that which it then had—viz., on the foundation which gives to it a commercial aspect, and which is cemented together by mutual interest.

It has been my fortune to hear and read no small amount of sentimental twaddle on what is, after all the talk about generous confidence, mutual esteem, and respect, but a commercial question in the fullest sense. It is in this light, then, that I intend to exhibit the

subject. Not that I am indifferent to, or insensible of, the advantages which accrue in conducting the ordinary affairs of life in the sunshine of mutual respect and esteem, for I well know that, blended together as are the interests of a landlord and his tenant, it is of very great advantage that they co-operate heartily and cordially. What I mean to inculcate is, that the mutual respect and esteem should spring from the proper performance of the duties required of each in his business relation to the other.

## LEASES AND CROPPING CONDITIONS.

It must, I think, be apparent to the merest tyro in agricultural economy, that the conditions under which land is held by a tenant should be such as to give him the greatest possible freedom of action compatible with security to the landlord, that the land shall not be deteriorated during the tenancy; and to do this the tenant requires a security in his tenure which practically places him in the position of owner during the period of his occupancy. The great cry is, and has been, that too little capital is employed in cultivating the soil. But capital is never attracted to a comparatively insecure investment, and hence we arrive at the important question of the tenure of land in its relation to capital. The history of British agriculture of the present and latter half of the last century, is but the record of the application of capital guided by experience. But it was at the close of the last, and commencement of the present century, that agriculture in the northern section of the kingdom made the most rapid strides in the path of progress. Then it was that, protected by long leases, and stimulated by high prices, capital began to be freely invested in cultivation, and in reclaiming from a state of nature much land, which, hitherto, had been comparatively barren. And in after years, when prices greatly receded, there remained a spirit of improvement which here and there manifested itself, and served as a beacon to lighten on to success, those who were following in the beaten path of a past generation, but which had ceased to lead to a profitable result.

The remembrance of how the land had been scourged by successive exhausting crops naturally induced landlords to look closer into the conditions as regards cropping under which they let their lands; and hence we may find some show of reason for some of those restrictive clauses which forbade growth, in a time when knowledge could not guide to restoration by other means. Necessary, however, as restrictive clauses might be in times when knowledge could point to no other means of restoring exhausted land than



rest, they are no longer required in these days of artificial manuring, of feeding stock with concentrated food along with grass and roots, of practice with science.

To my mind, restricting a farmer to a definite course of cropping, is but another method of preventing him from availing himself of that knowledge of his art he has attained by experience and observation. In a word: than the clauses as regards cropping inserted in many agreements, there could, in my opinion, be no better means taken to prevent the application of capital to the cultivation of land.

It were easy to fill a goodly chapter with quotations from agreements, having for their object the mutual advantage of landlord and tenant, but which only tended to impoverish both them and the soil. Some of them might take fair rank in a curiosity shop—such as, for instance, where a clause is inserted by which a tenant must either grind all the corn used on the farm at his landlord's mill, or pay him toll when it is ground elsewhere; the performance of a certain amount of labour by horses and men, or the payment of a certain number of eggs and chickens, will now-a-days raise a smile of derision, when mentioned in connexion with letting a farm. Such were, however, gravely insisted upon at no very distant date, by men who called themselves enlightened landowners. They may fairly be set down as remnants of a bygone age, when feudalism exerted its withering influence on everything connected with the soil.

The commutation of tithes, however, gave the all but finishing blow to this class of absurd and vexatious covenants, and opened the way to the free application of capital. Still, it has been the fashion to consider farming as a baby in leading strings, and quite unfit to be trusted to go alone. I knew an estate where it was absolutely forbidden under the leases on it to draw off any portion of a root crop for consumption in the yard, to grow wheat oftener than once in four years, or to take two straw crops in succession. All which are practised by men who have liberty, with advantage to themselves, and without deteriorating the soil.

The landlord is, undoubtedly, fairly entitled to protection. But I opine that the principle of sale, rather than growth, is the true basis on which protection should rest. It is quite time that all such time-worn bonds were cast aside, and that commercial principles should dictate what is necessary in this direction.

To lay down a rule which should be generally applicable is simply absurd. The soil and climate of the Principality is sufficiently various to indicate methods of management more conspicuous for applicability to particular farms than for their uniformity.

You are probably aware, all of you, that in Scotland, land is so invariably held on a lease that exceptions are hardly known. Whether agriculture in Scotland is progressing faster than it is in districts where yearly holdings are the rule, and leases the exception, I need not stop to inquire; because it is a fact which does not admit of doubt, that the agricul-

ture of Scotland has reached a high degree of perfection, that its farms are generally held by an intelligent tenantry, and that its labourers are skilful, and, for their class, well-informed, intelligent, and tolerably educated.

Of late years much draining has been done there with money borrowed from Government, which has to be repaid by the owner or occupier in a given time. But much land has also been drained, limed, and otherwise improved by cultivation at the cost of the tenant, whose sole protection for his capital so invested is a lease for a given number of years, say nineteen or twenty-one. And thus it is clearly shewn that land held on a lease attracts capital towards it, and affords it complete shelter. It would, however, attract more than it now does, did not the law give the landlord too much preference over their creditors. For, under Scotch law a landlord can not only secure himself for rent not yet due, but he can follow grain, and fetch back the value when it has been bought and paid for. [This power was abolished by the Hypothec Amendment Act of last year.] Now, only imagine what a position the tenant occupies under this law. To be safe, the corn dealer would require a certificate from the landlord that the rent had been paid. I do not give you this bit of insight into Scotch law for the purpose of raising a discussion upon it, but to serve as an illustration of the fact that over-protection to the landlord operates prejudicially to the best interest of the tenant, by limiting his means of acquiring capital, and by so much militates against success. It stagnates improvement and fictitiously raises the price of land, because the landlord, under its provisions, need not be so apprehensive of losing rent, and, therefore, he can let his land to the highest bidder, even when somewhat deficient in capital.

I do not think it is desirable that a landlord should be placed on a perfectly equal position with other creditors. But I certainly do think that it would tend to his own and his tenant's advantage, were his rights limited to the current six months, without any preferential claim over more arrears of rents than one half-year. The business of farming would come more within the scope of mercantile transactions, and money would be obtainable for temporary purposes on nearly the same terms as in commerce.

The restriction of the landlord's preferential rights, too, would necessarily lessen the competition for land; the undue pressure of which, as I have already said, raises rents to a point not warranted by its value, and obliges tenants to submit to restrictions in regard to management, too often at variance with the interest of all connected with a farm. To put a case:—Suppose that A has a farm to let, and that B appears among the list of applicants for it. B is known to A as a respectable man, and a skilful experienced farmer, but short of the capital required to thoroughly cultivate the land to let. He is, however, willing to give a somewhat higher rent than others, and has none of the new-fangled notions about payment for damage done

by game, is not very extensive in his ideas about buildings, nor requires to be paid for unexhausted improvements. A therefore lets B the farm in preference to C, who has ample capital, skill, and experience, and withal a respectable man, but who is also imbued with some disagreeable notions about right of management, game, and buildings, and insists on being paid at the end of his tenancy for unexhausted improvements made in the shape of draining, liming, artificial manuring; and for cake or corn used in feeding stock in proportion to the time expired after making such improvements, and using the manuring and feeding material. To protect himself, however, against loss from B's management, A inserts in the agreement that the land let shall be managed during the term of letting on a strictly four-course system, consisting of—1st, wheat after clover; 2d, roots; 3d, barley; and 4th, clover; and thinks he has secured himself against ultimate loss, while he pockets the present advance of rent without outlays on buildings, or diminishing the quantity of game; B requests a lease, which is granted, and he goes to work. But, after a rotation or two, it is found that the root crops fall off, and that clover ceases to grow. It is known that lime would do much to set this to rights, but the lease is half run, and there is not time to reap the full benefit of its application. Yet it is determined to apply it; but on reference to his cash account, our farmer finds that, notwithstanding his self-supporting system, his ready money is, somehow not increased, and therefore he solicits the loan of a hundred or two; which, not being obtainable, very much because there is every probability that the landlord will one day take all on the farm for rent due and arrears, all thoughts of improvement by liming is abandoned. The lease is then looked up, to see if it permits of a more extended or varied course of cropping; but no, its provisions are plain enough, and, on reference to his landlord the tenant learns that any modification of the covenants of a lease to suit existing circumstances is not to be expected. An application to have the lease cancelled is also refused, and therefore there is no other course open to poor B than to return to his already exhausted farm and still further exhaust it, by a continuance in the same course. His path lies in a groove, leading to ruin. He is probably a member of a farmer's club, and there hears a lecture on the rotation of crops, but alas! the suggestions of the lecturer are not for him to turn to account. He reads some agricultural journal, and learns that the substitution of a pea or bean crop had had a good effect on clover sick land. But his lease rigidly enacts that no departure can be permitted from the celebrated four-field course, which to him is likely to be four-fold ruin, as his cereals now fall off in consequence of the deficiency in his green or cattle crops. Money may be at one or two per cent. but in his case it may as well be twenty; for by this time the preferential claims of his landlord render borrowing an impossibility. The sequel is soon told; the lease expires; the tenant's capital has expired also; the farm is left on the land-

lord's hands to cultivate or to let at a reduced rate to some man of means, who crops as suits the condition of the land, and also, protected by his lease, which provides payment for damage done by game, and unexhausted improvements at the end, expends money freely in the purchase of manures and feeding material. He makes a good profit, and leaves the land in a high state of fertility, or he may renew his lease and go on in the path hitherto successful. And thus it is, that a lease may be a benefit or the reverse. Nevertheless, as proved by experience in Scotland, a lease is a solid security for the investment of capital.

The agriculture of this country is year by year becoming more intensive; the crops grown on old arable land, the live stock kept, the implements employed in cultivation, and the artificial manures and feeding stuffs used, together with the steady increase of rents, amounts paid for labour and taxes, afford an irresistible accumulation of proof that an energetic spirit of enterprise prevails. And, under its working results are brought about, by which not only the landlord, tenant, and labourer, but the whole community benefit. Nor is there the indication that the employment of capital has been overdone. On many farms, indeed in entire districts, there is ample opportunity for the outlay of larger sums; and these districts and farms are indications that the conditions of letting require revision in order to attract the necessary amount of capital to raise production to its maximum standard.

#### YEARLY TENANCY.

I may be told that there is much good farming, much spirited cultivation in districts where the land is held yearly; and that many instances can be pointed to of estates where, under this yearly tenancy, farms remain in one family for generations, and where, consequently, a tenant is practically as safe in his holding as if he had a lease. It may even be possible that men so highly favoured would not care to accept leases were they offered them. This is really very pretty talk, and sounds well in a *post-prandial* oration, but it is, after all, a baseless fabric on which to build the superstructure of rural economy.

I have seen estates let out at very moderate rents, where the tenants vegetated like the plants they cultivated, annually, who were the descendants of a line of ancestors, that had been, to use a familiar phrase, "bred on the farm," going on, surrounded by difficulties in various forms, apparently without desire for improvement; and I have spoken to such tenants about changing their rotation of cropping, of supplying lime, chalk, or marl, where it appeared necessary, and of using cake and corn in feeding their stock, and by this means bringing it earlier to maturity, economising their green crops, and enriching their manure heaps; and I have many times received some such answer as, "Well, we are only yearly tenants: if we grow too good crops, our rents will be increased, and without security for the investment, we cannot apply either

lime or ought else, the benefit of which we cannot receive back at once."

In such cases the right thing to do has always appeared to me to be to raise the rents as a stimulus to improvement, and to give security for the employment of capital, either by a lease for a given number of years with liberal covenants as regards management, or by providing that unexhausted improvements and manures shall be fairly paid for at the termination of an occupancy.

#### SHORT LEASES.

A lease, however, should not be for a shorter period than fourteen years under any circumstances, to give time for the repayment of capital invested in cultivation; and ought to be for nineteen or twenty-one years, where there is draining required, or where the reclamation of waste and hitherto unproductive land is to form part of the operations.

For example, a case which came under my own immediate observation may be cited. A certain farm of about 200 acres, arable, and as much pasture and meadow land, had been taken in hand by the owner, who found that in a given year the yield of wheat on one-fourth of the arable land was 26 bushels per acre. And as the farm had been in his hands for several years, during which a spirited system of management had been followed, this result was unsatisfactory. He, however, did not despair, but continued to expend money freely in the application of chalk, the purchase of artificial manures, and in feeding material. Six years later the average yield of wheat had risen to 40 bushels per acre, and for the next succeeding four or five years it rose to 44, with a corresponding increase in the quantity as well as quality of the other crops grown. Now, had this farm been held under a lease for seven or eight years, it is quite clear no such result could by any possibility have followed the system pursued. There is no royal road to success, and the instance cited proves, if it proves anything at all, that, notwithstanding a grateful soil, a genial climate, a judicious and persistent expenditure of capital, there was required time to make the result commensurate with the outlay. As this is no solitary instance, but a fair example of many others, it may be taken as pointing irresistibly to the conclusion, that to expect profitable results from really good farming on old arable land under a short term of holding, is to expect that which nature stamps an impossibility. This farm did not require much draining, but had there been a preliminary outlay of £6 or £7 per acre in drain pipes and labour, of course a much longer time would have been required to bring back principal and interest to the occupant.

The value of a farm to the landlord is the value in the state in which it is, not what it might be. The value to the tenant is its value after he has gone to the limits proposed in good thorough cultivation. The rent should, therefore, be estimated at the present value; the probable return for the capital estimated

by the maximum yield of the crops, and the period at which that maximum may be reached.

As enough has been advanced to prove the intimate connexion between tenure and capital, I shall go on to notice the connexion between tenure and labour.

#### TENURE AND LABOUR.

To the agricultural labourer the question of tenure comes home with stern significance. He, alone, of all directly connected with farming, is dependent on others. By the operation of a law he is practically prevented from carrying the only commodity he can bring to market, to that market which may be the best at the time. He is, therefore, found on farms where the tenants may have changed several times in his brief day, and have changed masters without any change in his position.

It would ill comport with modern farming, were the agricultural labourer to become nomadic in his habits and migrate with the seasons from place to place. The spirit of the age demands an amount of intelligence, skill, and steadiness in the man, inconsistent with unsettled habits and a varying home. Still, I have come to the conclusion, that the total repeal of the law of settlement would be of advantage to both employer and employed. I have seen agriculture languishing for the want of skill and intelligence in its labour in one county, while in another there were enough and to spare, but which, notwithstanding the inducement of higher wages, could only be obtained temporarily on account of this law. I have seen something like a vestry held over the conduct of an improving farmer, who had imported from a neighbouring county some man whose skill surpasses the skill of the parish, and who was valuable in the management of modern agricultural machinery. I have seen a valued servant die, and his widow and children cast back to their parish long after its ties and associations had been broken up and new ones formed elsewhere. But I have not yet seen that the interests of the employer have been advanced by such proceedings, while the labourer has materially suffered by the rigorous administration of a cruel law. Look at the condition of the labourer in districts where yearly tenancy prevails, and where no payment for unexhausted improvements attracts capital, and you will find him at zero in intelligence and skill. Here you will find but scant employment in the winter, and, consequently, semi-starvation, and all the attendant ills of poverty and idleness prevailing. You will find, it may be, men who have not moved from their parish from their birth, but you will look in vain for any other link of connexion between them and their employers than that they were born on the same farm. Even that link may be wanting, and the labourer compelled, for want of cottage accommodation, to live miles from the farm in a town.

Contrast with this the condition of things where security of tenure exist to the tenant, and who is expending money freely, and you will find every month



in the year bringing its peculiar demands for labour ; you will find in winter grubbing of hedgerow., making compost heaps, mending roads, &c. ; and you will find, too, that the acquired skill to manage a steam-engine and a reaping machine has given a brightness to the eye, an elasticity to the step of the man, while it has also increased his respect for his employer, and furnished him with material comfort unknown to him before, by the higher wages paid, and which he is worthy of.

As agriculture advances, the condition of the labourer must, perforce, advance with it. The art of swinging a flail is very different from the intelligence and thought required of the man who is entrusted with an engine costing several hundred pounds, and on whose carefulness and fidelity to orders the safety of the machinery and success of the whole operation, such as thrashing or ploughing by steam, depend ! You cannot depend on picking up such a man at a day's notice, and hence you must provide a cottage, and make him otherwise so comfortable that he can at least be counted on as being ready at any moment. Nor, can those whose duty it is to perform the less important parts of complex operations be discarded when the job is finished. Men acquire a dexterity in performance when frequently at the same task, which renders their continuance in the service of an employer advantageous, if not quite a necessity. The prudent farmer, therefore, will look around him for such men as will suit his purposes, and to lodge them near at hand. He will be under the imperative necessity of obtaining from his landlord cottages sufficient for the wants of his farm. As time goes on there grows up a new generation who are easily trained to the performance of the work they hear and see much of ere they can practically assist ; the whole resulting in the labourer becoming not only more skilful and intelligent, and consequently, more valuable, but a better member of society.

#### TENURE AND STOCK MANAGEMENT.

In stock management, security of tenure is absolutely necessary to the modern farmer. Except in some mountainous districts on which the light of improvement has not dawned, there are few wether sheep to be had now-a-days four or five years old. The consumption of beef and mutton by our increasing population outstrips population, and this of itself, were there no other cause at work, naturally tends to the slaughtering of animals as nearly as they can be produced.

It is a fact known to the initiated that a well bred sheep can be made into excellent mutton at, say 15 months, and really good beef from cattle not over 27 months old. But to do this, they must consume a considerable quantity of cake or corn, along with hay, grass, and roots ; the full benefit from the use of which is not got from the animals. Nevertheless, it is not of necessity lost. The sheep lives out of doors, and his droppings are, of course, on the land. The

bullock is kept more than half, or it may be, even all his time in the house, and the manure made under him is carefully collected, liquid and solid, and carried off to the land and ploughed in ; the result of this kind of practice being that much better crops of corn, roots, and grass are grown.

Time is, however, required to obtain the benefit. It takes three years to breed and feed your 27-months bullock, and it takes practically two years to breed and realize a crop of fat sheep ; and for the land to return interest on the indirect investment on it, another year or two is necessary. Therefore, we require, say five years for cattle and four for sheep breeding and feeding for repayment in full ; so that, under tenancy at will, where there is no power to obtain reimbursement for the outlay at the end, except from the animal, it is patent that a heavy loss would be the consequence of a tenure suddenly cut off ; to obviate which, and encourage good farming, it has some times been proposed to make such repayments compulsory under authority of an Act of Parliament. I confess, however, to have a decided objection to parliamentary interference in the arrangements made between individuals in matters of a strictly private description ; were it even possible to frame a law which would be fairly applicable to the generality of cases. Experience has shewn that the benefit the land derives from the consumption of cake, &c., depends in some measure on the method of feeding. Thus, if 1 lb. of cake per day be given to a 20 lb. per quarter sheep, there is reason to believe that not more than one-half of it will be converted daily into mutton, and, consequently, one-half ought to be charged to the sheep and the other to the lamb. But if the consumption of cake be limited to half-a-pound per diem, it is possible that the increase in the weight of the animal might pay the entire outlay. Cattle may be fed in the house on cake and other food, and the dung taken away every morning to all sorts of weather, whence issues a copious dark-coloured streamlet, evidence at once of the loss sustained by the bleaching process going on. Lime may be applied to newly broken up arable lands where it will render soluble the inert vegetable matter, abounding in such soils, and thus increase the food of the crops ; or it may be applied to newly-drained, though old cultivated lands, where it may act beneficially by neutralising or setting free acids injurious to vegetable life. It may only act mechanically, and yet by altering the texture of a field be of great service. But it may be applied to land deficient in vegetable matter, or where it can confer no benefit by acting on acids, or where its mechanical action is positive harm. Guano may be misapplied in its application, bones may be put on land where their results will appear for many years, or they may be applied to soils where their action is reduced to three or four. Where equal amounts have been expended, the reversionary interest of draining may be actually worth 100 per cent. less



on one farm than another. Hence it is, that a scale of repayment, to be just to an in-coming as well as to an out-going tenant, should be adjusted according to circumstances fairly considered by those qualified and having opportunity to judge of the merits of individual cases—not in blind obedience to an Act of Parliament, or at the dictation of an arbitrary local custom, but on the authority of a clear, specific agreement, entered into between the contracting parties. Even under a lease, it would be better to admit the principle of compensation at the end, than that the land should be exhausted to the verge of what the conditions permit, in order to recoup the outlay incurred by the tenant.

SUMMARY.

It is scarcely possible to bring within the limits of a single lecture all that could or should be said on a subject like that with which I have imperfectly attempted to deal. I have endeavoured to prove that the relation of landlord and tenant should rest on a more secure and business-like foundation than a tenancy at will; and have stated that where proper security offered for its investment, capital would be attracted to the soil in greater abundance than under present arrangements is found to be the case. I have argued that the preferential claims of the landlord are inimical to the procuring of capital for temporary purposes, and that they are one reason why so much land is held at high rents by men deficient in capital. By an example I have illustrated the working of this abnormal relationship, and exhibited what the result is under normal circumstances. I have proclaimed my conviction that easy rents are not alone the criterion of the value of land, and said that in some instances it were a wise policy to raise them. By a

case from my own observation it has been shewn that time is required to bring about desired results under the best management, and hence have deduced that a lease to be really useful should not be too short, and include in its provisions the principle of compensation for unexhausted improvements and manures at the end. The relation of the labourer's condition to tenure has been laid before you from different points of view, and it has been shewn that he fares best under progressive farming. It has been pointed out that really good stock management is incompatible without security of tenure. I have unhesitatingly stated that Parliamentary interference in matters of business of a private description is unnecessary and likely to prove unjust in some instances, and that arbitrary local customs are equally to be guarded against, and now leave the subject for your verdict. The question is one in which not only owners, occupiers, and labourers, but the entire community have a deep interest. The finances of the United Kingdom are largely affected by the result of our harvests. In a national point of view, then it is important that the soil should be let out and cultivated on those principles, knowledge and experience point to as calculated to produce the maximum yield. We cannot multiply our acres, but it is possible to increase the produce obtained from them. The welfare of millions not engaged in agriculture is affected by the barriers to the free application of capital and science to cultivating the land. Let them be swept away in the tide of progress, and by acting up to the highest standard of practical and scientific knowledge, ensure the prosperity of the agriculturist, and promote the material welfare of the people dependent indirectly on him. And then sing with the poet, "Be gracious heaven, for now laborious man has done his part."

## The Farm.

### ON THE CULTIVATION OF WHEAT.

OUR dictionaries very properly define wheat as the finest kind of grain, but some of our readers may not be aware that it is neither more nor less than a cereal grass; in short, it is a sort of cultivated couch grass. We fancy we hear some one exclaim, impossible! but it is true; and in our day, when its cultivation is almost carried to perfection, and new varieties introduced every year, well may we exclaim, What may not the skill of man accomplish, when he is assisted by "nature and nature's God?" Hundreds of years have rolled along since the rich valleys and plains of Palestine were first covered with golden grain, or since the days when Ruth was a gleaner in the wheat and barley fields of Boaz. Many years have passed away since the patriarch Jacob sent his sons to the exile home of Joseph, for he was told "there was corn in Egypt," and there found welcome and plenty. "The Dreamer" had truly interpreted Pharaoh's dream, and provision was made for the years of famine. Can it be possible that grain, ripened in those distant ages, has been handed down to us (preserved with full vegetating power) in those mysterious mummy tombs of Egypt—wheat that had been sown and reaped when those "distant isles of the sea," "where a people that will be born shall serve Thee," was, it may be, an ice-bound shore or a treeless waste. Wheat in our day is grown in Asia, in Africa, in Northern India, in America, and is ripened to perfection in Australia, but Europe may truly now be called its home, and our own little island stands pre-eminent above all other lands for the propagation of and cultivation of the best varieties. And here we would pay well-merited tribute to one who has perhaps done

more than any individual in Great Britain in improving her cereals—we refer to Mr Patrick Sherriff of Haddington. We purpose to deal with our subject under two heads:—

First, we propose to give our ideas on the preparation of the land with reference to the previous crop; the proper system of working the soil; the quantity of seed to sow, and the most approved method of putting it into the ground. In our second paper we will confine ourselves entirely to the best varieties to sow, and this portion of the subject will be illustrated by giving full particulars regarding a series of trials made this year with five varieties of wheat. Let us first consider the preparation of the land with reference to the previous crop. Suppose a jury of twelve East-Lothian farmers were empannelled to return a verdict on this subject, we assuredly say they would not all agree, but we have no doubt a majority would give their verdict in favour of a potato crop. The quantity of manure required to grow this crop successfully being so large, the next cereal crop must almost of necessity be a good one. The land is thoroughly well cleaned by the extra tillage required for potato husbandry, and a most favourable seed-bed is a natural consequence. Fallow wheat in former days was almost the only winter wheat grown, and no comparison made unless with wheat grown after beans, which some farmers still consider to be the best. No one will deny the fact that our bulkiest wheat crops are grown after beans, but the straw seldom arrives at the same rich yellow golden colour of potato wheat, and it is more apt to mildew. The land is seldom so well cleaned, and we question the chances of getting the grain equally well put in as after potatoes, although

admitting the advantage of getting the bean-land wheat earlier sown.

In reference to the working of the land, we do not approve of a system much adopted since steam power was introduced to work our land—viz., of sowing the grain after the land had been grubbed. This system is most unquestionably of advantage as regards speed, but we prefer having the land ploughed after being grubbed. One especial advantage of giving the land and seed furrow being the complete killing down of thistles; besides, it assists in making the ground firmer, and, in agricultural phraseology, it seems to make the land more true. In allusion to the quantity of seed to sow per acre, this must bear reference to the *condition* of the land and the time of sowing. Our motto or maxim is, sow thin. All land should be in good condition; if not, give an extra supply of artificials, and a small quantity of seed is required. We sometimes indulge in serious reflection on the hundreds and hundreds of pounds annually wasted by this absurd and reckless waste. Farmers' minds are carried away by seeing a rapid and luxuriant braird after thick seeding of the land. Let them watch its effect in spring. How startling the change. Some spot (where owing to the attacks of grub or some other cause) which looked bare and thin—so much so, it was nearly being ploughed up—is seen gradually to recover. The plants have room to tiller out, sending up from ten to fifteen vigorous stalks of wheat, while the thick portions of the field show both a smaller ear and a shorter straw. A good illustration of this came under our observation this year. Last autumn 22½ imperial acres were seeded with 30 bushels of wheat. In one part of the field, in agricultural parlance called butts, where the ridges became gradually shorter and shorter as they fall out on the side ridges, these were sown broadcast from the hand. They were sown thicker, and up to the middle of May they appeared much the best; but they were not so when the grain was cut. The thin sown portion was decidedly superior. Wheat may be sown any

time from October till March. Spring-sown wheat has of late been considered a risky crop, and there are great temptations now-a-days to sow barley. In reference to the comparative advantages of drill-sowing *versus* broadcast, we prefer broadcast for some stiffish soils, clear of wild oats or annual weeds; but for all free lightish land the drill is the best, unless a press wheel is used. The latter is the system generally adopted by the writer. The implement has three tolerably heavy wheels; it follows three ploughs, the furrow is pressed down, and, although the grain is afterwards sown by a broadcast machine, the rows of grain are most distinct, and can be hoed in spring. We have also, for the last three seasons, rolled nearly the whole of the autumn-sown wheat, when a favourable opportunity could be obtained, making the surface perfectly smooth and fine. The old idea of rough lumps lying here and there being of advantage for shelter is neither more or less than antiquated fallacy. After wheat is sown the land cannot be made too firm. We hear some exclaim, "This may be all very well for light land." It is good for all land where a roller can be used without what is called the *poaching* the soil. We have tried repeated experiments, and the rolled portions were always the best. It is the character of our people to be careful and cautious. Let any one who doubts, give this system a fair trial, and we have no fear but he will repeat it. We admit the young wheat plants obtain shelter during winter from those lumps of clay we designate *as clods*, but how difficult it is for the young shoots to run out and make fresh rootlets on this uneven surface. It is true, the wheat is rolled in spring whenever the season will permit; but these clods are pressed down, and for a time retard this, and check their tillering power. The autumn-rolled wheat requires only to be harrowed or hoed in spring. These observations are made from a three years' trial of this system. One word before we close this portion of our subject on autumn application of artificials. Nearly all autumn-sown wheat will be benefited by the application of something to give a rapid braird, and

on soft lands to stiffen the straw, and we highly value a mixture containing ammonia, phosphates, potash, and salt. Our first experiments with salt were made in 1855, with the following results:—viz., a top-dressing of 2 cwt. sulphate of ammonia per Scots acre gave 12½ bolls good wheat, equal to 4 bushels to the boll;  $\frac{3}{4}$  light; 229 stones, of 22 lb. each, straw; 61 stones broken straw and chaff. The same top-dressing, with 1 cwt. salt, gave 12½ bolls 3 stone 8 lb. good wheat;  $\frac{3}{4}$  bolls 2 stone 10 lb. light; 264 stone, 16 lb. straw; 39 stone 10 lb. chaff and broken straw. Here there is not a great difference in the quantity of grain, but the weight of straw is considerably greater, and the quality of the straw was so distinct we remember being able to distinguish it in *the dark*.

We approach this part of our subject under a full sense of the difficulty of giving a correct opinion. The variations of soil and climate completely negate any single experience when merely confined to one locality. We shall endeavour simply to give the results of a trial of one of the most approved varieties generally grown in East Lothian in competition with two new white wheats and two of the best red varieties. Suppose a farmer is asked the question—What is the best variety of wheat?—he can give but one answer—viz., the variety that he individually finds to produce most money per acre on his farm during an average of years. In order to ascertain this he *must make* experiments with different kinds. He must carefully watch the character of the season, and also study the nature of his soil, and pay the most marked attention to the general effect of the weather on the different varieties of wheat he has under cultivation. Taking the variations of seasons into account, we do not consider that anything like a fair or correct opinion can be formed unless the same experiments are repeated at least five times. It is true, there may be exceptional seasons like the summer of '68, which we may say stands without a parallel in the history of our agricultural experience, in having tested to the full the prolific power of all the varieties of wheat we had under experiment. All alike

shared the fine weather of November and December in braiding. The cold of early spring fell equally on all, and the genial April showers, and the tropical sunshine of our summer allowed the blooming qualities of each variety of wheat an equal and full advantage. It is well known that all wheats are most fruitful in dry seasons, and our bad wheat harvests are after wet summers. It is therefore evident the variety of wheat which will mature best under adverse weather, and proves the most profitable variety for an average of seasons is *the one to cultivate*. Wheat suffers much from being early laid before the ear gets free from the shot blade. It never blooms properly, and consequently cannot fill. Stiff strawed varieties are therefore to be preferred. Owing to this peculiarity of the straw, we have, on the same farm, known a difference of 8 sacks per acre—Fenton wheat yielding 12 sacks, and Hunter's wheat only 4 sacks, on land in the same condition, although the Hunter's wheat looked by far the most bulky. Here the variation of soil would apply, because we are well aware many of our best farmers sow nothing but Hunter's wheat, because they find it the most profitable. We have Hopetoun wheat, and a variety known as Lady Hall or Mungoswells, and Fenton, all shoots from the same tree as Hunter's; still, every one of them is marked by a distinct variation in character, all of them being much stiffer in the straw than Hunter's, and, consequently, on most farms more prolific. Of red wheats the number is legion; they are all prolific, and, in our opinion, too little sown in East Lothian. We fear there is too much of this feeling amongst our farmers—viz., *I got the top of the market to-day* for a fine sample of Chiddam, Talavera, or Pearl; and we all admit a very happy feeling this is, reminding one of "Dr Marigold," after his lucky tour and sale of his wares—and like him, makes one inclined to undo the two under buttons of his "veskit" to give room to a little extra "inflation;" but we should always bear in mind it is not a high price per quarter, but the most money per acre that pays us best. We have invariably found that all very fine varieties that top our



markets are the most delicate growers, and yield least produce. We give all honour to anyone who devotes much time to the cultivation of, and successfully propagates new varieties, which may stand unrivalled for the number of quarter loaves per bushel; but it is the farmer's interest to realize most money per acre, and we have no doubt he will better attain this by growing red wheats. Of these there are Kessingland, Hallet's, Browick's, and the Prolific Spalding, all belonging to the same family, and very large croppers; but we prefer Lammas red and Nursery red, the latter being a peculiarly good seller, and by all judges considered equal to the finest white for the baker. In the best wheat-growing districts of the south of England, a mixture of Lammas and Nursery is much grown. The straws being of different lengths, the ears have more room, and in this respect gives the mixture the character of Fenton wheat, which we consider the most prolific and profitable white variety in cultivation. We think it would well repay all farmers to get their seed wheat from England every year. We believe 8s. per qr. will fully cover the extra cost, and this alone is more than balanced by thinner sowing, &c., to say nothing of the superiority of the crop, which invariably is better after English seed. There is another great advantage, it ripens at least a week earlier, which is of importance for wheat sown late in the winter months. To illustrate the advantage of getting English seed every year, we remember some time ago getting a bushel of Kessingland from Norfolk. From the bushel we had 7 sacks. It was sown again, and the crop good. It was again sown, and the character of the wheat seemed quite changed, and the crop a poor one. This may be attributable to some peculiarity of the kind of wheat. We have many instances of the same wheat being grown on the same farm for twenty-five years and upwards, without ever being renewed or changed. The wheat which we would call the champion variety of Scotland—viz., Fenton, three stalks of which were found growing in an old quarry on Fenton-

barns' farm in the year 1838, has been most successfully grown there ever since, without ever being renewed or changed over a period of something like thirty years. The same remark may be made regarding Hunter's wheat, which has been grown on a farm in the neighbourhood of Dunbar for a still longer period. We do not consider these facts at all condemnatory of our views regarding the advantage of change of seed from the south every year, because we have never heard of changed seed having been tried on those farms, and its advantages have had no opportunity of being proved. When a farm is once celebrated for the purity of the kind of grain grown there it may be dangerous to introduce changed seed of the same variety. Some slight mistake or mixture might occur, and here, we would add, it would be well for all seed growers to confine themselves to one variety in order to establish perfect confidence in the purity of the grain. There is an old saying in East Lothian regarding seed grain—viz.,

“Oats from the hills and barley near the sea,  
And wheat from the best land there may be.”

We agree with the truth of this adage regarding wheat and barley-seed, but we question the advantage for oats, unless after an early season like last. In late seasons high country oats cannot possess the same vegetating powers of well-ripened oats in lower districts, and it would be well for all farmers in high country or late districts to procure *all* their seed grain from early land. The advantages of doing so are much greater in regard to wheat and barley than oats. We admit the possibility of a greater quantity of straw from high country oats; but the advantage is small compared to the earlier ripening qualities of low country grain. We must apologise for a slight digression from our subject in thus for a moment adverting from wheat to oats. We now turn to the trials which we made this season with five varieties of wheat, the results of which are given as fully as we are able to do in the annexed tables:—

TABLE SHEWING THE RESULTS OF THE UNDER-MENTIONED WHEATS (AFTER POTATOES), WITH THE SEVERAL DRESSINGS USED.—Oct. 1868.

Varieties of Wheats.	Quantity Sown.	Total Produce.		Net Weight of Grain per 4 bush.	Size of Plot.	Manures applied.	Cost per acre.	Produce per imperial acre.		Value of Produce.		
		Grain.	Straw.					Grain, per imp. acre.	Straw, do., 14 lb. 10 st.	Total of Grain.	Straw at 4l.	Total of both Per acre.
Lammass Red	5 pecks.	{ 6 bush. 4 st. of 14 lb. } { 2 st. 7 lb. inf. }	216 st. of 14 lb.	13 3 0 1 35	1 35				457 st.	£18 18 0	£7 12 4	£26 10 4
Fenton Wheat	Do.	{ 21 bush. 4 st. 9 lb. good. } { 10 st. inferior. }	628 st. of 14 lb.	18 1 1 2 3	1 35				411 st.	£18 11 3	£6 17 0	£25 8 3
Shirreff's Bearded White .....	Do.	{ 17 bush. 10 st. 4 lb. good. } { 8 st. inferior. }	568 st. of 14 lb.	18 7 1 2 12	35/	2 cwt. Lawson's Sulph. of Ammonia, 1 cwt. Salt, 1/2 cwt. Phospho. of Potash perac.	35/		354 st.	£17 12 7 1/2	£5 18 0	£23 10 7 1/2
Nursery Red	Do.	{ 18 1/2 bush. good. } { 8 st. inferior. }	658 st. of 14 lb.	18 9 1 2 24	35/	Phospho. of Ammonia, 1 cwt. Sulph. of Potash perac.	35/		397 st.	£16 9 10	£6 12 4	£23 2 2 1/2
King Richard	4 bush.	{ 20 bush. 6 st. good. } { 5 st. inferior. }	544 st. of 14 lb.	17 10 1 2 36	35/	Guano, 1 cwt. Sulph. of Potash perac.	35/		314 st.	£15 17 3	£5 4 8	£21 1 11

Before entering into an analysis of these experiments, it may be well to give the previous cropping of the land. The field had been two years in pasture, and turnips and oilcake eat on the grass. The succeeding crop was potatoes, grown entirely with artificials. The following crop was wheat; it got no dressing of any kind, but was *autumn rolled*, and was a very fine crop for that year, 1866. It was sold standing on the ground, and the measured imperial acre gave fully eleven sacks. The previous crop to the one now under notice was potatoes manured in the drill, at the rate of 18 tons of farm-yard manure and 6 cwt. of ammoniacal and phosphatic artificials. All practical farmers are aware of the difficulty of finding a uniform portion of land on which to fairly test either manures or different kinds of grain. We selected 26 ridges of this field, which we considered equal in quality and character. The previous cropping had all been the same, the potato drills having been made across the ridges in 1865 and along the ridges in 1867.

After the potatoes were lifted, the land was twice grubbed across the drills, the ground being very hard and dry. The land was then drawn off into ridges and ploughed, the press-wheel roller following three ploughs. Before putting in the seed, the mixture of manures given in the table was sown. We were much puzzled in regard to sowing the wheats. We took a small measure to ascertain the relative proportions regarding the size of the grains of the various wheats under experiment, and found as follows—viz., the bowl of a pipe, which held only 119 grains of King Richard, contained 134 of Fenton, 137 of Shirreff's Bearded white, 153 Lammass red, and 193 of Nursery red. The wheats were sown by a broadcast machine, which, with proper care and attention can be adjusted with the utmost nicety, when the same variety of wheat is sown over a whole field, would, we fear, be very difficult to regulate and adjust were we to attempt to proportion the quantities of each kind of wheat to the number of grains contained in the small measure referred to above. We therefore began with the largest sized grain, and sowed it

NOTE.—There are five ridges in each plot, 18 feet wide.—The boll is equal to four imperial bushels.

in five ridges, measuring a little over  $1\frac{1}{2}$  imperial acres. Our impression at the time, judging from the quantity of seed sown, in proportion to the ground seeded, and its appearance when sown, was that it was thick enough. We are now under the idea that it was too thin. The next variety sown was Nursery red, which, having the smallest grain in the series, required a considerable alteration of the machine. We sowed the 4 bushels equally over five ridges. Our impression was, that it was too thick. The Bearded wheat was next sown. The proportion of seed here was, we think, correct. Fenton was put in next, and was well proportioned in the ground, Lammas being last. Of this we only sowed one ridge to avoid variation of the soil. Now, we are most anxious by the publication of these experiments not to mislead, but to give a fair and unprejudiced opinion of these different wheats; although we admit that the germ of perfect accuracy may be wanting from the difficulty of properly adjusting the quantities of seed required, in proportion to the extent of land, owing to the great variation in the size of the grains, especially with reference to the King Richard and Nursery red, and a slight variation in the width of the ridges. The proportion in number contained in the small measure being more than 1-3d in favour of the latter, we endeavoured to conduct the trials on the principle, or rather general practice, by which different varieties of seed wheats are tried—viz., a given quantity per acre, without reference to the size of the grains. Let us turn to the results of the experiments. We take the various wheats *seriatim*, as given in the table. First comes King Richard—a name most appropriately bestowed—for a bold kingly-looking wheat it is. This is a new variety, propagated by Mr Shirreff of Haddington. The grain is large, and bears a strong family likeness to Talavera. The straw is singularly tall and stiff, and the ear finely developed. The *proportion of grain to the weight of straw is greater* than in any of the others. We consider this wheat well adapted for most of the best wheat soils in the country. But it should be sown thicker than ordinary varieties. We observed a

greater tendency to rust than in any of the others, but the rust passed away without injuring the quality of the grain. Nursery red stands next. This variety is much grown in Wiltshire. Its fine baking qualities make it a favourite in France, and large quantities are sent across the channel. The grain is small, the straw very tall in soil adapted for it, and likewise stiff, the ear is not large and tapering. To shew the necessity for experimenting carefully with different varieties on distinct kinds of soil, we tried this wheat on light sandy land, and the style, in fact the appearance of the wheat, seemed quite changed. The straw and ear developed themselves to the full, some of the straws measuring 6 feet 6 inches. In the field where the experiments were made (an average turnip loam) the straw was shorter and the ear smaller than any of the others. It was the heaviest grain, and stands third in weight of straw. This wheat, from the small size of the grain, should be thin sown. We highly prize this wheat for soft land. Shirreff's White Bearded comes next. This wheat surpassed all the others in quality, but was deficient in its appearance both on the ground and in the stook. *As a valuator we would have placed it first, judging by apparent bulk*, both in produce of grain and straw. It is a distinct and true variety, and much prized by some farmers; but we question much if a high price per quarter will make up for deficiency of produce. The quality of this wheat is superb, but we would rather lean to a coarser variety yielding more sacks per acre. Fenton wheat has long held a pre-eminent position in the opinion of most farmers, and its position in this trial of its productiveness shews how well it has stood the test. The peculiarity of this wheat is the great dissimilarity in the length of the straw. A sheaf of this grain is *cared* down to the band. The straw is very stiff and will stand much adverse weather. Our last is Lammas red. It has long been a favourite, but of late gone rather out of favour. It is tall and stiff strawed, and the grain a great favourite with bakers. Here we would remark on the very large weight of straw per acre of this wheat.

Its importance is very great, and the straw-giving qualities of wheats are a great test of value. Farmers in the south of England, as we have stated, sow it mixed with Nursery red; we highly approve of the mixture, having grown it successfully, the straws being of different lengths—the mixture assumes the character of Fenton wheat in this respect.

We may here observe in regard to sowing mixtures of wheat, that produce of the first mixture may assume quite a different character if sown again. The two varieties may hybridize and produce a combination of new varieties only partially developed. If mixtures are sown, we consider it safer to mix varieties which have been grown separate. It may be as well to mention that in the above experiments the wheats were sown on the second Monday of November, and were also all cut on the same day in autumn except the Lammas, which was reaped next morning. We were interrupted, from rain, during the carrying. We began about mid-day on the 10th of August. The Lammas red was all got in, and about half of King Richard, and half of the Bearded White. We resumed again on the 13th, and finished all except the Nursery, two loads of which we thought too wet to stack. We unloaded and opened out these sheaves next day, when a little of the grain was shed. The thrashing out was done in dry weather. We are thus minute in detail in order that nothing we state may have the slightest tendency to mislead.

We would now briefly draw attention to the value of making experiments. All over Great Britain large valuations are annually made of growing crops, in order to facilitate the outgoing and incoming to most farms. This is a most difficult thing to do, and it is almost impossible to judge accurately, the yield per acre of different varieties being so deceptive, and it is so difficult to tell the quantity of straw in proportion to the grain. Now, if most of our farmers were annually to measure off 1 or 2 acres, and carefully test the

crop, a correct and proper data would be given. We admit the results of one season may be totally upset by the next; but let the system be continued over a series of years, and a fair average will be secured. We fear there is a dogmatic spirit abroad in regard to the public discussion of many agricultural subjects. Antient laws or rules have been framed and laid down, we hope not so firmly as those of "the Medes and Persians," still they are strongly adhered to, and the suggestion of anything new is looked upon as an innovation. The element of caution is very fully developed, and it is thought imprudent to publish large returns per acre. In short, the motto or maxim is, "Put the candle under the bushel." But we know it is the opinion of a very great agriculturist not to do so, and we embrace it cordially, for it coincides with our own. Farming is like no other profession in regard to the great benefit we can confer on each other by frankly and truly communicating each other's experiences, and this can be easiest and best done through the medium of those admirable agricultural journals, which the enterprize of the present day has established. We have another motive for the publication of these experiments—and to divest them of all appearance of being at all flattering to the yield of one favoured locality; we distinctly state there are many larger crops grown this season in East Lothian, on lands in better cultivation and more favoured by nature for the purpose. The farmers of East Lothian are all naturally proud of their county. Other counties have made rapid strides, and may equal and even surpass it in some branch of the tree of agricultural fame; but the world must admit it holds a noble agricultural inheritance from those great and enterprising farmers, "on whose names we look back with a grateful reverence" who led the van—who gave impetus and life to the tillage of our fields when the agriculture of our country, at least in a great portion of the kingdom, was stagnant.



*AGRICULTURAL EDUCATION IN IRELAND.*

EDUCATION, and more especially, so far as we as agricultural journalists are concerned, the education of young persons in rural districts, is engaging so large a share of public attention that it may justly be regarded as one of the leading topics of the day. That it should assume more of a technical character than it has hitherto possessed is generally admitted; and, with respect to agriculture, it is essential that such should be the case. The education of children in rural districts should have special reference to the future business of their lives, and were this principle carried out it would lead to the best results for all classes engaged in the cultivation of the soil, whether as employers or as labourers. The idea of teaching the leading principles of agriculture in ordinary schools is by no means new. It was a favourite idea of the late Professor Johnston, Mr Henry Stephens, and other well-known authorities on agricultural practice, and the sciences which bear upon agriculture. As yet, however, education of this kind has not assumed any definite form in Great Britain. The rudiments of agricultural chemistry have been taught in a few schools, but even that step has not been followed up with much spirit or steadiness.

In Ireland the case is different. For the last thirty years the Irish National Board of Education has maintained an agricultural department, which has now become one of considerable importance, but still by far too limited in extent to meet the necessities of the case. It is not our intention to enter into a review of the history of agricultural education in Ireland, as it would occupy a much greater space than we can afford; nor indeed is such necessary at present. We shall therefore confine ourselves to a brief notice of its existing features, as we find those detailed in the last report of the National Board.

The agricultural department of National Education in Ireland comprises (1) the Albert

Institution, situated at Glasnevin, near Dublin; (2) First-class agricultural schools under the exclusive management of the Commissioners; (3) First-class agricultural schools under local management; and (4) Ordinary agricultural schools and school gardens.

The Albert Institution, although placed first on the list, forms the culminating point of the system of education laid down by the Board, the intern pupils, who are taught and boarded free of expense, being selected from amongst those who have passed through a preliminary training at the other school farms. The candidates, who must not be less than seventeen years of age before they are admitted to the Institution, are subjected to a strict examination, on the competitive principle, and the most promising of them are then summoned to Glasnevin, and again tested in various ways. Extern pupils, who pay a moderate fee for their education, are also admitted. The pupils receive a first-class literary education during their stay at the Institution, and they attend lectures on botany, chemistry, and geology, agriculture, and horticulture, along with practical instruction in the two last-named departments. Dr Moore, Curator of the Royal Dublin Society's Botanic Garden, is the stated lecturer on botany; Dr Sullivan, Professor of Chemistry in the Museum of Irish Industry and the Catholic University, also lectures on chemistry and geology, and the names of these gentlemen sufficiently indicate the kind of teaching provided by the Board in these departments.

The Albert Institution stands on about 179 imperial acres of land, which is appropriated in the following manner:—Gardens, shrubberies, &c., occupy 10 a. 0 r. 22 p.; a spade labour farm, 5 a. 2 r. 37 p.; an intermediate sized farm, worked by simple appliances, as an example for small farmers, occupies 22 a. 3 r. 7 p.; and the remainder, 140 a. 0 r. 38 p., which is called the large farm, is worked with the aid of a select col-

lection of modern implements and machines. The pupils are regularly changed from one department to another, so that they may have an opportunity of understanding the course of management pursued in each case. A "special class" was organized three years ago, composed of the most forward pupils, and the members of that class are sent out as working stewards to the provincial farms of the Board, where they gain additional knowledge and experience in the practical details of farming, which will be of great advantage to them in after life. The number of pupils attending the institution at the date of last report was 60, of which 58 were intern pupils, and 2 extern. The schoolmasters who are in training at the Board's central establishment in Dublin, with the view of being appointed to the charge of ordinary schools throughout the country, also receive instruction in practical agriculture at the Albert Institution.

The garden department includes a large kitchen garden, a fruit garden, orchard house, conservatory, vinery, &c., and a plot in which plants are botanically arranged. The "spade labour farm" of  $5\frac{3}{4}$  acres is divided into four portions, which are cultivated on the following system:—1st year, turnips and mangolds; 2d, potatoes; 3d, Italian rye grass; 4th, oats. The Italian rye grass is sown in autumn, as soon as the potatoes are lifted, and the plants are strong enough before winter to resist the frost. The grass is fit for cutting in April, and from that time till the end of autumn, it feeds three, and occasionally four, milch cows, besides affording some hay for winter use. In the end of autumn mangold leaves and soft turnips come into use, and are followed by swedes and mangolds. By careful management the portion in roots supports the same number of cows until the grass is fit for use. Any shortcoming in the feeding is made up by mixing together chaffed hay and straw with bran mashes; cabbages and vetches are also chaffed and mixed with bran mashes or brewer's grains. The balance-sheet of this small farm, for the year ending 31st March 1867, shews a balance of £67. 15s. in favour of the farm, which, however, "cannot be regarded as profit in the strict

sense of the word," as the report properly points out, no charge being made for the free labour of the pupils. It appears, however, that £11, 2s. 9½d. had been paid for hired labour. The report states that "the amount of pupils' labour expended on the farm would represent the labour of a small farmer and two lads. In other words, the balance shewn, together with the portion of the sum paid for hired labour, which could be saved by the small farmer who had the necessary labour in his own family, is the amount which would be available for their maintenance." The "intermediate farm" is managed on a five course rotation, including two years' grass, and a mixed system of grazing and house-feeding is pursued during summer. The statement of receipts and expenditure shews a "balance in favour of pupils' labour" on the farm, amounting to £126, 16s. 6½d., hired labour having cost, during the year, £43, 14s. 9½d. The "large farm" is chiefly managed on a four-course rotation, a portion of it being in permanent pasture. The balance in favour of the large farm for the financial year already mentioned amounted to £148, 3s. 7½d.; the outlay for hired labour during the year being £201, 12s. 5d. It will thus be seen that the farm department of the Albert Institution has become self-supporting, which was not the case at one time, and the fact that it was not so gave rise to some severe criticism on the management pursued. The improved state of matters is owing, we have reason to believe, to certain substantial alterations which have been introduced since Mr Baldwin was appointed superintendent of the agricultural department, and as these reforms, begun at the head institution, have also been carried out in the case of the agricultural schools throughout the country, the returns from them are now of a much more satisfactory nature than they were some years ago.

Objections have been raised against the subdivision of the land attached to the Albert Institution into small farms, but those who object forget that the Board of National Education has to deal with the circumstances

of landholders in Ireland as these exist at present. It may be correct to say that large farms are more desirable, but when we take into consideration that there are in Ireland 129,000 persons whose holdings do not exceed 5 acres, and 175,000 persons whose holdings are between 5 and 15 acres, it is evident that any system of agricultural training which would ignore the existence of that large class of Irish land-holders would be quite imperfect. And, in connexion with this point, it is worth noticing that in the accounts of the Glasnevin farms the balance per acre decreases as the size of the farm increases. "This result," as Mr Baldwin remarks in his report, "is curious and contrary to the currently received notions." There were certainly circumstances which affected the gross returns from the large farm, during the financial year referred to, which are in course of being removed, but notwithstanding this the results as shewn in the accounts of the "small farm," and the "intermediate" farm, are of sufficient importance to deserve the consideration of those who are totally opposed to small holdings.

Passing on to the next class of agricultural schools, namely, those under the exclusive management of the Commissioners, we find nineteen on the list, having farms attached, varying in extent from  $8\frac{3}{4}$  acres up to  $126\frac{3}{4}$  acres. At some of the schools the pupils pay £8 a-year for board and education, while at others the charge is £6 a-year. Each school has also a number of free places, which are filled by candidates admitted under certain regulations. Of first-class agricultural

schools under the management of local patrons, there are eighteen on the list, having farms attached, varying from  $8\frac{1}{4}$  acres to 172 acres in extent; but Mr Baldwin states that Templemoyle, near Londonderry, the largest of these schools, has been given up, not through any fault of the Board, but from other causes quite apart from the Board's management; and the landlords, who are the Grocers' Company of London, who own about 12,000 acres in the north of Ireland, refuse to allow it to be re-established, except on such terms as the Board could not agree with. It would, we think, be little enough, if a wealthy company which derives a large revenue from Irish soil, were to be at the sole cost of the maintenance of the Templemoyle school and farm. The ordinary agricultural schools are sixty-six in number, and the farms or plots attached vary from 1 acre to 54 acres in extent; but, as Mr Baldwin justly remarks, "if instead of sixty there were six hundred centres in which primary instruction would be afforded, the agricultural intelligence of the small farmers of Ireland would rapidly improve." In conclusion, we are satisfied from a careful perusal of the report, as well as other circumstances, that the agricultural department of the Irish National Board of Education is now vastly improved from what it was at one time, and in a fair way to benefit the country. There are still some points which are susceptible of amendment, but from the earnest spirit in which the superintendent has pursued his duties we have no doubt that by-and-bye any deficiencies which may still exist will be remedied.

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### PLEURO-PNEUMONIA IN CATTLE.

IF the Scottish Chamber of Agriculture had never done anything since its formation except to take up the subject of cattle disease and cattle traffic, and to concentrate within the pages of a single Report the opinions of the leading veterinary surgeons in the United Kingdom on these matters, it would have

richly merited the thanks and support of the community. Other questions to which the attention of the Chamber has been directed have been more or less of comparatively local interest, but the "cattle inquiry" is one of imperial importance. The law of hypothec was purely a Scottish question; even game,

considered from the stand-point necessarily adopted by the Chamber, might be included in the same category, but the prevention of the spread of contagious diseases among live stock, and the means to be taken for the purpose of improving the present system of cattle traffic, are matters in which the agriculturists of England and Ireland are equally interested with the farmers of Scotland. We may go further, and say that the entire community is affected by it, for the consumers of meat have quite as deep an interest in the question as those who produce it. It is not a question in which consumers and producers are placed in opposition to each other, although attempts have been made, even in Parliament, to shew that such is the case. It is surely not conducive to the interests of farmers that meat should be rendered scarce and dear in consequence of mortality among live stock, arising from diseases which are to a great extent preventible by the exercise of certain very obvious precautionary measures, but which cannot be carried into effect without legislative action.

The report of the directors of the Scottish Chamber of Agriculture, which appeared in our last impression, recommends that an Act of Parliament should be obtained for the purpose of regulating the home traffic in animals, by railway and steamboat, and for introducing certain much required provisions for the watering of cattle, and their protection from injury during transit; for the separation of store cattle and dairy cows in the fat stock markets of large towns; and for regulating the importation of foreign cattle, and the movement of home stock affected with contagious diseases. These recommendations were made by the directors after a full consideration of the opinions expressed by the veterinary surgeons with whom they had consulted. These gentlemen were Professors Simonds and Finlay Dun for England; Professor Ferguson, chief of the Government veterinary department, Ireland; Mr Edwards for Wales; Professors Williams and McCall for Scotland; and the mere enumeration of these gentlemen's names is sufficient to prove the

value of the Report which has been laid before the Chamber.

The Directors recommend, in the first place, that the Act of Parliament which they consider necessary should contain

“Very stringent regulations to ensure the expeditious transit of animals, and the watering of them during transit, when the time of transit exceeds ten hours; the thorough cleansing and disinfecting of all trucks, boxes, steam-boats, loading places, and pens; the ventilation of the holds of steam-boats carrying cattle; the covering of railway trucks, so as to protect the animals from sun and rain; and that such regulations should be enforced under Government superintendence.”

We need scarcely enlarge on the importance of the points involved in the above recommendation, for we have frequently urged the adoption of measures having the same objects in view. So obvious, in fact, is the necessity for reformation in cattle transit that the Chamber never dreamt of questioning the propriety of the Directors' views on the subject; and it is only to be regretted that railway and steamboat companies do not voluntarily undertake the removal of the evils complained of, instead of putting off the matter, as they are apparently inclined to do, until an Act of Parliament shall compel them to adopt measures for that purpose. They cannot now plead ignorance of the steps that should be taken, or the plans whereby live stock, carried by rail, may be fed and watered during the journey, without loss of time, confusion, or material expense. Those plans, so far as they are applicable to railways, have been approved of by practical men connected with railway traffic as well as by agriculturists, and it is therefore the duty of all railway companies which convey live stock, fairly and fully to test the plans to which we refer.

The next recommendation of the Directors is—

“That while it seems not desirable, nor indeed practicable, to dispense with fat stock markets in or for large towns, the present system of shewing store cattle and dairy cows in the fat markets is one of the most fruitful causes of spreading infectious diseases of all kinds; and, therefore, in or near towns where fat



markets are held, there should be provided separate markets for *store* cattle, for *dairy cows*, and for *fat* cattle, so that these classes should not come in contact with each other."

On this point, also, there was no difference of opinion in the Chamber. In fact, the mischief done by the intermixture of the different classes of stock in our public markets, especially those held in or near large towns, is so well known that many persons dread purchasing cattle which have been offered for sale in those markets, if the object is to take such stock home and place them among those already in the pastures or homesteads. In Professor Ferguson's replies to the queries issued by the Directors, he states that "contagious and infectious pleuro-pneumonia" is "frequently a result of collecting large numbers of animals from different places in one locality for market or transport, either by sea or land, or for commissariat purposes. In Ireland, until within the present year, the public live-stock fairs and markets, as well as the travelling of sound with infected animals by rail or road, or in vessels, and the halting of them in the same resting-places, have been fertile sources of the malady's extension." Referring to the Dublin Smithfield Market, which, previous to the establishment of the new cattle market in that city, was the principal central depot in the province of Leinster, and the source from whence the infection of cattle disease was disseminated both in Dublin and its neighbourhood, and also to all parts of Great Britain, he says:—"Many instances have occurred in the county of Dublin of the disease having been brought to lands and premises, which previously had been always free from it, by an unsold cow returning to them from the public market to which she had been sent for sale, and in which she had remained for a day. In such cases the animal which had been in the public market was almost invariably the first of the stock to evince symptoms of the disease." Professor Ferguson's experience will be fully corroborated not alone by veterinary surgeons, but also by agriculturists in all parts of the country; at least, where they have had the experience of cattle purchased for store or

dairy purposes in a market held in or near a large town. The beneficial results as regards the sanitary condition of live stock, arising from the separation of the classes recommended by the Chamber, was shewn some time ago by Professor McCall, as having been proved in the case of the Glasgow market, where a temporary separation of the dairy cows from the other classes exposed for sale was made; the dairy cows, while that arrangement lasted, being much freer from disease than they were when all classes were mixed up together.

The risk of infection, arising from different classes of stock being allowed to mix together in public markets, &c., and we may add from the entire absence of authorized supervision of markets, is further shewn by Professor Ferguson. In 1866, that gentleman instituted an official inquiry on the subject of pleuro-pneumonia in connexion with the dairy establishments within the Dublin metropolitan police district. The inquiry was sanctioned by the then Lord-Lieutenant of Ireland, now Lord Kimberley, and the commissioners of the Dublin metropolitan police afforded every assistance to Professor Ferguson in carrying out his inquiry. It was found that 485 dairy establishments existed in the district, having a stock, in April 1866, of 7306 cows. "The number of deaths which had occurred during the twelve months previous to the middle of April was 151, but the number returned as having been sold within the same period of time, in consequence of having become affected with lung distemper, amounted to 2460, all of which were travelled or moved alive from the premises or lands on which they became affected, either to slaughter-houses or to the public market;" and, as Professor Ferguson judiciously remarks, that so "long as such a procedure, as moving such diseased animals on so extensive a scale through a seaport town from which store stock are exported to Great Britain is permitted, so long will it be impossible to prevent the cattle intended for exportation frequently becoming infected before their embarkation for England and Scotland." An Order in

Council was no doubt passed on the 6th of March 1868, restricting the movement of diseased live stock in Ireland, but that Order, although good as far as it goes, is still defective, and especially in leaving it to be carried out by private individuals—to anybody, in fact, and therefore to nobody—instead of entrusting it to qualified official functionaries. Dublin, however, does not stand alone as a chief centre of disease. It is much the same in all large towns, and Professor Williams declared at

the meeting of the Scottish Chamber, that “he thought the market of Edinburgh was a greater nest from which pleuro was propagated throughout Scotland than any part of Ireland;” a strong testimony in favour of the object sought by the Chamber, namely, the separation of the different classes of cattle in the public markets, held in or near large towns.

We must reserve the further consideration of the Directors' Report until our next.

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### THE PROPER USE OF ARTIFICIAL MANURES ON A FARM.

A WRITER in *The Field* treats this subject in the following manner:—This is a question of much importance, especially in those districts where the nature of the cropping is exhausting. In the great potato district of Yorkshire, for example, which we quote as being more particularly in our mind, the large area of potatoes, in addition to a full proportion of corn, and the corresponding paucity of sheep stock, render a large quantity of artificial manures absolutely necessary, in order to maintain the fertility of our fields and grow such crops as shall prove remunerative. The theory of manures will be understood from a brief consideration of the nature of our crops. If we perform the simplest analysis of vegetable structure—viz., by combustion, we shall find that the great bulk disappears. This has been improperly called the organic part, and consists in the plant of various combinations of four simple elements—carbon, hydrogen, oxygen, and nitrogen, which as carbonic acid gas, watery vapour, and ammonia, the products of combustion, have passed into the air, there to accumulate for future plant food. Carbonic acid gas exists in the atmosphere in the proportion of four to six parts in every 10,000 of air, whilst nitric acid and ammonia are found in still more minute quantities. Small as those supplies appear, they are sufficient for natural vegetation. The rain in every shower brings down traces; the dew conveys the precious gases; the earth absorbs directly from the air. One of the chief values of the bare fallow consists in the frequent exposure of a fresh surface, which absorbs plant food from the air. So considerable is the power of absorption and retention possessed by most soils, that M. Barral, an eminent French chemist, has calculated that a well-made fallow ensures a supply of nitrogen equal to a dressing of 2 cwt. of Peruvian guano per acre. Cultivated

plants, being in an abnormal condition, require more of these organic materials than the natural supply; hence the importance of manures like well-made farm-yard manure and Peruvian guano, or the artificial, like nitrate of soda and sulphate of ammonia, which are rich in nitrogen, the scarcest and most important of the group. Returning to the products of our combustion, we find a small residuum in the form of ash, often not exceeding 3 to 4 per cent. of the whole; this is the mineral, or, as it is usually called, inorganic part of the plant, and, though so limited in quantity, is absolutely necessary, forming as it were the bony system of the plant. The minerals are derived entirely from the soil, entering by the rootlets in solution in water, and in no other way. The following bases and acids, variously combined, are usually present—potash, soda, lime, magnesia, iron, silica, phosphoric, sulphuric, and hydrochloric acids. The presence of all in the plant is essential; there is no power, as was once supposed, of substituting one for the other. The fertility of a soil is in proportion not to the presence only, but to the presence in a suitable form for absorption by plants, of its rarest ingredients; and just as the strength of a piece of timber is measured by its weakest part, so the fertility of a soil is dependent on the proportion of its most rare ingredients. Chemical analysis indicates that our ordinary soils contain abundant food for hundreds of crops. Practical experience proves that two or three crops in succession exhaust, or more properly reduce the yield to the natural limits, *i.e.*, the limits at which the necessary minerals are eliminated. Mr Laves has thrown light on this subject by his admirable series of experiments on the growth of wheat, extended over a period of twenty years. A careful study of the results, which are fully reported in the *Journal of the Royal Agricultural*

*Society*, will repay all who are interested in agricultural progress. We confine our attention now to one of the series—viz., the result of growing wheat for twenty years in succession on the same piece of ground, without manure of any description. The land was previously reduced to its natural state by a course of cropping. We should have supposed that after bearing three or four crops the land would have become so completely exhausted that it would cease to produce. Not so, however; on the contrary, the produce was as good at the end as at first, the average being 16.1 bushels per acre; the maximum 17.1 bushels; the minimum  $5\frac{3}{4}$  bushels, according to seasons. A most important fact is thus established—viz., that soils possess a natural production on which we can depend. It is in order to increase this natural yield to its utmost limit that we introduce rotation crops, expend large sums in feeding materials, and scour the earth for sources of extraneous manures.

#### OFFICE OF ARTIFICIAL MANURES.

The development of the artificial manure trade has been most remarkable; and, whilst unmistakably advantageous from one point of view, we are led to question whether the facility with which we have been supplied has not led us to be careless about our own resources. The very materials for which we pay so heavily are too often permitted to ooze away into the nearest ditch and pollute our streams. Baron Liebig, to whose investigations we owe in a great degree our present knowledge, denounces this terrible waste, and warns us that the time will come when our reckless extravagance will bring down on us heavy discomfort; and that the decay of our great country will date from the day when our supplies of phosphates fall short. Without going quite so far, we would earnestly impress our readers with the importance of taking care of the manure of the farm. It is sad to see the ignorance that is apparent in unsputted yards, washed-out manures, and the porter-coloured horsepond. Even if it could be proved that the waste thus incurred can be more economically made up by the purchase of artificials than by the outlay necessary to prevent it, it would still be clear that, taking a comprehensive view, and duly considering the future, our practice is most reprehensible.

The proper office of artificial manure is as an auxiliary, only to make up the deficiency which a forcing system requires when every care has been bestowed upon the home supply; and it should ever be remembered that it is more profitable to enrich our land through the animal's body than to depend upon artificial manures. "*The sheep's belly is the best dung-cart.*" The increase of flesh resulting from the use of purchased food will often cover the outlay, whilst the improvement of the manure is equal to one-fourth to one-half of the cost. The statistics of the

manure trade are remarkable. In 1841 and 1842 Mr Lawes, acting upon the suggestions of Liebig, commenced the manufacture of superphosphate of lime. At first bones only were employed as the source of the phosphate; now phosphatic materials of mineral origin, such as apatite and coprolites, and inferior guanos from which the ammoniacal matters have been dissipated by time or moisture, or largely employed; and we are within bounds in estimating the present consumption at over 250,000 tons per annum.

Peruvian guano, as a trade, was established in 1842. At first the demand was very limited. Thus Messrs Gibbs imported in 1842 only 182 tons, whereas twenty years after—viz., in 1862, 435,000 tons reached our shores, of which from one-third to one-fourth was used in the United Kingdom. The price at first ranged from £10 to £15; from 1846 to 1848 it sunk to £9; rose to £10 in 1854; £11 in 1855; £12 in 1856; and £13 in 1857. At the present time the price is about £13 a ton. Artificial manures may be separated into two groups; those that, like guano and certain composite productions, supply the various minerals and ammonia required for the additional produce beyond that which the soil can afford; and simple substances like nitrate of soda, sulphate of ammonia, salt, and, to a certain extent, superphosphate of lime. These latter supply one or at most two important materials of plant food, and their action is not so much as direct manures, but as stimulants, which enable the plants to absorb more the soil; just as we give a tonic in order that the animal's system may digest more food. This is an important distinction, which should be borne in mind and materially influence our views as to tenant right for unexhausted manures. We give one illustration.

Nitrate of soda as a top-dressing for wheat supplies an amount of nitrogen less than is contained in the extra produce which it induces; hence the additional nitrogen and all the minerals must have been obtained at the expense of the soil. Such a manure is therefore more or less exhausting, and its use will depend upon the supply of mineral food in the soil. We have known compensation given to tenants for all the nitrate of soda used on the last crop, whereas in reality the outgoing tenant should be taxed for exhausting the soil.

#### PERUVIAN GUANO.

Peruvian guano heads the list of extraneous manures; long may it occupy that position. Its value depends upon its completeness, and especially upon the large proportion of nitrogen, which, in the form of ammonia, should average from 17 to 19 per cent. Of this 6 to 7 per cent. exists as ready-made ammonia, and the remainder is made up of various nitrogenous combinations, which on decomposition yield from 10 to 12 per cent. of ammonia. The phos-

phates are present in a moderate degree—generally from 20 to 23 per cent.—mostly in an insoluble form, but are gradually rendered soluble in the soil by the action of rain water, due to the presence of carbonic acid. This may be accelerated to a remarkable extent by the addition of a small quantity of sulphuric acid (oil of vitriol). From experiments made by Dr Voelcker, it appears that the addition of only 5 per cent. of vitriol causes fully one-half of the phosphate to become soluble, whereas barely one-fifth occurs in a soluble state. An increase of acid causes increased solubility, and it is probable that 25 per cent. would render the whole soluble; but the effect is not in proportion to the outlay, and the smaller quantity is most practical. The action consists in converting oxalate of ammonia into sulphate of ammonia, the latter possessing a solvent action on the phosphate of lime. The directions for making this addition are so simple, the expense so trifling, and the effect, especially upon root crops, likely to be so beneficial, that we strongly recommend a trial. Dilute the acid with an equal weight of water (soft preferable), sprinkle the liquid over dry sawdust or sand, the former best, as most absorbent; the guano, reduced to a fine powder, is mixed intimately with the damp sawdust, and may be used in the course of a day or two. Good Peruvian guano suffers no loss from exposure to the air, and hence may be kept under cover from one season to another. The pungent smell arises, not from salts of ammonia, but from certain gaseous products which have no value as manure.

Guano has a tendency to cake; hence careful sifting and pounding the lumps is necessary, and the neglect of this simple precaution is often attended with serious loss. The guano should be passed through a fine wire sieve, and the lumps that remain mixed with dry sand, beat with a mallet, and again sifted until all is fine. Sand prevents caking. When fine, salt may be added, especially for light soils. Peruvian guano is valuable on nearly every kind of soil, and benefits most crops. We have heard of particular soils, where its action was not seen. Fully alive to the value of really good Peruvian guano, we warn our readers against depending too entirely upon it. Already warning notes have reached us that the supplies are becoming exhausted, and there can be no doubt that the quality is less regular than formerly. Great as were the original deposits—the accumulations of thousands of years—it is quite evident that a time must come when the supplies will altogether cease, or be greatly reduced. What are we doing to economise our own resources all this time? Will it be believed in the future that, whilst paying millions for birds' dung, we are allowing our own excreta, not only from large centres where collection may be difficult, but on individual farms, to be lost—not absolutely, but relatively to us. Moule's earth closets should be in use everywhere. The following analysis of three samples by Dr Voelcker will

show the composite nature of Peruvian guano, and explain the reasons for its great value as a fertilizer:—

Moisture .. .. .	18.42	15.14	16.56
*Organic matters and salts of ammonia.....	52.11	52.81	51.70
Phosphates of lime and magnesia (bone earth).....	21.99	20.26	23.55
†Alkaline salts .....	6.37	10.52	6.44
Insoluble silicious matters (sand).....	1.11	1.27	1.75
	100.00	100.00	100.00

*Containing nitrogen .....	15.34	15.41	15.13
Equal to ammonia .....	18.62	18.69	18.37
†Containing phosphoric acid.....	2.23	2.48	1.08
Equal to bone earth.....	4.83	5.36	2.34

The above are very uniform, and we shall do well if we can always get as good. To ensure this as far as is possible, deal only with those who buy direct from the importers, and whose character is above reproach. Avoid all allurements in the form of cheap guanos, not quite equal to the best. The following is the analysis of such a guano, sold by Liverpool brokers at £11 a ton, and worth about £8:—

Moisture.....	14.95
*Organic matter and salts of ammonia .....	31.30
Phosphate of lime, &c. &c. ....	25.95
Hydro-sulphate of lime .....	9.85
Alkaline salts.....	7.70
Sands, &c. ....	10.25
*Nitrogen, 5.28; ammonia, 6.38. ....	100.00

NITRATE OF SODA, ETC.

Nitrate of soda and sulphate of ammonia are cheap forms of nitrogen, which, acting much in the same way, may be considered together. There is, however, one important distinction. Sulphate of ammonia, in common with all ammoniacal products, is retained and stored up by soils for plant use, whereas nitrate of soda passes through, and unless absorbed by the plant is lost. Hence the latter should be applied only to the growing crop, and sown on the top, so as to pass through the whole depth of soil; whilst the sulphate of ammonia may be incorporated with the soil, and applied either before the crop is sown or during growth, as is most convenient.

Both these manures have a special action on cereals, and their fitness depends upon the presence in the soil of available mineral food to meet the greatly increased demand. On limestone marls we found nitrate of soda invariably a success. The addition of 1½ cwt. per acre, in conjunction with 3 cwt. of salt, gives an increase of from 10 to 14 bushels of grain and 5 to 6 cwt. of straw per acre. On thin weak soils these manures,



on the contrary, do harm by stimulating the plant, drawing the plant, and resulting in mildewed straw and shrivelled grain. Nitrate of soda is valuable on all those soils which are rich in mineral food; hence its action on clays. The best time to apply it is towards the middle or end of March. In order to determine the effect, it is well to miss a land; the difference will be perceptible till harvest. Nitrate of soda is principally obtained from Chili and Peru; it is a white crystalline salt, very soluble in water, and readily attracting moisture from the atmosphere. It is so soluble that its effects have been seen without rain, the dew being sufficient to dissolve it. It loses nothing by exposure; but the first shower carries it to the roots. Commercial nitre is considered good when it does not contain more than five per cent. of impurities. It is a cheap form of nitrogen when it can be obtained at £15 a ton.

#### SALT.

Common salt is useful in many ways. We can trace its action under at least four different heads. It acts as a direct manure, supplying soda and chloride; but, as most soils contain abundance of both, it is not thus that salt is chiefly valuable. Indirectly, salt increases the solubility of certain silicates, hence its value in conjunction with nitrate of soda; and it is well known that in many cases the addition of salt strengthens and lightens the straw, clearly owing to an increased secretion of silica. This may be effected in two ways. When the soil contains carbonate of lime a double decomposition ensues, carbonate of soda and chloride of calcium being formed. Silica is soluble in carbonate of soda. Secondly, silicate of ammonia is more soluble in a solution of salt than in water. A third action of salt, which is of great importance on sandy soils, consists in its property of retarding growth, and thus prolonging vegetation and preventing premature ripening, a frequent source of loss on hot forcing soils. Lastly, salt absorbs moisture. In addition to the above, a dressing of salt on clover ley, or on corn stubbles, checks and destroys insect life. For this purpose a dressing of 4 cwt. to 5 cwt. per acre may be applied.

#### PHOSPHATIC MANURES.

The most important groups of artificial manures are those in which soluble phosphate of lime forms the presiding element. The influence of phosphates on the growth of our green crops is remarkable. Bones have been used as a dressing from an early period. It was Liebig who first pointed out that by the addition of sulphuric acid the insoluble or only slowly soluble would be changed into a more efficient substance. The action of the acid will be readily understood. There are several forms of phosphate of lime, the solubility depending upon the proportion of acid to base. In bones it exists as tricalcic phosphate. Sulphuric acid, by uniting with a portion of the lime,

and taking it away from the phosphoric acid, converts tricalcic into monocalcic phosphate. If an excess of acid be used, nearly, but not the whole, of the phosphate is rendered soluble. The superiority of fresh or boiled bones for the manufacture of superphosphate over mineral phosphate, coprolites, and even burnt bones, depends upon two points; first, that the insoluble portion, which generally exists to the extent of 7 to 8 per cent., is capable of being gradually utilised in the soil, whereas, as far as we know, the insoluble from mineral sources is useless, because not capable of solution in the soil; secondly, because fresh bones contain an appreciable quantity of nitrogen, which adds considerably to value. Soluble phosphate, from whatever source, is equally valuable; hence, if we can render all soluble, we shall have a valuable manure, whether from bones or coprolite. In order to dissolve all or nearly all the phosphate, we must use a quantity of acid that will make the mass semi-fluid, and manufacturers frequently use fresh bones finely ground as driers; such a plan ensures a high-quality manure. In this way, and by the judicious mixture and due mechanical preparation of various materials, the manufacturer can produce a better manure, at less cost than can be made by the farmer. And by the aid of chemical analysis the purchaser can protect himself and ensure money's value. It should always be remembered that by analysis alone can we judge of a manure. We cannot distinguish the good from the bad by colour, feel, taste, or smell. The most eyeable manures are often the least valuable. Varying with local conditions, we ought to have a good bone phosphate made from a mixture of fresh and burnt bones, containing 23 to 25 soluble, and 7 to 10 per cent. of insoluble, with  $1\frac{1}{2}$  to 2 of nitrogen, at £6, 5s. to £6, 10s. a ton. A mineral phosphate should yield 28 to 30 per cent. of soluble, and 3 to 4 of insoluble phosphate, and should be bought at £5, 10s. to £6. Our advice is to purchase only of men of known character, buy by a guaranteed analysis, and under an agreement that a deduction *pro rata* shall be made if the manure is not equal to representation, and send a fair sample from bulk for analysis. The Royal Agricultural Society offers great advantages to its members; not the least, the analysis of their manures, &c., at half the ordinary commercial charge.

#### PHOSPHO-GUANO.

Phospho-guano, which has been extensively used, is an example of a highly soluble phosphate combined with ammonia. Its base is a mineral phosphate, found as a crust on certain trap rock islands within the tropics. The following analysis has been recently made, and proves the high value of Phospho-guano. The present price is, we believe, about £11 a ton. How far the mixture of a good superphosphate with a portion of Peruvian guano will compare as to price and effects, is a question which farmers should determine for themselves by experiment. Phospho-guano

is a manure of high quality, manufactured by a firm of character, and generally remarkably even.

Moisture.....	10.76
*Organic matter.....	22.28
Biphosphate of lime.....	29.88
(Equal to bone earth rendered soluble.....)	42.09)
Insoluble phosphates.....	1.69
Sulphate of lime.....	35.30
Alkaline salts.....	2.15
Sand.....	.94
	100.00

\* Containing nitrogen, 3.17, equal to ammonia, 3.86.

PREPARATION OF ARTIFICIAL MANURES.

Manure makers, under the advice of the agricultural chemist, prepare compounds for various crops on particular soils. Many of these mixtures will be found more efficacious than any simple substances, because they combine a variety of ingredients all more or less useful for plant food. The substances principally em-

ployed are superphosphate of lime, Peruvian guano, rape cake, nitrate of soda, sulphate of ammonia, potash, &c. The farmer may make such mixtures himself, but he is seldom able to ensure such a perfect mechanical mixture. The market value will depend upon the proportions of each material used, which cannot be shewn by analysis; hence we must trust to the good faith of the manufacturer, and should purchase only from those in whom we have confidence. We have found such mixtures answer well.

It should always be remembered that *low-priced are not necessarily cheap manures*. Farmers are too often the dupes of unscrupulous vendors, who trade upon their culpable ignorance and love of bargains. "Show me the company a man keeps, and I will tell you his character." Let us see the class of agents employed to vend a manure, and a shrewd guess may be hazarded as to the value of the manure. Our advice is, to go to the principal where it is practicable, otherwise to deal only with reliable men, and, above all, to trade only with those who sell by analysis. On a future occasion the application of artificial manures will be treated of.

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## FLAX CULTURE.

By MR MICHAEL ANDREWS, JUN., Secretary to the Flax Extension Association, Belfast.

AS the time is now approaching when farmers, intending to sow flax next year, will be allotting such portions of their farms as they consider most advantageous to set apart for the cultivation of this crop, a few observations on the subject may be useful, more especially in reference to the West and South of Ireland, where there exists so much land adapted to the culture of flax. The success of the crop depends very much on the selection of the land and its preparation. Hitherto too little importance has been placed on these points.

Farmers in Ireland do not sufficiently attend to growing the description of fibre most suitable to the requirements of the spinner: they aim at producing weight not quality.

I do not intend to enter into how the operations connected with flax culture are to be conducted. I have done this before; but what I would now wish to dwell upon is the selection of land and most judicious rotation, and at no period of the year could a few hints be given with more benefit than now, when wheat-sowing is about to be commenced.

In Ulster, where flax cultivation has been prosecuted to such an extent for many years that the produce has been materially lessened per acre, I would impress upon farmers, who have been in the habit of growing it, to reserve some of the land which has been this year in

potatoes, and put it in flax next spring. I am sure the result would be an increased yield of the fibre and of superior quality.

In the South of Ireland flax is too frequently put into lea land, which will produce a strong, coarse, uneven fibre. It would be most difficult and laborious to bring lea land into a proper state of tillage to produce a crop of flax to the best advantage. Nothing can be a better rotation for flax than, after oats grown on old lea, and those farmers who have grown oats off lea this year, should not fail to put a portion of their stubble land this year in flax. In Belgium uniform tillage is considered necessary to obtain an even crop; this tillage should be given in the autumn, thoroughly pulverizing the ground, and allowing it to remain and consolidate in the ploughed state till seed-time comes round, always selecting, when practicable, flat lying ground with a cool bottom. Fine and medium flax is what is most in demand by the spinner, and to produce this description should be the farmer's study. If grown on the stubble land I have before mentioned, and more seed sown than is usually done in Ireland, I think crops more satisfactory to the farmer would be produced. Much however, depends on the character of the season.

Notwithstanding the dryness of the past summer, the average production of the South of Ireland has been most satisfactory. In some instances, such has

been the yield and price obtained, that large profits have been made which will doubtless stimulate the culture next year.

I have before remarked that the great advantage in the South of Ireland is the climate which matures the crop earlier, and favours all the after operations connected with its preparation.

Last year the growers of this valuable crop had to struggle against many obstacles—one was indifferent seed, which vegetated very imperfectly; the result in some cases was total loss; in others, thin crops. This year there is little likelihood of cause for complaint respecting the important item of seed. The testimony this season is general as to the superior quality of all

descriptions, and in such quantity as to warrant an expectation of moderate prices. Foreign supply will be supplemented to some extent by seed saved in Ireland, which, when once grown from foreign, is considered to produce a favourable crop. We had a diminished acreage this year in Ireland, but there were causes in operation to produce this result, which, it is to be hoped, will not occur in the coming year. We have passed through a summer of almost unprecedented dryness and heat, which materially injured flax on poor soils; but this should not, nor will it, deter the farmer again sowing flax, which, when cultivated with judgment, care, and skill, is, without doubt, on an average of years, the most paying crop of his rotation.

### WINTER KEEP FOR SHEEP.

THE following seasonable article appeared in the editorial columns of the *Agricultural Gazette* of Oct. 17:—There is a law of reaction in human affairs, and especially in markets. The price at which store sheep are now sold, 30s. for good half-bred ewes and 25s. for lambs, is about 50 per cent. below their usual value. To avoid this sacrifice we recommend a plan by which we have maintained a large head of sheep and lambs without roots, by feeding them on straw chaff softened and made nutritious with hot farinaceous soup. The only apparatus required is a copper for boiling water. In heavy-land districts, where roots are always dearer food than corn and cut straw, steam power chaff-cutters, on wheels, travel from farm to farm, and soon reduce a stack of straw to fine sifted chaff. The meal should be of Indian corn, beans, peas, cake, barley, &c. About one-fourth of the quantity used should be boiled with the water; the soup should be well stirred into the chaff, and the rest of the meal then added and well mixed with the heap. A lump of rock salt should be put into the troughs.

The quantity of chaff each sheep will eat is about 2½ lb. a day, and in the coldest weather rather more. A stout lamb eats ½ lb. a day less. The food, when well prepared, is damp, but not wet, and free from lumps of pudding and unmixed meal. The quantity of meal should be about ¾ lb. a day for a lamb at starting, increased to 1 lb. a day as the season advances. The present price of beans and of maize is 1d. a lb., and the cost of the corn would be 5¼d. to 7d. each per week. Best linseed-cake is nearly 1½d. We prefer one-fourth or one-fifth of oil-cake in the mix-

ture, reducing the average cost to 1d. a lb. by using a portion of rape-cake, which gives a piquant flavour to the *potage* that is never objected to.

One pound of meal a day will maintain a lamb through the winter in good store order, but without roots it will not fatten him. The health of our flock has always been excellent, and the ewes have lambed satisfactorily; but their treatment has differed from that of the other sheep. The latter are folded on stubbles and clover-leas the whole of the winter, while the former—lambling about the first week in February—are removed at Christmas from the stubbles to the pastures and sheltered at night in yards, where they receive a mixture made less stimulating by using ¼ lb. a head less meal, and adding ½ lb. of pollard. They should also have a few bushels of uncut roots a day on the pastures; and there must always be free access to water. The other flocks may have water taken to them, but the ewes must always be able to go to the water, or there will be thirst and excessive drinking, followed by abortion.

The cost of boiling the water, mixing the food, carrying it to the field, moving the fold, &c., is rather less than 1d. a week per head. Heavy land is folded with great advantage after a corn crop on the stubble. If a small quantity of mangold can be spared and heaped in the field, they will save a portion of corn. We have had to maintain lambs during 24 weeks, up to 21st of April, without roots, and they were then in common store condition. It is hardly necessary to add that in the case of ewes in milk there is no adequate substitute for succulent food.

## IRISH AGRICULTURAL STATISTICS.

THE General Abstracts shewing the acreage under the several crops and the number of live stock in Ireland, for the year 1868, were issued on Saturday. From them we learn that the total acreage under all crops in 1868 was 5,547,335 acres, compared with 5,459,702 acres in 1867, which gives an increase of 87,633 acres in 1868. The crops which exhibit an increase this year are—cereals, 80,667; green crops, 43,197; and meadow and clover, 33,462. These make a gross increase of 157,326 acres, but it at the same time appears that there was a decrease of 69,693 acres in peas and beans, turnips, vetches, rape and flax, which reduces the gross increase, as we have stated, to 87,633 acres net. It appears from the summaries that, compared with 1867, wheat increased

by 25,756 acres, oats by 39,408, barley by 15,199, and bere and rye by 304 acres; beans and peas decreased by 3582 acres; potatoes increased by 33,072, acres; mangold and beet root by 270, cabbage by 8753, and carrots, parsnips, and other green crops by 1102 acres. Meadow and clover increased by 33,462 acres. The crops which decreased in area in 1868 were turnips by 15,662 acres, vetches and rape by 3638, and flax by 46,811 acres. The returns of live stock for 1868, when compared with 1867, shew a decrease in the number of horses of 1216; of cattle, 87,451; of sheep, 13,075; and of pigs, 372,748. The total estimated value of horses, cattle, sheep and pigs, this year, was £34,098,742, being a decrease of £1,058,477 compared with 1867.

## THE HARVEST OF 1868.

MR JAMES CAIRD sends to the *Times* an estimate of the harvest of the present year. He says:—

The yield of wheat has been ascertained in various parts of the country, and, with the exception of that grown on shallow gravels and light sand, it is pronounced nearly equal to the fine crop of 1864, but not so good as the abundant crop of 1863. It is nearly as much above an average as the crop of 1867 was below it. My own inquiry and observation lead me to the conclusion that 32 bushels, or four quarters, an acre may be safely reckoned as the yield of this year, which is five bushels an acre above the yearly average yield of the United Kingdom.

So far we did not need the agricultural returns to help to this conclusion. But without them we could not have known that upwards of 300,000 acres had been added to the breadth under wheat, and that thus, beyond the bountiful yield of each acre, we have this year secured an addition of 1-12th to the acreage, which is the same thing as an additional month's home supply. The money value of this knowledge may be difficult to estimate. If we reckon its influence on price at but 1s. per quarter on the total consumption of the country, the cost of obtaining these returns will be repaid to the public one hundred-fold.

At four qrs. an acre the wheat crop will give 15,700,000 qrs., and if the annual consumption is taken at 20½ million qrs., the foreign imports absolutely required will not exceed five million qrs. But

as we began one month earlier than usual on the present crop, and as the old stocks were exhausted, we ought not to reckon on less than an additional month's consumption of foreign corn to make the country safe to next harvest. This will increase our demand for foreign wheat and flour within the harvest year to a total of six and a-half million qrs. The importations of the first two months of the harvest year—August and September last—having been very nearly on this scale, it would seem that the present range of price in this country is not more than is required to draw from abroad the necessary supply.

The cost of imported wheat in the current year will be about £15,500,000. Last year it was £31,000,000. The highest average price of the year was reached in May, 73s. 11d., from which it has fallen in four months to 53s. 7d., or rather over 20s. a qr. But this saving of £15,500,000 in the price we shall have to pay for foreign wheat will be considerably diminished by the deficiency in the barley and oat crop.

These I reckon to be at least one-fifth below an average crop, and there being likewise a deficiency in the acreage, the ordinary money value of the barley and oat crops of the United Kingdom will this year be probably £10,000,000 under an average. Of this rather over one-half applies to the oat crop, a large portion of which being consumed on the farm, the loss will fall more heavily on the farmer than on the public.

The hay and green crops are also greatly deficient. It would be very difficult to place a money estimate on



this deficiency, but the loss of these, which are the basis of stock husbandry and productive corn crops, will seriously trench upon farming capital.

The potato crop remains to be considered. There is an increase upon it of 80,000 acres—somewhat more than one-twentieth of the whole extent. It will prove an average crop, the second growth, which began after the rains in July and August, having added greatly to the bulk. Both first and second growth seem to be sound; but as the first crop has ripened earlier than

the second, there will be some risk in storing, to prevent which the potatoes should be left as long as they safely can be to ripen fully before being taken from the ground.

On the whole, the harvest of 1868 will prove a productive one of wheat and potatoes—the main food of the bulk of the population—which will thus be supplied at a moderate price. But there will be a great deficiency in the food of live stock, and a very serious loss in that branch of agricultural industry.

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### IMPROVEMENT OF SHAP FELL.

MANY persons in different parts of the kingdom doubtless remember the cold and cheerless ride which, before the days of railways, travellers encountered over the dreary mountain waste of Shap Fell, a tract of about 6000 acres, the property of the Earl of Lonsdale. No operation in recent times better deserves record than the extensive drainage, liming, and other improvements recently carried out there by his lordship.

The portions operated upon are from 1200 to 1600 feet above the sea-level. This ground was previously, in Westmoreland phrase, mere “room out of doors,” *i.e.* of insignificant value, carrying little beyond grouse and blackfaced sheep, but never looked upon as capable of, or worth improvement. The design of draining and liming this class of land at such an elevation was thought by many a costly and hazardous experiment. In some measure an experiment it undoubtedly was, there being no previous guide to point out what could, and what could not, be successfully and profitably accomplished.

Interspersed with the heath, with the advantage of being intersected by good roads (the old and new great north turnpikes), were considerable stretches of “white land,” *i.e.*, producing decent grass with bent and rushes, while still better pasturage was found in grassy and sheltered dells and dishes. The upper portion of the Fell is naturally a mountain sheep walk and grouse ground, and must remain so.

Under the skilful superintendence of Mr Parkes the first operation was to tile-drain the wet portions, and this was carried on from year to year, advancing higher and higher up the hill side, till upwards of 1200 acres

were drained. Limestone being on the ground, kilns were built, and about 1500 acres have been limed. The lower lying, sweeter, and limed portions were enclosed with 6 feet walls, and sheds erected in suitable situations for sheltering stock.

Numerous were the hostile critics and foreboders of failure; any attempt to invade these regions in such a way being contrary to all previously received opinion and precedent. Some parts of the work, doubtless, might have been better done, and with the experience gained would be done differently if started afresh. The returns may not have been so certain and uniform as in more favoured situations, but on the whole the result is a great success, and beyond expectation.

The ground was partly stocked with the proprietor's cattle and sheep (bought on in the spring, and sold off by auction in autumn), and also thrown open to the public for agistment on the following terms:—Age 1 cattle, 40s.; two-year-olds, 32s.; yearlings, 23s. This privilege was eagerly taken advantage of by the low country farmers, and extensive herds of fine cattle covered the ground every summer, in numbers beyond expectation, coming off in capital condition in autumn. The ground, however, was found to be too high for successfully wintering “hogs.” In the dry hot summer of 1859, when all the pastures in the Vale of Eden were parched, and the watering-places dried up, the herbage on Shap Fell was succulent and plentiful, and the supply of fine water unlimited. In the cold wet summers, such as too frequently occur, the results, of course, were less favourable.

This tract is now let to a tenant at a rent of about £800 per annum.

## Farm Architecture and Engineering.

### NOTES ON COTTAGES WITH COTTAGE PLANS.

#### CHAPTER THE SECOND.

WE now come to the considerations connected with the second division of our subject—viz., *Accommodation in the cottage, or the number of rooms it should contain.*

On this subject there are a variety of opinions. The following remarks on it are made by the Association for Promoting Improvement in the Dwellings and Domestic Condition of Agricultural Labourers in Scotland:—"Some maintain that a kitchen and a bedroom, with a milk-house, is quite sufficient, and to give more is an error, as a ploughman can only furnish one apartment. But very little furniture will suffice. In a small bedroom they must have the requisite number of beds, and it seems quite as easy to have them in separate rooms as to have two in the same room. All the addition, therefore, that is required is a small table, a couple of chairs, and, if thought necessary, a small basin-stand. It is plain that if there is a large family living in such a house as that mentioned—namely, a room and kitchen—there cannot be a proper separation of the sexes. On the other hand, it is asserted that there should be *no* beds in the kitchen, and no fewer than four separate apartments; one, the kitchen, or living room, a bedroom for the parents, and two smaller bedrooms for the children, and this seems the proper method, if there is to be a due separation of the sexes, and no beds in the kitchen. There is, however, a strong prejudice among the ploughmen themselves against removing the beds from the kitchen, and it may be worth while to consider whether something between these different methods might not answer the same purpose. By allowing *one bed only* in

the kitchen, and having two bedrooms besides, three separate sleeping apartments can be obtained (as in the former case) without violating the prejudices of the inhabitants so much, as if the beds were entirely removed from the kitchen. This method is liable, however, to the objections urged against sleeping in the kitchen. Each house should also have a milk-house or pantry; a scullery (if properly used) will also be a great convenience for washing, &c., as by this means the kitchen may be kept in a much cleaner and more orderly state than it would otherwise be. To decree, therefore, the ends above mentioned, it appears that at least three apartments are necessary, two of these being used exclusively as sleeping apartments; the other, the kitchen or living-room, for cooking, &c., and also as a sleeping apartment; and if the kitchen is used for cooking and eating only, four apartments will be required. There should also be attached to each cottage an ash-pit and privy. These may be placed either in a small court at each end (as in a pair of cottages), or at the back, leaving a clear space of at least ten or twelve feet between them and the cottage. The piggery should be built as far as possible from the house."

On the accommodation of the cottage, the following hints will be useful:—Every facility should be given to the mistress of the cottage to keep things tidily arranged. As to the cultivation of habits of order and tidiness, it is folly to talk of their absence in the houses of the poor, where there is a complete absence of all those conveniences by which alone this tidiness is assisted, and by which, we may here

add, it can alone be secured. If one part of the axiom of household economy is to be perpetually dinned into the ears of the cottage housewives, "everything in its proper place," let not the other part be forgotten, "a place for everything." We have often seen the hands of astonishment uplifted at the dirty habits, personal and household, of village cottagers, in forgetfulness that no water was provided near their dwellings by which cleanliness could be secured. It is somewhat difficult to wash without water, and no less so to be "tidy in a house where no means of securing tidiness are obtainable." Closets and pantries should be given with an unsparing hand, and these in positions "handy" to the mistress, so that no time shall be lost in going out of a room for articles which are principally required in it. Thus a closet or cupboard should be provided in or near the living-room, in which the crockery in daily use can be stored. Where pantries cannot be properly formed in spaces, two cupboards can always be made in the living-room, one at each side of the fire-place, in the recesses formed by the projecting jambs. A scullery or wash-up place should invariably be provided to every cottage. This is one of its most important appliances. For when it is provided, a greater degree of tidiness and cleanliness can be secured than where it does not exist. Moreover, washing can be carried on within it, leaving the living-room free from the annoyances attendant upon "washing-day"—annoyances which too often operate in a prejudicial way, causing the male inhabitants to flee to the public-house. Another point should be attended to, namely, giving an exterior porch, or an interior lobby, through which entrance can be obtained to the living-room. This arrangement prevents currents of air passing into the room, rendering it warmer in winter. Independent entrances should be provided, if possible, to all rooms, more especially to bedrooms. Passing through one bedroom to gain admission to another is an arrangement which should be avoided. It may be admissible where the children's room is immediately off

the parent's, but where the two rooms are for adults bedrooms should be made of as large dimensions as possible. The plan often pursued of cramming beds into any small closet or recess cannot be too strongly condemned. On this point, the following remarks of Dr Kilgour, in his lecture "On the Ordinary Agents of Life," are well worthy of consideration:—"We are beginning to recover from the absurd plan of cramming our beds into small closets in order that they might be out of sight, and out of the way. Architects, a few years ago, seemed to think that the public rooms could not be too large, nor the bedrooms too small, provided only a dressing closet was attached. A third part of the twenty-four hours we spend motionless, and exhaling the rankest and most fetid part of our cutaneous and pulmonary secretion, in a small and confined bedroom, in order that we may shiver and starve in a large room during the rest of the day that we remain in the house. How often has the physician to regret the confined bedroom in which his patient is placed! Often it is impossible to ventilate it by raising the window without risking the full draught of cold air on his patient. I have more than once seen the convalescent from fever cut off by pneumonia from being exposed to the currents of cold air from a window raised a little to refresh him, or to ventilate the room. Alcove beds are improper, from retaining the foul air; the bed should stand in the middle of the room, and not in a corner, yet so as not to be in the draught from door to window or chimney." Another feature in the accommodation required in a cottage, is the store place required for provisions, and nothing so completely comes up to the standard of excellence required in a store place as the dry *cellars* so commonly met with in Lancashire and the north of England. These are there considered essential even to houses of the most ordinary description. They keep meat in a good state of preservation for a much longer time than can be done in pantries or meat-safes placed on the level of the ground floor. Indeed, wherever these advantages have been

experienced they commend themselves at once to the common-sense notions of housewives, who know the economical advantages obtained from a good provision store. It is surely unnecessary to note that a privy is an essential feature in the accommodation required for an agricultural labourer. In immediate juxtaposition with this should be the ash-pit. All smell can be completely prevented from arising, both from the privy and from decaying matter thrown into the ash-pit, by putting now and then a layer of common earth; this should be dried before it is applied. Indeed, so speedy and complete a deodoriser is dried earth, that in manufacturing what we call "home-made guano" out of human excreta and dried earth, no smell is at all perceptible ten or twelve minutes after the mixture is made. The cottager's pig is, or ought to be, an important feature in the cottage domestic economy; so in like manner should be the poultry. If he can to these add the dignity of a cow, little fear of his ever descending in the social scale; on the contrary, mighty helps they will be found to be in raising him surely, if slowly, up it. The pig, the poultry-house, and the cow-house should all be arranged together, and, along with the privy and the ash-pits, should be placed at some distance from the cottage.

There is one point which is of great importance in connexion with the setting out of cottages, but which, nevertheless, is frequently overlooked—namely, the necessity to proportion the cottage accommodation to the wants or necessities of the family which is to occupy it. Too frequently is it the rule to build cottages after a uniform plan, utterly regardless of all considerations respecting the size of the family. On this point Mr Stephens, in the "Book of the Farm," has some excellent remarks:—"The usual practice in building cottages for farm-servants is to adopt a uniform plan upon which all are built. The practice is not founded on sound principle, nor even on expediency, because it implies that families consisting of very different numbers should, nevertheless, be accom-

modated within a similar space. Instead, therefore, of a family accommodating itself to the size of the cottage, the cottage ought to be adapted to the wants of the family, and there is no way of establishing this mutual understanding between cottages and their inmates but by building them of different capacities for accommodation, and appropriating them to families in accordance with their numbers. This is the only rational course to pursue, and in pursuance of it, it is as easy to build a given number of cottages on different plans as on the same plan."

We have long maintained that the future extension of cottage building for the labouring classes, in a degree fully commensurate with the demands of the rural districts, depends chiefly upon the cheapness of their erection. It is all very well to talk of the claims of philanthropy or those of an enlightened economy, but this may be done, and will be done in vain, if it is found in the future, as it has been found too frequently in the past, that the system of building adopted is that which greatly enhances the cost of the buildings. All the more decided will this be if it should be proved that this expensive mode of building is unnecessary—at least so in many departments of construction; and that much of the expense is unnecessary, can, we think, be easily proved. If only in one department money can be saved, every endeavour should be made to find out what that department is. One is to our minds very obvious—namely, the giving of unnecessary accommodation. It has been the lot of the writer to have had through his hands a very great number of plans for cottages, and in nearly all has he found that they had been designed more in accordance with pre-conceived notions of the designers as to what *they* conceived necessary in the cottages, than with what those who were to occupy them required. It is in every way worthy of remembrance, that cottages are built, or should be built, with accommodation suited to the actual every-day requirements of those who are to inhabit them, not brought up to, or measured by, the



standard which the designers conceive to be the right one. Some accommodation is frequently given which is just of as little use to the occupiers as a third wheel would be to a cart. The procrustean mode of design-

We confess, indeed, to a conviction that it is in this way that economy is to be obtained in the future. In the large majority of erections a vast deal of unnecessary work is done, and many kinds of fittings given which could,



Fig. 1.

ing which compels a uniform style and amount of accommodation to meet all cases, has done a vast deal of harm in retarding the extension of healthy houses for the labouring classes ;

if not dispensed with altogether, be at least put up at a cheaper rate. But it is not only in the direction of economising the use of old and established materials, but in the adoption

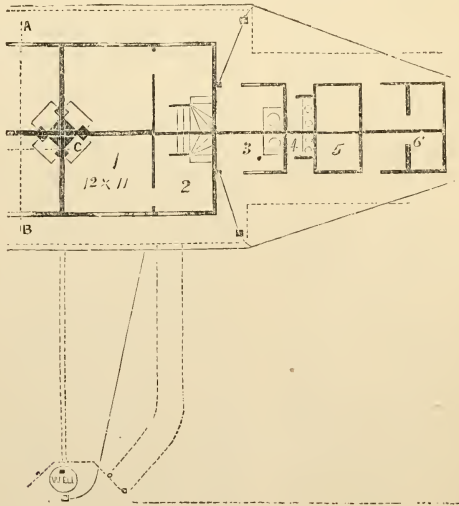


Fig. 2.

inasmuch as it has impressed people with the notion that all cottages are costly affairs to erect. And in the department of construction, also, we believe much remains to be done in the way of building cottages cheaply.

of new, that we hope to see a cheaper mode of construction placed within the reach of the landlord or owner of property. We hope from time to time to point out to our readers the improvements made or suggested in this

department; meanwhile we conclude the £150 a-piece, but that they can be built for present paper by giving here the plans of a much lower sum, from £50 to £85. Fig.

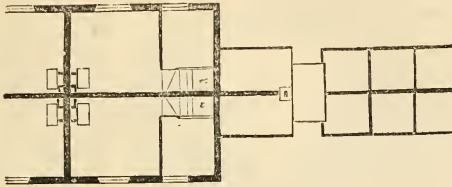


Fig. 3.

cottages built by Mr Walker, of Rugby, who, in a letter recently addressed to the *Society of Arts*, claims for them notice, upon the ground that they shew that the cost of

1 is half front elevation; fig. 2, half ground plan; fig. 3, half chamber plan; fig. 4, half

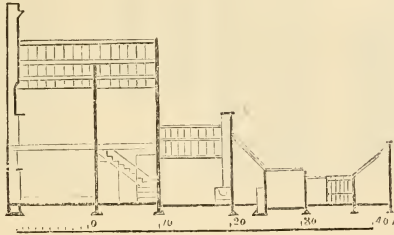


Fig. 4.

*Arts Journal*, claims for them notice, upon the ground that they shew that the cost of

longitudinal section; and fig. 5, the transverse section, all of which are drawn to the scale as in fig. 4. In fig. 2, the ground plan, 1 indicates the living-room; 2, ante-room or entrance with stairs; 3, the wash-house; 4, the w.c.; 5, dust-bin; 6, pig-sty. There are four cottages in each block, two facing in opposite directions. This "back to back" arrangement has been objected to, but Mr Walker states he has found no real objections arising from the plan, as both sides of the block are fully exposed to the air. There can be no doubt that this arrangement results in great economy of material, and all the chimney flues can be carried up in the centre. Two bedrooms are given to each cottage.

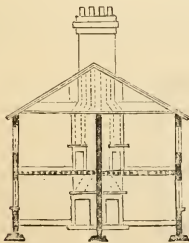


Fig. 5.

erecting good cottages need not be so high as is generally supposed, as, for example,

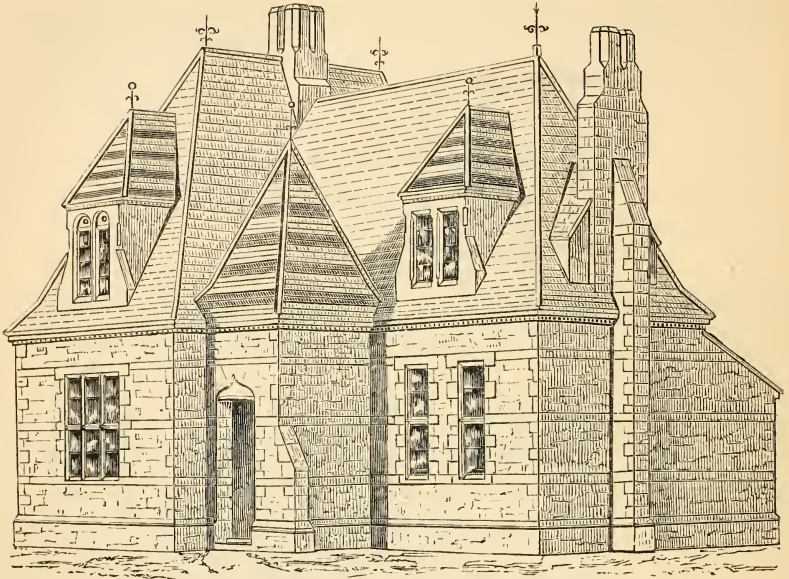


Fig. 1. Elevation.

*DESIGN FOR ENTRANCE LODGE OR GARDENER'S COTTAGE.*

IN pp. 31, 32, we gave a design for an entrance lodge or cottage; with remarks which are also applicable to the design

tion in perspective; fig. 2, ground plan; and fig. 3, chamber plan. In fig. 2, E is the porch or lobby; B, living-room; A, bedroom; C,

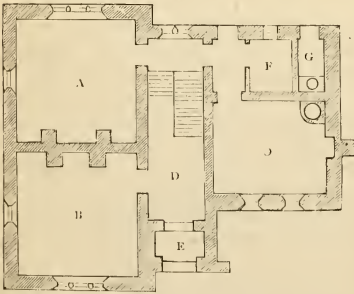


Fig. 2. Ground Floor Plan.

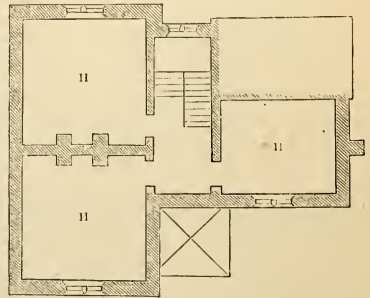


Fig. 3. Bedroom Plan.

we now give for a building of a modern character in figs. 1 to 3. Fig. 1 shews the eleva-

tion in perspective; F, pantry; G, w.c. In fig. 3, H, H, H, are bedrooms.

## The Garden.

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### FRUIT-KEEPING IN WINTER.

HOW frequently are complaints heard, that the reputed long-keeping kinds of apples and pears, frequently decay long before the times assigned in fruit manuals and nursery lists for their being in season; which complaints are not unfrequently followed by hasty affirmations, that all pomological authors are little else than humbugs, and that especially no dependence is to be placed on what they record in regard to the durability or keeping qualities of the different kinds of fruits which they essay to describe. Before judging thus rashly, it is but fair, however, to consider the latitudes and places for which the maligned authors may have written, and it is also necessary to bear in mind that the great diversity which exists in the earliness and lateness of different seasons has a material influence on the keeping properties of fruits. But far beyond all natural influences are those arising from the management and mismanagement of fruit-rooms and their stored contents. It should be always kept in view that fruits, as well as flowers and foliage, have their naturally assigned limits of duration, which, as in the case of these two last, may be lengthened or shortened according to the diminution or increase of temperature to which they are exposed. But, as with flowers and foliage, fruit should be protected from frost, yet the lower that the temperature can be maintained without causing actual injury, so much longer will long-keeping fruits remain before they attain to perfect ripeness or maturity, provided no other hurtful agencies, such as dampness, impurity of atmosphere, or contamination with decay, be allowed to exert their baneful influences.

The first care with keeping-fruit is to see that it is gathered when sufficiently but not over ripe; that it be, at the same time, perfectly dry; and that no blemishing be caused by roughness in handling or otherwise. Then it should be carefully deposited in the fruit-room separately, if there is sufficient space to allow, but if not, then apples or pears may be laid over one another, four to six deep, provided due care is afterwards taken in frequently looking through them, and removing any that are shewing symptoms of decay.

Shortly after being thus stored, these fruits, but more especially smooth-skinned apples, commence what is termed sweating, by the exudation of moisture, which, if left untouched, soon becomes clammy and then dry, so as to form a surface varnish, which by retaining the natural moisture and excluding air, materially aids in preserving the fruit, but the drying and rubbing off of which by cloths, is often the first perpetrated piece of mismanagement after the fruit is shelved. Until the natural drying up of this moisture is completed, the fruit-room may be moderately aired for a few hours in the morning and evening, but it is better that it be shut up and kept dark throughout the warmest portion of the day. The great essentials for fruit-keeping being an atmosphere which is neither too dry nor too moist; exclusion from air, in so far as compatible with the requisite dryness and freshness in the atmosphere; the exclusion of light; and the maintaining of a nearly equal low temperature.

To secure the proper amount of dryness



or moisture in the atmosphere, much less airing is requisite than is generally applied, and fresh air should never, if possible, be introduced when the weather is very moist, nor when very dry and windy—quiet, dry, cool, but not frosty days being the best; and it is advisable to admit it through or near to the floor, and to pass it off through openings in the highest parts of the ceiling. All of which openings should be made to shut easily at pleasure, so as to exclude the air almost entirely after the fruit is stored from four to six weeks, and particularly when warm, dust-drying weather sets in.

As light promotes the maturation of plants, so in like manner it does that of fruits; and in combination with over-dryness it causes that shrivelling of the skin, which destroys its beauty as well as texture, and imparts a toughness to both late- or long-keeping apples and pears. This shrivelling is a frequent annoyance, and although it may in some instances be primarily caused by too early gathering, yet it principally arises from the injudicious admission of light, air, and heat. In confirmation of which, an instance may be quoted of a gentleman who had a fine healthy tree of the Easter Beurré pear, that regularly bore excellent crops of large and beautiful fruit, which, however, invariably became so shrivelled, tough, and unrepresentable, when it should have been in season, that its owner resolved on cutting down and re-grafting the tree, but a friend, chancing to call at the time of pulling them, who admired the pears, was made welcome to the whole, with the assurance that they were never fit for anything else but feeding pigs. In the following Easter holidays the grower dined at his friend's house, and partook of some most excellent pears, which pleased him so much that he asked for some grafts of the kind, and his astonishment may be guessed at on being told that they were the identical pears which he had so lightly esteemed at the time of gathering; but that, instead of their having been shelved in a dry fruit-room, each had been enveloped separately in soft dry paper, then packed among dry

sand in a strong close deal box, and placed on the cellar floor, under the potato bin, till ready for use.

A temperature ranging between 35° and 42° is the best for keeping the forementioned fruits, and in a northern exposure, with a double ceiling, walls lined with thick deals and strong shutters, with extra straw or mat door and window coverings, in hard frosty weather, such a temperature is by no means difficult to retain. The covering of potatoes in the forementioned case ensured freedom from frost, and it is presumed that a high temperature was also guarded against in the cellar so as to ensure the proper preservation of the potatoes. Instances may occur, however, in which frost will reach the fruit, and in such cases the injury arising from it will be avoided, or at least greatly modified, by keeping them perfectly dark and untouched till they become thoroughly thawed by the return of fresh weather.

Many who cannot command the use of well-constructed fruit-rooms, store their long-keeping kinds of apples and pears in dry, airy garrets, or other equally unsuitable rooms and closets; and that often because it is supposed that they have no other places for the purpose, unless where the smell arising from them would taint the whole atmosphere of the dwelling-house. Let such try the packing of them in paper, dry sand or charcoal, and strong deal boxes, as before described; then, if they have no cellars for them, let them be set in presses or in spare rooms upon the ground floor; or, if large earthenware jars can be obtained for use in place of the boxes, and these covered over with oilskin or other airtight substances, the smell will be more efficiently prevented, and better keeping also ensured. Tin cases, such as are used for preserving biscuits, will do equally well, if properly closed. And if it be wished at any time to hasten the maturing of a particular sort, it is only necessary to place the box, jar, or tin case containing it in a convenient place where it will be surrounded with a suitable warmth of temperature. Some pack their long-keeping apples and pears in hay, straw, chaff, dry

tree leaves, dried ferns or brakens, dry moss, &c. None of these are, however, to be recommended, although the two last are the least objectionable; for, as a rule, all dried vegetable substances impart less or more of their flavour to the fruit packed among them.

Even shelves or boxes made of pine or fir deals should be avoided, more especially when new, as they impart a resinous flavour to fruit stored on or in them, so that hard wood is preferable, such as beech, plane, oak, poplar, &c.

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### ROOT-KEEPING IN WINTER.

THE keeping of culinary roots, so as to retain their freshness and excellence unimpaired for the longest possible period, is a matter of the highest importance in household management, notwithstanding that it is too generally neglected; and these indispensable articles of daily consumption are treated as if their deterioration by careless or unskilful management was of no material moment. Town residents have much to plead in excuse when their potatoes, or turnips, manifest signs of bad keeping; but even they are in most cases not entirely blameless, although they may be so to a much less extent than their neighbours who have ground-floor and underground cellarage at their command; or those country residents who have both ample out-door and in-door root storage at their disposal.

To maintain culinary roots in a proper state of freshness and excellence it is indispensable that the following general rules be attended to. They should not be taken up except in dry weather, nor stored when either too wet or too dry, without in the latter case being mixed with lightish soil or fine sand, either of which should be just so dry as to retain a lumpish form after being firmly pressed in the hand, without falling down immediately when it is opened. After storage they should be protected, by proper covering, from frost and rain, as well as from high temperature, or kept as near down to 38° of Fahrenheit as possible, so as to retard their vegetation to the utmost; and at no time during their storage should they be exposed to either light or drought. No universal rule can, however, be laid down for storing all

kinds of culinary roots, but the *potato* and the *beet* may be taken to exemplify different requirements in root-keeping, which, with certain minor modifications, will apply to most other kinds.

We will not here allude to the preservation of great masses of potatoes for wholesale marketing, further than that, other essentials being attended to, they should be provided at storing with ample ventilation to carry off all vitiated atmosphere and superfluous moisture caused by sweating, partial decay, or otherwise. Ventilation is seldom needed in the limited quantities that are required merely for home use; for storing which, out of doors, naturally dry, or well-drained, cool-shaded airy sites should be chosen, in which the potato pits may be excavated in a northerly and southerly direction, to a depth of about 9 inches by a width of 3 feet, which excavations should, however, be dispensed with when the ground is unavoidably of a wet or water-retaining nature. The potatoes, being then regularly heaped up as steep as they will lie, should have light dryish earth shaken over them in sufficient quantity to fill up the interstices, so as almost to cover the outer surfaces of the tubers. The whole should then be covered with good bare turf laid with its grassy side down; but where turf cannot be conveniently got, 4 to 6 inches in thickness of clean dry straw may be substituted, that of wheat being preferable, over which a covering of firmly tramped earth, from 9 to 12 inches in depth, must be laid, having its surface smooth beaten to prevent the ingress of rain. With the same view, any cracks or subsidences occurring afterwards

on the surface should be filled in and beaten in like manner. Little further attention is required, except where the potatoes are not likely to be needed till between the end of the year and the coming into use of the next crop, in which case it is better to cover the whole pit over with 12 to 18 inches of straw, dried ferns, or other non-conducting substances, of which dry sawdust and tree leaves are often easily attainable; but when employed, these should be thatched over with 3 or 4 inches of well-drawn straw, to prevent their dispersion by winds, and to keep out rain. Whether stored on the surface or in shallow excavations, it is most essential that the surrounding open trenches, from which the earth used in covering has been taken, be at least 6 inches lower than the potatoes, and formed so as to prevent the retention in them of any rain water. The storage of potatoes in cellars, as well as in other places, should be done as far as possible in accordance with the foregoing remarks—viz., by keeping them in total darkness, neither too moist nor too dry, and as cool as possible, without admitting frost, or allowing the temperature to fall at any time lower than 35°. These requirements will be much promoted if a supply of clean, dryish light earth or sand is kept for always mixing among them, which, in the event of being too dry, may be turned out upon the cellar or kitchen floor, passed through an inch-mesh sieve, to keep out any potatoes or stones left among it, then sufficiently and regularly moistened by frequent light sprinklings of clean water, accompanied by repeated turnings, before being again intermixed among the potatoes.

Beet-root, unlike potatoes, will bear a few degrees of frost almost without sustaining any perceptible deterioration thereby. And it requires the utmost care in taking up, conveyance, and storage, so as to avoid the least bruising or mutilation of even its smallest extremities. Nor should its leaves be cut off nearer than half-an-inch to its crown—some even recommend leaving as much as 6 inches; but in the latter case too much decayed vegetable matter becomes introduced into the mass when the roots are stored in bulk. When pitted in the manner of potatoes, beet-

root is apt to become mouldy, and liable to premature decay, besides losing much of its depth of colouring and delicacy of flavour. And when kept too dry, or too much exposed to the air and light, toughness or stringiness is induced; hence it keeps best when stored in heaps upon cellar floors, in root-houses, or in sheds—the crown ends of the roots being turned outwards, and each layer of them carefully laid alternately with a layer of dryish sandy mould; not perfectly dry sand, mould, or coal ashes, which have been recommended, but all of which are objectionable. Then the whole should be finished with a close compacted 12- to 15-inch thick covering of straw; and a similar mode of storage may be applied to carrots, parsnips, turnips, salsify, scorzonera, &c.

With the exception of the tubers of that very excellent, but too little appreciated, vegetable, the ocas of the Peruvians—*Oxalis crenata*—none of our culinary roots are so susceptible of injury from frost as the potato. But while beet will stand several degrees of frost, carrots still more, turnips a yet greater, and Jerusalem artichokes perhaps the greatest amount of cold, without becoming what is actually deemed frosted; yet frost to any extent, although it may not perceptibly affect the texture, does, in all cases, depreciate the quality of any culinary roots that are exposed to it. Much stress is often laid upon the thawing of frosted roots in the dark, or before they are in any way exposed, touched, or handled, till the frost has entirely left them. No doubt there is much in this, as far as regards the appearance and texture of the roots so treated; but as regards their qualities, these are often only faint remnants of former excellence. And here it may not be amiss to notice the practice occasionally followed in some parts of the country, of allowing potatoes to stand where they grew through the winter, after laying an extra furrow or two over them with the plough. Unquestionably most of the tubers, when so treated, retain what may be termed their vital or growing freshness, although that they must have been thoroughly penetrated by the frost in the course of the

winter, from which cause, however—and it may also in part be from their having long lain in wet soil—they become watery, as well as earthy tasted, and their edible qualities in every way depreciated, as any one may ascertain who will take the trouble, in February or March, of comparing well pit-kept potatoes, with those of the same crop which may have been left till then in the ground, from having been unobserved at the time of lifting. And while this mode of winter-keeping is so detrimental to potatoes, it amounts to waste in the case of beet-root, carrots, and others, which, although they may retain their forms, are almost unfit for culinary purposes after remaining over winter where they grow.

Retarding the sprouting of culinary roots to the latest possible period is a subject which receives far too little attention. Occasionally picking off the young sprouts, and turning the roots so as to check their growth by change of position, and the rubbing off of the young rootlets being commonly deemed all that is needed, while for potato pits a cool shaded site is seldom thought of, and the recommendation that they should be formed in a northerly and southerly direction is by many looked upon as something on a par with the notions of antient authors in regard to sowing, planting, and pruning, at certain defined periods of the moon's age; yet, from want of attention to this simple rule, many have in early spring to deplore premature sprouting on the southern side of their pits, while on the opposite side the tubers present little or no appearance of bud-swelling; vegetation having been promoted in the former solely by the heat which the southerly exposed side of the pith as absorbed from the sun shining daily upon it at the warmest time of the day. Whereas, had the pit lain from north to south, the sun could only have shone directly upon its sides at six o'clock in the morning and evening, and its rays would have fallen more obliquely on the eastern side as they increased in strength, till at mid-day they would have only rested directly upon its narrow end, falling off again in intensity as they came round upon the western side. Another frequent error is the putting

of too many potatoes that are intended for late keeping into the same pit, which should never contain more than can be taken into the kitchen store at one time, as when the pit is opened up at the growing season, and only a portion taken up, vegetation becomes more rapidly promoted among those that remain. Too many pits may be deemed both troublesome and unsightly, but only one may be employed, if the precaution is taken to subdivide it effectively at proper distances with earth, in which case the pit should be filled from south to north, so that the slope of the earth divisions will allow of its being progressively opened from the coolest end—viz., north to south. Although the differences between unsprouted, and first sprouted roots may not appear prominently to the consumer, yet it will seem more evident when it is considered that unsprouted potatoes contain a much larger quantity of starch than sprouted ones; and that for the manufacture of beet sugar, those roots which have commenced to sprout yield no remunerative saccharine extract. But that nothing be lost which can be formed into excellent food, it is well to bear in mind that the young shoots of beet-root make an excellent substitution for spinach; and that the blanched sprouts of both common and swedish turnips are scarcely if at all inferior to those of sea-kale.

Looking to the importance of thus carefully preserving culinary roots, it is to be regretted that the subject has not received more attention at the hands of sanitary reformers and others, who have the welfare of all classes at heart, and more especially that of city inhabitants, who have only very limited accommodation for root storage at their command; but many of whom might have much more were architects only instructed to provide proper repositories for them, if only of a few cubic yards in extent; even under the ground floors, where no better situations are available. For up-stair dwellers much better accommodation than they now possess might also be provided. But under existing circumstances they must, we fear, be content for the present to put up with nothing better than



deal boxes in which to store small supplies of carrots, turnips, and beet-root, intermixed with dampish soil; and to purchase their potatoes from the vegetable shops at high prices, because, of necessity, in small quantities. And in choosing the place to purchase from, we would advise them to avoid

all shops where bags of potatoes are exhibited at the doors in frosty weather, or where the carrots and beets are allowed to lie exposed on dry shelves or floors till they become so sapless and flexible as to bend without breaking.

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### LAWNS AND CROQUET GROUNDS.

THE dissatisfaction often experienced at having a new croquet ground or bowling green marred with the coarsest and most unsuitable grasses, instead of its being exclusively covered by those fine-turf forming kinds, which the seeds sown should have produced, is only illustrative of an annoyance which is too frequently experienced by those who expect a fine grassy surface, after sowing the kinds of grasses which they have purchased best adapted for producing that desired result. So frequent, in fact, is the occurrence of this vexatious disappointment, that instead of sowing, many resort to the far more expensive mode of laying their greens and lawns with turf from fine old pastures, in which neither coarse grasses nor unsightly weeds exist. It is only the privileged few who can obtain such turf on any terms, while for the many, and more especially those who possess suburban villa gardens, the choice lies between procuring bad or indifferent turf, and sowing down with the best grass-seed mixtures which they can procure.

When complaints are made of coarse grasses coming up where only fine ones were intended, and supposed to have been sown, the reason usually assigned is, that the ground must have been so foul that their seeds naturally abounded in the soil. And, doubtless, there is often much truth in this assertion; but the natural presence of coarse grass seeds will not suffice to account satisfactorily for the regular and abundant braird of obnoxious grasses where fine lawn grass seeds have alone

been sown. Even within the bounds of an ordinary bowling-green nature-sown weeds and wild plants of all kinds have their favourite spots, where, influenced by a difference in the soil or other causes, they come up thicker in some than they do in other places; but where any of them appear regularly over the whole surface it is generally safe to infer that they must have been sown in mixture with the grass seeds; and that they have been so introduced amounts to a certainty when they so appear over a considerable area, or in differently situated small patches, which may have been sown with the same seed mixture. Having lately been asked to examine several play-greens and lawns, for which the most approved seed mixtures had been ordered, but all of which presented a coarse and very unsatisfactory appearance, we were struck with the abundant and regular growth, throughout the whole, of that very coarse-stuffed growing grass, the *Holcus lanatus*, or "Yorkshire fog." The presence of this had been pointed to by those from whom the seeds were procured, as proving that the foulness complained of must have been in the ground and not in the seed mixtures, "seeing that its light chaffy seeds were so very different from any of the kinds supplied; that had they been there their presence must have been easily detected." On looking at some portions of these mixtures, which had been left over, none of these chaffy seeds were present; but a closer examination shewed, nevertheless, that those of the

*Holcus lanatus* were there, only they appeared in a less easily recognised, or what may be termed a naked or clean form.

The crested dogs-tail grass (*Cynosurus cristatus*) is well known as one of the best of the flat-leaved grasses for fine lawns, and it is consequently universally recommended in mixtures of seeds for sowing down lawns. These are among the heaviest of grass seeds, weighing on an average about 26 lb. per bushel; and in retail seed lists for the present season, they are quoted at from 1s. to 1s. 6d. per lb., whereas the chaffy seeds of *Holcus lanatus* weigh only about 7 lb. per bushel, and their price varies between 3d. and 4d. per lb. Further, the seeds of *C. cristatus*, which are terminated by a hard finely-beaked point, which appears toothed or serrated under a high magnifying power, may be compared to barley, in leaving their glumes or outer chaff adhering to the straw when thrashed, and in having their paleæ or inner chaff covering firmly adhesive. The seeds of *H. lanatus*, as they usually appear, are loosely enveloped by the glumes, as well as encased in their smooth thinish paleæ, just like oats with their outer loose chaff attached; which they further resemble in having two seeds or grains within each glume, the latter, however, being much larger in proportion to the seeds than that of an oat spikelet. The terminal or smaller of the two grains, which is more slender in form than the other, has a short recurved awn at its point; while the under grain is entirely unawned, and when fully ripe its paleæ is so fragile and thin that its point, and more or less of its other parts, frequently get rubbed off, and the kernel then presents a blunted form, with a clear light, coppery-yellow, transparent-like colouring. Thus far it will be seen that the difference is very marked, the seeds of the first being compact and heavy, while those of the last are chaffy and light; but here the fraud, or if a more mild term must be used, the *doctoring* begins. When fully ripe, the seed of the *H. lanatus* is easily separated from the outer chaff by thrashing or rubbing, and then to the unassisted, or more correctly the unaccustomed, eyes, they resemble one of *C. cristatus*

so much as not to be easily detected, and although some little weight may be lost by the dispersion of the chaff, yet the difference in original value, as before stated, is sufficiently great to leave a good profit as the reward for skilful manipulation.

For the purposes of more fully illustrating our present remarks, we have been enabled to produce the accompanying engravings from microscopic photographs, kindly prepared for us by Mr James Bryson, optician, Edinburgh. The first of these represents the seeds of *C. cristatus*; the second, those of *H. lanatus*, in their natural state; and third, the same when in their "prepared" state; all being equally magnified. By the first it will be seen that the seeds of *C. cristatus* bear a considerable resemblance to light barley, and under a higher magnifying power their short terminal awns, as before mentioned, appear beautifully toothed, or roughed with short delicate spikes; whereas, the prepared seeds of *H. lanatus*, in addition to being remarkably smooth and lustrous, are, in general, thicker swollen in their centres, and more blunt-pointed than those of *C. cristatus*, while they are also of a lighter and brighter transparent-like colour, so that they aid in imparting or improving that coveted appearance, which obtains the name of "golden-crested-dogstail seed," which is esteemed from its being deemed indicative of careful and successful dry harvesting. The third illustration further shews the three phases presented by the prepared seeds of *H. lanatus*—viz., the two attached, and both, as they appear when separated: the recurved short awn, which occasionally becomes broken or rubbed off in the preparation, being present on the upper, and the lower ones are distinguished by its thicker and blunter form. The last is the most prevalent in adulterated mixtures, the others being light, and consequently more liable to be blown out in cleaning; but all present themselves in greater or less proportions; and the appearance of any is sufficient evidence of doctored seed.

We must be allowed to disclaim all intention of insinuating that seed merchants,

as a body, wilfully practise this adulteration of *C. cristatus* seeds. On the contrary, we feel satisfied that comparatively few of them know anything at all about it,



Fig. 1. Seeds of *Cynosurus cristatus* magnified.

and consequently they are only blameable in so far as they ignorantly, negligently, or without careful examination, purchase and disseminate adulterated samples, which we be-



Fig. 2. Seeds of *Holcus lanatus* in their natural state magnified.

lieve are mostly of foreign origin. But home seed-growers are not altogether blameless, for although they may not produce the mixture complained of designedly, yet we have ob-

served samples of *C. cristatus* mixed with a decidedly hurtful proportion of naked or clean *H. lanatus* seed, in consequence of the two having been grown and harvested together. This home-grown seed is generally saved from old policy parks or other pastures, in which the crested dogstail grass naturally abounds, and where, from not being well eaten down in the early part of the season, its seed stems



Fig. 3. Seeds of *Holcus lanatus* in their "prepared" state magnified.

have shot up thickly. These, as well as those of the *H. lanatus*, are disliked by grazing stock of all kinds; hence they grow up and ripen together, and although all of the latter which have their chaff attached are easily blown out in cleaning, yet if very ripe, and should they be "hard thrashed," a considerable number will part with their husks, and thus become a hurtful mixture among the other. Seedsmen as well as seed-growers may, however, be able to detect the exact proportions of surreptitious mixture by examining these seeds with an ordinary pocket microscope, which they should never go without; and that growers should at all times have this mode of detection within their power, they should invariably procure their seeds unmixed, and microscopically examine each parcel separately before mixing and sowing them.

## IS THE ALMOND IDENTICAL WITH THE PEACH?

AT the recent meeting of the British Association, Professor Koch read a paper "On the Specific Identity of the Almond and the Peach." The author stated that he had travelled over the mountains of the Caucasus, Armenia, some parts of Persia and Asia Minor, during four years, for the purpose of studying the origin of our fruit trees. Although he could not assert that he had found them perfectly wild or run wild, he nevertheless had collected much interesting material. He believes that our pears and apples, cherries, most prunes, also peaches and apricots, are not natives of Europe. Only certain bad varieties of prunes have their origin from the *Prunus insititia*, the tree which grows in a wild condition in the woods of Europe. After discussing the wild stock of our cherries and pears, Dr Koch stated that apricots do not grow wild in Oriental countries, but may, perhaps, come from China and Japan, as also the peaches. In the east of Persia, however, a peach-shrub grows, which is intermediate between the almond and the peach trees. For some time naturalists

and gardeners have asserted that there is no difference between almond and peach trees; that the latter is merely a variety in which the dry peel of the almond has become fleshy, and where at the same time the stone has acquired a rough surface. Botanists say also that the petioles of the almond tree have at the superior end small glands, which are absent in the peach. But the nectarine, which is but a smoothed peach, exhibits these same glands. The flowers are not readily distinguishable of peach and almond. On the shores of the Rhine a double-flowered variety grows, as to which it is not certainly known whether it is peach or almond. In England and France, also, there is a plant which is well-known as the peach-almond, and which is a constant variety. This plant occasionally produces a branch bearing good peaches, but, as a rule, its fruit is intermediate in character.

The property of atavism seems to prove the derivation of the peach from the almond; for occasionally a sound peach-tree will produce a branch bearing almond-like fruit.

## ADULTERATION OF SEEDS.

THE following Interim Report to the Council of the Royal Horticultural Society, by the Subcommittee appointed to inquire into the Adulteration of Seeds, contains some valuable information:—

1. In accordance with your instructions, your committee have taken steps to ascertain whether there is any just foundation for the representations which have been made to the Council regarding the unsatisfactory state of the seed trade and the bad quality of much of the seed sold to the public.

2. It was represented to the Council that, as the business of seedsmen is at present conducted, the purchaser of seeds frequently receives neither the kind nor the quality of the seeds he pays for, and that against this he has no remedy except a doubtful and expensive lawsuit after the mischief has been done.

3. It was also urged that, unlike most other kinds of adulteration or deception in the quality of goods, the injury done in the case of seeds does not terminate with the use of the article purchased, but entails, in addition, the loss of the rent of the ground on which the seed may be sown, and of the labour expended upon it in preparing the soil and tending the crop—not to speak of the disappointment of the reasonable expectations of the cultivator.

4. Having no means of compelling parties to give evidence, your committee's investigation into the alleged adulteration, mixing, or deterioration of seeds has necessarily been confined to making inquiries of those who have the means of knowledge, and on whose statements they could rely.

5. From information so acquired, they believe that the public suffers more or less from the neglect and malpractices of dealers in seeds in at least the following ways:—

*a.* Generally by seeds being kept too long and being sold after they have lost their vitality.

This is the most injurious of all the causes of depreciation; for it applies equally to the honest and dishonest trader. In adulteration the evil must be done with intent to defraud. Here there may be no intention to defraud, but mere neglect or want of judgment may be as injurious to the purchaser as if there were.

*b.* By the addition of bad seed to good, and mixing old and new.

*c.* By the addition of seed whose vitality has been killed.

This is done in the case of varieties of peculiar excellence, when the supply is insufficient to meet the demand. Killed seed of a cheap kind, similar in appear-



ance to that of a dear kind, is added to increase the quantity without affecting the quality. In this kind of adulteration the purchaser is only deceived in the quantity. What comes up at all, comes true, and the character of the dealer for supplying a true article is maintained.

d. By manipulating and doctoring the seed so as to make bad seed look like good, as by dying bad clover seed, sulphur-smoking bad grass seed, oil-dressing bad turnip seed, &c.

6. Your committee have been unable to ascertain to what extent these different practices are carried on; but they have reason to think it must be considerable. One of their informants was able, from personal knowledge, to instance one individual whose principal business consisted in destroying the vitality of cheap seeds for the purpose of mixing with sound seed of greater value; and they have reason to believe that this is by no means a solitary case. They are told also that a large number of people obtain a livelihood by the manufacture of bad into apparently good clover seed.

7. Your committee next endeavoured to ascertain how far the various causes, above-mentioned, actually affect the productiveness of seeds sold in the market. They have not, at present, made any tests with the view of determining how far seeds sold as of special quality or kind come true. Their experiments have, in the first instance, been directed solely to the vitality of seeds; and to that alone the present report applies. In a future report they may deal with the quality of the kinds of seeds sold, as well as some other collateral points.

8. In entering on the inquiry as to the vitality, your committee attempted to obtain a test for guessing at the age of seed by the percentage which comes up; but this they found impossible, so much depending on the original quality, and the care with which the seed has been afterwards stored. They made, however, some trials of turnip seed with this intent; and it may not be without interest to mention that, in them, they found the percentage which came up from home-grown good seed one year old to be 80, three years old 43, seven years old 32, and the older the seed the lower the rate of germination.

9. It would have been beyond the means at the disposal of your committee to test even a small sample of the goods of all the seedsmen and nurserymen in London; but by going only to the wholesale dealers, from whom the retail dealers of course chiefly obtain their supplies, they thought they could arrive at a fair estimate of the general character of the seeds sold throughout the country. It appears from Dr Hogg's "Horticultural Directory" that there are twenty wholesale dealers in London. From each of these (with the exception of two, who were accidentally omitted) the committee purchased samples of five of our commonest garden vegetables (cauliflower, broccoli, carrots, and white and yellow turnips)—care being taken to prevent the purpose for which they

were wanted being known. The samples were numbered, and the names of the dealers from whom they were got were kept secret. One hundred seeds of each package were tested by the Society's officers at Chiswick, and a like sample separated by one of the members of the committee, and the number of seeds which came up were counted. In addition to this test, in a number of instances, especially where, before sowing, the appearance of the seeds was not good, they were mechanically tested by crushing and microscopical examination; and that test was found to correspond with the result of the trial by sowing. The test by floating was also tried, but found of no value, in the kinds of seeds specified.

10. The results of sowing, as shewn by the average of both trials (which, it is right to say, in general corresponded very closely) were as follows:—

Out of the eighteen packages of 100 cauliflower seeds, the following numbers respectively came up—viz., 86, 70, 66, 60, 56, 54, 54, 52, 51, 51, 50, 44, 44, 44, 43, 39, 36, 24.

Out of the eighteen packages of 100 broccoli seeds, the following numbers respectively came up—viz., 86, 83, 70, 68, 65, 62, 60, 59, 56, 55, 50, 46, 42, 42, 39, 35.

Out of the eighteen packages of 100 carrot seeds, the following were the numbers which came up—viz., 61, 56, 54, 48, 47, 45, 44, 43, 41, 38, 38, 37, 37, 35, 33, 30, 19, 14.

Out of the eighteen packages of 100 white turnip seeds, the following numbers respectively came up—viz., 98, 95, 93, 87, 87, 83, 82, 71, 70, 68, 68, 66, 65, 64, 62, 60, 58, 57.

Out of the eighteen packages of 100 yellow turnip seeds, the following numbers respectively came up—viz., 95, 84, 79, 79, 78, 77, 72, 72, 67, 66, 65, 64, 62, 58, 55, 55, 44, 28.

11. It should be added that the quality of different kinds of seeds obtained from the same tradesman was not always uniform, all good or all bad; the cauliflower would sometimes be inferior and the turnip superior, and so on; but, on the whole, a good position in one kind was generally accompanied by a good position in all. It is also to be observed that the general percentage is less on some seeds than on others—a difference probably due to the greater care required in harvesting them, and, in the case of carrots, to the difficulty in separating the good seed from the bad.

12. In seeking for a remedy for the evil, your committee recognized the existence of two distinct elements in it, each requiring different treatment:—1. The actual adulteration of seeds; and, 2. The mere keeping them too long and selling them when too old.

13. Actual adulteration is entitled to no mercy. It is a deliberate and intentional fraud, in the suppression of which the trade is as much interested as the general public, and ought to be suppressed by the strong hand of the law in the same way as any other fraud.

14. It is different with the selling of old seed. The seeds produced in different years, like different vintages, vary in their quality and in their power of retaining their vitality. It thus sometimes happens that two years' old seed is better than one year's old. There is thus a special difficulty in dealing with it; but it is clear that the public are entitled to get what they pay for; and if it is necessary to secure this that the dealer should test the quality of his seeds each year, it is his duty to do so.

15. It seems a right and proper thing that Government should bestow some pains in protecting the very large numbers of ignorant and uneducated people who have to purchase seeds. In Prussia, Sachverständigen, or, as we should call them, experts, are appointed by Government, whose duty it is, for a certain fee, to test the quality of the seeds of such merchants who

apply to them, and to publish the results; and in some districts (Saxony and Wurtemberg, for example) there are officials paid by the Government or district, whose business it is to look after the culture of fruit trees and to give gratuitous advice to all who apply to them for it.

16. But, independently of the action of Government, your committee are disposed to think that the Council of the Royal Horticultural Society might itself do much to encourage the sale of good seeds, if not to prevent the sale of bad. How it can most effectually exert its influence for this purpose, is a question on which the Council might probably obtain useful suggestions from the respectable members of the seed trade; and your committee recommend that a number of them be invited to meet the Council and give their views as to the best steps to be taken to remedy the evil.

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### EFFECTS OF MANURE ON HERBAGE.

THE following is the substance of an interesting Report drawn up by Dr Voelcker, and made by the Chemical Sub-Committee to the Scientific Committee of the Royal Horticultural Society, on the effects of different Manures on Herbage.

Dr Gilbert, at a previous meeting, had referred to some very striking experiments conducted for many years at Rothamstead Park by Mr Lawes and himself on permanent pasture, which has been under grass probably for centuries.

Under ordinary management this herbage yielded about fifty species of graminaceous, leguminous, and other plants usually found in permanent meadows.

The number of species of plants was but little changed on those experimental plats in the park to which a complex but purely mineral manure was applied, consisting of salts of potash, soda, magnesia, and sulphate and phosphate of lime.

On the other hand, salts of ammonia, nitrate of soda, applied by themselves, or the addition of nitrogenous manures to mineral fertilizing matters, greatly diminished the number of species in the herbage.

According to the particular kind of nitrogenous manure used, and the quantity and combination with other fertilizing matters in which nitrogenous manures were employed, the diminution in the number of species varied, but in all cases it was strikingly apparent, and in some instances amounted to about one-half of the species in the herbage from the unmanured part of the park, or those parts dressed with purely mineral manures.

Attention was further directed to the fact, that not only the weight of the produce reaped per acre was much influenced by the description of the manures which were put on the different experimental plats, but that likewise the relative proportions of graminaceous and of leguminous and miscellaneous plants in the produce were found to vary considerably with the manures employed.

Thus, to cite only a few examples, the weight of the graminaceous plants in the produce from the unmanured plats, and those dressed with purely mineral manures, in round numbers amounted to about 60 per cent. of the whole produce. Dressed with salts of ammonia or nitrate of soda, and other purely nitrogenous manures, the herbage yielded from 70 to 80 per cent. of the whole weight of produce in graminaceous plants, and in some instances in which an abundance of both nitrogenous and mineral manures were employed together, the weight of the graminaceous plants in the whole produce amounted to nearly 95 per cent.

The effect of nitrogenous manures in encouraging the growth of true grasses, and raising the weight of graminaceous produce and the corresponding diminution of the weight of the leguminous and miscellaneous plants in the produce, was strikingly exemplified in these experiments.

On the other hand, it was found that purely mineral manures, such as salts of potash and phosphate of lime, favoured materially the growth of the clover tribes, and greatly increased the percentage by weight of the leguminous plants in the whole produce of the permanent pasture.

At a subsequent committee meeting it was agreed to call together the Chemical Sub-Committee, who, regarding the co-operation of botanists and others interested in vegetable physiology, were joined by Dr Masters, Dr Hogg, Mr Murray, Major Trevor Clarke, and Mr Miers.

The Sub-Committee fully discussed the manner in which manuring experiments on graminaceous and other plants occurring in pastures might with ad-

vantage be instituted, and considered it advisable to investigate rather the more strictly scientific physiological questions, which no doubt will suggest themselves in the course of the experiments, than to bear in mind the purely agricultural and economic points of interest which they may present.

Instead of growing together a number of plants, such as are common in pastures, it was deemed desirable to study the influence of various manures on particular species, grown separately in wooden boxes 2 feet square and 18 inches deep, filled with poor soil, such as is found in unmanured and rather exhausted soils of our fields, and not with good garden mould.

It is suggested that experiments be carried out in the Society's gardens, at Chiswick, and also at Rothamstead, by Mr Lawes and Dr Gilbert, as well as by any gentleman who feels disposed to undertake them.

In each set of experiments the same kind of soil should be employed, but as the nature of the unmanured soil must exercise its due influence on the growth of the plants submitted to experiments, it will be desirable, if possible, to try one series of experiments on rather light sandy soil, and another on more heavy clayey soil. Dr Voelcker will willingly undertake the chemical analysis of any soils that may be employed for the experiments.

“After due deliberation the Chemical Committee have selected the following plants for experiments :—

*Dactylis glomerata*; *Anthoxanthum odoratum*; *Lolium perenne*; *Poa pratensis*; *Poa trivialis*; *Bromus mollis*; *Trifolium pratense* (perenne) red clover; *Lotus corniculatus*; *Trifolium repens* (perenne) white or Dutch clover; *Plantago lanceolata*; *Achillea millefolium*; *Bunium flexuosum*; or, failing any of these, such other plant of the same natural order of plants as may be preferred by the Chemical Committee.

It will be seen that of the dozen plants recommended for experiment, six are true grasses, three clovers, and three common weeds in pastures.

For each of the preceding plants six boxes, each 2 feet each wide and 18 inches deep, are recommended.

1. One box to be left unmanured; 2, one box

manured with a purely mineral mixture; 3, one box manured with ammonia only; 4, one box manured with nitrate of soda only; 5, one box manured with ammonia and mineral manures; 6, one box manured with nitrate of soda and mineral manures.

The following manures and quantities are recommended :—

	oz.	per acre.
Box 2.	1.47 sulphate of potash, or at the rate of	1000
	1.47 carbonate of lime . . . . .	1000
	.15 chloride of sodium . . . . .	100
	1.47 bone ash treated with . . . . .	1000
	1.10 sulphuric acid . . . . .	750
Box 3.	.59 sulphate of ammonia . . . . .	400
	.59 chloride of ammonia . . . . .	400
Box 4.	1.62 nitrate of soda . . . . .	1100
Box 5.	The manures used in 2 and 3.	
Box 6.	“ “ “ 2 and 4.	

The amount of nitrogen in the preceding quantity of nitrate of soda recommended for box 4, it may be observed, is the same as that in the sulphate of ammonia and chloride of ammonia, employed in box 3.

Dr Gilbert has kindly promised to furnish the preceding manures, which should be intimately incorporated with the whole of the soil in the several boxes.

When necessary, the plants under experiments should be watered with soft pure water, and otherwise attended, and their progress be watched and recorded.

A sample of water to be retained for examination when distilled water can be used.

The preceding experiments cannot be undertaken without a good deal of trouble, but it is confidently expected that they will throw light on the conditions most conducive to the rapid development of various orders or species of plants, as regards some of the more characteristic manuring elements present in complex manures, and they may lead to a more systematic and certain mode of treatment of not only these but also of other plants as regards manuring.

Some of the manures recommended in the foregoing scheme are known to favour early maturity; it is therefore likely that the experiments will suggest others which may be of much value to fruit growers.

## GARDEN ARCHITECTURE.

## V. SHADES FOR GARDEN SEATS.

AT page 92 of the present volume we gave two designs for shades for garden seats of a very ingenious construction, the

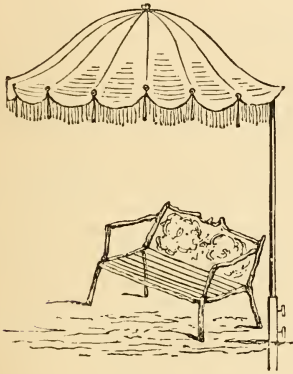


Fig. 1.

invention of Mr Scowan. We give now a third design differing in form from the others. For the mode of construction, the reader is referred to the previous article.

## VI. DESIGN FOR A GARDEN KIOSK.

The visitor to the Paris Exhibition of 1867, and to that which is but recently closed at Havre, must have noticed the peculiarity in the wood work of the various departments stalls, divisions, &c.; that peculiarity being the elaborate way in which it was ornamented with cut out portions. This mode of ornamenting timber work is almost entirely confined to continental works, it being rarely seen with us. Take, for example, the eaves of houses, or even of common sheds, as railway sheds, &c., with us, we content ourselves by giving a plain fascia board without any attempt at decorative effect; whereas, on the Continent, the outer edge is cut up into elegant curves, with perforations in keeping, the result of which is exceedingly pleasing to

the eye. This kind of work is quite a speciality amongst the continental workmen, going by the name of "bois decoupée," and is carved out as in the case of panels, &c., to a high degree of elaboration. The Exhibition we have above referred to abounded in specimens of this elegant species of work, much of which attracted great attention. It is applicable, as the reader may suppose, to a vast variety of structures; but it is specially so in the various departments of garden architecture, with which this article specially concerns itself. Evidence of this was met with in the beautiful summer-houses in the parks in the Exhibition already referred to. These are called "Kiosks" by our lively neighbours; and some idea of the elaborate work put upon them in the way of "bois decoupée" decoration, may be gathered from the fact that one exhibited at Havre, of comparatively small size, was valued at 4500 francs. On the occasion of our visits to Paris and Havre, we filled our sketch-book with a goodly number of designs in every department of timber, some of which we shall

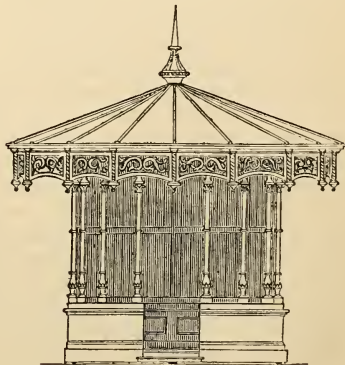


Fig. 2.

from time to time present our readers with. In fig. 2 we give a sketch of a *Kiosk*.



## Rambles by Road, River, and Rail.

### A TOUR IN THE WEST OF SCOTLAND.

#### II. CAMERON HOUSE.

BY a preconcerted arrangement the village car was in readiness to post on to the Drymen station, so as we might be able to catch the early afternoon train to Balloch. Once there, we learned that we were some two miles distant from Cameron House, Mr Smollett's residence, where the late retired M.P. for Dumbartonshire resides. We found, after travelling over a rather circuitous road, that the mansion and pleasure-grounds were nestling at the lower reach of the queen of Scottish lakes, Loch Lomond. The grounds are somewhat limited in extent, but the picturesque views at salient spots are particularly beautiful, comprising a comprehensive panoramic scene of the waters of the lake and the adjacent hills that flank it in the background like a huge amphitheatre. It is quite an Edenic spot, whether we regard it from that point of view or from its agricultural richness. The fine glossy texture of the pasture, and the density of the "foggage" at once attested this, notwithstanding the contending influences of drought. The house is nicely situated, and modern in its character. The effect of it, however, situated as it is on the margin of the lake, is in no way enhanced by a huge bastion-like retaining wall of no inconsiderable dimensions and varied outline. In this latter respect, indeed, it is somewhat incongruous with the architectural surroundings, but it doubtless serves the purpose of enlarging the grass and gravel platform, and barring effectually the incursion of the waters. A judicious mixture of trees and shrubs shut out the gardens from the carriage-drive, conspicuous among which, in addition to common trees, are fine plants of *Acacia inermis*, purple beeches, rhododendrons, and hollies, which thrive with great luxuriance.

The little flower garden adjoining the kitchen garden and forcing houses was very gay with ornamental plants, comprising such things as *Aurea floribunda*, *Calceolaria*, *stella pelargonium*, very effective indeed, with its huge conspicuous trusses of crimson; the fine old, but effective Mangles' variegated, which is a splendid sort for grouping, fronted up with verbenas of scarlet, and purple, and white. In addition to these were the charming tiny dark-leaved *Oxalis*, the now ubiquitous *Viola cornuta*, *nasturtiums* of sorts, the dull coloured *Heliotrope*, which emits so delightful a fragrance, and *par excellence* the violet coloured *Clematis viticella*, which must have astonished every visitor with the profusion of its blossom, so delightfully refreshing in contrast with the primary colours, and seeming to revel in pure wildness in the heat and drought of the past summer.

But the soil is plastic and alluvial, and seems to have great capacity for feeding the roots of all plants. Witness the crops in the kitchen garden immediately adjoining the parterre of which we are discoursing upon! The onions, the peas, and the beans, and everything that is under cultivation, are of a size and freshness to delight an epicure, and this, too, in a season remarkable for the generation of mildew, and the consequent short duration of the cropping powers of such a valuable esculent as the pea. Nor were the fruit trees less noteworthy. Small fruits were large and fine in quality, and the apple grafted on the paradise stock had grown quite beyond estimated bounds. All seemed, in fact, to be cultivated to good purpose.

But the *mirabile dictu* of the whole are the vineries. Year after year Mr M'Connachie—who, by the way, is an apt pupil of the

Trentham school—has taken distinguished positions both at the Edinburgh and Glasgow shows, and his produce has been at all times of the first degree of excellence. He certainly has occasionally been beaten by “foemen worthy of his steel,” but his worst friends dare not refuse him a badge of honour as a grape grower. When one looks first to the houses, and then to the crops, and lastly to the borders, and sums up the gist of their observations thereupon, they are compelled to say that this is grape-growing on the limited system with a vengeance. There are four houses, each measuring 20 feet long by 12 feet wide. These houses have only a length of rafter of scarcely 14 feet, and you can touch the apex of the roof with your hand, so low are the houses set. Again, the outside border is only 8 feet wide, so that the vines, if they were confined to the borders intended for their reception, would only have 20 feet width of border inside and outside. But on questioning Mr M’Connachie as to whether the roots were walled in within that compass, he categorically answers, “No. They are growing away into the garden borders,” and, mayhap, into the quarters of ground portioned out for vegetable culture. Well, either the soil must be very suitable and the drainage without question, else all our great growers who rest their claims to success upon a scientific basis may be cordially ridiculed. Of course, we must assume that the tilth for fruit tree or any kind of cultivation is all that could be desired, else the results would not systematically follow of so auspicious a character. The width of the borders, therefore, may be reckoned a mere nominal power, but the size of the houses and the length of the vine, and the weight and character of the crops are, taken together, astounding realities. In truth they are little better than huge Wardian cases or ground vineries. The vines will be planted about 3 feet apart, a very good distance for those grown under the restricted system, and the crops this year, in the aggregate, are reckoned by the grower to be larger and better in every way than those of former seasons. With regard to colouring of the fruit, which

calls up many a testy argument among horticultural coteries, Mr M’Connachie expresses a most decided opinion that it is generally better with him this season, and he bluntly asserts that he does not know the cause. “I have treated the plants every year after the same fashion, my calendar of operations has remained unchanged, and you have seen samples of my produce for years past—you can judge for yourself.” There can be no doubt that in respect of finish and general excellence the fruit is a move in advance of former seasons, and it must be entirely owing, seeing that no extraneous means were used, to the heat influencing the soil in the one case, and the roots in the other, that the extra points have been gained. The geothermal state of a border is one of the germane points to be considered by the vine cultivator, and this of course premises a proper physical capacity for absorbing and retaining heat and dispensing with an inordinate supply of water. The plastic sort of oily soil that seems to abound in this quarter was a capital feeding medium in a year of heat and drought; soil of a lighter capacity prepared to do battle with excessive moisture, if not copiously irrigated, would have been quite impotent to carry through even an average crop well.

Coming to the more immediate inspection of the houses, we find that the vines have been planted eight years, and that they are all in the height of vigour. The early house had been nearly all cut at the time of our visit, but from the samples left, and from those we saw upon the exhibition table in July, they were admirable indeed. Black Hamburgs, although not up in size of berry and colour to those Mr Meredith usually shews, were very fine, and the clusters large and proportionate. In this house was an instance of a remarkable growth of a one year’s cane of Hamburg. It has grown up to the back wall of the house, run along that, and has returned, measuring in length about 40 feet, and the cane proportionately gigantic. One really knows little of the growing power of the vine under proper treatment, nor need any be surprised if under wise cultivation its dimensions could be extended to fill a very

large house in a few years. The Muscat house was full of extra fine fruit, averaging, over all, about 3 lb. per bunch. Estimating that, and then looking to the number of bunches, there would be something like from 20 to 24 lb. of grapes on each rod, which is a very heavy crop for a 13 feet rod. Mr M'Connachie adopts the principle begun under Mr Meredith's tuition, of stopping the wayward bunches at the period of setting, which induces a compactness very desirable for all cultivators to imitate. In one of the later vineries there were black St Peter's, Lady Downes, Hamburgh, and Muscat Hamburgh on its own roots, but by no means so good in quality or finish as its compeers, and not at all equal to those which we subsequently inspected, and of which we shall yet treat upon at Castle Kennedy. All these, with that single exception, were noble fruit, such as must, indeed, give unqualified satisfaction to the owner and employer. In the late black house there were Victoria Hamburgs, quite as large in berry as damsons; but then the flavour is not at all in keeping with the name which it bears. It is quite insipid, and then it is a shy setter, requiring to be artificially impregnated. Black Prince was much finer than we ever saw it before or since, the bunches and berries and bloom being quite up to the mark. On that one vine, moreover, there were eight bunches, and it is only a fair estimate to say they would weigh 30 lb. This is great grape growing, indeed such as would astonish Mr Hill the champion Black Prince grower if he saw it, the corrective manipulation of stopping these bunches adding powerfully to their contour and effect. In this house, also, was a vigorous vine of the Black Damascus. It bore extra good fruit of its kind. It is considered a good late sort by the grower when properly mature, only it is somewhat of a tardy setter. This is owing to the glutinous drop that hangs on the stigmatic surface, which a good shaking disperses, and allows fructification to take its course. The skin of this grape is very crisp, something in that respect like Chasselas Musqué, and has the same tendency to crack

at the maturing point. A great point noticeable in inspecting this little range, the vines were comparatively free from red spider, and yet not a single puff of sulphur had been used, not even so much as painting the pipes with the idea of generating sulphurous acid. The great health that prevailed was the best antidote to the insidious approach and devastating influence of the nimble red-coated enemy. The whole place was in a good state of keeping, and the results specified bear ample testimony to the general ability of Mr M'Connachie.

A rather inviting porter's lodge on the opposite side of the road induces us to have a hurried run over Mr Martin's grounds, a gentleman holding a high position in the commercial capital of Scotland. We find exceedingly well-macadamized well-kept roads, and pleasure grounds to match, with a few nice portable specimens of conifers dotted over the lawn. The gardens, and indeed the whole place is new, and considerable sums of money must have been spent in rearing what ultimately must be a well-appointed place. A fine range of hothouses adorn the principal wall in the kitchen-garden, some of them forming long limbs in span-roof form, standing north and south. Vineries are recently planted, and will in a few years be useful for supplying a table throughout the year. The plant department of the establishment is rich and varied, especially in such things as foliage plants, that so much entice ladies and gentlemen. These are to be found in several houses especially reserved for them, and must be useful for in-door decoration of all kinds. Retracing our steps into the approach, and crossing over a neat ornamental cast-iron bridge, we make the best of our way to the station, for, according to previous arrangements, the mapping out of our journey necessitated us to proceed with all despatch, return to Glasgow in time to catch the last train of the Glasgow and South-Western Railway for Ayr, so as we might be able early in the morning to see the birth-place of Burns, and reach Kilkerran, the seat of Sir James Fergusson, by ten o'clock.

## III. CAMBUSDOON.

Occasional tourists cannot always reckon upon the best accommodation at the various hotels unless some previous notice has been given. Arriving, as we did, at ten o'clock, at Ayr, we found the rooms of the principal hotels occupied by a "covey" of gentlemen about to engage in the delightful and interesting excitement of otter hunting on the morrow after our arrival. Thanks, however, to mine host of the "King's Arms," dormitories were secured for us in an adjoining unpretending hostelry, where cleanliness and comfort were evidently well catered for, and we slept soundly, after having done ample justice to the wants of the inner man. Our arrangements for the morrow had been agreed upon, and an order given to the "boots" to call us at six, to have a conveyance in readiness at 6.30 to take us to Cambusdoon and the Burns' Monument, which was faithfully attended to. In driving along the outskirts of the town of Ayr, the suburban villas are conspicuous for neatness of architectural features, and for charming gardenesque fronts. Nothing so pains an eye, educated to a proper blending of natural and artistic beauty, than to see fine blocks of masonry without cognate surroundings. A cottage, or a villa, or a mansion, to be what it ought, should each have a fair and proportionate quota of tree, shrub, flower, and grass for proper harmony, and the well-to-do inhabitants of Ayr have been well advised in this matter. The bracing atmosphere had an excellent influence upon the physical system, and the glorious expanse of sea and land, that unfolded to our view as we passed along, incited the faculties of the mind, preparing us all the more to relish a view of the cherished hallowed spots where the great national poet rambled, and which furnished matter for his muse to revel upon.

The estate of Cambusdoon has been acquired by Mr James Baird, one of the scions of the great commercial family, whose wealth in the aggregate is something astounding. On this estate is the birthplace, and the scene of the early history and associations of Burns, and it is visited by many thousands throughout the year. The old thatched house, and the

very furniture, has been preserved so far as that has been practicable. It originally stood alone, but being made use of for what the Scotch people call a public-house, some additional rooms have been added at right angles to the old building. It consists of what the girl attendant called a "but and a ben," and the very bed in which the poet was born is still there—a box-like recess about 6 feet by 3 feet, with a curtain hanging over the front. Many of the appurtenances common to a peasant's kitchen of the olden time were visible. In the "ben" apartment, the chairs, tables, and anything of a timber kind, were cut and carved with no end of monograms, notwithstanding a printed notice to the contrary confronting every entrant; and it is a pity that this should be so, when it seems to be an object to preserve as many things as possible in their entirety. Passing on towards the river Doon, we inspect the ruins of the auld haunted kirk of Alloway, rendered famous by the tale of "Tam o' Shanter;" and, looking first to that, and then to the road over which Tam's mare had to gallop before reaching the "keystane of the brig," one's curiosity is awakened, and they can peruse with much greater relish the most interesting and novel rendering of the tale, where the witches start in hot pursuit, and Tam, somewhat pluckily and confidently, calls upon his nag—

"Now do thy speedly utmost, Meg,  
And win the keystone of the brig;  
There at them, thou thy tail may toss,  
A running stream they daurna cross:  
But ere the keystone she could make,  
The fiend a tail she had to shake."

The site of the Monument has been well chosen, being placed so as to command all these places of interest, not to speak of the landscape that is to be seen from its summit. But we cannot dwell upon details in connexion with this, looking to the ground that has to be taken up before our notes are exhausted. Suffice it to state that the reader and admirer of Burns will be amply compensated by a personal inspection. He or she must, indeed, be an ingrate, and a stranger to the feeling of common humanity, who refuses to pay homage to the genius of,



notwithstanding all his failings, one of the brightest examples of Nature's own nobility.

Mr Baird's residence is situated on the river Doon, quite in proximity to the ground we have touched upon. The ornamental features of the pleasure-grounds are very much enhanced by the river, with its "banks and braes," and the grass terracing and artistic borders, and beds of flowers are captivating. These sloping gardens, reminding one of the hanging Babylonian gardens of ancient history, have a peculiar charm, more particularly when we look to the solitude that must ever be associated with them. The murmuring of the water rill over the pebbly boulders, and the limited range of vision by the side of the meandering stream, necessarily begetting quietness and solitude in every way well-fitted for creating poetic rapture. Mr Baird has also an auxiliary garden, with a range of forcing-houses, and a well-appointed home farm, which the eye skipped over *en passant*. To this must be added a fine stud of horses that met our gaze pacing lightly and gracefully along on a morning promenade.

By this time the appetite was beginning to assert its prerogative, tacitly inviting the eye to rest for a while from its labours, and in obedience to physical demands, we made all haste to our hotel, had a substantial breakfast, shouldered our valises, and, after fairly satisfying all reasonable demands, got to the station in time to catch the early train from Glasgow to Kilkerran. The agricultural aspect of Ayrshire generally was more favourable than any of the other western counties over which we travelled. True, root crops were a partial failure, but then in some places, as, for example, Kirkcudbright and Wigton-shires, they were all but a total failure. The fields, as far as the eye could reach, from Ayr through Maybole to Kilkerran, had a good appearance, and the yield, in some of the farms in that district, must have been quite up to the average, Mr Barnwell, the head gardener at Kilkerran, was in waiting at the station to receive us, and we found ourselves quickly within the dress grounds of the policies.

## IV. KILKERRAN.

This fine estate, which comprise 22,000 acres of very rich alluvial soil, belongs to Sir James Fergusson, who has been for some time, both before and since his official appointments in connexion with the present Government, a non-resident at Kilkerran. He has, therefore, meantime let his mansion, garden, and pleasure-grounds to Mr. J. Fleming, and his home farm, we believe, to Mr J. Nicol Fleming, a brother of the present occupant of the mansion, and a well-known agriculturist, distinguished for his choice stock. Among them, and the spirited farmers of the neighbourhood, we can truly say that the face of the earth is well cared for, whether as regards agricultural husbandry and all things in connexion therewith, or horticulture in its many ramified details, comprising, of course, the production of fruit, flowers, and vegetables, general tidiness, and arboricultural features of a very high order. Keeping to the order of inspection as arranged by Mr Barnwell, we shall reproduce our notes in the order they were taken, and at once emerge into the Flower Garden.

This forms an adjunct of the garden proper, being walled off from it transversely by means of a high brick wall, which is, in turn, utilized for the production of fruit, and some choice climbers, of which we shall hereafter speak. It is shut out exclusively from the road, on one side, by a continuation of the north wall, which runs up to, and forms a buttress for, the gardener's bothies—an indispensable adjunct to all horticultural establishments. On the south side, which first confronts the eye, there is a deep valley, and that valley has been planted with spruce, which have attained a gigantic size. Indeed, the eye first catches this sombre background, made up as it is with individuals of strict formal outline. Elsewhere they would be out of place, notwithstanding their portly figure, but here, as a back screen to a forest of flowers and geometrical beds, they are in keeping. Such an array with the undulating foreground, would have delighted Humphry Repton, one of the most precise, and probably one of the best, judges of a landscape either con-

temporary with, or since, his time; all the more so because of the difficulty in getting such a splendid lot of fellows, rank and file, ready drawn up to suit such a purpose. The ground-work of the flower gardening is grass, with broad boundary walks round the square. No ladies can tolerate, and few gentlemen care about, getting their feet damp upon lawns, and all the more necessity for the proper provision of good consolidated walks for an uninterrupted course of pleasure to be enjoyed. So much for general outline; now for details.

The borders that run parallel with the walk have some scope for displaying to advantage an artistic arrangement. Without scope the best planned devices are unappreciated. Scope, in fact, alters a critical and hasty opinion very materially. It matters not really whether it be a drawing-room, a flower-garden, or a landscape; unless either of them has size to recommend them the best furniture looks diminutive. These borders, then, running parallel with the walks were by far the most effective, and the articles that furnished the colour were of the simplest kind. A beautiful and an effective arrangement, as displayed in one of these parallel beds, was so planted. Little centres of *Stella pelargonium*, with concentric bands so planted as to form elliptic outline, done with Purple King Verbena, the ellipses running into each other at easy distances lengthways, and the arcs filled with *Cerastium tomentosum*; then a broad straight line of *Gazania splendens* on the one side, and blue lobelia on the other, the whole edged neatly with the *Cerastium*, which, either placed in juxtaposition to grass or gravel, as it was in both cases here, had a charming effect. Another good combination was, Mrs Pollock, Christine, Brilliant, and Tom Thumb geraniums, in circles alternately, the ground-work being made up of *Cerastium tomentosum*, and blue lobelia as an edging. Besides these squatty combinations, the high wall gave scope for the introduction of lines of hollyhocks, dahlias, ageratums, and some of the taller subjects which often have to be set aside in out-of-the-way corners in parterre bedding, where high-formed taste is in the ascendant; and when we have these goodly

subjects backed up with masses of colour, such as was the case in the gardens in question, the effect is pleasing and good. The colour referred to here was given by a trained-up mass of Clematis; such sorts as *C. viticella venosa*, Jackmanni, and rubro-violacea, and truly no pen can adequately pourtray the beauties of these varieties, and their admirable colour of violet, which is so scarce in all parterre and flower garden arrangements. Nothing could possibly have been more bewitching than the soft, and withal showy inflorescence of these clematises. Then the beds in the parterre, set as it were in a closely shaven lawn, where the drought, bad and all as it had been, had had little effect, were neatly filled, and took their places alongside of specimen araucarias, beds of roses, nice arborvitae and such like, with much grace, and the *coup d'œil* was all the better for it. One of the most effectively planted circular beds was alternate plants of *Perilla Nankinensis*, and Flower of the Day geranium, edged with a broad belting of Cloth of Gold: the gold, the green, the black, and white were in beautiful blending, such as to tempt the eye for a long time to rest upon. Some of the more important *individuals* in the background were a unique plant of *Araucaria imbricata*, the very type of health and symmetry, capital Portugal and bay laurels, a fine round-headed specimen beech; while elms, oaks, and walnuts, of great size and age, crop up to catch the eye in its estimate of what comes within its range. As you near the boundary on the south side you find a retaining wall built, and a quiet retreat at its base by a bending walk and a broad plat of grass, into which detached beds are inserted, agreeably and tastefully planted with decorative plants, until with a bold sweep the whole is hidden from your view in the density of sylvan scenery. The whole picture is somewhat antique, rendered all the more so from the muffled sound of the stream that is concealed amongst dense foliage, which, at times, from the sloping character of the ground, and the plentiful supply of water, must drown the voices of speakers like the sound of a cataract.

## Plantations and Hedges.

### WEEPING TREES.

WHY are those beautiful pendent trees, which we call weeping trees, so rarely planted about our parks and lawns? Why are they banished to our graveyards and cemeteries? And why do we so seldom meet with well-grown specimens anywhere? We believe that it is partly owing to the proper mode of treating them not being understood; partly that they are not appreciated as they deserve; that, in fact, they have fallen back in public estimation from want of proper selection of the kinds to be cultivated, and of the fitting places in which to plant them. In questioning the excellence of the present mode of dealing with them, we mean no reflection on the care or attention of the horticulturist or forester. With one exception, weeping trees need little or no special treatment. There is one point in which they do, and in which we think they are badly managed—but only one. With that exception, all that has to be done is to put the plants in the ground, and let them grow in the same way, and subject to the same rules, as should regulate them in the case of ordinary forest trees. Nay, they have some advantage over ordinary forest trees; for being usually intended to serve as objects of view, they are put in good situations, are well protected, and isolated from the encroachments of other trees, and secure of more individual attention than any other tree standing mixed with a multitude of others can ever expect to enjoy. The point of treatment where we think they are erroneously dealt with is what may be called the æsthetic treatment.

Generally speaking, we have no very defined idea of what we would be at with them, and unless we have that, our success must of course be as hazy as our object. Generally

speaking, too, so far as we have an aim, or we should rather say an expectation, we expect two or three incongruous results when the trees shall be full grown. We hope for a tree of beauty, and we expect it also to serve as a parasol or umbrella, as well as an arbour or a summer-house—things which appear to us wholly incompatible. Fig. 1 represents the parasol or umbrella phase, and we defy Lucifer to say that it is possible to combine that with the idea of beauty. Next, fig. 2, shews the cabin or arbour phase, which is even more irreconcilable with beauty than the



Fig. 1.

parasol feature. In contrast with these, and as an example of our idea of what beauty is in a weeping tree, we ask the reader's attention to fig. 3, which is copied from a photograph of a weeping ash in Mr Beresford Hope's park, at Bedgebury. This tree, it will be observed, is thick and closely packed with branches and foliage. Of course, if Mr Hope should make it an arbour or a summer-house the inside of the cabin must be cut out, and deprive the tree of the denseness and richness of its foliage, which artists would call its "breadth." Again, if he should wish to do so, he must cut a slit or a door on one sideto



get in to the inside, and so make a break in the continuity of the foliage, which is one of its chief charms.

jected to the usual treatment, we should have had nothing of this. The gardener or forester—the terrible man with the knife—would

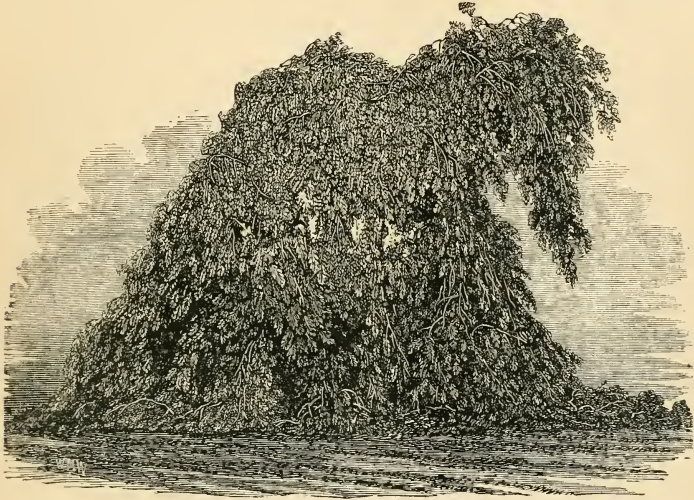


Fig 2.—Mr Hope's Weeping Ash.

Next, the branches come down to the ground like a cataract or an avalanche. They have come round, and apparently afraid that the powerful shoots would [dive into] the



Fig 3.

are lavishly overflowing and gurgling around ground and come up somewhere else, have kept amputating and amputating as fast as



each twig reached the ground; and yet we see that this very overflowing of the foliage is one of the chief charms of the tree.

If we have any particular wish for a parasol or umbrella-shaped weeping tree, by all means let us have it; or if we prefer a willow cabin or summer-house, let us get it; but, for any sake, don't let us build it at our gate. Let us hide it out of sight in the most out-of-the-way corner that we can find, and let us keep the likings for such things a profound secret, as we should any of those little weaknesses or idiosyncracies which bring us occasionally acquainted with Dr Winslow or Dr Lowe.

In what we shew aboveboard, let us restrict ourselves to something within our power to accomplish; let us try only one thing at a time, and we shall succeed; let us aim at beauty, and all that we have to do is to be still; let us refrain from interfering; let us not be ever more meddling, and there is no reason why our weeping trees should not be as beautiful as Mr Hope's weeping ash. It is plain that we cannot have a more refractory subject than the ash, which, instead of being pendulous and flexible, sends out its shoots like iron rods on every side. A very down-looking tree, as stiff and impracticable as any we know. If such a result as that shewn in fig. 3 can be produced with it, it is plain that all others must be easy and simple, if they are pendulous at all.

Supposing us to desire to follow the example we have given, let us pay attention to putting our weeping trees in the right place, and the right kind in the right place, for all are not indifferently suited to every place. The rule seems very simple. Do not put large trees, such as weeping ashes or weeping elms, in the garden or the lawn. Put them in the park or circuit. If we have not a park, that is no reason for putting them where they would be otherwise unsuitable. We have plenty of suitable weeping trees for gardens, shrubberies, and lawns—small, with tiny and beautiful green leaves, as *Sophora Japonica*. We do, however, protest against the fashion adopted by some, of grafting some low-growing and creeping plant on the top of a long stick. Of course it tries to creep in its new position, and the young twigs droop not as a

natural pendent variety or species, but simply droops for want of support. The result certainly is not satisfactory. Take *Caragana pygmea*, where you have a few long filaments bearing trifling and insignificant foliage, hanging down, and pretending to be a pendulous plant. Loudon, who seldom has an ill word to say of anything, and never of a plant, says of this absurdity:—"The dwarf and pendulous growing species (we call it an absurdity, because, how can a dwarf plant be pendulous?) when grafted standard high on *C. arborescens*, form very singular trees; and though such trees cannot be recommended for general introduction into gardens or pleasure-grounds (for no kind of impression sooner fatigues the mind than that of excessive vulgarity), yet the occasional introduction of what is singular or unique among what is natural or general, produces, by contrast, a striking effect, interrupts the ordinary train of impressions, and recalls the mind of the spectator from the beauties of nature to those of art."

We do not quite go along with Mr Loudon here. The occasions where a mixture of nature with art is beautiful are where the two are mingled together, yet felt to be distinct, as a cottage embowered with honeysuckle; a church spire rising from a cluster of trees; a mixture of nature with art where you cannot tell which is which, is but a bastard kind of beauty after all.

Another reason, besides the ugliness produced by the treatment which we have ventured to object to, why weeping trees are not so popular, nor so much planted as they would otherwise be, no doubt is their constant association with cemeteries and graves. We may not own it, but there are plenty of us who feel like Falstaff, and say to ourselves, "Peace, good tree, do not speak like a death's head. Do not bid me remember my end."

But if we get out of the conventional death's-head shape, and make the trees as they are, really things of beauty, the objection will disappear. Fortunately, it is the wrong system which has been followed in the cemeteries, so that with a new treatment we get rid both of old errors and the unpleasant impressions.

## ON THE SUPPLY OF TIMBER FROM SWEDEN AND NORWAY.

BY ANDREW MURRAY, F.L.S.

(Concluded from page-481.)

THE statistics given in the previous part of this paper, although strongly suggestive of over consumption, do not in themselves prove it. When we see a man indulging in great expenditure, one not unnaturally surmises that he is exceeding his income, but unless we know what the income is we can do no more than surmise. Desirous of obtaining something more to go upon with regard to the expenditure of timber by Sweden than mere suspicion, I set myself to ascertain what her legitimate income in timber really is, and with this view I propounded various questions to my correspondents in that country, by which I proposed to learn (1) the amount of land under timber, and (2) the amount of timber that an acre will carry. These should give the income. We already know one portion of the expenditure—viz., the exports; and if we could in addition learn the amount of the consumption at home, we should then have all the data necessary not only to tell whether Sweden is exceeding her income, but by how much, and how long (always supposing no change to take place) it would be before the inevitable catastrophe of total exhaustion came.

I have received replies to my inquiries, but so uncertain that no absolute inference can be drawn from them; but, at the same time, so valuable, that I think it advisable to put them on record, so as to serve as a basis for others to start from in the search which may lead to more definite conclusions.

1. As to the amount of land under wood in Sweden my correspondent writes as follows:—

“As to the extent of the area covered with wood nobody knows anything with certainty. The only calculation which has obtained some authority is the one given by the late Hofjägmäster of Strom, according to which the accessible wood-land in Sweden should be 1123 Swedish square miles—i. e., about

33 per cent. of the area of the whole country. Still, I believe these figures to be too low, and think that from what is already known a more exact result may be arrived at. To do so, the area of Sweden south of Delarne must be distinguished from that of the six northern counties (Län). Now, the area of the wood in the seven counties (Län) south of Delarne and in three of the northern counties is known rather approximatively, and as these counties are in such a state that they may be considered as representing the others, I believe the most certain result is to be attained by calculating the area of the woods of the whole country on the same ratio as that of the known counties.

“The result would then be 37 per cent. of the mainland south of Delarne, as the lakes are to be deducted (1157 square miles), which will give 427 square miles wood field; and 68 per cent. in Norrland, with exception of Lappmarkerne (1381 square miles), which will give 939 square miles. The wood area of Sweden, with the exception of Lappmarkerne, should thus be 1366 Swedish square miles. The proportion with Lappmarkerne is of course still more uncertain. That a considerable part of Lappmarkerne is overgrown with wood is known for certain, but how much?

“The Rev. Mr Lœstadius suggested that three-fourths of Lappmarkerne might be woodland, but this might be too high, for according to the limit for the growth of trees given by C. A. Pettersson in his book about Lapland, it seems as if about a third part of Lapland should be within this limit—i. e., 319 square miles. If we add the last named, 319 square miles to the former 1366, the woodland of whole Sweden and Lapland would be 1685, or very near 1700 square miles. The figures of the absolute area are taken from the statistical descriptions of Hahr's map of Sweden.”

2. In answer to my inquiries as to the mode of dealing with the wood-lands in Sweden, and the amount per acre that might be obtained by total clearing, the following information is given:—

“If I understand the question right, it means in what way the wood is opened (which can be either *traktöis*, when a larger or smaller part (*trakt*) is felled at once), or *bladningsöis*, when only single trees are felled, and to what degree the forest is to be injured.

It is by the former (the *Traktöis* or “through” felling, called *trakt hugning*) that the wood is felled in all so-called common forests—*i. e.*, those which are under the direct administration of the State—*viz.*, (1) the woods which belong direct to the State; (2) the woods which belong to the parish, common (*almaning*), and are given to the farm-houses (*bostalle*\*) which are situated in the southern and midmost part of the country. With regard to the woods belonging to the small farms (*bostalleskog*), which have not previously been under the administration of the State, this has been done only exceptionally hitherto, but, according to the new forest ordinance (*skogförordning*) of June 29, 1866, *trakt hugning* will have to be introduced there. Besides, the wood is felled *traktöis* in a great many mine-property woods (*bruksskog*), and in woods belonging to larger freehold farms.

On the smaller farms, *bladning* (*i. e.*, opening by felling single trees) is used. Where the forest is felled *traktöis*, it is generally not more injured than is consistent with the future existence of the wood.

As to the quantity of timber (*virke*) which our woods can give in case of total felling, nothing can be said for certain. It depends of course on the quality of the wood; which, again, depends very much on its former treatment. A well spared old red and white pine forest (*barrskog*) can give even 80 normal fathoms (*famn*), or 100 cubic feet solid wood, and perhaps more per acre of land (*tunland*), but such woods are (at least in the more cultivated parts of the country) exceptions. On the contrary, there are many ill-treated

forests which do not give more than 8 or 10 fathoms per acre. The late F. of Strom supposed 22 *famn* per *tunland* to be the average number for the whole country, and perhaps he came very near the truth, at least for his time. This may, however, have improved a little in the forests on which some sort of care has been bestowed, for these (as the case is now with the commons, *allmanni*) have decidedly improved lately. According to the official reports from the administration of the forests, the average number for the years '56-60 is given in the Royal Parks (Kron Park) at 46 *famn* per *tunland*, and in the district commons (*harrads allmanningarne*) 36 *famn* per *tunland*. Thus much can, however, be said, that if the woods were in the condition in which they ought to be, and easily could be, then the result in the usual wood-land ground (*i. e.*, land neither too mountainous and sterile, nor ground which can be easily cultivated) there should generally be of ripe wood, which is fit to be felled, not less than 60 or 70 *famn* per *tunland*—but we are very far from that yet.”

3. The total amount of exports and the probable proportion between them, and the quantity of timber consumed at home, is thus estimated by our correspondent:—

“About the proportions of the exported timber and what is used within the country.—A definite reply cannot be given, for we do not know what quantity of timber there is used within the country. Several approximate calculations are to be found, which I shall give. Forsell calculated that 7,000,000 *famn* were consumed at home; Strom 8,000,000; Ljungberg 9,000,000; and Obbarius 11,000,000. I have calculated myself, and come nearest to Obbarius, 10,500,000 *famn*. I suppose it will be nearest the fact to say, that 10,000,000 *famn* are consumed every year at home. According to Posttidningen, “it is stated that, during the nine months of 1865, 45,000,000 cubic feet of sawn timber was exported, and, in 1867, 60,000,000 do.; but this can only mean the sawn material, for if you calculate the quantity of sawn beams, planks, and boards, which were exported in 1863, after the round tim-

\* *Bostalle* means the house belonging to the State, in which the soldier lives when not in active service.

ber (*rundh wirke*) which has been required for the above-named quantity, then another result comes forward. According to the very lowest calculation there will be required about 100,000,000 cubic feet round timber to make 1,000,000 worked fann. It is not possible to object that what falls off during the dressing of the timber is of any good for the consumption at home, for in the most cases it is lost. The proportion between the exported and within-the-country-used timber should thus be, that the former is about a tenth part of the latter. But, I repeat, these figures, as well as the former, have no *definite value*. Perhaps they approach the real proportion."

The Swedish mile is 11,700 English yards or  $6\frac{5}{8}$  English miles and 40 yards. One Swedish square mile is equal to 44 English square miles. A Swedish tunland contains 65,000 square feet, and 32 tunlands are equal to 39 English acres, so that to reduce English acres into Swedish tunlands, about one-sixth has to be deducted from that number.

Now, taking the number of Swedish square miles under wood in Sweden and Lapland at 1700, that would give us 74,800 English square miles. There are 640 acres in a square mile, so that this multiplied by 640 would give the number of English acres in it as 47,872,000, or about 48,000,000, equivalent in Swedish to about 40,000,000 tunlands.

Next, taking the average of fathoms produced per tunland at 22, as stated by my correspondent, we get the total number of fathoms of wood in Sweden to be 880,000,000. Then we have seen that 11,000,000 fathoms was the yearly consumption in 1863 and 1864. It would thus take 80 years to consume the whole of the timber in the country at the same rate as in these years, and supposing every acre to be replanted either by nature or man as soon as cut down there should at the end of 80 years be no trees older than 80. This is a great deal lesser age than the average of that of the trees which are now being cleared away. We have records of Scots fir in Sweden of the age of 300

years, and we doubt not that double the 80 years would be a low average.

This, however, is on the assumption that as every acre is cleared off, it will at once be replanted by nature; but it is unnecessary to say, that in a peopled country, there are many chances against this being done, and the natural increase of the population will render it always increasingly more difficult to preserve the *status quo*.

We have not yet received similar information regarding Norway to that which we have obtained for Sweden, but are promised it. In the meantime the statistics given in the previous part of this paper furnish us with data of another kind, from which we may attempt to arrive at some conclusion. It will be still more imperfect than that for Sweden, but if it confirms it, it may give us more confidence in the other general results.

Norway contains 123,000 square miles. This multiplied by 640 to turn it into acres gives for Norway 78,720,000, or, in round numbers, 78,000,000 square acres, but almost the half of that lies within the arctic circle, and produces no timber worth exporting. Its extent, as regards this question, therefore, must be put at only about 40,000,000 square acres. According to Rentzch, two-thirds or 66 per cent. of all the land in Scandinavia is forest. Murray's Hand-Book, again, gives four-sevenths of the whole land as covered by forests. We have seen that this is considered much too high an estimate for Sweden, where it is put at 33 per cent., but to err on the safe side, let us take two-thirds as our starting point. She will then have 26,000,000 square acres of forest.

Now, it takes from 130 to 200 years to produce a full-grown spruce taking it only at 100. Norway has a hundredth part of 26,000,000 or 260,000 square acres, which she may cut down annually without diminishing the source of her supply, provided always no encroachment is made on the acreage of wood for agricultural or other purposes.

Let us next ascertain the number of trees and tons of manufactured deals which each acre produces.

From the consular reports we learn that "It



has been estimated that ten acres of forest are required for the annual manufacture of 1 ton of deals, and that if, according to the practice followed in the trade, a tract of forest of 200,000 English acres, lying on both sides of a planting, a hundred miles from the sea, be taken on a lease for 50 years, it will yield 100,000 trees annually, producing in deals 5000 standard, each of 165 cubic feet, or over 4 tons."

Now, we may reckon that each acre bears 30 trees, each capable of producing one-third of a ton of manufactured deals. The following quotation from Loudon's *Arboretum* will show that this is at any rate not too low an estimate:—"In an estate (in Norway) belonging to Mr White (a London builder who imported his own timber, and furnished Mr Loudon with the details in question) of 5600 acres there are 200 acres of naked rock and bogs; of the remaining 5350 acres one-tenth part consists of the stunted trees already alluded to, or of trees only half-grown. There remain 4118 acres of thriving wood, all situated on the sides of hills, in narrow valleys, or on plains; and all the trees are growing close together and sheltered on good soil, the basis of which is the *debris* of granite rock. On each acre of this good soil there are from 320 to 500 trees, of which above 30 in each acre are considered full grown and fit for timber—that is, from 130 to 200 years of age. The diameter of the trunks of these trees, at about 1 foot from the ground, is from 16 to 20 inches, and at from 52 to 63 feet in height from 4 to 6 inches. Thus the average dimensions of the Scots pine and spruce for timber produced by such an estate are as follows:—Length of the log or tree, 57 feet 6 inches; diameter at the lower end, 18 inches, and at the upper end 5 inches. Each log or tree may be sawn up into two deals 9 inches wide and 3 inches thick, fit for the English market, and two other deals, 8½ wide and ½ inch thick, fit for the French market."

The latter is what is called a *batten*. *Deals* are no wider, but they are thicker, and as in the above statistics they alone are specified, we shall confine ourselves to them, the smaller pieces being necessary accessories,

which will not affect the calculation if allowance is made for them on both sides. If we reckon the gradual taper of such a tree as is spoken of by Loudon from 18 inches in diameter at the base to 5 inches at the 57th foot, we shall find it about 8 inches at 48 feet. It will, therefore, give two deals, 48 feet long by 9 wide and 3 thick—or dividing them into 12 feet, the usual length into which deals are cut—we shall have 8 deals out of that tree. Now, 120 deals of that scantling are equal to 5⅔ loads. It would, therefore, take 15 trees to produce the 5 loads.

Each load is equal to 50 cubic feet of squared timber, and 57½ cubic feet of Riga fir are equal to 1 ton; so that a ton is about equal to a load and one-sixth, or precisely a load and  $\frac{7}{10}$ ths of a sixth. It will be near enough for our purpose to reckon a load and a ton as synonymous.

Again, as to the number of such trees which an acre will contain at one time? Mr White, in the above extract, says 30, and there seems no reason to doubt his estimate. Calculation of space gives a very similar result. The above trees to be 18 inches in diameter at the base, and 5 inches in diameter at 57 feet high, and to taper gradually to the top at the same rate, should be about 90 feet in total height; and if we allow a space of about a third of their height (say 30 feet) for the distance between the stem of each tree, it will give 48 as the number of trees in an acre. But as some deduction must be made on account of those inaccessible tracts from which it is impossible to remove the wood, even were it cut down, and on the score of inequality in distribution and condition (it being by no means an unusual thing to find patches of dead and dying trees, we may be pretty sure that we err on the liberal side when we allow an average of 30 trees per acre. At that rate, if 15 trees make 5 loads or tons, an acre will produce 10 tons.

Applying the figures thus got we find—1. That Norway might cut down 260,000 square acres every year for 100 years without diminishing the extent of her forests if she always replanted what was cut down, and at the end of that period would have her yearly fall of timber always 100 years old; or, turning the

acres into tons, she might consume 2,500,000 tons. 2. We have seen that she exported in 1864 403,000 *lasts*—equal to 806,000 tons (two tons making one last); and if to this we add ten times this amount for home consumption, that being the proportion which we have given in our reports from Sweden, the exports being stated at only a tenth of the home consumption, we should have her actually consuming 8 or 9,000,000 of tons as against 2,500,000, which she may fairly consume. In other words, on these data it would appear that Norway is consuming and exporting more than three times as much as she ought to do, if she wished not to encroach on her capital stock of timber.

She has 26,000,000 of acres of forest altogether, and she is, according to the above calculation running through it at the rate of 870,000 acres per annum. At this rate it would take only 30 years to consume it, and supposing an amount equal to what is cut down to be every year replanted, either by Nature or man, she would have at the end of 30 years no forests older than that age. This is a much worse result than that obtained for

Sweden, but it would still appear that both are encroaching, although at different rates, upon their capital of timber. There is, however, so much that is conjectural in both, that we cannot ask the reader to accept them as justifying more than a call for more reliable information. Their apparent tendency, if not sufficient to occasion alarm, can scarcely be viewed without uneasiness. It is not an irrelevant subject to us. There is no looking on as indifferent spectators in such matters; so nicely balanced are the demand and supply of the civilized world that it is scarcely possible to estimate the inconvenience, we may say the misery, which any derangement of these proportions in such an essential article as timber would entail upon all who use it (and who does not?).

There is much reason to wish, therefore, that the Governments of Sweden and Norway would make inquiry into the subject, and if they found that the consumption is excessive that they then take steps to bring the annual consumption of wood into more just proportion with the total they possess than seems to be the case at present.

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## STUDIES OF THE BARK OF TREES.

### 4. SCOTS FIR

THE character of the bark of the Scots Fir is different in different parts of the tree. Putting out of view its appearance, as seen on the young twigs where the scars left at the insertion of the leaves (the *phyllulæ*), it has three other phases in a large well-grown tree. At the lower part of the tree it is deeply and longitudinally broadly furrowed, and the spaces between the furrows scale off more or less in large, long irregularly oblong patches. The spaces between the furrows are broader than the furrows, and are flat, or even a little hollower in the middle. Fig. 1 shews this state. Higher up, or when the tree is not so old, the scales are smaller, and in particular are not so long—they are short and irregularly shaped; and still further up, it is smooth

and slightly scaly, but to the eye, at a moderate distance, it looks quite smooth. This phase may be observed in the higher branches as in fig. 2.

### 5. THE BIRCH.

No tree that we know has a more beautiful bark than a birch tree, nor any that comes more effectively into the landscape. It is no wonder that it is a favourite with artists, some of whom have carried the use of it into mannerism. It is, for example, as rare to find a picture of Ruysdael's without a bit of birch tree in it as it is to see one of Wouwerman's without a grey horse and something with a red coat or cloak on its back. But there is one thing about Ruysdael's birch trees which has always discomposed us. It is their size, and

that notwithstanding it, they are all painted with the grey silvery bark of the young tree. They are all large trunked trees, as big as a full-grown oak, often cut down, riven, or turning up at the end the sawn surface of its red-hued timber, and usually with some person in a red cloak sitting on it, like the something on Wouverman's grey horses. Now, it looks like heresy to question the accuracy of Ruysdael's painting from nature. Every touch

greenish skin of the young twigs—one of them the silvery glossy white bark which Ruysdael paints, and which with us is confined to the youth of the tree. It is shewn in fig. 3, (which, although taken from a photograph, is not quite so characteristic as we should have liked.) As the tree gets older the bark assumes a totally different character—that shewn in fig. 4. Every bit of silver is gone, and cracked off from the lower part of the tree. We must go half up the tree now to see it, where it still flourishes as before. Perhaps in some districts, of which Holland is one, the tree grows faster and bigger than here in a shorter time, and assumes the proportions given to it by Ruysdael before the bark cracks up. The alternative supposition, that Ruysdael should have painted these large silver-



Fig. 1.—Scots Fir, near the ground.



Fig. 2.—Scots Fir, upper part.



Fig. 3.—Birch, young state.



Fig. 4.—Birch, full grown.

breathes of nature; and yet we cannot help it, but we never saw birch trees of a size that a man could sit on bearing the silvery bark that Ruysdael gives them. The bark of trees of such a size with us is old and cracked. We can understand that that would be of no use to him—it is only for the silvery bark that he wants them; but certainly with us old trees have not got it. In this country the birch bears two kinds of barks besides the first

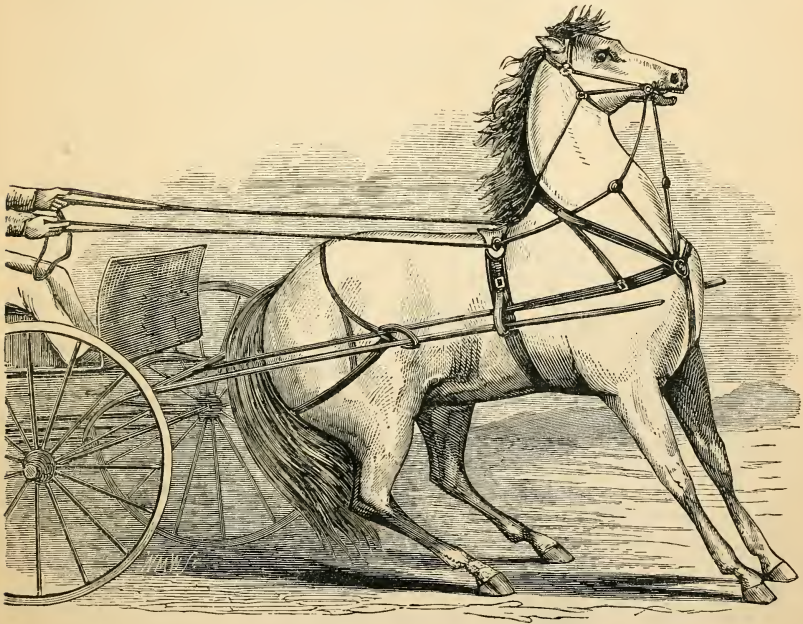
stemmed beeches from imagination, is something too heterodox to be tolerated for a moment.

## The Stable.

### RUNAWAY HORSES.

THE *American Agriculturist* some time ago gave an illustration and description of a highly useful and convenient invention for restraining impetuous and hard-mouthed horses, which we have had engraved or the benefit of our readers. The inventor

ground, the weight of the body thrown completely off the fore-feet, so that kicking is out of the question, and the animal, being thrown upon its haunches, of course must stop; he cannot even back, for the Doctor says—and though we have not tried this, it seems true



is Dr S. B. Hartman of Millersville, Lancaster County, Pennsylvania; and the accompanying illustration shews in a very clear manner the effect of these reins upon a horse. "The head," says the journal referred to, "is thrown up, the eyes lifted so that he cannot see the

—that a horse may be made to sit down squarely on his rump. The bit is a simple snaffle, or plain bar bit, attached to the head-stall in such a way that the check-strap (not buckled into the bit ring, but running through it) may be shortened up almost indefinitely



by a pull upon the safety-reins. These are attached to the check-strap, passed up through the bearing or check-rein swivels (the rein being removed) and joining the direct reins at the saddle or hames rings: from this point they pass back to the hands, *through* the centre of the round driving-reins, and terminate in loops and straps. While driving with two hands, the loops may be held by passing the fore-fingers loosely through them, and when the driver wishes to use only one hand to drive, the straps of the safety-reins hang down in front of his knuckles, and may be seized by the whip-hand at any instant that he wishes to apply their latent power. The safety-reins are not borne upon at all in ordinary driving.

We have tried them somewhat ourselves, and have placed them in the hands of several experienced horsemen, who agree in their good opinion of them. 'Atalanta' is a rather famous trotting mare owned in this neighbourhood, so hard-mouthed as to be entirely unmanageable with common reins and bits: with the safety-bridle she was driven not only with safety, but with ease, and, in her horse way, owned 'beat' for the first time in her life.

In Lancaster county, where the reins have been in use a year or two, we learn that they are regarded with high favour, ladies and children driving horses considered entirely unsafe before they were applied."

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### THE NEWMINSTER CASE.

By Mr JOSEPH GAMGEE, V.S. Edinburgh.

ON the 15th of August, *Bell's Life*, under the heading, "Tufts of Turf and Stray Views," says, in reference to distinguished stallions, that Newminster "is as good a horse at the end as he was in his best day;" and the sporting correspondent of the *Illustrated London News* for 22d August, who had called at Rawcliffe, and had seen Newminster on the occasion of the York meeting and Fairfield yearling sales, says:—"The old horse, who has been the stay of Rawcliffe for some ten or a dozen seasons, is very much wasted, but nearly a score of foals by him are expected next year. Fever in the feet has been his great bane, but he is able to walk out into the paddock when the humour takes him." The fact of Newminster being in any state of usefulness, or even alive, is due to his having accidentally come under my treatment for three months in the early part of last winter. I may regret that this statement should have to come from myself, but so important a case ought to be made public, as it is by such means that knowledge progresses. The facts of the case are the following:—On

the 9th October 1867, I went to Rawcliffe on business, and, having seen the horses on sale, asked Mr Martin to allow me to see Newminster; he replied with a sigh, "You will only see the wreck of the old horse." Accompanied by the head groom, I drove to Newminster's paddock, and on entering his box I found the man, who had just got him up, standing by his side. The horse shewed symptoms of great agony and prostration, and was standing with his hind legs drawn under his body in order to support his weight, the seat of pain being in his fore feet. The horse was reeking with perspiration, and bleeding sores were conspicuous on all the prominent parts of his body—the effects of lying and struggling in his box—viz., on the sides of his head, shoulders, hips, knees, hocks, and fetlock joints. On attempting to examine his fore feet, I found that to be impossible, until he was allowed to lie down again, when I perceived descent of the soles of both fore feet, protrusion of the coffin bones, which were in an advanced state of ulceration, discharging, and extremely fetid.

In one foot, on which was a large sinus, extending from the coronet in front, in a vertical line over the coffin bone and through the sole, great maggots were crawling.

With this miserable picture before me, I asked the groom why some proper measures were not taken to relieve the animal; he replied that the best veterinary surgeons in the kingdom had seen the horse, and had pronounced him to be incurably affected with navicular disease. I then drove back to Mr Martin, and asked to be allowed to treat the horse, assuring him that I could give relief. Nothing was determined upon then, but before leaving York I wrote him a note, in consequence of which Mr Day, the veterinary surgeon, called upon me, and on Monday the 14th October, we went together to Rawcliffe, and found the horse in the state already described. I proceeded with my instruments to remove a great deformed growth of the hoofs, which were overlapping below, and turned up in front. This occupied me several hours (the horse was lying and I was operating at great disadvantage in the kneeling posture); and that work of relief was accomplished without giving even momentarily increased pain, but such was his agony and fear of being touched that he struggled constantly. I adapted a shoe to one foot, which, with the assistance of the smith, we applied. I then dressed his feet and his wounds generally, and left him, and from that moment he was greatly relieved. I then gave instructions as to the course to be pursued with him till my next visit, which was on the week following, when I found him vastly improved, and made the necessary suggestions for future management. On the 5th of November I again operated on his feet, still more reducing the abnormal hoofs. I found all the aggravated symptoms had subsided, and the horse at ease. On the 28th November I visited the patient again, repeated my treatment, and by this time the horse had so much improved that we walked him along the road for a considerable distance; it must be mentioned that he had for a month previously been led out on the dry turf. He had now gained flesh, his rest had thickened, his coat

was blooming, he looked happy and well, and his wounds were completely healed, with one important exception—viz., that of the pastern-joint of the near fore-limb, which had been for a long time opening and discharging. In order to give support and protection to that joint, I applied a starched bandage with pasteboard splints and cotton wool, carbolic acid dissolved in oil being applied to the fistula of the joint. By the next morning the starched apparatus had consolidated into a hard and light easily-fitting case, admirably accomplishing the object I had in view. I gave directions, and left the horse in the most satisfactory state.

The foregoing is but a part of the history of the case, but it is correct as far as it goes, and embraces an important and critical period. There is an antecedent history of the case, however, spreading over years, and consequences still in progress, all of which, with the description of the character of the disease and its causes will form the subject of another paper.

The case of this horse, as it has been described, was exceptional, in so far as it was one of unusually chronic and complex character, but as a case of foot disease it was in its origin, course, and sequences, a type of one of the most prevalent and commonly occurring of such affections.

Eclipse was similarly affected to Newminster in both fore feet, but less extensively so, as I know by the opportunity which was afforded me of examining the skeleton of the former renowned horse, whilst of the state of the latter I made myself well acquainted, procured marked relief, and restored him progressively to the extent my treatment was pursued.

Weatherbit, I was informed last autumn, was also in a like state to Newminster, but this horse, of which I only speak from report, has since died or been destroyed.

The stallion Augur, though not an old horse when I saw him, about two years before he died, was far advanced towards the same stage of disease of his fore-feet as Newminster.

It is rare to find any but stallions of the

greatest value with equally extensive and long-standing disease of their feet, because those less esteemed, as well as horses used for ordinary work, are usually put away when no more service can be got out of them; still, the resolution is generally deferred until the animal has endured much suffering, and is only had recourse to after futile attempts to cure have been made and much expenditure incurred. In the case of thoroughbred stallions, the sires of many winners, whose subscription lists fill without there being any need for them to travel, there are inducements to keep them alive and obtain as many fifty and hundred guinea fees as possible for their services.

Only a few horses, however, are endowed with stamina, and other conditions enabling them to survive years of suffering in their feet, such as we have been contemplating. A remarkable case, where death occurred to a cart stallion, came under my own observation a few years ago. The subject of it, a five-years-old Clydesdale horse, was the property of a nobleman at his estates in Ayrshire, and I was summoned by telegram to attend the horse when his death appeared imminent. I started from Edinburgh by the earliest train, but it was only at noon on the day after the message was sent that I reached the castle, and found that the horse had died during the night. My mission so far reduced, I proceeded to examine the subject, and learn the history of the case. The horse, a noble specimen of its class, had been purchased of a farmer some twelve months prior to the last crisis. The inflammation and suffering in the feet had set in acutely about two months before, and he had been unable to stand for the three weeks or month previous to his death. I found all four feet affected in this case. Both the fore-feet exhibited depression of the soles and ulceration of the pedal bones, the last phenomenon being quite extraordinary of its kind. I came to the decision that although the early stage of the disease had been unobserved, and the progress less rapid than at the latter period, yet about a year must have elapsed from the time the morbid change in the feet had set in. At a later stage the course

had been more rapid, one foot in succession becoming acutely affected until all four suffered, when pain, general fever, the exhaustion attending on them, and lastly, purulent poisoning of the blood proved the cause of death.

I removed the feet from the subject, and brought them to Edinburgh to dissect, which I did with interest and most useful results, devoting many weeks at intervals to the work. The preparations themselves were so typical of the origin and cause of the disease as to be quite unsurpassed for the instruction afforded.

Some readers may be inclined to question the grounds for the similarity which I find subsists between the cases of the horse first noticed and that of the young Clydesdale stallion. As a result, however, of my own investigations on this subject, I have become quite persuaded of the similarity or rather identity in cause of the two cases. Those members of the veterinary profession who have read my papers in the *Edinburgh Veterinary Review*, will have some notion of my views of the horse's foot—*anatomical, physiological, and pathological*—relating to subjects which must be worked out extensively, and as thoroughly discussed, before much useful knowledge can become sufficiently widely disseminated.

*Atrophy of the palal bone* (or to be less technical, *wasting of the coffin bone*), is the condition found in all these cases. This wasting occurs at the bottom surface and on the anterior and outer margin of that bone, more commonly (for obvious reasons, which need not here be discussed) in the fore-feet than in hind, which, however, also, though less extensively, suffer.

*Atrophy of the pedal bone* happens to all horses according to the prevalence and urgency of the causes to which they are exposed. It is, certainly, more prevalent in England than, I believe, any other country in the world. Effects only follow causes in this as in other cases. It need scarcely be said that the high qualities of a horse neither diminish nor increase the chance of his becoming affected, except to the extent that young horses, well managed from the first, are

relatively strong, and have feet and all parts well developed at a given age, and these, as a matter of course, resist causes of deterioration longer than the weaker; hence we hear people saying "they are likely to stand sound." Admit, however, the intervention of causes of deterioration, and the effects will, with but few exceptions, sooner or later appear. The racing colt just out of the breaker's hands, or as soon after as he can be got into condition to gallop, and has become hardy at his work, appears free in its action, each foot in succession being implanted firmly and fully on the ground, and the feet in relation to the pastern joints shewing their due degree of obliquity.

A colt in such a case, tried with a weight, and over a distance determined by the trainer's judgment, will at that time display a speed which it will not excel at a more advanced age, and only maintain under exceptionally good management and favourable conditions.

The energy and speed may, it is true, be maintained, like other inherent functions of the animal, long unimpaired, or only slightly so. But in the larger proportion of instances form is changed, and some of the rate of speed is simultaneously lost in the space of a few months, after hard work has been continued. The colt becomes upright on his pasterns, his fore-legs straighter than they were originally, and the movements less free, and if tried again in this state, loss of form—*viz.*, of speed—will be the answer. In other more favourable instances the young animal appears in public, and wins at two years old, and three, and, in a few cases, at four and upwards. But the most favoured by circumstances lose speed. Taking such a specimen of power, speed, and bottom as Caller-Ou, we find that she was reduced at last to the speed of a fifth-class race-horse. A case still more to the point is that of that excellent mare, Regalia. I observed that mare, and the state of her feet in the saddling paddock at Ascot, when she was going to run with Gladiateur for the cup. I will not say what I could foresee—for every one is wise after an event—but to see her labouring and tiring behind the French horse

was a sight and a study. Her feet were flat, thinned down, the pedal bones mean; and, in fact, from the spring of the previous year, her fore limbs had lost something in length, taken from one, and that the most energetic region—*i.e.*, the last phalange of the digit.

Blair Athol, on the contrary, was managed with more consummate tact by his breeder, owner, and trainer, all combined in the same person; he was reserved for the cream of his engagements, and completed his whole racing career in the space of four months, beginning by winning the Derby in May, and ending with the winning of the St Leger in September, losing two and winning one race in the interval. The process followed in his case might be aptly compared to working the iron while it is hot.

The incident in Blair Athol's career that will be longest remembered will probably be the price at which he was said to have been sold. After that brief turf career, 7000 guineas was the reputed sum given for the horse. Whether Blair Athol could have run in the best company of horses of all ages when he was four years old, if he had been retained in training, is a question which can never be solved, but great judges, as Blair Athol's owner, &c., were, do not usually stop the racing career, at three years old, of horses like Lanercost, Fisherman, and Asteroid.

I shall not express an opinion, nor does the question affect greatly my estimate of the stallion. The horse was a good one, as it was proved, and the spoiling of the race-horse, and depriving him of his speed, does not necessarily affect the worth of the future stallion. For instance, The Earl has been tried and found good, and then wanting, and Julius excellent and then declining, but both have proved what horses they are; and though the abstraction of the eighth of an inch of the lower margin of their coffin bone spoiled their actions and racing powers, it will no more affect their worth for propagating their species, if the process be arrested, than if so much were clipped off the tips of their ears.

But, to return to our subject, atrophy of the pedal bone is the most serious, as well as the most common phenomenon in the list of



affections and sources of lameness to which horses of all classes are subject.

The most expensive and best coach horses, hunters, &c., in the world—as those of England unquestionably are—fall victims in large numbers, and almost all are deteriorated by the condition of their feet, as above described; and if we turn attention to the hardest-worked horses in towns—metropolitan and provincial—we are humiliated by the reflection of the amount of suffering endured by the lame cab, coach, and other horses, and experience a horror, which is doubtless intensified by a know-

ledge of the causes and exact conditions. Well may foreigners express wonder at the number of lame horses met with in all parts of this country.

Baron Cuvier said, and the statement is worthy of attention—“It may safely be asserted that more horses are consumed in England, in every ten years, than in any other country in the world in ten times that period, except those which perish in war.”

NOTE.—Since the above was written, the report has come to hand of Newminster's death.

## The Dairy and Poultry Yard.

### GENERAL NOTES ON POULTRY-KEEPING.

BY "THE HENWIFE."

#### VALUE OF COCHINS AS MOTHERS.

ALL persons conversant with poultry matters allow that in order to secure early hatched chickens it is a necessity to have Cochin hens to act as mothers. Dorkings, &c., may lay during winter, but they rarely sit until their usual time which is spring. Cochins, on the contrary, sit three or four times a-year, and as they are good winter layers, if young, they can be depended upon to hatch the eggs of all tardy sitters. For this purpose alone, therefore, Cochins would be valuable additions to our stock; but I consider them besides very beautiful birds. Their soft downy feathering, of such exquisite tints of yellow and maize, all ladies must admire, and the true types of the high-caste Cochins are of handsome, massive build, majestic carriage, large size, and (which is but little known) very short on the leg. They are hardy, docile, and very productive; their eggs are not large, but by no means so small as those of the Hamburgs. They bear confinement well, and a fence 3 feet high is sufficient to keep them within bounds. They require no perch in their houses, preferring the floor, which must, however, be littered down with straw, as in a stable, and as regularly renewed, for the feathering is so delicate in colour and texture that it is easy soiled and ruffled by damp. I do not consider Cochins good table fowls unless when quite young, and I consequently advise their being kept principally as egg-layers and sitters. Pure-bred birds command high prices, and at all our principal shows the classes fill well. Each fancier has her or his individual taste regarding colour, and, as the varieties are numerous, if the points and qualities are good,

colouring only holds a secondary place. White Cochins, from the contrast of the scarlet comb, yellow bill, and snowy plumage, are peculiarly attractive, and they are quite as robust as the coloured birds, but they must have a clean grass run, and be seen only under a pure sky. They are apt to become yellow if exposed much to the sun, so require a shaded yard—if the birds are intended for exhibition—the yellow tinge being a great disqualification. To those who have the wish to breed early chickens for market, I confidently recommend crossing the Cochin hen with a Dorking cock. The chickens will feather more quickly than the pure bred Cochins, which are backward in fledging; and although there may be a shade of yellow in the skin at that early season, say in March, poulterers cannot be fastidious, and I have known them thankful to pay high prices for chickens that would be almost worthless later. There is no doubt Cochins are very productive, when properly managed; and I strongly advise the introduction at once of a few hens into all poultry-yards feeling sure they will give satisfaction on trial.

#### DAILY FOOD.

Eggs may now be safely sent to market, few caring to take the trouble of rearing chickens through a long dreary winter, and at present prices both poultry and eggs should be repaying part of the expense of feeding. All inferior birds must be killed off. Grain is daily rising in value, and, as insect life is scarce, fowls are more dependent upon the food given to them. A reduction in the stock, therefore, becomes advisable, and good birds can readily be sold at fair remunerative prices. Where the stock is known as prize-

takers, matched pens of chickens fetch from £3 to £6 each; single birds for breeding, 30s. Turkeys (hatched in May), which should now weigh—cocks, 17 lb.; hens, 12 lb.—are considered cheap at £3 per pair; goslings and ducks, ditto. Pens for exhibition must of course be reserved, as only by success in the show-room can stock command high prices; and it is a pleasant thing to watch the progress of birds intended for Birmingham or Manchester, where, if a prize is taken, almost fabulous prices may be obtained, and a certain sale for eggs in spring secured. To breed for market only will pay; but then a great source of interest is lost, and all individual tastes must be sacrificed in trying to keep the balance on the right side of the account. Where exhibition (in moderation), home supply, and market are all combined, a daily, nay hourly, amusement is afforded, and profit may still exist; it will only be a matter of time, not of degree, for there are many well-known amateurs who gain considerably by their prize poultry. Poultry rearers must make up their minds to one or other plan, and adhere strictly to it. As a matter of business, and solely for profit, the great object is to increase the stock as fast as possible. Sell off when ready for market—the earlier in the season the better, when young poultry is in greatest demand. Feed economically, and give the birds entire liberty. Keep only young hens of the best kinds for laying and crossing, to obtain large chickens.

It is often asked “how much grain should I give daily to my fowls?” This is a question not easily answered, so different may be the treatment in poultry-yards. Where exhibition is the rule, a very high and varied course of feeding is necessary—the birds must be forced into feather at the proper time at any expense; but where one pure variety of fowl only is kept—however numerous the stock—from having full liberty during the day, when they pick up much food in farm-yards, fields, &c. (which makes them in a great measure independent of the provision commissariat), the cost of keep is obviously less, and the birds never do better, are in greater health, or

feather more quickly, than when treated thus. But they will not be in exhibition condition—they will be merely in good buying and breeding order. It is impossible to lay down exact rules as to feeding: some varieties eat more than others. At all times feeding well is positive economy. Hens lay better and earlier when abundantly fed, and the eggs (on a yearly average) will always more than repay the extra cost. My next “note” gives the details of the weekly diet of a cock and fourteen hens, set apart for the purpose of arriving at the exact expense of their weekly food. The hens are principally crosses between Dorking and Bramapootra, the cock pure Dorking. From the numerous varieties of pure breeds kept, it was impossible to give the occupants of this experimental yard entire liberty; they have, in common with the others, merely access for a couple of hours daily to a grass field and plantations which adjoin the poultry-yard. I give a true and faithful description of the treatment of this particular house and run, and it may in some measure be a guide to beginners in poultry life. Amateurs who themselves look a good deal after the comfort and wants of their stock can best judge of its requirements, and will soon fall into the little peculiarities of taste shewn by their favourites. One bird will not eat barley, another reject Indian corn, so that a mixed diet in that case is necessary. No one kind of food can be forced upon fowl; their likes and dislikes must be studied. Feed at regular hours, and watch them while they eat. It is at that time you can best judge of the state of health they are in.

For a cock and fourteen hens, confined entirely to their yards, the following description and quantity of food, given daily, is abundant—2½ lb. paring and whole meal mixed, and 2 lb. of wheat and Indian corn mixed. In the morning open the trap and give the fowls access to their yard, feed with one-half of the soft food, and give fresh water. In the middle of the day throw down some lettuce or cabbage leaves and calcined oyster shells broken small, also the remaining half of

the soft food. At four o'clock give the grain, and again fresh water. The birds will retire shortly after this last meal to roost, when they must be shut up for the night. During the day let the flock out to graze and pick up what they can in the shape of insects and seeds. At this season there is very little to be found, but the exercise is conducive to health, and it is astonishing how much grass some fowls will eat, especially Brahma-pootras. One hour's liberty is sufficient, but the more they can have the better will they thrive. Much less food would be required if the fowls had complete liberty, but the quantities I have specified have been proved in my own establishment to be sufficient for the support of fourteen early-hatched pullets (some pure Dorking and Cochin, others crosses be-

tween the Brahmapootra and Dorking), all laying regularly. The cock is of the Dorking breed, aged eighteen months, and is in full health and vigour. It may be thought that one male bird is not sufficient for so large a flock of hens, but in the particular case given, the object being merely the produce of eggs, and to ascertain the actual cost of the food consumed, the domestic arrangements are quite satisfactory. The yard should be frequently dug over, and the floor of the fowl-house swept every day, and sprinkled with ashes or sand, and occasionally a little lime. This keeps the house perfectly pure and free from taint. Cleanliness is indispensable; and there can be no doubt that the more we attend to the comforts of domestic animals the more will they repay our care.

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### THE HENWIFE'S KALENDAR FOR DECEMBER.

THIS being the season when poultry is most in demand, the prudent henwife will see that her remaining cockerels and pullets of both spring and autumn broods are in good condition for the table. In order that they may be so, she will resort to whatever mode of fattening commends itself to her judgment, or which past experience may point out as the best. Whatever be the plan adopted, the fowls must be put into a dry, warm place, with very little room, as moving about prevents fattening. During the intervals of feeding they must be kept in the dark. On no account must they be retained in the feeding trough more than a fortnight; the state of repletion in which they are kept is apt to induce fever if continued longer, and thus to render them unfit for the table. It is obvious from this fact, that although fowls may be fattened to a great degree by penning and cramming, that the fat thus acquired is not a wholesome fat, but verges on disease, if it does not indeed amount to it. And it is

our opinion that a fowl left at liberty, provided it be supplied with abundance of corn, will be a more general favourite than the swelled-out subject of the cramming system. Opinions, however, differ on this as on other points, and many have a decided preference for these over-fed fowls. We know of one individual who had always treated his poultry in the natural way, if we may use the expression, but who bethought him of trying the much-vaunted method of cramming. He penned up his fowl, *stuffed it once a day* with a paste made of barleymeal, suet, coarse sugar, and milk. The paste was forced down its throat till it could literally contain no more. It was then left *in the dark* till next feeding-time. At the end of a fortnight its size was enormous. It was sent without remark to a friend. Next time the friends met, the question was put with a tone of surprise—"What sort of a fowl was it you sent to us?" "Why, was it not good?" asked the other. "Good!" was the reply, "never was anything



more delicious, and such a size ; it was like cutting into a leg of mutton!"

Another mode of fattening we would recommend is this :—Mix barleymeal with water or skim milk into the consistency of cream ; put a little coarse sugar or treacle into the mixture ; put it in a shallow dish beside the fowls ; do not give them any water—thirst induces them to consume large quantities of the mixture ; let them have as much as they want ; change or clean the dish three times a day, to prevent the food getting sour, as sourness prevents fattening. They must have sufficient light to see their food, but the

less they can do with the better ; put a little sand or gravel in the coop.

Another plan is, to give oatmeal and barleymeal alternately, mixed with milk and a little dripping ; let the dish be cleaned as in the previous directions, gravel and sand supplied, and, in this case, abundance of clean water given. Many other details might be given, different plans, or modifications of those already given ; but we imagine that these will be sufficient for the observant henwife, who will be able to change or modify the plans proposed, according as her judgment may direct or her circumstances may require.

## Hunting, Fishing, and Shooting.

### MY FIRST SALMON.

I AM an old fisherman, and have caught many "odd fish" in my day, of all shapes and sizes, in different parts of the world. But up to this very month I had never had a chance of catching that prince of fishes the salmon. A kind friend having invited me to try my hand on the Tweed, in about the best part of that lovely river, I waited impatiently for a summons from his fisherman, who was to let me know when the river would "fish." At last, towards the end of September, came the welcome tidings of a flood, and a speedy prospect of sport.

Twenty-four hours took me from Salisbury Plain to the Tweed. Here I came to a new world. I had left behind me all discourse of greyhounds, foxhounds, "birds," and so forth, and had entered upon a new circle of acquaintance, gentle and simple, who talked only of the Tweed and the salmon. Observe here, in passing, the river is always *she*. Will she fish to-day? She has *waxed* 6 inches this morning. She is *drumly* (thick), &c. The fish, on the other hand, is always *he*. "There he is," "There he looped," &c. Now, however many big fish a man may have caught with a fly in other countries, if he has never tried his strength against a salmon, he is of course set down as a mere novice by local fishers; his flies are thrown aside in disdain; his reel is put on wrong; his rod is a foot too short. At last he begins and gets his hand in. There may be harder work than wielding an 18-foot salmon-rod on a warm day, but I have never come across it. I had left home professedly to catch a salmon, and had declared very rashly that I would not return *re infecta*. Day after day passed, the river was in flood, and I got almost desperate. At last, on the

5th of this month, the water was declared in order, but there was no wind and a bright sun. I went to work with the energy of despair, but my back ached so much that at last, between every throw, I was inclined to stoop, if not to squat down in my boat for some relief. About four the sun went behind either a cloud or a hill, a light air breathed on the water, and, when least expecting it, there came a tug, the hook was well in, and a big fish lashed its tail and floundered for a moment on the top of the water. "He's a sma' salmon," said Wullie Johnson, my boatman. "Not so very small, Wullie," replied I, as the fish dived and went steadily upstream. After a few minutes of sulky struggle, I landed and tried to come to better terms with him. Now came a series of rushes, until the fish had some 60 or 70 yards of line out, and seemed bent on crossing the river, and going down stream and away. I had been giving him the butt end of the rod to the best of my power, but it now was plain enough that I must either keep a tight hand upon my fish or lose him. Every inch of line was of value, every moment critical. At this instant, *jam* went the reel. For the life of me I could not wind it up. A few inches I could get in, then came a hitch, and so on. It was like a windlass with a foul anchor. The fish seemed to feel his advantage, and made a fresh start. "Ah, but he's a dour deevil," said an antient fisherman, who had appeared at my back. "Wind up your line or he'll beat you." "I can't wind up," I replied. Wullie Johnson being hard of hearing, I at last got him to put his two hands to the reel, and to wind with all his force when I nodded my head, and pulled in line with my left hand when I could

get a chance. This is just like my luck, thought I. I fish like a slave for hours, and when I catch a fish he swims off to sea with my line. "He's gone," cried Wullie. "You're a ——," said I. The struggle went on. I thought of my friends at home, who were longing to hear of my first salmon. I wished the man who made the reel well under the Tweed. I wished the gut on the fly\* were double instead of light single. I nodded, pulled, let out line again, and so on, in an agony until the shades of evening came on. At last, just before dark, Wullie let go of the reel, rushed into the river, and cleverly put the landing net under my fish. At last he was mine. He was a salmon of 22 lb., white as silver, fresh from the sea, and, as better judges than me declared, the finest fish of the season.

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\* A silver doctor, by Beloe, of Coldstream.

## The Country Gentlewoman.

### ON THE THEORY AND PRACTICE OF COOKERY.

BY DR LETHEBY.

(Continued from page 506.)

#### HOW TO COOK MEAT.

IN the treatment of animal food there are several points for consideration. In the first place, it is always best to prepare the animal for the shambles by fasting it for a few hours before it is slaughtered, as partially digested food, and the food recently absorbed into the system, quickly pass into a state of putrefactive decomposition and taint the whole carcase; besides which, a day's repose is often necessary to quell the excitement occasioned by the journey or voyage which the animal may have made on its way to the place of slaughter.

In the second place, it is proper to remove as much blood from the body as possible at the time of killing, as this also is apt to pass into a state of decay. The regulations of the Jews in this particular are most effectual, and are derived from very antient statutes in Leviticus, which ordain that no manner of blood, whether it be of fowl or of beast, shall be eaten by man; and with the view of letting as much of it flow away as possible, the practice is to slaughter every animal by cutting its throat with a sharp knife. There are, indeed, the most precise rules for this purpose. In some countries, however, the blood is regarded as a very nutritious part of the animal, and great pains are taken to prevent its escape. Dr Livingstone says, that many of the South African tribes kill the beast by thrusting a javelin into the heart, so as to prevent the loss of blood. But in these cases the meat is never kept, but is eaten directly after the animal is slaughtered. A proposition has also been

made in this country for killing animals by letting air into the pleural cavities, whereby the lungs collapse, and so cause almost instant death by asphyxia, without loss of blood; but the practice is objectionable, not merely because of the liability of such meat to quick putrefaction, but also because of the difficulty of discovering disease in it.

In the third place, it is proper that the carcase of the animal should be allowed to cool and set thoroughly, before it is packed for conveyance to the market. If this is not properly attended to it soon decays. It should also be packed loosely, or even freely exposed to the air, as the colouring matter of the blood and muscles continue to absorb oxygen, and to breathe, as it were, for some time after death, and while this goes on decay is arrested.

Lastly, all meat should be kept a little short of decomposition before it is cooked, or even until decomposition has just commenced, as the tissue then becomes loose and tender, and very digestible.

In the culinary treatment of animal food, the objects are fourfold:—

1st, To coagulate the albumen and blood of the tissues, so as to render the meat agreeable to the sight.

2d, To develop flavours, and to make the tissue crisp, as well as tender, and therefore more easy of mastication and digestion.

3d, To secure a certain temperature, and thus to be a means of conveying warmth to the system.

4th, To kill parasites in the tissues of the meat.



## BOILING.

Now, as the researches of Dr Beaumont and others have demonstrated that meat is always rendered more and more indigestible in proportion to the prolonged action of heat, it is highly necessary that the temperature should not be continued beyond the point necessary to accomplish these objects. Liebig says that a temperature of 133° Fahr. will coagulate albumen, and that the red colouring matters of the blood and muscle are coagulated and destroyed at from 158° to 165° (say 170°). He therefore advises that all cooking operations, in respect of meat, should be limited to 170°. His directions are, that in *boiling* meat it should be introduced into the vessel when the water is in a state of brisk ebullition, and that the boiling should be kept up for a few minutes. The pot is then to be placed in a warm situation, so that the water is maintained at from 158° to 165°. The effect of this is, that the boiling water coagulates the albumen and tissue upon the surface of the meat, and to a certain depth inwards, and thus forms a crust which does not permit the juice of the meat to flow out, nor the water to penetrate into the meat. The flesh, therefore, retains its savoury constituents, and is not too sodden; but if, on the other hand, the meat be set upon the fire with cold water, and then slowly heated to boiling, the flesh undergoes a loss of soluble and savoury matters, while the soup becomes richer in them. The albumen, in fact, is gradually dissolved from the surface to the centre; the fibre loses, more or less, its quality of shortness or tenderness, and becomes hard and tough. The thinner the piece of flesh is, the greater is its loss of savoury constituents.

This explains the well-known observation, that that mode of boiling which yields the best soup, gives the driest, toughest, and most rapid meat; and that, in order to obtain well-flavoured and eatable meat, we must relinquish the idea of making good soup from it.

If *finely* chopped flesh be slowly heated to boiling, with an equal weight of water, and be kept boiling for a few minutes, then strained and pressed, we obtain the very strongest and

best flavoured soup which can be made from flesh. When the boiling is longer continued, some little additional organic matter is dissolved, but the flavour and other properties of the soup are thereby in no degree increased or improved. By the action of the heat on the fibres of meat a certain amount of water or juice is always expelled from them; whence it happens that the flesh loses weight by boiling, even when immersed in water (as much sometimes as 24 per cent. of the weight of the raw flesh). In larger masses this loss is not so great.

## ROASTING.

Even in *roasting* meat the heat must be strongest at first, and it may then be much reduced. The juice which, as in boiling, flows out, evaporates, in careful roasting, from the surface of the meat, and gives to it the dark brown colour, the lustre, and the strong aromatic taste of roast meat. It is doubtful, however, whether the heat of 170° is sufficiently high to ensure the destruction of the parasites of meat, and therefore, I would advise that the temperature should be as nearly as possible to that of boiling water (212°).

## COMPARATIVE MERITS OF BOILING, COOKING, ROASTING, AND FRYING.

Of the four methods of cooking which are commonly practised in this country—namely, *boiling*, *baking*, *roasting*, and *frying*, the former is undoubtedly the most economical, and produces the most digestible food, but the flavour of the meat is not well developed, and it is quite unsuited for many descriptions of meat; the flesh of young animals, for example, consisting of an undue proportion of albumen and gelatine in the tissues, will boil away to a large extent, and so will lose fatty tissue, like that of American bacon; and, indeed, unless the process is well managed, there will always be considerable loss, as I have just stated, from the escape of albumen, saline matter, and the alkaloids of the meat, into the water, amounting sometimes to from 16 to 24 per cent. of the weight of the joint; and that these are valuable constituents of flesh, is proved by the experiments of the French Academicians, who found that when

a dog was fed daily upon half a pound of boiled flesh, which had been previously soaked in water and pressed, it quickly lost weight, as much, indeed, as one-fourth of its entire weight in 43 days; and in 55 days the emaciation was extreme. Of course, these observations do not apply when the liquor in which the meat is boiled is eaten with it, as in the case of hashes, stews, &c.

Dr Pereira states that, at the Wapping Workhouse, where mutton (chiefly fore-quarters) and beef (consisting of the brisket, thick and thin flanks, leg of mutton pieces, and clods—all free from bone) were boiled, the average loss in weight was only about 17½ per cent.; but this is under the common proportion, and shews that the meat was from old and lean animals. The ordinary loss of weight in cooking is about as follows in every 100 parts:—

	Boiling.	Baking.	Roasting.
Beef generally .....	20	29	31
Mutton generally .....	20	31	35
Legs of mutton .....	20	32	33
Shoulders of mutton .....	24	32	34
Loin of mutton .....	30	33	36
Necks of mutton .....	25	32	34
Average of all .....	23	31	34

But although the loss of weight in baking and roasting is greater than in boiling, yet it is chiefly from evaporation, and from the melting of the fat. Flavours also are developed which give a pleasant relish to the meat; but there are many disadvantages to these methods of cooking, as that the surface of the joint is often overdone, when the interior is almost raw; and that the action of the heat on the superficial fat frequently produces acrid compounds (consisting of *acrolein* and *fatty acids*), which are very distressing to a sensitive stomach. This is always the case when meat is fried or grilled, and is thus subjected to a temperature of 600° or more; in fact, all baked and roasted fatty foods are apt, on this account, to disagree with delicate stomachs; and it is often remarked that, although bread and butter, boiled puddings, boiled fish, or boiled poultry can be eaten freely without discomfort, yet toast and butter, or meat pies and pastry, or fried fish, or

roasted fowl will disagree with the stomach. The practice of covering poultry and game with lard, or oiled paper, or thin dough, or even with clay (feathers and all, as is the Indian custom), and then roasting, is no doubt advantageous, as it modifies the temperature and prevents the formation of acrid fatty compounds. It was by some such device as this that Aristoxenes was able to serve up a pig apparently boiled on one side and roasted on the other—the savoury crackling being suited for stronger stomachs, while the more delicate side of it was best adapted for weaker digestions.

In deciding, however, on the proper method of cooking a joint, regard must always be had for the kind of flavour that is to be developed. Shoulders of mutton and fresh beef are rarely boiled, because of their insipidity. The same is the case with game and poultry, for the barn-door fowl and turkey are nearly the only examples of the latter which can be boiled, and there are no such examples among the former. What should we think of a boiled pheasant? A story is told of a poacher who wished to seduce a bumpkin new poacher by a practical illustration of the fine flavour of game, and calling at his cottage one day, he left for him a hare warm from the chase, telling him to cook it, and try if it wasn't a nice dinner for nothing. A week after he called again, and asked him how he liked his dinner. "Didn't loike it at all," exclaimed the recipient. "Well, man," says the poacher, "how did e cook en?" "Why, biled en in tarmuts to be zure." I won't attempt to describe the disgust of the poacher. The same is the case with venison, although it may be boiled, especially when it is rather high, for about half the time necessary for cooking it, yet it must be roasted, in order to develop its flavour. Hunters in the wild prairies of America are accustomed to cook the flesh of the deer by *brittling* it in the following manner:—They strip off the long muscles from each side of the spine, both above and below, and tie them up in a roll, after well smearing them with oil or fat; they then roast them, and baste them perseveringly

with oil. If opportunity permits, they sprinkle them with lemon juice before they are oiled and made up into a roll. The flavour of roasted meat and its grateful effect on the sense of smell must have been recognised in very early times, for burnt-offerings are frequently spoken of by Moses as a "sweet savour unto the Lord," and particular accounts are given of the manner in which these offerings of the lamb and the kid, &c., were to be made acceptable, not merely to the Lord, but also to Aaron and his sons, who were to eat of them. How far back in history the flavour of roast-pig was eulogised I know not, but it is immortalised in the essay of Charles Lamb. As for the process of *baking* meat, it is not nearly so refined as that of roasting, although it has one advantage, in the circumstance that the temperature can be more easily regulated than with roasting.

#### PREPARATION OF SOUP.

In making *soup* the object is to extract, as completely as possible, all the soluble constituents of the meat or bone, and when the latter is used it should be chopped or broken into small pieces, and boiled for a considerable time—not less than nine or ten hours. Shin-bones will then yield about 19 per cent. of their weight of fat and gelatine—the soup being, according to Dr E. Smith, very nutritious, so that 6 lb. of bones will produce a soup that contains the nutritive power of 2 lb. of meat, as far as carbon is concerned, and of 1 lb. of meat in respect of nitrogen; but although this may be so as regards the actual quantities of carbonaceous and nitrogenous matters present, yet it is very doubtful whether they are equally nutritious, for in the renowned experiments of the French gelatine commission it was found that the soup or jelly from boiled bones would not support the life of dogs, although raw bones, in like proportion, would.

*Ox-tail soup* is much richer than that from bones alone, as it contains the saline and other constituents of flesh. It is now a favourite and rather expensive soup, although at

one time it was the humble fare, and almost the only nitrogenous food of the poor Protestant French refugees of Clerkenwell. Prior to the year 1679, or thereabout, the butchers of London left the tails attached to the hides, which were sent to the tanners of Bermondsey, but the poor French refugees, in their extremity of want, bought the tails for a mere trifle, and converted them into soup, which was soon found to be of excellent quality.

*Soup made from meat* should be obtained in the way already described—that is, a given weight of meat, chopped fine should be allowed to macerate in its own weight of cold water, and should then be gradually heated to the boiling-point, after which it should be strained and pressed. In this way about 3 per cent. of the nutritious matter of the meat is dissolved, besides the saline constituents. If the soup is simmered with the meat for some hours, a larger proportion of organic matter, chiefly gelatine, will be dissolved; and a good soup thus made from shin of beef will contain about 600 grains of solid matter in a pint, and of this about 39 grains are saline.

#### "EXTRACTUM CARNIS" OF LIEBIG.

Lean meat contains about 25 per cent. of solid matter, the rest being water, and of this from 7 to 10 parts are soluble in cold water; rather more than half of this is albumen and miochrome (colouring matter), which are coagulated by heat, and thus, if the cold solution of flesh be boiled, it contains only from 3 to 4 per cent. of the meat; and when evaporated to dryness it constitutes the *extractum carnis* of Liebig. It can hardly be said, however, that the nutritive power of this extract is very great, for its chief constituents are *certain acids, lactic* and *inosic*, with *enosite, creatine, creatinine*, and an indefinite colloidal organic substance of a brown colour and syrupy consistence; besides which it contains the soluble saline matters of the meat, as phosphate and chloride of potassium, with a little chloride of sodium. Analyses of this extract, as found in commerce, have furnished from 41 to 60 per cent. of water, from 22 to 41 per cent. of organic matter, and from 8 to

16 per cent. of saline matter. The extract is always acid; and it should be of a pale yellowish-brown colour, with an agreeable meat-like odour and taste. It should also be perfectly soluble in cold water, and should not contain albumen, fat, or gelatine.

False views have been entertained of the nutritive power of this extract, for, as one pound of it represents the soluble constituents of from 30 to 34 pounds of lean meat, or from 45 to 48 pounds of ordinary butchers' meat, it has been assumed that its nutritive power is in this proportion; but Liebig has taken care to correct this error, by shewing that the extract, when properly prepared, merely represents the soup or beef-tea obtainable from that quantity of meat; and, as it is deficient of albumen, it must be conjoined to substances which are rich in this material, as beans and peas. No doubt the physiological action of the extract is due to the alkaloids which it contains; and as the former of these are of tea and coffee (theine or caffeine) in their effects on the body, it must be concluded that extract of meat is more of a vital restorative than a nutritious food. It is from this point of view that Parmentier, Proust, and even Liebig himself are disposed to regard the physiological effects of the preparations. "In the supplies of a body of troops," says Parmentier, "extract of meat would offer to the severely-wounded soldier a means of invigoration which, with a little wine, would instantly restore his powers, exhausted by great loss of blood, and enable him to bear being transported to the nearest field hospital;" and, in almost the same language, Proust remarks that "we cannot imagine a more fortunate preparation under these circumstances; for what more invigorating remedy, what more powerfully-acting panacea than a portion of genuine extract of meat dissolved in a glass of noble wine?"

#### MEAT BISCUITS.

As in the case of soup and beef-tea, its nutritive power must be assisted by vegetables and other substances which are rich in nitrogenous matters. Conjoined, therefore, with wheaten flour, with peas or lentils, or even with the gluten obtained in the manufacture

of starch by Durand's process, it may be made to have the nutritive power of meat. Already there is a preparation of it by Messrs Peek, Frean, & Co., in which the extract is mixed with baked flour and pressed into small biscuits; indeed, as far back as the year 1851, Mr Borden, jun., obtained a patent for combining extract of meat with flour, farina, or meal, and baking it in the form of biscuits. In this manner, by using the extract of 5 lb. of meat with 1 lb. of flour, he produced biscuits which contained 32 per cent. of nitrogenous matter, and 1 oz. of the biscuit grated into a pint of water, then boiled and flavoured, made a good soup. In the case of Liebig's extract of meat, one pound of the preparation is sufficient, with the usual rations of potatoes and other vegetables, to make soup for 130 men; and a strong broth is made by dissolving a teaspoonful of it (about 150 grains) in half a pint of boiling water, and flavouring with salt and pepper.

A still more nutritious broth, containing the albumen of the meat, is obtained by infusing a third of a pound of minced meat in 14 ounces of cold soft water, to which a few drops (4 or 5) of muriatic acid, and a little salt (from 10 to 18 grains) have been added. After digesting for an hour or so, it should be strained through a sieve, and the residue washed with 5 ounces of water and pressed.

The mixed liquids thus obtained will furnish about a pint of *cold extract of meat*, containing the whole of the soluble constituents of the meat (albumen, creatine, creatinine, &c.), and it may be drank cold, or slightly warmed—the temperature not being raised above 100° Fahr. for fear of coagulating the albumen.

#### VESSELS FOR COOKING—CAPT. WARREN'S POT.

There are many questions connected with the economy of cooking, and as to the simplest and cheapest apparatus for the purpose. Foremost among them is the cooking-pot of Captain Warren. It is a sort of double saucepan, and is easily made by fitting a small covered saucepan into a larger one. The inner vessel contains the joint or other thing to be cooked,



and the outer one has a little water in it, so that the temperature in cooking can never exceed  $212^{\circ}$ . By this means the joint is cooked in its own vapour without coming into contact with water or steam, and thus it cannot lose its soluble constituents; and if it be desired to improve the flavour of the joint just cooked, it may be afterwards roasted for a short time before the fire. The loss in weight under these circumstances is not nearly so great as in the common way of cooking, and the flavour and tenderness of the meat are considerably increased; besides which, there is the certainty of cooking the joint equally throughout, without over-dressing it. Moreover, by the adaptation of a steamer to the outer vessel, vegetables may be also cooked at the same time. When the meat is boiled by this process, there is little or no loss of weight, and even when it is afterwards roasted, for the purpose of improving its flavour, the loss is not nearly so great as when a joint is roasted in the ordinary way. In one experiment it was found that 15 lb. of meat roasted in the usual manner, in the kitchen of the Cambridge Barracks, lost 4 lb. 4 oz. in weight, whereas the meat cooked in Captain Warren's pot, and then roasted, lost only 2 lb. 15 oz., so that there was a gain of 1 lb. 5 oz.

Another apparatus of very great ingenuity is a cooking-pot from Switzerland, where the saucepan containing the joint and a little water is, after boiling for a short time, placed in a box lined with felt, and thus left for an hour or two to cook, the conducting power of the felt being so bad that the heat is retained in the most perfect manner. The apparatus is not only economical, but it is also excellently well suited for picnic parties, or for soldiers on the march, who may thus secure a hot dinner, cooked while on the journey.

#### COOKING FOR THE POOR.

The cooking appliances of the poor are very imperfect, and hence they resort to the cook-shops of their neighbourhood; but even then their meals are scanty and wretchedly cooked. In the poor districts

of London three halfpence is the usual expenditure for a dinner by children—a penny going in pudding, and the halfpenny in potatoes. If they pay twopence they are allowed to sit down, and have a little gravy with it. Everybody has heard how the poor of Paris dine *à la squirt*, where the tin soup basins are nailed to the table, and where the attendant Leonoras draw up the seething soup from a hidden cauldron by means of a huge syringe, from which it is driven out into the customer's basin. The price of the meal (4 sous) must be instantly paid down, or the callous handmaid sucks up the soup into the monster squirt. Scenes like this, and even worse than this, in the abodes of the poor have urged philanthropists to seek a better means of supplying their wants, without trespassing upon the dangerous ground of charity. In Paris an enterprising widow (Madame Robert) conceived the idea of giving a poor man a good dinner for twopence. Her daily bill of fare was cabbage-soup, a slice of bouilli (beef), a piece of bread, and a glass of wine; and thus, in the neighbourhood of the Marché des Innocents, did she daily provide for some six thousand workmen, who took their dinners in the open air, but sheltered from the weather; and she gained a farthing by each guest. In [this country a like benevolence has set on foot, with more or less success, in different places, restaurants for the poor. In Glasgow, for example, the working-class dining-rooms, which are far above the rude accommodation of Madame Robert, are established to provide a substantial dinner for 4d. or 5d. Long ago the special correspondent of the *Daily Telegraph*, in writing about them, said that he obtained a capital dinner of good pea-soup, boiled beef, ten ounces of potatoes, and pudding—more than he could eat—for the sum of  $5\frac{1}{2}$ d.; and a writer in the *Times* also stated that for  $4\frac{1}{2}$ d. he had a pint basin of pea-soup, a plate of hot minced collops, a plate of potatoes, and eight ounces of bread; while his companion had, for the same sum, a pint basin of broth, a plate of cold beef, a plate of potatoes, and a slice of plum pudding, all excellent in their quality, and well cooked.

The practice of these places is to provide daily a variety of hot foods, as soup, broth, potatoes, rice, cabbage, pudding, tea and coffee, besides bread and butter, cold pressed beef and ham; and every ration, except meat, is so apportioned as to be sold at the uniform price of a penny. The meat costs three halfpence; and, with the view of clearing off the remainder of the soup after the proper dinner hour, so that a fresh quantity may be made every day, it is the practice to sell the soup and broth, at half-price, from six o'clock to eight o'clock in the evening, and then to give the remainder away. All the articles are of the best quality, and are well cooked. They are bought by contract at wholesale prices; and, although they are sold so cheaply, yet they yield a small profit, and so give the system the stability of a commercial enterprise.

Very recently, too, Mr Riddle has proposed that arrangements might be made for cooking dinners on a large scale, and sending them out to the houses of the poor. He proposes to prepare, daily, good rations of roasted, baked, and boiled meat, with vegetables, and to send them out in 2 lb., 4 lb., or 6 lb. tin canisters, all ready for immediate use, and kept warm in little compartments of a properly-constructed cart. There would be no difficulty about this, and the meat might be delivered in excellent condition, and with great punctuality. None but those who are acquainted with the utter helplessness of the poor in the matter of cooking food, or who know the difficulties of even better classes of persons in this matter, can form any notion of the value of such a proposition; and I should be glad to see it realized.

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### FASHIONS FOR THE MONTH.

FROM what I have seen at the various operas and theatres, I can only say that the fashions for evening dress are not yet fixed. I have observed many white robes in muslin and more square décolleté bodices than any other form.

A particularly original toilet struck my attention: this was a kind of white taffeta, ornamented with galloons of gold. First skirt short (that is to say, without train), with five small cut volants; between each volant, three galloons of gold, rather large, and formed in squares. Tunic to match, ornamented with two of the same volant. Watteau bodice, with square décolleté bodice; behind, a small cut volant around the bodice, which opens on a chemisette of white blonde, with spots of white silk. Flat sleeves ornamented by bracelets of gold galloons to the elbow, and (a great novelty) a pair of small epaulettes with a gold trefoil, set on the robe like a uniform. The principal part of the epaulettes is in gold, the fringes in white silk and gold.

A sash of white gros grain with algerine stripes (across) completes this toilet.

The knot of the sash was very large, with four coques set like the sails of a mill, and having large and short pans.

I here give you details of a few chapeaux. A demi-fauchon, ruby velvet, in front of a coquille ornamented with black lace; on the side a bow of velvet to match, with a very curly plume set with a ruby aigrette. Strings of cotelé silk tied; a Louis XVI. toque in lapis blue bouillonné velvet, edged with small black lace, behind the toque of a bow of velvet to match with a double coque. Knot on the side to match. On the other side, demi-couchée aigrette with bird of paradise feathers. Strings of lapis blue velvet, lined with yellow taffeta glacé with white.

Regent toquet, black velvet, forming a decided point on the front; on the side tuft of purple velvet eyelets. Barbes of black lace forming the hood behind, and enclosing the chignon. The strings, tied behind, in black velvet, passing under the barbes.

The following is the description of a very charming toilette which is destined to be much copied. On a robe of black faille, with a long and straight train, a volant plissé à la Russe, the head of which is formed by three gauzes of gold satin, a tunic of well-stretched black tulle, forms a double puff or panier, behind: the two stages of the panier are marked by rows of black lace, with two rows of yellow satin. Very tall ladies may add a third lace, which may descend very low behind, and rounded near the volant.

Among some of the most elegant toilettes which have been prepared for this season in half velvet, half satin, the most charming I consider to be those of a single colour, because the difference of tissue causes a difference in tone. I have particularly observed two robes, one in iris velvet, jupon of satin to match; the other in "vin de Bordeaux" satin, plain jupon, pekine with stripes of velvet and satin.

The iris robe had lappels behind, a moderate tuft which seems retained by a band of flat passementerie parting from both sides of

the waist, rising on the bodice where it describes a square ornament; this passementerie is very straight on the bodice, gradually enlarging towards the tuft, on which it crosses, and is terminated by a very long fringe. The tunic, long behind, has all round a bouillonne of iris satin and fringe of the same colour. The jupon is very small behind, and is decouvert very high in front, and has a bouillonne of satin to match with that of the tunic. The sleeves are flat, with double reverse rising to the elbow, and ornamented by very small bouillonne biases.

The "vin de Bordeaux" robe was made with tunic largely denticulated; in the middle of each denticulation was set an embroidered bouquet composed exclusively of cordonnet pearls, garnets, and jet, all very small.

The bodice was not embroidered, but had epaulettes in bias, very large, and only covering the principal part of the shoulders on which the same embroidery is reproduced. The cuffs bear the same ornament. Three rows of the same colour satin encircle the tunic epaulettes and trimmings.

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