



AUG 18 1958

S.F.
279 -
F28

CORNELL UNIVERSITY

THE

Flower Veterinary Library

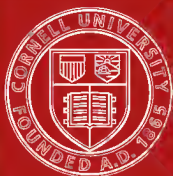
FOUNDED BY

ROSWELL P. FLOWER

for the use of the

N. Y. STATE VETERINARY COLLEGE

1897



Cornell University
Library

The original of this book is in
the Cornell University Library.

There are no known copyright restrictions in
the United States on the use of the text.

<http://www.archive.org/details/cu31924001096746>

LECTURES
ON THE
EXAMINATION OF HORSES
AS TO SOUNDNESS.

(Delivered at the Edinburgh Veterinary College.)

WITH AN APPENDIX ON
The Law of Horses and Warrant.

BY

WILLIAM FEARNLEY, M.R.C.V.S. (LOND.),

LATE PRINCIPAL AND PROFESSOR OF VETERINARY SURGERY, EDINBURGH VETERINARY COLLEGE; FORMERLY EXAMINER IN VETERINARY ANATOMY TO THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND; FORMERLY VICE-PRESIDENT AND TREASURER OF THE YORKSHIRE VETERINARY MEDICAL SOCIETY, ETC., ETC.



London:

BAILLIERE, TINDALL, AND COX,
20, KING WILLIAM STREET, STRAND.

1878.

R.

~~Xaa~~
~~F31~~
No. 7600

SF
279
F28

P R E F A C E .

IT is under a feeling of great responsibility that the author lays before the profession his views on one of the most difficult subjects connected with veterinary science.

The lectures were delivered at the Royal Veterinary College, Edinburgh, during the summer session of 1874.

They are for the most part based on the teachings and practice of the late Professors Dick and Barlow, but have, the author ventures to hope, a further value in being based also on the notes and observations of about five hundred cases of horse examination by the author himself. This is exclusive of the extensive experience gained by the author as the pupil of one of the busiest practitioners in Yorkshire for a period of nearly four years.

Including this time, they are the result of fourteen years' close attention to a subject which always had a peculiar interest with the author.

There being no text-book or guide on the subject, so far as the author is aware, he feels that, though no longer in the profession, he has contracted an obligation to impart to others that which dearly-bought experience has taught him; and his end will have been answered if, with the help of these pages, young practitioners learn the subject at an easier rate than he did.

It is also humbly hoped that these pages may be of some use to those whose years and maturity have secured them that confidence in their skill which is the laudable ambition of all.

W. F.

LONDON, 1st Jan., 1878.

CONTENTS.

LECTURE I.

	PAGE
Introduction—Horse Examination might well form a Speciality—General View—The Horse remains a Living Testimony to your Opinions—Importance of Method—Professor Dick's Method—Watch the Horse in his Stall—Cribbing, Weaving, Windsucking—Weaving—Attitude in Standing—Spavin and Stringhalt—Latent Spavin—Examination of Eyes—Ophthalmia—Iritis—Tension compared . . .	I

LECTURE II.

Examination of Eyes (<i>continued</i>)—Tension—Oblique or Focal Illumination—Catoptric Test—The Conjunctiva—Cornea—Iris—Corpora Nigra—Ruptured Lens Capsule—Mirror of Ophthalmoscope of very great use—Horse is now brought out of Stable—Shaky Fore Legs—Bent Fore Legs . . .	II
--	----

LECTURE III.

Examination outside the Stable—Place on Level Ground—Great Superiority of Automatic Movement—Nostrils—Mouth—Milk Teeth Extracted—Lampas—Parrot Mouth—Worn and Broken Incisors—Irregular Molars—Signs of Hard Mouth—Intermaxillary Space—Poll—"Poll Evil"—Cribbing Strap—Parotid Gland—Jugular Vein—Obiteration, Partial and Complete—Evidence of Phlebotomy may indicate Serious Disease—Shoulder—Pined Shoulder—Collar Marks	19
---	----

LECTURE IV.

	PAGE
Shoulder—Shoulder Slip—Causes—Slight Cases “doctored up”—Case—Caused by Sprain—Curability—Point of Shoulder—Space between Shoulder Point and Elbow—Knee—Broken Knees—Five Degrees—First Degree—Second Degree—Third Degree—Fourth and Fifth Degrees—Severe Blow on Knees.	28

LECTURE V.

Knees (<i>continued</i>)—Broken Knees—Term Misleading—Law on Subject—Case in Point—Another Case—To decide on Intermediate Cases of Broken Knees—Enlargements about the Knee—Ganglions—Nature of Ganglions—Cannon Bone, Subcutaneous—Front Part seldom affected—Pastern Joint	36
--	----

LECTURE VI.

The Fore Foot—Only a Part of a Whole—Its Relation to the Fore Leg—When the Horse is Awake—When Asleep—Not so much Weight on it when Awake as when the Horse Sleeps Standing—The Fore Legs have efficient Mainstays, except at the Navicular Joint—The Navicular Joint very Defective—The Relation between the Phalanges and the Column of Bones above—Importance of the Line of the Coronary Band being always Noted—Its Tendency to become Horizontal—Long Pasterns, Low Heels, and Long Toes—A Good Foot and Pastern—A Boxy Foot—Shoëing Blamed for every Ailment of the Foot—Shoe Inventions—The Charlier Shoe	41
---	----

LECTURE VII.

The Fore Foot (<i>continued</i>)—Horse Examination very Difficult : Why. Cases as Examples—A Classification : I. Anomalies of Size ; II. Anomalies of Shape ; III. Anomalies of Position ; IV. Injuries ; V. Diseases—Feet compared with each other, and with the Horse's Bulk—Too Large Feet—Feet too Small—Signs of previous Fever in the Feet—Test for a previous Inflammation in the Feet—Frogs Atrophied—Frogs too Large	50
---	----

LECTURE VIII.

Showing how Heels become High and Contracted	58
--	----

LECTURE IX.

	PAGE
Evils of Calkins—Evils of Paring and so Weakening the Sole —Flat Soles—Degrees of Flatness—Positive Flatness and Seedy Toe—Low Heels—Calkined Heels—Knuckling Fore Legs—A Horse with Low Heels may be Quite Sound—Long Toes and Sprain on Back Tendons— Pasterns Short and Upright—Toes Out-turned—Brushing —In-turned Toes, Digging and Stumbling—The Unnerved Foot	65

LECTURE X.

The Unnerved or “Nerved” Fore Foot—Discovers itself in the Gait—The Tissues of the “Nerved” foot degenerate —Brittle Hoof—Pricks in Shoeing—Gathered Nails— Bruised Sole—Bruised Coronet—Speedy Cut—Diseases Obvious—Grease—Ringbone—Sidebones—Corns	72
--	----

LECTURE XI.

Navicular Disease	81
-----------------------------	----

LECTURE XII.

Sandcrack—Thrush—Thrush as a Constitutional Disease com- pared to Fistula in Ano—Thrush always a Bad Form of Unsoundness—Elbow: Tumour on Elbow—The Back Tendons examined—“Wind-gall”—“Thoropin”—Filled Legs	90
--	----

LECTURE XIII.

Mallanders—The Back Tendon—Signs of Injury to the Back Tendon—Suspensary Ligament—Its Signs of Injury—The Sesamoid Bones—Splints—The Foot Lifted	100
--	-----

LECTURE XIV.

Fractured Ribs—Herniæ—Down in the Hip or Fractured Ilium—The Stifle Joint—The Tibia—Fracture of Tibia— The Hocks—Curbs in Human Beings—Mechanism of the Hocks—Coarse Hocks—Spavin	106
--	-----

LECTURE XV.

	PAGE
Spavin (<i>continued</i>)	121

LECTURE XVI.

Spavin (<i>continued</i>)—Bog-spavin—How the term Blood-spavin arose—Thoropin—Curb—“Sprung Hock”—“Occult Spavin”	131
--	-----

LECTURE XVII.

Sallanders—Ring-bone—Sandcrack—Tuberosity of Ischium knocked off—Go over the off side like the near side, but look under the Mane for Poll-evil—Case—Time required for the whole of these Movements Five Minutes—Advised to Practise these Movements on a Sound Horse—The Third Part of the Examination—Testing for Lameness—Testing the “Wind”—How best accomplished	140
---	-----

LECTURE XVIII.

The “Wind” or Respiration—The Respiration and Circulation Interdependent—Mechanism of Respiration—“High Blowers”—“Whistlers”—Snoring—Nasal Polypi—Distended Guttural Pouches—Roaring, Grunting, Trumpeting—Warts on Vocal Cords—Tumours in the Ventricles of the Larynx—Chronic Laryngitis—Ulceration of the Larynx—Chronic Cough—Thick Wind—Broken Wind—“A Wheezer”—Conclusion—Backing the Horse—Turn him round Quickly on the Ground he stands upon—Lastly, Remove his Fore Shoes	148
---	-----

APPENDIX.

I. Unsoundness	163
II. Vice	163
III. Fraud	164
IV. Malformation	164
V. Warranty	165
VI. The Mode or Custom of Returning a Horse	171
VII. Trial in County Court	173
VIII. Trial at Assizes	175

SOUNDNESS IN HORSES.



LECTURE I.

Introduction—Horse Examination might well form a Specialty—
General View—The Horse remains a Living Testimony to
your Opinions—Importance of Method—Professor Dick's
Method—Watch the Horse in his Stall—Cribbing, Weaving,
Windsucking—Weaving—Attitude in Standing—Spavin and
Stringhalt — Latent Spavin — Examination of Eyes —
Ophthalmia—Iritis—Tension compared.

GENTLEMEN,—It is customary, on delivering the first
lecture of a course, to refer the students attending
the class to the best text-books on the subject; but,
unfortunately for me and for you, there are no works
at all on the matter which is to occupy our attention
now; so that you will have to rely entirely on what
you hear and see, and take notes as best you may.

There is possibly no subject in connection with horses
of more importance than their examination as to sound-
ness and fitness; and I venture to assert that if the
same spirit for specialism existed in our profession as

obtains so conspicuously in the sister profession, we should have had a hundred workers in the field, each with his book, and that book containing the same matter, in another form, of every other book on the same subject, embodying the one idea—too often forced—which has acted as the excuse for its author.

Without further comment we will, if you please, take a general view of the ground we propose going over, and then enter into particulars; the importance of which must be ever present before you, in order that what may seem to you trivial and of little importance may not be overlooked or passed by lightly.

You will be called upon frequently in your professional career to decide, not upon the particular ailment, its causes, effects, and probable termination, from which an animal may be suffering; but upon the far weightier question, in many cases, as to whether the horse is or is not in sound health in wind and limb, and if not, as to how far he is unsound, and how far the unsoundness is likely to interfere with those duties which are to be expected of him. So that you see there is this difference in the latter case as compared with the former, you have a patient which is likely to live, and be a living testimony to the truth or error of your prognosis. But this is not all: your mistakes, if any, will too often be set down for something worse, and your actions will not seldom be interpreted as dishonesties. Such, then, being the importance of the duties you will have to perform

hereafter, I hope the remarks which may fall from me may at least point out the thousands of pitfalls which beset every young veterinary practitioner who attempts the examination of a horse as to soundness. I shall make it no part of my duty to instruct you how to examine a horse under unfavourable conditions, such as we meet at a sale or in an open market, but at once proceed to give as clear an account as it is in my power to frame of the most exact method I know of ascertaining the soundness of a horse. Method is a thing which I wish particularly to draw your attention to. For any veterinarian to attempt the task without method is a folly which will as often land him in difficulties as not. Science does not recognise slipshod work, and if you are to perform the task of going over ground beset with so many hidden pitfalls, you will either have to follow the path which I, or some other who knows the road, am about to point out to you, or find it for yourselves, and in doing so find it after repeated and humiliating failures that may spread over one-third—as it too often does—of professional life. After you have traversed this beaten track for years, you will still be unable to leave it with safety, although sorely and often tempted to do so.

Of course, there are numbers of cases brought to us for examination where we see flaws at once, and where we can in one minute give a sound opinion: and there are times when we have not an opportunity

of making a thorough examination,—then there is every excuse for any but the most glaring errors; but, even in these cases, we are bound in honour to take every advantage which offers. There are more methods than one; indeed, you will hardly ever find two veterinarians have the same way of going about the task; but a method of some kind you must have, and if it be imperfect, you must study to perfect it; but whatever it is, you must follow it always, if you wish to avoid mistakes. The one I have followed, and which has seldom led me wrong, is the one taught at this college by the late Professor Dick. It consists of, or rather is capable of being considered under, three divisions: 1. Seeing a horse for as long a time as possible in his stable; 2. Seeing him and feeling his several points when standing on level ground outside the stable; and 3. Seeing him in his various paces, and watching and listening to his respiration, and afterwards removing his fore shoes.

Just a word as to the class of horse we must take for our example. Fortunately the hunter will do for our type. There is nothing in the world a horse can do which we do not find the hunter capable of. He sadly too often sees all sides of horse life, and fills all situations creditably; indeed, the hunter is wrong nowhere where the services of the horse are required; so that we will, if you please, take as our type a hunter standing fifteen-two and up to thirteen stone across country. Every point of any value which a

man has to look to in purchasing a horse has to be well looked to in the type we propose to take,—eyesight, wind, limb, everything. Suppose such a horse is for examination: look at him in a stall, if possible in his own stall, and spend ten minutes in seeing *what* he is doing, and *how* he is doing it. It not unfrequently happens that the very tying of a horse is objectionable, and has to be rectified; he is often tied short for various reasons, so that your first care is to have the horse tied so that he may have plenty of liberty. We may often learn a great deal by merely looking at a horse as he stands in his stall; but watching a horse for some time is of the greatest importance to us in making a thorough examination.

“Crib-biting,” “weaving,” and position in standing, are what we are for the most part looking for. Crib-biting can only be practised when the horse has something to pull at; but if he be more accomplished, he will be able to “suck wind,” as it is called, by elevating his head, and having nothing to grasp. As veterinary surgeons, you have little to do with vice, and these come under that head; but it is always to your advantage to get every information you can about any horse you examine, and both “cribbing” and “wind-sucking” are, or lead to, real unsoundness. Crib-biting is at first a nervous disease, and may be the result of imitation; or it may result *de novo* from gastric discomfort long continued or fre-

quently repeated, and which is brought about by any of the forms of indigestion. Crib-biting is very objectionable. The victim of it imparts it, through imitation, to others, and injures his own teeth, and his digestive track generally, directly he begins to "suck wind." It is truly astonishing how soon these diseases of imitation are contracted. I at one time rode a white pony for six months, during which period I scarcely could tire him ; when one day I had the misfortune to tie him in a stable alongside a "cribber:" he certainly was not in the stable more than twenty minutes, but from that day he began to "crib." This at first was of little consequence, but in a very short time—certainly in less than six weeks—he began to "suck wind;" then every time I wanted him he was full of wind, and for the first mile or two on the road he was wet all over with perspiration, and he could not be kept in condition. Watching a horse in the stable will not at all times detect this. Sometimes a horse may be for hours, or for days, without the habit ; but we have still another way of detecting it, which I shall mention afterwards, of looking at the incisor teeth for their being broken and worn, and at the top of the neck for marks made by the "cribbing" strap.

"Weaving" is a vice which may generally be detected by watching a horse in the stable. This, like the last, is a nervous habit which is very objectionable, as it keeps the fore legs in a constant state of

wear when they should be at rest; so that they are very much sooner worn out. Upon the whole, it is even more objectionable than crib-biting, and should you fail to detect it while in the stable, your chance of doing so is remote, as it leaves no marks that can be distinguished from the ordinary wear of the fore legs. The horse's attitude you must pay particular attention to. He, like ourselves, often "stands at ease" with his hind legs, but never rests the fore legs unless from disease; so that a horse not standing equally on both fore legs should immediately arrest your attention, and arouse your suspicions. When lame before, and resting the limb, he will either "point" by throwing the foot forward under the manger, as in Navicular disease, or he will swing the limb—let it hang, as it were, from his side; but in any case, if he rest a fore limb, you must not only note the attitude, but the limb "near" or "off," so as to examine it very particularly when he is outside the stable.

It frequently happens that a very slight amount of lameness may be detected in this way, when it would be overlooked at any other time. In the stable there is nothing to excite the horse; he is doing what he finds most comfortable, and favouring his weak points, if he has any. With regard to the hind limbs, nothing so definite can be said. Here there are fruitful sources of error. It is quite natural for a horse to rest his hind limbs one at a time, and the attitude is familiar

to every stableman. But he may be lame on a hind leg; and what is more, he may be standing upon it, and resting the sound leg, on account of his having stood so long on the latter as to tire it and make it painful, so that nothing short of an unusual attitude or some visible defect can justify your coming to any definite conclusion with regard to the hind legs, seen merely in the stable.

If you have spent ten minutes very quietly watching, and, provided there is no disturbance, have seen nothing unusual, you may now make the horse "stand over" briskly in his stall, and watch for evidences of "spavin" or "stringhalt." It is not the best situation for seeing either; but we can frequently detect them in this way, and we should resort to all the means of detecting disease we know. There are sources of error here which have to be attended to, with regard to this test for "stringhalt." If a horse has been used to standing deeply in new straw, he will get into the habit of catching up his feet higher than usual when "standing over," even though there should be at the time no straw at all. Of course, such an occurrence is rare; but it is these rare occurrences that are so apt to be overlooked. "Spavin" is by no means rarely detected under these circumstances, and when it can be detected under no others. You will read of, and be told of, such a thing as "latent spavin." We all know what latent disease is, but latent "spavin," I may tell you, is that form of lameness referable to the hock, when

nothing can be either seen or felt, and which only manifests itself occasionally; but when it does, the symptoms are unmistakably those of "spavin."

If you are quite satisfied with what you have seen in the stable, you then have the horse brought out. In doing so it is best, if you have your choice, to have a snaffle bridle put on; but before the horse leaves the stable you had better examine his eyes. There is no contrivance so good for examining the eyes as a "top light," which we often find over a stable door. Bring the horse quite up to the door, and shut it. By this means you can examine the anterior half of the eyes thoroughly, and it is seldom we want to examine the posterior half—the fundus—which we can only do by means of the ophthalmoscope. The first thing in examining the eyes is to see that they are of equal size. Repeated attacks of ophthalmia leave the eye smaller than its fellow, together with other serious changes. One attack usually leaves behind it very perceptible changes, of which the fore-mentioned diminution in size is one. The smaller eye will also show signs of previous disease in the shape of the pupil; the iris being involved, we not unfrequently have adhesion of its posterior part to the lens. This usually is only partial; so that on contraction of the iris, the part adherent does not move, and so alters the general outline of the margin of the pupil. To see this to the greatest perfection, place both hands gently over the eyes, so as to exclude the light, and

on quickly uncovering and observing the affected eye, the impaired movement of the iris may be seen. Often it happens that the iris has been adherent to the lens, and the adhesions have given way and liberated the iris. When this is so, we may generally see bits of iris adherent to the lens, and the pupil ragged in that locality, and showing evidence of being torn. The tension of the two eyes is also altered after a severe ophthalmia. To try the tension, rest the three last fingers of both hands upon the eyebrow, and then press your index fingers alternately upon the globe of the eye—covered by the upper lid, of course—and compare the resistance of the two eyes. The first healthy pair of eyes you come across do this, and once feel the tension effectually, and you are not likely to ever forget it. This knowledge of the feel of normal tension is quite necessary, because it may happen that you come across both eyes of the same horse with abnormal hardness or softness; but this is seldom the case. What commonly happens—probably in nineteen cases out of twenty—is that one eye only is showing signs of a previous ophthalmia, and you have the other eye to compare it with. But, as I have before said, when once you feel the tension of a sound eye; you never forget the peculiar elastic feeling of resistance which it gives.

LECTURE II.

Examination of Eyes (continued)—Tension—Oblique or Focal Illumination—Catoptric Test—The Conjunctiva—Cornea— Iris—Corpora Nigra—Ruptured Lens Capsule—Mirror of Ophthalmoscope of very great use—Horse is now brought out of Stable—Shaky Fore Legs—Bent Fore Legs.

GENTLEMEN,—At our last meeting you will remember that we had brought the horse out of his stall, and having closed the door of the stable, were examining his eyes by the light over the door. I mentioned trying the tension of the two eyes, and shall only further observe that so much is tension resorted to as a test in the sister profession, that Mr. Bowman, of London, the distinguished oculist, indicates nine degrees of tension. We ought at least to distinguish three degrees: 1, normal; 2, increased; 3, diminished.

The anterior half of the eye, when apparently sound, or, still more, when evidently affected, claims our attention, seeing that the tension test and the relative size test have disposed of the posterior half satisfactorily. I mean by the anterior half of the eye, the conjunctiva, cornea, iris, and the lens, with its capsule; the aqueous humour seldom suffering, so far as we

can make out, independently of the structures I have named.

The *oblique or focal illumination* is the readiest and best way of examining the anterior half of the eye. By its aid we are enabled to examine, with great minuteness, the appearances presented by the cornea, iris, pupil, lens, and even the most anterior portion of the vitreous humour. A candle or small lamp, and an ordinary pocket lens of from two-and-a-half to four-inch focus, is all we require. The light is held in front and to one side of the eye, at a distance of about a foot to eighteen inches, and on a level with the eye; the flame is then brought to a focus with the lens, and thrown first on the cornea, then on the iris and crystalline lens; the examiner's eye, being placed on the opposite side, in front of the horse's eye, catches the rays emanating from the latter. By shifting the cone of light from one portion of the cornea or lens to another, we may rapidly, yet thoroughly, examine its whole expanse, and detect the slightest opacity. Opacities of the cornea or lens appear by this reflected light of a light grey or whitish colour.

The catoptric test is a very useful one in diagnosing cataract, and had better be used along with the oblique illumination. It is conducted as follows:—A lighted candle or taper is moved before the eye. If the organ be healthy, three images of the light are seen. Two of these images are erect, the third is inverted. The

first is an erect image of the light, and is produced by reflection from the surface of the cornea ; the second is also erect, and is produced by reflection from the anterior surface of the lens ; the third is inverted, and is due to reflection from the concave posterior surface of the lens. The first two images move in the same direction as the light, the third in the opposite direction. If the lens becomes opaque, of course the image from the posterior surface is lost, and that from the anterior surface also soon becomes indistinct.

Before proceeding further, let me say, once for all, that this is not a course that admits of any discussion on disease, further than considering those disorders, and their various degrees of intensity, which are open to doubt as to their rendering a horse unfit for the ordinary requirements of work, and therefore unsound.

The conjunctiva being more vascular, is less liable to permanent change than the cornea, so that we seldom look for alterations in it ; but there are passing emergencies, such as conjunctivitis (cold in the eye), foreign bodies, and wounds inflicted with the whip, which prevent our examining either the conjunctiva or the eye. In these cases, time should be allowed for a cure to be effected before offering an opinion. If, however, the case cannot wait, then examine and give an opinion on the other points of the horse ; but make yourself clearly understood by your client that you give no opinion whatever as to the ultimate soundness of the affected eye. I have known a piece of

wheat husk purposely introduced under the upper eyelid of a horse suffering from cataract, for reasons too obvious to mention.

The cornea, of all other structures of the eye, most frequently shows signs of previous disease; and when we allow ample room for enlargement of the pupil in comparative darkness, the cornea in front of the pupil so dilated claims our special attention; for any opacities, from whatever cause, are unsoundness so long as they may last, and it is for us to determine whether they are temporary or permanent. The degree of opacity within this area must be entirely set aside, as there is no opacity which can be seen by us that will not materially interfere with the rays of light, and therefore with vision. When we come to remember how frequently the whip is abused, we must be careful in noticing the cornea of the right eye more especially; and since we do not find the pupil fully dilated, we may safely allow that the eye is practically sound if the opacity is so near the margin of the cornea as the sixth of an inch, and is of long standing—that is, that it is not progressive. Should any cicatrix from wound or ulcer, no matter on what part of the cornea it occur, alter its convexity, then it is unsoundness; indeed, you should always look at the convexity of the cornea; for if conical or too flat, we have not the means of rectifying the ingoing rays by lenses (spectacles); therefore such eyes cannot be considered sound.

The iris we have already partially noticed. Care should be taken to ascertain whether this important muscle is in proper tone. Excluding the light from the eye with both the hands, then suddenly uncovering the eye under examination, will determine the amount of tone the iris possesses. It should diminish and enlarge the pupils slowly and steadily, but obviously. Sometimes the "corpora nigra" hang more loosely than usual, or they may be actually torn. I have known several instances of hunters falling on their heads and displacing these little black bodies. When so displaced, the circumstance is not of importance in itself, but the blow which caused it may have displaced the lens, or even partially ruptured the capsule of the lens, when—the aqueous humour being admitted into that body—cataract results in the course of a few hours. This is the explanation of cataract suddenly forming after a severe fall or blow on the head.

The lens and its capsule next engage our attention. After the cornea they are of most importance.

Since the use of the ophthalmoscope has become general, the catoptric test is now no longer used by skilful surgeons in examining the lens, the oblique illumination and the mirror of the ophthalmoscope having quite displaced it. Although you may not be able to use an ophthalmoscope in its entirety, still you ought to carry one. The lens you use for oblique illumination, and the mirror part, with a light, can be

employed by the most unpractised; so much so, that frequently when I have been asked regarding the cause of "shying," and on examining the horse's lens with a lighted candle and the mirror part of the ophthalmoscope, have found the most minute speck of cataract, I have delighted the owner by allowing him to see that which has been the cause of the shying in this way. To use an ophthalmoscope efficiently requires almost as much practice as it does to play the pianoforte, it being the most difficult to use of any instrument in the whole of surgery, not excluding the lithotrite; but any one may use the mirror part at once. When doing so, any opacities of the cornea or lens appear as dark spots upon a bright red background. I need hardly say that any trace of opacity in either the lens or its capsule is an unsoundness which cannot be passed over.

Having got so far, and the eyes being found all right, we next bring the horse out of the stable, and, when possible, place him on level ground. During the next manœuvre—that of walking round the horse, and taking a general view of him—we have often to find fault with dealers' men for holding the animal with the head up, instead of their taking a long hold of the bridle or halter, and allowing the horse to have his head free. This is really important, for at this stage it often happens that we find blemishes which would render it unnecessary to continue the examination; some of which blemishes may be con-

cealed by the trick of holding up the head and frightening the horse into the attitude of "attention." In going round the horse at this stage, a practised eye soon finds a spavin, a fractured ileum, odd eyes, odd fore feet, and so many other things, that it is of importance to do this carefully, as we may frequently cut short the examination. Of the thousand-and-one blemishes, one or more of which we may now perceive, I have nothing to say at present; but it is at this stage one sees "shaky" fore legs, with or without broken knees. With regard to broken knees, we can dispose of the case quickly and without a second thought; but if, as often happens, we come across them when in other respects they are perfect, we frequently find a difficulty in deciding. I may here tell you that this trembling condition of the fore legs is due to a loss of balance in the tone of the extensor and flexor muscles of the leg; this may be congenital, or be brought about by overwork, or, suddenly, by over-exertion. In some cases, this loss of balance between the two opposing sets of muscles is sufficient to throw the knees forward, and give the fore legs a permanent bend. I have no doubt you will all have seen such cases in horses of unblemished reputation as hunters and as harness horses; but in these cases safety of the "forehand" is ensured by the limbs accommodating themselves to the altered circumstances.

Almost at any cover-side you may observe this bent condition of the fore limbs. I have frequently seen

hunters carrying heavy weights while labouring under this, at all times, unfavourable condition ; but when it may be looked upon as safe, the neck and shoulders are fine, the latter are well back, and the legs thrown forward. In not a few of these cases you may learn that the horse has been so from the time he was a foal. Without signs of broken knees, you will be unable, and mostly unwilling, to condemn such as unsound. When, however, you find shaky legs, and upright clumsy shoulders, with or without a heavy "forehand," and without broken knees, you will have little hesitation in condemning the horse.

At our next meeting we will begin to review the second stage of the examination.

LECTURE III.

Examination outside the Stable—Place on Level Ground—Great Superiority of Automatic Movement—Nostrils—Mouth—Milk Teeth Extracted—Lampas—Parrot Mouth—Worn and Broken Incisors—Irregular Molars—Signs of Hard Mouth—Intermaxillary Space—Poll—"Poll Evil"—Cribbing Strap—Parotid Gland—Jugular Vein—Obliteration, Partial and Complete—Evidence of Phlebotomy may indicate Serious Disease—Shoulder—Pined Shoulder—Collar Marks.

GENTLEMEN,—With your permission I will preface the remarks I have to make on the second part of the examination by a few words on the three methods of performing it; also, on the advantage of going through the movements of the method we adopt, until by their repetition they are removed from the sphere of thought and become automatic.

Most veterinarians begin by placing the horse on level ground; after that they adopt one of three methods: either they begin at the nose on the near side and go backwards, finishing at the near hind foot; or they go entirely round the horse, passing along the off side from behind forwards. The third mode I shall not dignify by the name of method, as

it is a slipshod proceeding, born of the certainty which accompanies ignorance : fostered by idleness or indifference ; and ending in either a lucky " fluke," a lawsuit, or professional disgrace. It consists in handling the most important points, and seeing the rest without the aid of touch.

The first method is the one I adopt ; relying, as I do, on the superiority of *automatic* movements over movements under the direction of the *will*. The second method involves going through a set of movements, then repeating the same movements in reverse order. This we should avoid, if we wish to perform automatically. As examples of the superiority of *automatic* movements over those directed by the *will*, I would advise you to go up or down a familiar flight of steps, thinking at each step how to advance your foot for the next ; or take an example without the trouble of experiment, and look at those beautiful products of automatic movements — the honeycomb or the spider's web. Such being the case, then, after the movements are perfected by repetition, your examination will be none the less perfect if your thoughts are not immediately dwelling upon each successive step.

Begin your examination by looking at the opening of the nostril, making a speculum of the thumb and index finger of the left hand, and observe the Schneiderian membrane. The nostrils are liable to accidents, such as being torn by projecting nails. I saw one the other day so affected. A slough had

evidently taken place, and there was much contraction from cicatrisation. In such a case the horse is unsound; because a horse, not being able to breathe through his mouth, requires a healthy pair of wide nostrils when used for speed or heavy draught. Again, from affections of the facial division of the *portio dura*, or seventh pair of nerves, we not unfrequently have paralysis of the nostrils, complete or partial. When partial, it may escape a casual glance, and is only to be detected by the distress shown in a smart gallop, and the noise made under those circumstances. The Schneiderian membrane should not be dry, nor too wet, but bedewed by innumerable drops, and should show no signs of ulceration nor evidence of catarrh.

You next pass on to open the mouth in order to observe the teeth, gums, and tongue. The teeth are noticed most, and you are now to look for the indications of the horse's age as shown by them. It is not my duty now to teach you this; so that I pass on to remark that it is a common trick with "dealers" and others to extract the corner "milk" teeth, to "forward" the mouth. It is evident that, in such a case, you have not the proper corner teeth to observe, but you should notice the signs of youth in those that are left, and be guided more by their appearance than by the general aspect of the horse. Among others, two signs of extreme youth in the permanent incisors are their shelliness, and the prominence of the gums immediately behind them (*lampas*). Then, again, the

incisors should come into exact apposition; "parrot mouth," produced by the upper teeth overhanging the lower, although not an unsoundness, is unsightly. Should these teeth be in perfect apposition, and their edges worn and broken, it may be from "crib-biting," or from feeding out of an iron or stone manger. On finding this condition, you will have to trace its cause. Old horses frequently have the edges of the incisors worn and chipped; but you must inquire about the material of the manger, unless you find, besides the worn teeth, the marks of a cribbing strap that has been worn. The molar teeth we too frequently fail to examine, though, as you have already seen, irregularity in these is frequent, and sometimes interferes with the horse's feeding. The gums between the incisors and molars are to be looked at for evidences of injury by the bit. If the marks are old cicatrices, and alike on either jaw, the horse may be a "puller;" or if confined to one side, it is very likely he has that very objectionable mouth, "hard," on one side. Either condition, if exaggerated, amounts to a dangerous vice, and is therefore an unsoundness. The tongue you can seldom object to.

You next pass your right hand beneath the jaws. The intermaxillary space should be a hollow in which you can lay your hand. We frequently meet this space filled up, so that its surface is flush, or nearly so, with the under surface of the jaw. This latter condition is usually due to a severe attack of strangles, or

to a mild attack in which the intermaxillary abscess has been badly treated. In such a case we often find an old cicatrix or other unmistakable sign. Now when you come to think that, next to the eye itself, one of the most delicate organs of the body (the larynx) has been, it may be, for weeks, half, if not wholly, surrounded by inflamed tissue, and involved in the inflammation, you will readily understand how guarded you should be in your examination of the "wind" of such a one for evidences of "roaring." The glands of this part should be normal. A hardened, slightly enlarged gland may indicate disease in the nasal chamber, or in a molar tooth.

Next pass your right hand to the "poll" (vertex of the occiput) gently, and use pressure; there should be no soreness, tumefaction, nor evidence of a strap having been worn. The hand is then passed over the parotid gland, and the end of the second finger should be buried as it travels along the posterior border of the jaw. Inflamed parotids are not uncommon, but almost the same may be said regarding them as was said of the evidence of strangles; though the larynx, being further away, is less liable to suffer. Calcareous degeneration of the parotids is by no means unfrequent; usually only one is affected, and the subject is aged. Beyond being an eye-sore, this affection is of little or no consequence in itself, though it points unmistakably to the horse being the subject of degeneration in one gland which

can be seen, and we have no evidence of its being the only gland affected by degenerative change. However, they are for the most part aged subjects, and so are of less importance.

You now pass your left hand over the course of the jugular vein, and raise it as though you were going to bleed. Distend it to its utmost by keeping pressure upon it for some time. By so doing you see its capacity, also any evidences (cicatrices) of phlebotomy. Besides cicatrices, we have often another evidence of phlebotomy in a sacculated condition of the vein. If there is only one sac or two, their apices should be closely observed for cicatrices. We often find this latter condition without there having been phlebotomy, from unequal power of resistance in the coat of the vein. Prior phlebotomy is of importance locally, as pointing to possible injury to the vein itself; and remotely, as pointing to the cause requiring this operation—such as inflammation of important organs like the lungs, bowels, and feet. With regard, first, to injured vein. The injury may be obliteration, partial or complete. When complete, the vein has a hard, corded feel, and pressure upon it fails to raise (distend) it. I have used the words “complete obliteration,” for practically it is so; but in nearly all cases, even the very worst, there yet remains a small irregular channel through which a thin stream of blood meanders. This condition is one of the worst of unsoundnesses, as the subject

of it cannot hold down his head to eat or drink without congestion of this part of the body following, from inability of the remaining veins to transmit the blood with due celerity, except under favourable conditions. Slight obliteration, again, may be felt, or, still better, seen, on trying the capacity of the vein, and should be regarded as an unsoundness; as at least the elasticity of the vein has gone, and its transmitting powers diminished.

The vein quite sound, yet showing evidences of phlebotomy, should put us on our guard. Why has the animal been bled? For anything we know, it may have been for acute inflammation of an important organ; and, as I had occasion during the winter to tell you, of all the causes predisposing to inflammation of a part, not one is to be compared for frequency and effect with previous inflammations. The tissues are altered in some way, and, if I may be allowed the expression, they are never themselves again.

But now, how are we to know for what the horse has been bled? The feet may plainly show a prior attack of inflammation, but we can have no evidence of a previous enteritis or pneumonia; and I regret to say that I cannot advise you to enquire the occasion for the bleeding, as experience will show you that you will be often grievously deceived if you believe what the vendor has to say concerning the merits of his horse in regard to soundness. For my

part, I have found it best to explain very fully to the purchaser, in writing by preference, the whole matter. It is clear that you can do nothing else ; as a horse that has had an acute attack of inflammation in any vital or essential organ cannot be sound for the reason I have named ; yet you may not be able to say where and how the horse is unsound. You know how subject some horses are to periodic attacks of colic, and what a common remedy bleeding is for it, and how anxious owners are to get rid of such horses, for fear of their having a fatal attack. So that an unmistakable mark of a horse's having been bled from the neck is not to be passed over, although the jugular vein may be perfect.

You next proceed to the shoulder, and look for injuries to the skin caused by the collar ; for atrophy of the muscles occupying the spaces in front and behind the spine of the scapula ; and for evidences of injuries from accident or surgical remedies about the point of the shoulder. With regard to "collar marks," as they are called, we are too apt to overlook them, or pass over them lightly. About five years ago I was much annoyed with a case. One market day, a gentleman brought into Leeds for my inspection an aged horse that had carried his owner with hounds, to my own knowledge, for some years. The gentleman was selling this horse to one of my best clients. I noticed the collar marks, which I took as little notice of as of the marks on his fore legs, made by timber and stone walls. The horse was passed as practically sound, and I assure you that

for the next twelve months he was a constant patient of mine. The collar never went on to his shoulders a third time without making them "raw." Alterative and other treatment for irritable skin proved of no use; so that it taught me this lesson, and it may teach you the same, that there are some horses whose skin will not bear the pressure of harness. Or it would, perhaps, be wiser to say that there are some horses whose skin, to all appearance healthy, may at the same time be so sensitive as to be rendered inflamed and sore by the pressure of harness.

LECTURE IV.

Shoulder—Shoulder Slip—Causes—Slight Cases “doctored up”—
Case—Caused by Sprain—Curability—Point of Shoulder—
Space between Shoulder Point and Elbow—Knee—Broken
Knees—Five Degrees—First Degree—Second Degree—Third
Degree—Fourth and Fifth Degrees—Severe Blow on Knees.

GENTLEMEN,—At our last meeting we had got so far in our examination as the near-side shoulder, and I warned you about collar marks, and what they occasionally pointed to. The shoulders are liable to injury in one or two ways, and show it either as atrophy of the muscles on either side of the spine of the scapular, or by some mark at the point of the shoulder from injury or from surgical treatment. Atrophy of the shoulder, vulgarly known as “Shoulder Slip,” is rather a common disease, more especially among young horses used for much collar work. Those used for ploughing and harness are perhaps more liable to it than others. It has been supposed that slipping in the furrow produces it in the one case; but in the other I am not aware that even a guess has been made as to its cause. This is scarcely the place to discuss the matter; but I

believe it to be caused by prolonged over-exertion of the muscles of the shoulder, so that the sarcous elements are so worn out and enervated that they are incapable of reproducing themselves in their integrity, and some degree of degeneration results. However, we know that wasting of the parts is a common disease, and often incurable, so far as I have observed; and it has, and this is most important to us now, degrees of intensity—from an almost imperceptible diminution, to the most bony, wasted flatness, where the outline of the scapula is nearly as well seen as in the skeleton itself. In the more confirmed cases, a horse would more probably be brought to you for treatment than examination as to soundness; so that we have rather to do now with the slighter cases. When a shoulder is well nourished, the muscles on each side of the ridge so fill their respective fossæ, that little besides the asperity on the spine of the scapula for the insertion of the trapezius, is seen; and both your hands laid flat on the shoulder at the same time, meet from these muscles a firm elastic resistance on pressure, and do not come in contact with the spine of the scapula except at the point I have mentioned. Then, again, the surface of these muscles, from before backwards, is rather convex; indeed, very convex in such as are of good healthy tone. You fail to find the firm, elastic resistance and the convexity in such as are diseased to any great extent. I rely more on these signs than on a comparison of one shoulder with its fellow, which we can effect by standing in front of the horse

and elevating his chin above our head: because, in the first place, both shoulders may be atrophied; and further, we so very frequently find the shoulder of the leading leg rather larger than its fellow. This is a part of the examination in which you cannot be too careful. The injury leading to the affection may be inflicted one week, and the lameness and stiffness, treated by rest, hot fomentations, and physic, may have so far been overcome the next, that physical signs are absent, and the lameness only is to be detected; and this may be so slight that an expert dealer's man, in trotting the horse for you, may effectually conceal it. I cannot too much impress upon you the necessity of being on your guard in these slight cases; for in not a few instances do they become serious within the time that a horse, found to be unsound, may be returned. I remember passing a three-year-old bay carriage horse, that became lame from this cause soon afterwards. I detected no difference in the two shoulders at the time; not that I was very closely looking for any, but when he had been driven alongside another horse for three weeks or less, he became decidedly lame. The gentleman took him to an elderly veterinarian in whose district my client happened to be staying for a time, when atrophied shoulder was made out, and an opinion given that it was of some standing. Now, there happened to be a distinct history of accident in this case. The coachman, a hard driver, in going down a hill, saw the horse half fall on what afterwards became his lame side; recovering

himself, the horse went home all right, but next morning he was lame—stiff on that shoulder. Here, no doubt, was a sprain, followed by partial disuse of the parts, and consequent atrophy. The horse was treated by rest, hot fomentations, physic, counter irritation, etc., and when brought home some weeks after, the shoulder, much less than its fellow, showed symptoms of having been well blistered; so that inflammatory action had ceased. I recommended the owner to have the cold-water hose turned on to the animal's shoulder for three minutes night and morning, the part to be afterwards rubbed till it was not only dry but hot, and the horse to be allowed to run in a small paddock during the day. In a few weeks he was quite well.

Please to note the difference between these cases, through enforced idleness of the muscles from the pain of inflammation of a part of the shoulder, and those which arise from exhaustion, and consequent innervation of the whole muscle from prolonged exertion. In the former case, we have a very curable condition, but not so in the latter. Again, should the atrophy be due to enforced rest of the muscles from disease in the shoulder-joint, it is not likely to be overlooked by you; inasmuch as you have two distinct evidences of it, in the diminished size of the parts, and the lameness, which is always pronounced. The point of the shoulder should claim your attention. Marks of setons, blistering, or firing, are not unfrequently to be found. Should the horse be a valuable one, and he be at the same time sound, so far as

you can make out, you will often be at no little loss how to act when there are evidences of treatment. What was said with regard to evidences of a horse having been bled at the jugular vein, might here be repeated. It may be that the horse has really been lame in the shoulder, and the lameness now absent may recur; or it may be that he has never been lame in the shoulder, and yet has been treated for shoulder lameness. In any case, should the horse pass muster in everything except these marks, by all means let him pass with the whole of that limb (and not the shoulder only) warranted to stand sound for a prescribed time.

The parts from the point of the shoulder to the elbow are seldom found to require much of our attention at these times, and the elbow joint is remarkably free from ailment at all times; and, as the parts from the elbow to the "carpus" (knee) are also singularly free from disease, practically we can pass from the point of the shoulder to the knee almost at once. We are, in our plan, examining the front part of the limb first.

Having come to the knee, we are arrived at an important part—a part much liable to injury, and one which can receive none but the most trivial scratch with impunity. The sight and touch do a good deal for us here, but by no means all. On passing the fingers over the front of the knee, and smoothing the hair, we may feel and see any injury to the skin. Unfortunately, the term "broken knees" is such a vague one that it includes every degree from mere clipping or chipping

off of the hair, to laying open of the joint and exposure of the bones. And yet, strange as it may appear to you, I can assure you that, throughout the whole horse universe, there is almost as strong an objection to the very mildest blemish at this part as there is to the very worst. Why this widely-prevalent suspicion of "broken knees"? We ought never to altogether ignore a popular belief, and therefore not this. The degrees of injury to the knee, all alike known opprobriously as "broken knee," I will enumerate as they actually occur. 1. You may have mere chipping or clipping of the hair, with or without a bruise of the integuments beneath. 2. You may have the above, together with wounded skin. 3. You may have the first two together, with a clean incision of the subcutaneous (cellular) tissue; or this tissue, instead of being simply incised, may be bruised and lacerated. 4. You may have the three foregoing conditions, together with exposure and wounding of the hard tissues forming the extensor tendons and their sheaths, as they pass in front of the knee. 5. You may have the knee joint itself laid open. Now as to your diagnosis of these respective conditions, beginning at the first. It is evident that, if the hair only is cut, it will grow again, and you would fail to find any evidence of the injury after two or three weeks. If, however, as more frequently happens, the knee receives a blow at the time of the accident—although the skin may not be cut—the skin may have been damaged and the hair bulbs so injured, that they for ever afterwards

are more vascular, and consequently the hair grows stronger, and will not lie smooth; or, again, the hair bulbs may be so encroached upon by the organized hyperplasia which has become permanently lodged in the skin, that atrophy takes place through absorption, and you find thin, wiry, starved white hairs.

The second degree, or wounded skin, shows itself in either condition of hair already enumerated, if the injury has been severe, or in the form of a bruise; but if only a clean incision—a condition seldom seen—you would have no evidence whatever after the hair had grown, as the cicatrix would be entirely covered. If the cellular tissue have suffered, as well as the skin, here again a clean incision leaves no evidence; but when, as in the majority of cases, it has been crushed and lacerated, a slough forms, and the cicatricial tissue being hard and inelastic, renders the skin fixed and immovable. The fourth and fifth degrees of injury cause adhesion between the extensor tendons and their sheaths; so that if you flex the limb, and endeavour to make the fetlock touch the elbow, you find it will not do so. It must be evident to you that a horse suffering from the effects of the fourth and fifth degrees is unsound, inasmuch as he cannot bend his knee; but how about the remaining three? It is just as evident that the lesions, if any, remaining after any one or all combined of the first three degrees of injury, will not mechanically interfere with the free flexion and use of the knee. But, unfortunately, there happens to be an injury, the nature

extent, and consequences of which we have no means of estimating. I refer to the weakness following a *severe blow* upon a joint.

Question a man who has suffered at any time from a severe blow upon one of his joints, and he will tell you that the joint is *weak*, and yet he may have no scar whatever to show you. Four years ago I received a blow from a horse on the knuckle of the index finger of my right-hand while bleeding him at the toe. At first I thought the joint was laid open, but this proved not to be the case. The only evidence left now is a cicatrix of the skin, which is freely movable, and can be pinched up as high as the skin on the fellow knuckle; the tendon over it is also freely movable, and so is the joint; and yet, with all this seeming perfection, the joint is weak. This being so, then you see we have two forms of imperfection only to look for in the knee of the horse: namely, mechanical impediment and weakness. The former arises out of either of the fourth or fifth degrees of injury, which we have such a ready and sure means of detecting; the latter we are not so certain about—the evidences of a blow sufficient to cause permanent weakness being more equivocal. But, practically, we look to evidences of injury to the hair; such as absence, stiffness, or discolouration; finding any of these, unsoundness is our verdict, although the action may be perfect, and the horse in every other respect sound. This is such an important part of our present study, that I shall make a few more remarks upon it at the beginning of my next lecture.

LECTURE V.

Knees (continued)—Broken Knees—Term Misleading—Law on Subject—Case in Point—Another Case—To decide on Intermediate Cases of Broken Knees—Enlargements about the Knee—Ganglions—Nature of Ganglions—Cannon Bone, Subcutaneous—Front Part seldom affected—Pastern Joint.

GENTLEMEN,—At our last meeting, in speaking of injuries to the knee I laid much stress on the two conditions, *mechanical impediment* and *weakness*. With regard to the former you have physical signs, but this is not always the case with the latter. We have no more unsatisfactory term in the whole of our nosology than the term “broken knees.” Every degree of injury, from the mere chipping off of a few hairs to the injury that breaks open the joint, breaks the bones, and drains the joint of its oil (synovia), is alike termed “broken knee.” This vagueness, bad as it is in itself, becomes a fruitful source of injustice in the law courts. The law holds that broken knees are unsoundness according to the extent of the injury. What are veterinarians to do, with the law on the subject in its present state? With the law as at present, all we can do is to make the best of it. Here is a case in point. About a year ago a very re-

spectable dealer sent his most trustworthy stableman leading a valuable six-year-old bay carriage gelding in a snaffle bridle to my premises to be examined, and a written certificate was to be sent back along with the horse, which was to be purchased by a wealthy woollen manufacturer, if sound,—only if sound. When turning a corner he was startled by a passing vehicle, jumped on one side, came down on one of his knees, and a little piece of hair was neatly taken out of the front of the knee as if cut with a pair of sharp scissors. This happened not a stone's throw from my infirmary. I examined the horse and found him sound in all other respects, but I could not write a certificate of soundness because I should have to say he had a "broken knee." I knew the intending purchaser, he was one of my employers, and a certificate with qualifying remarks he would not have looked at twice, so that, in fairness to the dealer as well as to the purchaser, I waited upon the latter personally, and explained the whole matter, at the same time explaining the vague interpretation of the law upon the subject. The result of the interview was the purchase of the horse subject to my giving a certificate of "soundness in every other respect." From the difficulty I experienced in gaining the attention of this gentleman in explanation, I feel sure a certificate would have been thrown into the waste-paper basket in three seconds, and the clerk ordered to write to the dealer saying, "That in consequence of Mr. Fearnley being unable to give a certificate of soundness, Mr. —— must

decline to purchase the horse," or something to that effect. The dealer would have been incensed against me, and the intending purchaser would have missed a really good bargain. The mere accident of my personally knowing the purchaser, and of being able to wait upon him, are not available in many cases. Take another case. The same dealer as in last case had bought a horse with his knee "chipped," that is, the hair was cut and the skin a little bruised, and had to keep the horse on his hands for nearly five months before he could present him as a sound horse, and procure a certificate accordingly. It was five months before the signs of the injury were obliterated. These are cases of unsoundness *pro tem.*, but are not so physically but only through a rotten vagueness of a term. These very trivial cases, along with the graver defects I have mentioned, are at least clear to us, and we can estimate them at their proper value. In the very slightest cases we can at the most advise the owner to wait a few months for the evidences to become obliterated. It seems to me that I have a good opportunity now of offering a piece of advice which will, if followed, be of real service, and save you from much unmerited blame. It is to assure you that there is a wide difference between a veterinarian's certificate and a business letter, much more a friendly letter; and when you are going to put a good deal of qualifying matter into a certificate, it is in many cases best to prepare the recipient by a friendly letter sent first, that is, of course, when you are not able to wait on him personally.

So few horses are quite sound that there must be qualifying matter in many pass certificates, and this may be of so formidable a character from its length as utterly to drown the few words in which an opinion is offered. But of this I shall say more further on. Lastly, with regard to broken knees, you have the intermediate cases to decide upon, and you will find it a good rule to reject as unsound all cases in which you find distinct evidence of injury which has failed to become entirely obliterated in six months. This I do without any qualification whatever, irrespective of form and action, for both are of little moment when the horse gets "leg tired;" it is then that the weakness left after a *severe blow* shows itself.

Enlargements about the knee are sometimes of no importance. We not unfrequently find enlargements, just above the joint, of the hard tissues, caused by leaping over timber and stone walls, which are of no importance physically if they do not prevent the perfect flexion of the joint, tested by lifting the foot and causing the pad of fetlock to touch the elbow. There are other enlargements, called *ganglions*, which appear about the knees and hocks, generally in front of the former and at the sides of the latter. Sometimes these are of considerable size, and are, either from their size or from their causing impaired mobility of a joint, unsoundnesses. They do not seem to arise from inflammation, but rather to be of the nature of simple cysts. They are slightly movable, indolent, and painless, and appear to be situated in the

reticular tissue, which immediately covers the sheath of the extensor tendons. To the latter they are connected firmly, to the skin but loosely. The consistence of their contents varies very much, but they seldom communicate with the articular synovial cavity. If nothing else, they are unsightly, being sometimes as large as cricket-balls, or larger. A horse bought with such a tumour would have to be taken for better for worse, because, if an unsoundness, they are unmistakably apparent. Sometimes you will see more than one on the same animal, just as you will frequently see several enlarged bursæ on the same animal. These ganglions impede mobility or not, according to their size and position.

You must remember we are examining the front part of the fore leg, and having finished the knee pass our hand over the front part of the cannon bone down to the front of the fetlock joint. The bone all this way is nearly subcutaneous, the tendon of the extensor of the foot only passing obliquely in front of it. Practically, it is subcutaneous, so that here we have only the skin, the front of the cannon bone, and the tendon, just mentioned, to examine; and I might also have said that practically we can pass over this part without a thought, as we seldom find it affected in any way.

The front part of the pastern joint comes next. This and the pasterns are so intimately connected with, and influenced by, the foot, that I shall here make a wide digression, and describe all the parts beneath the fetlock joint together.

LECTURE VI.

The Fore Foot—Only a Part of a Whole—Its Relation to the Fore Leg—When the Horse is Awake—When Asleep—Not so much Weight on it when Awake as when the Horse Sleeps Standing—The Fore Legs have Efficient Mainstays, except at the Navicular Joint—The Navicular Joint very Defective—The Relation between the Phalanges and the Column of Bones above—Importance of the Line of the Coronary Band being always Noted—Its Tendency to become Horizontal—Long Pasterns, Low Heels, and Long Toes—A Good Foot and Pastern—A Boxy Foot—Shoeing Blamed for every Ailment of the Foot—Shoe Inventions—The Charlier Shoe.

GENTLEMEN, — We have now come to the most important part of the examination, namely, the fore foot. Although there are no end of treatises on this subject, I shall be obliged to describe the mechanism exhibited here, because authors take a view of the subject which I consider to be radically wrong—all seeming alike to regard the horse's foot as a thing *per se* and not, as really is the case, *as only a part of a whole*. You cannot understand numerous causes of the diseases of the foot by looking upon it as a whole. Of course you may say that it is only a part of the body technically, but, prac-

tically and anatomically, it is neither more nor less than a *part* of a phalanx, much modified by being surrounded by hoof and otherwise, but still a *part* of a phalanx, and one (the distal) of three parts whose bones, from above downwards, are named respectively the suffraginal, coronal, and pedal.

This being so I utterly ignore all descriptions of the foot as such, and proceed to describe *all the structures from the fetlock joint downwards as a whole*.

The fore legs, as you know, are the *weight-bearers* and the hind legs are the *propellers*. You will best see this by letting fall an imaginary plumb line through the long axis of the fore leg. This *line*, as the horse is standing on level ground, comes up through the root of the neck at its upper end, but at its lower (in a well-shaped limb) finds the fetlock joint its lowest point, and reaches the ground *slightly behind* the heel of the foot. Here I am speaking of a well-made horse, irrespective of breed, standing on level ground, thoroughly *awake*, and in *attention*. Notice how little weight there now is in front of this line, for you have only the—

1. Head.
2. Neck.
3. Half the shoulders.

So that in this position, when the horse is *awake* and in *attention*, you see, the fore and hind limbs bear the weight of the body equally; because, if the fore limbs have the head, neck, and half the shoulders in front of them, they have the large light thorax immediately behind them, whilst the hind limbs have their own

weight, the pelvis, and most of the abdomen for their share.

Still using our plumb line, let us watch the well-made horse, or any other for that matter, standing on level ground *asleep*; and we find the column of bones from the fetlock to the elbow, not perpendicular as before, but inclined very much forward, so that our plumb line, instead of passing through the long axis of the fore leg and falling *behind* the foot, actually passes *through* the *foot*, obliquely through the phalanges, and out of the leg just below the knee; again comes through the body at the girth place, and comes out above on the *posterior part of the withers*. You can verify this any day you like by going to a street cab-stand. It will be strange if you do not find some horse in the stand either sound asleep or nodding. Now what weight have we before the line? You have—

- | | |
|------------------------------|------------|
| 1. Nearly all the fore legs. | 3. Thorax. |
| 2. Shoulders. | 4. Head. |
| 5. Neck. | |

And to balance this extensive weighty mass you have little more than the hind legs and pelvic organs; so that when the horse is asleep you see the fore legs are truly the weight-bearers. In this attitude the hind limbs have themselves only to take care of, and very little else. In the *walk* and *trot* we find the fore limb similarly related to our plumb line as in *sleep*, but only one limb so at a time, and not both. When the horse lies down, all the

fore limb rests, and does not concern us here, so that we have left us to consider the fore limbs when the horse is

1. Standing at attention.
2. „ „ asleep.
3. During motion.

I next wish to draw your attention to the column of bones themselves. It is necessary for them, when the horse is in action, to be bent one moment and to be *rigidly stiff* the next. I need not dwell on how freely they bend forwards, but must lay special stress on the very narrow limits in which they bend backwards. In order that they may be rigid, stiff, and fixed, they are provided with *back stays*, and these stays are, for the most part, in every instance but one, *powerful, unyielding, true ligaments*. Enumerated from above downwards, these are the—

1. Superior Carpal and Interosseous.
2. Superior Sesamoidean or Suspensory.
3. Inferior Sesamoidean.

The superior carpal and the interosseous ligaments act as a *main* stay to the knee, the two sesamoidean act as main stays to the fetlock joint; the inferior sesamoidean also acts as a main stay to the joint below the fetlock joint, which is placed between the suffraginal and coronal bones; but to the last joint of all (the coffin or pedal joint) we have a complicated stay capable of some considerable extension and therefore *not rigid*. I refer to

the flexor tendon and navicular bone; the former pushing the latter, wedge-like, against and into the joint. Here I have enumerated the chief or main stays, and am not forgetting that there are others to each joint, even to the coffin joint; but all others are insignificant as compared with the ones enumerated.

Next, I wish to draw your attention to the phalanges as a whole. We find when the limb is *rigid* and bearing more or less of the weight of the body, the phalanges are placed *obliquely* to the long axis of the bones of the leg, from the fetlock to the elbow joint.

That the long axis of the phalanges themselves is *straight*.

That the line (seen on taking a side view) formed by the upper margin of the hoof or *line of the coronary band*, as we shall call it, is very nearly at a *right angle with the long axis of the phalanges*—thus :

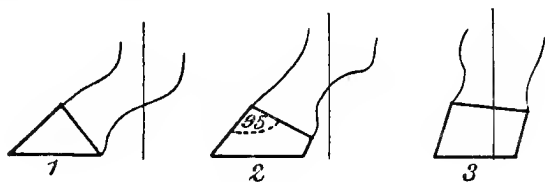


FIG. 1.

That the angle formed by the *line of the coronary band with the hoof* is of necessity the same whether the horse be lying, standing, or in motion. This angle, when the limb is bearing the horse's weight (*rigid*), is just a trifle

over a right angle ; that is, instead of being 90° , it is about 95° . (See Fig. 1,².)

This lower angle being *unalterable* by any movement or position, it follows that where the phalanges bend in either way, it is at the expense of the upper angle or that formed by the pasterns with the top of the hoof; and it was shown that in a state of rigidity of the limb, or when the horse was standing fully upon it, that this angle was 5° less than a right angle (85°), the other angle below it being 5° more ; therefore when bent, as when a horse is trotting, galloping, or jumping, and gathering his limbs well under him, this angle is still less ; or in other words it is this angle which is alterable.

The *lowermost* phalangeal bone (*os pedis*) bears a constant unalterable relation to our *lower* angle, because it is *fixed* in the hoof ; and we have seen that the lower angle is altogether formed by the hoof.

We have also seen that in a state of great *rigidity* of the limb, as when the weight of the body is thrown forwards upon it in sleep, or when in motion, that the column of bones, from the pedal joint to the elbow joint, becomes one rigid column, practically as stiff and unyielding as if it were made of iron. It is a rigid bent lever having a very long arm and a very short arm. (See Fig. 2.)

This being so, we have the foot below on the one hand, and the whole leg above on the other, as two rigid pieces, with their juncture and yielding point at the coffin joint—the joint with the tendinous yielding stay.

The *line of the coronary band* has a constant tendency to become more *horizontal*, or, in other words, our lower angle has a tendency to become larger. This is effected by more rapid growth of hoof at the heels than at the toes. Long pasterns, low heels, and long toes, are

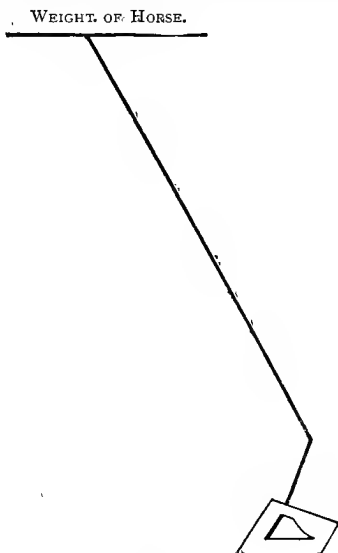


FIG. 2.

accidents of the same condition, and give the side view of the foot a triangular appearance. (See Fig. 1, 1.)

Well-made pasterns of proper length are not too obliquely placed, and cannot, except under most unusual force, be too obliquely placed, and are generally found with good heels of moderate height and strength.

The side view of the foot is neither too triangular nor too square. (See Fig. 1,².)

The pasterns have a strong tendency to assume the perpendicular when we may or may not have the *line of the coronary band* approaching the horizontal. When short pasterns assume the perpendicular, we have almost invariably a high-heeled boxy hoof. (See Fig. 1,³.)

I might have added to the above propositions, but trust that by their aid we shall be able to further discuss the subject in a clear and intelligible manner. You will often read and hear of shoeing being a necessary evil, and of its being the cause of foot lameness and so forth. Now please note that the shoe is nailed on to the *end* of the phalanges. At the other end of the phalanges is applied the weight and the power of its distribution. Those who blame shoeing for *all* the ills of the foot, either invent, or stimulate others to invent, all kinds of contortions and vagaries in the name of horse-shoes. They will even go into a state of ecstatic mania over what they call "this most beautiful mechanism." They will wrangle and quarrel over the question whether the heel contracts or expands, and look steadfastly and for ever to the *end* of the phalanx for the interpretation of the ailments from which the foot suffers. They will watch a horse drawing a heavy load up a hill violently digging his toes into the ground; or, backing a load down a hill, digging his heels into the ground, sliding and wrenching; and then go home and invent a shoe. The late Professor Dick used to delight in showing his

class about half-a-ton's weight. He would have one lot brought out of the museum after another for eight or ten successive lectures, and at the end hold up to the class in triumph the every-day shoe. This shoe has been slowly evolved, and answers every purpose as a shoe, and has undergone little change for 300 years at least. But these shoe inventors do not seek a shoe as such at all; they rather seek for some iron, leather, or india-rubber contortion which, being applied to *one end* of the structure, will save the structure from all adverse influences soever. But no doubt there will always be an army of shoe-inventors in the profession, as there is a restless army of pessary inventors in the medical profession. In both cases each may be able to apply his pet contortion to seeming advantage. These vagaries have a short life in very limited areas, then they quietly die, are museumed, and forgotten. The day will come, but perhaps it will not be in our lifetime, when the streets of our large towns will be paved rationally (with wood pavement); and then—happy day!—we shall have horses wearing on their fore feet at once the most scientific as it is the most common-sense shoe, the *Charlier*. The stone pavior will cost the country many millions of pounds in horse-flesh before this revolution comes about, but no doubt it will one day be discovered to be a *State* question.

LECTURE VII.

The Fore Foot (continued)—Horse Examination very Difficult: Why Cases as Examples—A Classification: I. Anomalies of Size; II. Anomalies of Shape; III. Anomalies of Position; IV. Injuries; V. Diseases—Feet compared with each other, and with the Horse's Bulk—Too Large Feet—Feet too Small—Signs of previous Fever in the Feet—Test for a previous Inflammation in the Feet—Frogs Atrophied—Frogs too Large.

GENTLEMEN,—It occurs to me that the last lecture and the present one will give you some idea of the great difficulty of the task of any one, I don't mind how wide his experience may be, who undertakes to examine a horse as to soundness. The points you have to look to at this stage are so numerous that we cannot do better than classify them first, and then go over them in detail, but not necessarily one by one, because you will find that there occur endless combinations. These combinations are often extremely embarrassing, for whilst the least experienced can at once give an opinion and have no doubt in his mind upon well-marked cases of disease—such as corn, sand-crack, and so on—we find the most experienced sometimes at a loss when combinations of minor defects are met with. Let us suppose a few cases

such as you will frequently have to decide upon. Let us take six cases, of minor combinations, but quite sound in every other respect.

CASE 1.—A gentleman asks you to examine a six-year-old carriage gelding in hard working condition. The horse has been in regular work. You find his knees tremble just a *very little* when he comes to stand; his feet are just a shade warmer than common; he has soles not too flat, but *inclined* to be flat; and he is shod with shoes having a *little* more cover than common, and with a shade more iron in them.

CASE 2.—A seven-year-old carriage gelding is sent for your examination. You find him sound in every other respect, but you find him “leggy,” flatsided, wearing “calkined” fore shoes, shreddy half-atrophied frogs, with no discharge (thrush), but the bottom of the cleft of the frog has a white appearance.

CASE 3.—A horse, sound in every other respect, is brought to you. You find him five years old; fore feet small; lateral cartilages less yielding than common, but yet not at all ossified; toes turned a little in, and the least possible hypertrophy on the top of one hoof on the outside, and the part of the shoe immediately under this hypertrophy a little more worn than is common in this situation.

CASE 4.—A carriage horse, sound in every other respect, has fore feet of unequal size, and the wall of the smaller foot is dry and brittle, yet so far there is plenty of wall to nail to, and no undue heat.

CASE 5.—A horse sound in every other respect is brought to you ; you find him aged, wearing leather soles, has been newly shod, his feet neatly rasped, has rather upright short pasterns, and has the slightest touch of hypertrophy of both fetlock joints, frogs half atrophied, but no corns.

CASE 6.—A horse sound in every other respect has long, very oblique pasterns, long toes, low heels, has marks of speedy-cut on both heels, has flat feet, and brittle, as shown by their being chipped, and has a very small hypertrophy of one fetlock joint.

In these cases you are supposed to have to say whether the horse is or is not sound. Could you give an opinion at once, without having any doubt, in any one of these cases? I don't think you could ; and yet I might have multiplied these cases a hundredfold and still not have given you examples of a tenth part. They are practically unlimited, and the only satisfactory method of dealing with so wide a subject will be for us (1) to go over each departure from the normal one by one, and (2) to enumerate and discuss the more common combinations. With this method in view I will now proceed to place before you the following classification :—

I. ANOMALIES OF SIZE :

- | | |
|---------------------------|--------------------------|
| 1. Feet too small. | 3. Feet unequal in size. |
| 2. „ „ large. | 4. Frogs atrophied. |
| 5. Frogs large, "fleshy." | |

II. ANOMALIES OF SHAPE :

- | | |
|---------------------|--------------------|
| 1. Contracted feet. | 3. Heels too high. |
| 2. Flat soles. | 4. „ „ low. |
| 5. Toes too long. | |

III. ANOMALIES OF POSITION :

- | | |
|----------------------|---------------------|
| 1. Pasterns upright. | 3. Pasterns short. |
| 2. „ long. | 4. Toes out-turned. |
| 5. Toes in-turned. | |

IV. INJURIES :

- | | |
|-----------------------|---------------------|
| 1. Brittle hoof. | 5. Bruised coronet. |
| 2. Pricks in shoeing. | 6. Speedy cut. |
| 3. Gathered nails. | 7. Brushing. |
| 4. Bruised sole. | 8. Unnerved. |

V. DISEASES :

- | | |
|---|-----------------------|
| 1. Canker. | 8. Laminitis chronic. |
| 2. Carbuncle of coronary band. | 9. Navicular disease. |
| 3. Corns. | 10. Quittor. |
| 4. Disease of Pyr. Process of <i>os pedis</i> . | 11. Ringbone. |
| 5. False quarter. | 12. Sand-crack. |
| 6. Grease. | 13. Seedy toe. |
| 7. Laminitis subacute. | 14. Side-bones. |
| | 15. Thrush. |
| | 16. Villitis. |

1. ANOMALIES OF SIZE.—In judging these we of course are regarding the foot alone and leaving out of considera-

tion the remaining part of the phalanx. We usually compare one foot with its fellow, but there are times when we have to ask ourselves the question, Are these feet as large as feet usually are belonging to horses of this size and class? or, on the other hand, we may have to regard them as too large. Now, when feet are of equal size, and are free from disease, but are larger in proportion to the body than common, you may regard it as of no consequence. So far as you are concerned, as it is neither an unsoundness nor does it of itself lead in any particular way to unsoundness; but it is very different when they are too small, that is, small out of proportion to the body. They may be perfectly sound, but you will not so readily satisfy yourselves on this point as on the last. You know that when a part is inflamed, nutrition, and therefore growth, is arrested. Now the foot of the horse, as also the entire body, enlarges by growth up to the fifth year, or more in many cases, and it comes to be a question whether small feet have not, during the period of their growth, suffered from inflammation in some degree. Inflammation would necessarily be of a mild form that would leave the foot without further evidences than those of arrested growth. If it had been present in a mild form it must have been of considerable duration, because after recovery from a mild attack a growing part resumes its growth. I have before told you that a part once acutely inflamed is "never itself again," and that there is no cause of inflammation nearly so potent as a previous inflammation. When inflammation has attacked the foot

of the horse it invariably leaves behind it permanent and observable pathological changes, such as alterations in shape, and in quality of texture of the horny box, or it leaves a badly balanced vascular system within this structure. The altered physical conditions of the horny box are—

1. Laminated, shelly, diverging rings round the hoof.
2. Diminished convexities of sole.

There are others, but these are the most constant and obvious. Should the feet we are now considering have these two altered conditions, of course we have no doubt in condemning the horse as unsound. Suppose we have sound-looking feet, no matter of what size, we can at all times test their vascular system by a battering canter on a hard road. This will tax the capacities of the vascular mechanism to its utmost, and it is only a vascular mechanism that has never been damaged that can, after such an ordeal, immediately resume a quiescent state. After the canter tie up the horse in a cool shade for twenty minutes, then trot him slowly in hand. If he has had inflammation in his feet you will now find that he goes on his heels and picks up each foot as soon as he puts it down, or, as horsemen say, he will go “feely, like a cat on hot bricks.” You will all, no doubt, have experienced the painful and highly unpleasant jar or sting when leaping from a height and alighting flat on your feet when they are hot and swollen. The horse no doubt feels this on moving, and this is why he goes on his heels.

The bloodvessels within the unyielding horny box are dilated and crowded with blood. Healthy vessels would have followed the example of their near kinsmen in the skin and have contracted upon their contents, and the excited blood flow would have quieted down. This is a capital test for feet suspected of having suffered from inflammation. It is a test you should never fail to apply under such conditions.

Feet may be of unequal size, and still both may be quite sound. It not unfrequently happens that the right foot is distinctly the larger. Here we account for this by the right foot being more used, which is quite a natural thing; or we look for signs of previous inflammation in the lesser foot, and apply our test when there are no pathological changes of structure visible in the horny box. Should there be no physical signs, permanent or produceable, it would be a grave mistake to certify the horse as unsound, but you would be justified in mentioning it in your certificate. You would, were the foot very much less than its fellow, need to be very careful. It often happens that young unshod horses gather foreign bodies, such as thorns, nails, and other sharp penetrating substances, whilst running in an ordinary pasture, or they bruise their soles. We frequently find inflammation of a severe character, and prolonged, under these circumstances: This being so, we cannot be too careful when we find odd feet.

Frogs that are atrophied and frogs that are large (fleshy), are neither of them conditions which exist

singly, and if they did would not constitute unsoundness. They are nearly always, if not always, associated with other defects, and as such we shall discuss them at another time.

LECTURE VIII.

SHOWING HOW HEELS BECOME HIGH AND CONTRACTED.

GENTLEMEN,—We now come to consider anomalies of shape, and we cannot do better than spend our hour to-day by going carefully over the functions of the foot, and, by rigid adherence to strict logical method, investigate the causes of high “boxy” and contracted heels.

If you examine a healthy fore and hind foot of a five-year-old horse, you will find that they are both inclined to be oval; and all ovals, as you are aware, have a long and a short axis. The long axis of the healthy fore foot is from *side to side*, but in the hind foot it is from *before backwards*. This long axis has a strong tendency to alter its position in the fore foot, and to become like that of the hind foot—from before backwards; but the long axis of the hind foot has no tendency to alter.

Again, I have before told you that the *line of the coronary band* in the fore foot has a tendency to become horizontal.

A foot having undergone these two revolutions is known as a “*long contracted foot with high boxy heels*,” or, as some have it, a *muley foot*.

These two alterations of shape occur in the same

structure, take place simultaneously, and spread over a considerable time. I have before shown that *the line of direction* of weight is through the long axis of the phalangeal bones, and we find that this comes out at the point of the frog. For purposes of illustration to-day we take two sections of the foot—both vertical sections, but one from before backwards, exactly through the centre (see Fig. 3¹), and the second from side to side,

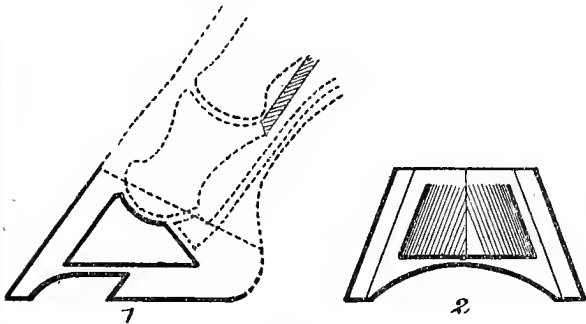


FIG. 3.

through the long axis of the phalangeal bones, coming out at the point of the frog using the anterior section (see diag. 2, fig. 3). In the first section we get symmetrical halves; but the section of the coffin bone will mislead you if you do not remember its wings, which you do not see, but which extend much further back than the surface of the same bone which is open to view.

The anterior part of the second section of the foot shows the coffin bone resting upon an arch. This arch is formed of the bottom part of the wall of the foot, on

either side as its *buttresses*, and of the sole for its *span*. Keystone it has none.

Take either half of the *first section* of the foot, and you again find the coffin-bone resting upon an arch. This arch differs from the last in its posterior half. *Its anterior half*, like the former arch, has the wall of the foot as a *buttress* and the sole for a *span*; but for the posterior half of the span and buttress it has one structure, and this structure is yielding and highly elastic, and diverges as it proceeds backwards. Seen from above, or as we see it when looking into an empty hoof, we find it like this—

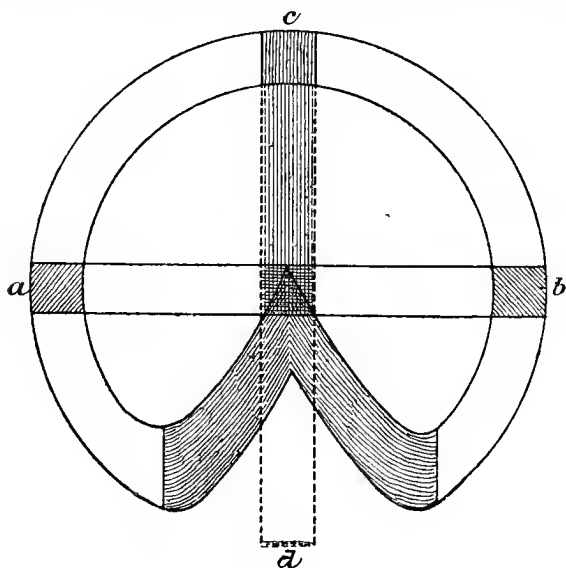


FIG. 4

We have, then, two arches crossing each other at right angles, which have *the same centre of weight*. The centre or focus of weight is at the coffin-joint,—please remember that. After passing this joint the weight *radiates*, and so gets diffused. In radiating, the rays pass from this joint through the coffin bone, which is itself a radiating structure, on to the *entire* base of the foot, the most direct, therefore the shortest rays, as I have already told you, pass out at the point of the frog.

Let us stop a moment to consider the difference in *intensity* between focused and diffused rays. In the case of light, you can focus with a magnifying glass the rays on the back of your hand until you get an intensely bright spot about the size of a pea, when all the rest of the back of your hand appears in shade ; but move the glass nearer to or further away from your hand, and you see the bright spot becomes larger and larger, darker and darker, until it ceases to be discerned as a spot at all, and the back of your hand is not now in the shade, but is faintly lighted up. The rays have *radiated*, and now cover a wider area, and *faintly* light up this area, instead of lighting an area the size of a pea *intensely* and leaving all the rest dark. This you can see. In your penny-peep-show days you will no doubt have seen a large muscular mountebank lie upon his back, and have a large size forge anvil placed upon his chest, and this struck by the swinging blow of a very large sledge-hammer. The centre, or focus of weight, here is the face of the hammer upon the anvil, and the rays have the

large area of the anvil bottom whereon to diffuse themselves, and are of considerable length. The weight, moreover, is momentary, and is not confined to the face of the anvil, but diffused through most of the body of the anvil. The rays are so faint when spread over this large area that they scarcely alter the *inertia* of the anvil, and are therefore barely felt by the bearer, who rises, supposed to have survived a crushing blow. Had the anvil been one-tenth the size the rays would have been in focus, or nearly so; there would have been one-tenth the inertia to overcome; and the earthly career of our friend would have been cut short. Distance, then, is, as we have endeavoured to show, an important factor in *radiation* and in *concentration*. Without proper distance there can neither be radiation nor concentration; so that if the coffin joint be our focus or centre of weight, and we wish the weight to be diffused over the base of the whole foot, it is of the very first importance that this joint be *well above* the surface of the foot.

Again, referring you to our two arches, you will notice that in addition to their cutting each other at right angles, and having the *same centre of weight*, the weight is placed in the middle of the transverse arch, but further forward in the arch, which is formed from before backwards, so that we may represent this diagrammatically by a cross (see Fig. 4).

This cross also represents the *direction of shortest rays*; therefore at all points between these lines there are longer rays. It will further occur to you that the rays

alighting on the points at and between $a c$ and $c b$ do not in the shod foot terminate in the bottom of the wall of the foot, but in unyielding iron, and the hoof at these points is bound tightly down to this iron by nails, so that it cannot move; the remaining parts between $a d$ and $d b$, not being so nailed to iron, can move. If you

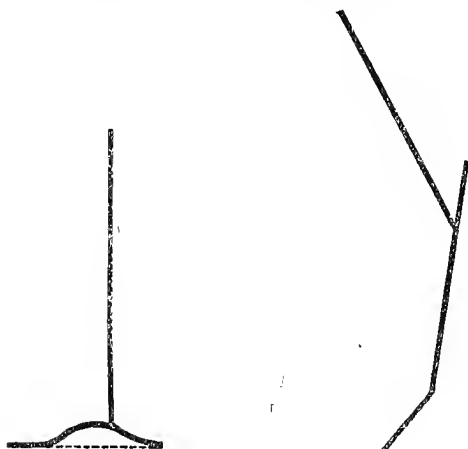


FIG. 5.

observe a shoe that has been worn for a time, you will see this is so for yourself. The bright mark left by the constant movement is familiar to every horseman. It also follows that (as less pressure yields to greater pressure), the line of greatest weight passing through the middle of the frog, and the other lines being longer between $a d$ and $d b$ respectively, the heels recede from

this line of greatest weight,—or in other words they expand.

Again, physiology teaches us that when a part is deprived of functional activity by enforced rest it loses in weight and bulk; therefore the front half of the foot being deprived of function (expansion), grows less rapidly than the heels, which, as we have seen, do actually expand; and as we know that growth of the horny fibre of the hoof takes place from above downwards, therefore we have the heels, whose functions are freely exercised, growing in height at a faster ratio than the front half of the foot. It further follows that the deeper the heels grow the higher does the frog become lifted from the ground, *and approximate to the level of the centre or focus of weight*, and therefore the more horizontal do the rays become; so that as the frog is lifted higher and higher, the less and less weight has it to bear, it therefore melts away, and allows the heels to come together.

It is thus we get high heels and contraction. *Quod erat demonstrandum.*

LECTURE IX.

Evils of Calkins—Evils of Paring and so Weakening the Sole—Flat Soles—Degrees of Flatness—Positive Flatness and Seedy Toe—Low Heels—Calkined Heels—Knuckling Fore Legs—A Horse with Low Heels may be Quite Sound—Long Toes and Sprain on Back Tendons—Pasterns Short and Upright—Toes Out-turned—Brushing—In-turned Toes, Digging and Stumbling—The Unnerved Foot.

GENTLEMEN,—The conclusions at which we arrived at our last meeting lead to practical results of the highest value, and although they have been empirically well known since, and before, the days of St. Bel, known alike in our ranks, among horse owners and shoeing-smiths, yet they have led to no higher results than those degrading sights of lame ambling horses, which are to be witnessed in any street in this or any other town of Great Britain. Although shoeing-smiths do not know that the focus or centre of weight ought to be kept well above the ground surface of the foot for the reasons we have just exemplified, yet *practically* they know it, and yet take no pains to accomplish it, but on the contrary use means to tilt up the heels by wedge shoes and calkins.

If the ruinous process sketched yesterday is to be averted, it is evident that it can only be so by *keeping the heels and quarters low* by careful rasping of the horn at those parts, and the thinnest possible piece of iron put upon them. We have also seen what indispensable services the arch renders ; and yet we see the smith weakening it by paring with the drawing knife. Taking into consideration the vast wealth invested in horseflesh in this country and the enormous deterioration of this capital through lameness in the fore feet, which everybody sees and admits, there could be no better service rendered to the horse universe, and therefore to the State, than the passing of an Act of Parliament rendering it a misdemeanour for any person in shoeing a horse to reduce the thickness of his soles or frog, or to put under his heels and quarters iron exceeding a defined thickness, except under the certificate of a qualified veterinary surgeon, which should, after defining the horse, explain the need for the same. Horses, like every other property, are national property, and a man *owning* them mediately has no more right to deface them than he has to deface the coin of the realm, which he also *owns* only mediately. "What's mine's my own," is still the creed, not only of the vulgar, but of those who ought at least to know the *rudiments* of political economy.

Again, referring to our classification, we find flat soles are the next anomaly of shape. We have already arrived at the main conclusion regarding this defect. The causes of flat soles are three :—

1. Paring with the drawing knife.
2. Laminitis.
3. Congenital.

From whatever cause, this is a grave defect, for the reasons we have seen. It may be an unsoundness of the greatest magnitude, or it may not be an unsoundness, legally, at all. In judging it you will have to be guided by its

1. Cause.
2. Degree.

The degree of flatness varies between the just perceptible lowering of the arch down to, not only flatness, but actual convexity. We may leave out of count actual convexity, as you will not have such a case brought for your opinion under present circumstances. Cases are brought sometimes where the flatness is either absolute or nearly so. In such cases a leather sole stuffing, and a broad webbed shoe having in it more iron than common, will be required in order that the horse may go sound. So that you have this test: have him shod carefully in ordinary shoes, and then see if he goes sound. If he now goes lame or "feely," he is unsound, because a sound horse can go with ease in ordinary shoes.

Before leaving the subject of flattened soles, let me remind you that in these cases "seedy toe" is frequently present, so that whenever you see the former suspect the latter and test for it by tapping the front of the hoof lightly with a hammer. "Seedy toe" to a very slight

extent is frequently present without lameness resulting. Of course this can only be to a limited extent. You may have it without flattened sole, but in these cases you usually have a dry brittle hoof, which of itself would put you on your guard.

Low heels, though not in themselves legal unsoundness, yet are frequently associated with radical unsoundnesses, such as corns, bruises, and great tenderness. They are natural concomitants of long oblique pasterns and long toes. When such is the case the fetlock joint, or rather the sesamoid bones, and the ligaments at the fetlock joint are frequently the seat either of simple enlargement or are actually diseased. In either case you would reject a horse as unsound. Shoeing smiths take special pains in these cases to lame the horse by raising his heels by calkins and wedge shoes. This, by making the tendon heels either bear pressure or get out of the way, tilts up the oblique pasterns, and then presently we find low heels, long upright pasterns, and knuckling fore legs. This latter most undesirable combination is all brought about to save the thin tender heels from their calkined penalty, and is an unsoundness for evident reasons. A horse may have low heels and yet be quite sound. We see such cases every day, but you will need to take care such is the case.

Long toes, like low heels, are no unsoundness, but are very apt to lead to it. Smiths usually avoid great length of toe by shortening it when they shoe the horse. It often happens, however, that a horse wears his shoes

over the regular time, and then when he has a tendency to have long toes, the strain upon his back tendons for some time before he is re-shod is very great. In all cases you will do well to bear this in mind in examining the back of the leg from the knee downwards, when you either find long toes or see that the toes have a tendency to become long.

We now come to the third division of our classification, namely, *anomalies of position*.

Upright pasterns, as a general thing, are short as well, but I have already pointed out that they may be long and upright. With short upright pasterns the line of weight passes through the foot (*see Fig. 2, 3*). The jar in such cases is so great that the foot is extremely likely to be the seat of grave malformation or disease. We frequently have shaky thickened fetlock joints. The stilty crumpling gait of such horses is highly jarring and disagreeable to the rider, and renders the horse liable to fall. Such are highly unsafe for riding or for driving in two-wheeled vehicles. When the weight comes through the foot we look for corns, sandcrack, boxy heels, withered frogs, and thrush. We may not have all these, but some of them are sure to be present. More difficult cases for us are those where the weight does not pass through the foot, but very nearly so. A horse perhaps that is growing old is brought to us. We find that he is sound, but the pasterns are growing year by year more upright. We cannot reject such a case, although we may feel certain that in another year he

will be unsound. Happy will it be for the purchaser if he be in a position to let his purchase work a year on land and take him off the hard roads altogether.

Toes out-turned or in-turned are not of themselves an unsoundness, but lead to it.

Out-turned toes are frequently the effects of badly-formed legs; and we cannot be too careful in examining the inside of the fetlock joint for signs of "brushing." The fetlocks often receive such severe blows with this defect that the horse comes down. We often find thickening of the parts and scars. In such cases the *thickening* is not from simple hypertrophy, but from inflammatory deposit set up by the blows, and can only be of a very limited extent for a horse to remain technically sound. If he has to go fast with a weight on his back, he is with such a conformation practically unsound. There is often a thickening about the sesamoid bones in such cases. This is on account of the parts having more than their share of weight, also to the internal lateral ligaments of the fetlock participating in the inflammation and becoming softened, and therefore relaxed. I have invariably rejected horses with out-turned toes and enlargements on the inside of the fetlock joints, and have never had cause to regret it, although a horse might be sound in every other respect, because I regard it as so very probable that the internal lateral ligament may have become deteriorated.

In-turned toes are very objectionable when the defect is very pronounced. The conformation which leads to it is

highly conducive to defective action, such as "digging" of the toes and stumbling; we also find enlargements on the outside of the pastern and foot which render the limb stiff and awkward.

In-turned toes can only be so to a slight degree without being accompanied by organic defects amounting to unsoundness, so that if there be this condition to any extent, organic defects will almost be sure to be found, when you will reject the horse on their account. If no organic defects are present, of course you will have to pass the horse just as you would with any other defect of form.

We now come to our fourth division in classification, which is injuries. Eight forms are set down, but as every injury to the foot is aggravated when occurring to feet deprived of the salutary influence of its nerves, we shall consider first of all the foot that has been deprived of its nerves (unnerved).

LECTURE X.

The Unnerved or "Nerved" Fore Foot—Discovers itself in the Gait—The Tissues of the "Nerved" Foot degenerate—Brittle Hoof—Pricks in Shoeing—Gathered Nails—Bruised Sole—Bruised Coronet—Speedy Cut—Diseases Obvious—Grease—Ringbone—Sidebones—Corns.

GENTLEMEN,—We now come to one of the most repulsive forms of unsoundness to which the horse is exposed, namely, the un-nerved fore foot. However neatly executed the operation, the unnerved foot is betrayed in two ways—by the marks where the incisions have been, and by the numb, awkward manner the horse has in using his feet, which is seen when he walks, and is felt when ridden in the trot. Last year I examined two valuable-looking hunters at York, aged respectively eight years and nine. The younger one I passed, and the elder one I was perplexed over. I had handled every part of him, tried his wind, had his fore shoes off, and in the second part of my examination—the one we are now going over—I had searched for cicatrices over the positions of "nerving," as is my custom; had his shoes carefully replaced, and had him

walked and slowly trotted. There was nothing in the gait to be called lameness, and yet there was a something in the gait which I thought was awkward—something wrong. He seemed physically such a perfect horse, and was not too old. In trying his wind, I had ridden him hard in a grass field and at a swinging canter. Now in walking on the hard road his gait was wrong. I got on him again, and immediately felt his numb wooden feet. On dismounting I carefully searched for and found the very neat cicatrices. He had been “nerved” on both his fore fetlocks, very neatly indeed, and so effectually that it was discovered in his gait *on the hard road*. The hard, metalled road was as much a paradise to him as a soft grassy park,—which, as I have said, betrayed him. The man who can have pleasure in riding a “nerved” horse has no claim to the title of horseman. You cannot be too careful in looking for “nerving” marks, in order that one so vilely mutilated may be rejected at any price. If the foot has been “nerved,” it has been deprived of the most precious gift of organic life—*the power to feel*, therefore the power to feel pain; and, in consequence, it has lost the first essential of self-conservation. Degeneration of the tissues may be delayed for a time in the “nerved” foot, but if it has been effectively done, that is, done so that there shall never be reunion of the nerve, then it is physiologically impossible for degeneration of tissue to be delayed over a very short time. Having satisfied yourself that there has been no

“nerving,” then all other injuries declare themselves through *pain*, or if of a painless character, can usually be seen.

Brittle hoof is an unsoundness when it won't bear the nails with which the shoe is fastened. You may, and often have, “seedy toe” as a complication. Brittle hoof is frequently present in the autumn when the coat is being cast. You then often find a dry, dead coat; and, as hair and hoof are identical tissues, the hoof also suffers with the coat. Prolonged derangement of the digestive organs will also similarly affect these structures at any time. It may be also due to congested feet; if so you have increased heat, quite perceptible to the feel, and if you have not a “feely” ambling gait, this is soon induced in the way before described. In this latter case the brittleness will be of a permanent character very likely, but in the former far more temporary, but yet an unsoundness.

Pricks in shoeing may be of any magnitude, from the simple “drawback,” to use the smith's phraseology, to a suppurating sinus appearing at the top of the hoof (Quittor). In their minor forms they will be detected by

1. Lameness.
2. A left-out nail.
3. Tapping the sole and wall with a hammer.

Gathered nails almost invariably penetrate the highest part of the arch formed by the sole (the point of the frog), and give rise to marked lameness.

Bruised sole, when freshly done, also gives rise to much lameness, and to discolouration of the sole seen on paring with a drawing knife. If the lameness has all gone, and there be no undue flatness of the sole—which there often is—although there may be discoloration still visible, such a horse could not, for this reason alone, be properly rejected as unsound. The blood extravasation is only a sign of what *has* been, and is not a physical detriment, nor will it lead to any. Very different is it when the sole from any cause is flatter than it ought to be ; then, unless protected in some way, as by a leather sole, a bruise to the sole may re-occur at any time. In such a case a bruised sole of any degree whatever is an unsoundness, occurring as it does in a conformation suffering from it, and predisposed to it. We should condemn such a case for the same reasons that we should condemn the faintest possible thickening in the curb place occurring in “curby hocks.”

Bruised coronet, however slight, can seldom be looked upon as a trivial injury. Without the greatest care such injuries are apt to assume a most aggravated character. If the only evidence you can find is a simple peeling off of the skin, accompanied by increased heat, such cases you will do well to reject, at least till the effects of the injury, slight as it may appear, have gone.

Speedy-cut when fresh done only can be looked upon as unsound. No matter how many scars we may have, no harm can arise from them. It shows, however, a somewhat grave defect in the horse's action.

Unlike brushing, it has little tendency to throw him down.

The last division of our classification is the greatest numerically, but is hardly the most important, because actual disease in the foot is as a rule not only soon detected but the subject of it is rarely brought for examination as to soundness. Some of these are so obvious to all concerned that we can erase them at once. These are—

1. Canker.
2. Carbuncle of Coronary Band.
3. Disease of the Pyr. Process of Pedal Bone.
4. False Quarter.
5. Quittor.
6. Villitis.

Others, though obvious, require some little comment. These are three, namely,

1. Grease.
2. Ringbone.
3. Sidebones.

The remainder are, or may be, obscure. For this reason, as well as for their great importance, we must dwell upon them more at large.

These are :—

1. Corns.
2. Laminitis, Subacute and Chronic.
3. Navicular Disease.
4. Sandcrack.
5. Seedy-toe.
6. Thrush.

Passing over the first division, in which six unmistakable diseases are enumerated, we come to the second division, which contains three. Grease affects the skin of the heels, but more often the hind ones. We frequently have it or cracked heels in the hollow of the heels of the fore extremities. If it is unmistakably present, of course the horse is for the time unsound. If, however, the skin of the heels be swollen and only slightly cracked, or not cracked at all, if you can make out that it is an attack of grease which threatens, the horse is for the time unsound, because work would aggravate the seemingly trivial disease; therefore, before he would be fit to use he would require cooling medicine, and a horse actually requiring even so little as a dose of physic does not answer the definition of a sound horse. However you may regret having to reject such a one, you will either have to do so or give an opinion such as no law court would support you in. It is best in all temporary and easily removable cases of unsoundness to advise proper treatment, and ask to be allowed to prosecute your examination at the expiration of a specified time, which you name. On no account ought you to give a certificate of soundness in these cases and trust to the purchaser or any other person to remove the temporary unsoundness and make your certificate good. It is a matter of daily experience of parties buying horses and regretting it within twenty-four hours. If they are really dishonest, they will even try and cripple the horse by "beaning," in order that they may return him. The

consciences of most men are extremely elastic in matters equine. So that a temporary and easily removable unsoundness has not, under such circumstances, a fair chance. Then again it is far less satisfactory to have to give either in writing or orally a qualified opinion.

Ringbone more usually affects the hind pasterns, but *may* be found on the fore ones. Ringbone is an unsoundness which cannot for a moment be regarded in any mitigated light. You ought, however, to bear in mind that the asperities at the sides of the heads of the coronal bones for the insertion of the lateral ligaments may be so prominent as to mislead unguarded persons into the belief that ringbone is present. When ringbone is present, you have a most unmistakable "ring" of bone, if not actual lameness and stiffness.

Sidebones (ossified lateral cartilages) are among the commonest forms of ailment of heavy cart horses, but we seldom find them in the lighter breeds. We not unfrequently find the lateral cartilages *strong* but *yielding*, and when that is the case a horse with a good foot otherwise may be considered as sound. About nine months ago I passed such a horse for one of my best clients, which was to cost little short of three hundred pounds. These strong lateral cartilages are not ossified, and have no particular tendency that way. If you can feel them yield, no matter how little, they are not ossified. Very different, however, is it in the heavy-bodied dray horse in which they have a strong tendency towards ossification.

We now come to the last of our subdivisions, which contains six. They are—

1. Commonly met with.
2. All concealed (more or less).
3. All unsoundnesses.

Corns are among the last things you look for at an examination, because in order to make sure of finding them you must remove the fore shoes and have the corn places carefully pared out. Removing the fore shoes is deferred to the last by all veterinarians for obvious reasons. You will constantly meet with those who do not remove the shoes in searching for corns at an examination as to soundness. This, however, is unpardonable in all cases where you have an opportunity. Extremely bad corns can quite easily be detected with a searcher without removing the shoe, but then such discover themselves also by causing lameness. It is the slight corns for which you are looking, quite as much as for the more aggravated; and, in order to find them, you will have to have the heel pared out thoroughly. You must remember that the extravasated blood constituting a slight corn is not embedded in the crumbly exfoliating material that the knife first cuts through, but is embedded in the *living horn* beneath, so that you will have to clear away all this *débris* thoroughly before you will find a small corn. All corns are very properly regarded as unsoundnesses; because, if they do not already lame the horse, the feet require more than ordinary skill on the

part of the smith when being shod. Pathologically regarded, corns, one would think, could be easily removed; but such is not the case—plainly showing, to my mind, that their tendency to form is very strong in such feet as those in which we find them. Let me caution you against being satisfied by looking for corns on the inner side; the very fact that they do occur on the outer heel shows us that we have no more right to pass over this than we have to pass over any other point because defects found in it are of *less frequent* occurrence. We do not pass over unnoticed the hind foot because it is less frequently the seat of disease than the fore foot. I mention this because so many persons only search for corns in the inner heel and pass over the outer one.

Whilst you have the shoe off, you can observe better than with it on the state of the sole as to its convexity. It is astonishing how one may be deceived in this matter when the shoe is on, especially if the shoe be rather thick. In such cases a somewhat flattened sole may appear to be far more concave (arched) than it really is.

Laminitis, subacute and chronic, I have already told you about, and I shall reserve the subject of navicular disease till to-morrow.

LECTURE XI.

NAVICULAR DISEASE.

GENTLEMEN,—We now come to the subject of navicular disease, vulgarly called “groggy lameness.” This is no place for much pathological reasoning, but as very different explanations have been given as to both the causes and nature of the affection, I feel bound to say a few words about it, although I would like altogether to evade the question. And it would be not only possible but reasonable for me to do so were the affection always apparent, as quittor or canker is apparent; but it is in many cases so concealed that we can only arrive at the conclusion that we have navicular disease by a process of exclusion, that is to say, when we find a case of lameness of the fore extremity, and we fail to find any physical defect we conclude that it must be navicular disease which is causing the lameness, or, in other words, we have to guide us,

Negative Signs and Symptoms.

Before going any further I will trespass on your time by defining the difference—the vast difference—between

a *sign* and a *symptom*. A mare supposed to be far advanced in pregnancy is brought to you, and you are requested to give an opinion as to whether or not she be in foal. You find an enlarged abdomen, an enlarged udder, and perhaps the udder contains milk, as you can see by squeezing some of it out. You then, for protection, have the mare's fore foot lifted, take off your hat and press your ear against the abdomen, far underneath, and shift your ear from place to place till at last you hear the beating of the foetal heart. You may fail to find it on one side, but you go to the other—well under the belly. By patience you at last find it; you hear the tick-tac, tick-tac, just like the beat of a large watch. This is the beat of the foetal heart, it is nothing else,—it *can* be nothing else; nothing in the animal economy, normal or abnormal, could produce such a sound except the foetal heart. Here then is a sign. You can say for *certain* not only that the mare is in foal, but that she has within her a *living* foal. You can mark the place with a piece of chalk and delight your employer by letting him hear it,—and he can disappoint himself and his boon companions by taking them next day to listen over the chalked spot, and fail to hear the foetal heart. He calls you again. You have to explain that a living, healthy foetus takes regular exercise, and sports about in a fluid of its own specific gravity (amniotic fluid), and that it will have altered its position most likely, and will give you another hunt with your ear. But what were the enlarged abdomen, and udder containing milk? We call them symptoms; and

they are symptoms of the most unreliable kind. A hundred things will cause enlarged abdomen, from gross feeding on succulent food, down to the most aggravated tumour; and anything occupying the womb, no matter whether it be a healthy, living foal, or a fibroid tumour, may cause the udder to swell and fill with milk. A *group* of symptoms constitutes a sign, but never can a single symptom. I have said that we diagnose navicular disease by the most unsatisfactory of methods, namely, by absence of signs and the presence of symptoms. We have lameness, and we fail to find signs of disease such as would account for it,—as a hot tender splint, a gaping sand-crack, or a suppurating corn. We have to all appearance, it may be, a perfectly sound limb and a good irreproachable foot, but when the horse trots he goes lame, and when he comes to stand he “points.” Now I believe that there neither is nor can be a greater delusion than to suppose that “pointing” is a *sign* of navicular disease. It is no such thing; and as a symptom, which it undoubtedly is, I don’t know of a more unreliable one. Regarded as a sign, we have only to find out that a horse, feeling pain in the back part of his foot, as for instance from a corn, points, and it at once condemns “pointing” as a *sign* of navicular disease.

There is another delusion in the horse universe. Excepting among veterinary surgeons, and a very few others, it is generally believed that where you have contracted wiry heels you also must have navicular disease. Very early on in these lectures I advised you always to pay

some regard to popular belief. In this case the great frequency with which we find contraction and navicular disease to co-exist, has given rise to their being looked upon as cause and effect.

When we come to think how frequently we find the two conditions co-existing we can scarcely wonder at this; it even led the late Professor Coleman to see cause and effect in it. We do, however, often find contracted wiry heels without navicular disease, and, on the other hand, we often find well-formed feet with wide open good heels afflicted with navicular disease. In the latter case we have an acute form of the disease, and the heels, should the disease continue, will not be long before they become atrophied (contracted) from suspended function. When we have navicular disease in a well-formed foot, we have it then of an acute kind, and accordingly we have a *group* of symptoms which constitute a sign; these are—

1. A frequent shifting of the weight from one foot to the other, and pointing with the rested foot, when standing.
2. Increased *heat* in the hollow of the heel and *tenderness on pressure* with the thumb in the hollow of the heel.
3. Throbbing of the plantar arteries.
4. The horse goes on his toes, tripping and stumbling, and is lame.

Unfortunately, however, we have no such distinctive signs of the disease in an examination as to soundness. If it be present at all it will be in a chronic form, and giving rise to an unnatural gait, only to be detected by the

practised eye, and by this only with care and attention. Frequently we find a horse with this disease coming out of his stable stiff and crambly, and after he has gone awhile he will go sound. If you suspect him to have groggy lameness of an obscure nature, do as the late Professor Dick used to do. He would have the horse stabled and have him brought out at intervals throughout a whole day. This of course was when he had either seen symptoms of lameness or thought he had. Prolonged rest in a loose box has sometimes a wonderful remedial effect in the more chronic forms. When this is so, I suspect the disease is in one of two conditions: it is either at the very beginning of the disease, before pathological changes have far advanced; or there are adhesions, or a state suitable for adhesions, between the ulcerated navicular bone and the ulcerated flexor tendon, the rest allowing these adhesions to organise and attain resisting power. Of course this is a mere guess, but you can take it for what it is worth. But what I wish to impress upon you is that you may have to all appearance a sound horse who all the time has navicular disease, and you are therefore to take means for discovering it. Have the horse warmed with exercise and taken straight into a stable, and let him stand wrong end first in his stall secured by pillar reins, and leave the stable door open. You can watch him and see if he "points," then in half an hour or so have him quietly led out of the stable and notice his *shoulders* and *pasterns*. If he has any navicular disease at all, no matter whether he has been cured by

rest or not, you will find his *shoulders stiff*, his *pasterns upright*, and *that he goes on his toes*. If you do not watch him yourself during the time he is resting, something like the following may happen.

About six years ago I drove a distance of a few miles from Leeds to examine a horse that I suspected had a slight touch of groggy lameness, and used the means I have above recommended, but went and sat down with the vendor after warming the horse and putting him in the stable. On my making my appearance the vendor's man quarrelled with the horse and excited him so that, instead of his walking *quietly* out of the stable, he made a rush for the door so as to effectually mask any stiffness of gait the horse might otherwise have evinced. It was late in the afternoon on a winter's day, and darkness approaching; there was no time for a repetition of the exercise and standing, so that I bid the intended seller good-day and started home, and for my own sake I had to make a second journey, because it was clearly my fault for not having watched the horse myself. Indeed you miss a good deal by not watching how he disposes of his feet during his rest, to see if he points and keeps shifting his feet.

If you see the symptoms named as the horse is being led out of the stable, you may be pretty certain that navicular disease is causing them, and condemn the horse as unsound. You are not bound to specify the particular disease, either in a certificate or orally, to either your employer or any other body. It is far safer

to say that you reject a horse because he is lame in his fore foot, than to certify that he has navicular disease; because you have not in these masked cases a group of symptoms amounting to a sign. The stiff shoulders, the upright pasterns, and the going on the toes, do not constitute a group of symptoms amounting to a sign, because tenderness and pain at the back of the foot, from any cause, produces the same symptoms, and your not being able to find any cause that could give rise to these symptoms is but a negative proof. Without being infallible, this group is found by the profession to be a sufficiently good working hypothesis.

Lastly, in what class of horse have you to suspect its presence? Undoubtedly in the *lighter* breeds, because we find that these have—

1. Less feet than the heavier breeds, and therefore the radiation of the rays of weight is limited to a narrower area, and the shock is consequently the greater to the foot.

2. They batter their feet more on the hard roads with having to go at quicker paces.

3. They are not used for walking, but faster paces, and when not moving they are standing, and often sleeping while standing.

Having gone somewhat at length into the mechanism of the fore limbs, and explained that the centre of radiation is at the coffin joint, I have only to ask you to look closely at a section of this joint (*see* Fig. 3,¹), and see that the navicular bone is not a hair's-breadth from

this focus or centre of weight ; indeed it helps to form part of it, and but for the oblique direction of the phalanx would certainly have transmitted through it a portion of the rays in their most intense form. This obliquity of the phalanx saves it in every position save one, and that is when the foot is planted on the ground *far under the body as in sleep*. In some paces, such as the walk and trot, the foot occupies at every pace almost, but not quite, the same relation to the body. It is in *sleep* only that the body is thrown over the fore feet to such an extent that the *posterior* rays of weight pass through the navicular bone. If you take a perfectly fresh section of the fore leg and foot from the knee, plant the foot surface on the ground, and place your whole weight on the knee of the section and bend it forward, you tighten up the navicular bone by the perforans tendon as though it were held in a vice ; then notice the direction of the long axis of the phalanx, and you find that it still does not pass through the navicular joint ; but you are not to suppose that with the weight of your body the direction of the axis is directed backward to the same extent as it is with the weight of the horse's body. But above all, you are not to lose sight of the fact that the centre or focus of the rays of weight is the *whole* of the lower articular surface of the coronary bone. When therefore the line of the axis of weight passes *immediately in front of but not through the navicular joint*, this joint is in the very blaze of the focus of weight, besides acting as the *mainstay* of the coffin joint. The

wedge-shaped navicular bone acts as a mainstay to the coffin joint, and the more the coffin joint needs staying the tighter and firmer is the wedge pressed in the cleft by the perforous tendon. The bone, having an extremely precarious nutrient supply, and being compressed for hours together, no wonder that disintegrating changes take place in it so often as they do. Where surface meets surface you find the elastic buffer-like provision of articular cartilage opposed to the surfaces of the navicular bone at the coffin joint; but the articular cartilage over the navicular surface, pressed upon by the perforous tendon, does not meet with the same amount of yielding elastic resistance from the tense hard tendon which presses it forward into the joint; hence the prevalence of degenerative changes in the bone nearest this surface, and involving this surface and the tendon which presses it in perhaps most cases.

LECTURE XII.

Sandcrack—Thrush—Thrush as a Constitutional Disease compared to Fistula in Ano—Thrush always a Bad Form of Unsoundness—Elbow : Tumour on Elbow—The Back Tendons examined—“Wind-gall”—“Thoropin”—Filled Legs.

GENTLEMEN,—We now come to the consideration of the last three diseases of the foot that we have named, which need not occupy much of our time, inasmuch as there are no disputed points about any of them.

Sandcrack is a split or crack in the hoof, running from above downwards, occurring in the direction of greatest pressure; and therefore we find it on the inside of the fore foot, and on the front of the hind foot. As a rule, we find it on the inside of the fore foot; but where, from toes very much either in-turned or out-turned, we have the line of weight abnormally directed, we may at times find it elsewhere. If the crack is wide and deep, it is of course easily recognized; and it has only to be deep—that is, to involve the deep, sensitive structures—to give rise to lameness, by which alone it may be discovered. When the crack is limited, so that no lameness results, it is an easy matter to overlook it.

AS TO SOUNDNESS.

It is often concealed by being neatly plastered up and the feet greased ; but such means do not hide it from a close view. When you lift the fore foot *forward*, and rest it on and above the opposite knee, you must invariably lift the fringe of hair overhanging the coronet, and you will find the beginning of the crack. No sand-crack can be overlooked, if looked for, however neatly "doctored." However slight—although there be no present lameness—the horse having one is unsound ; because it may get larger and deeper, and cause "dead" lameness ; and if not, it at least shows a hoof incapable of performing its functions and retaining its integrity.

Seedy-toe has already been considered.

Thrush is a disease in which a stinking morbid product wets the cleft of the horny frog, the result of degenerative changes in the fibro-fatty frog. It is sometimes due to local causes ; but far more frequently is it the local expression of grave constitutional defects. I daresay you will have heard or read of *fistula in ano* in human beings. The discharge in this case is by the side of the anus, from a large space (ischio-rectal fossa) filled with fat. *Fistula in ano* may have a local cause, such as an abscess ; but is very frequently indeed connected with constitutional derangement, and frequently accompanies pulmonary phthisis. Mr. Bryant, in his "Practice of Surgery," says of it : "Of the causes of this disease little positive information can be given. The abscess, in the majority of cases, begins *without any evident cause*, and careful questioning generally fails in obtaining defi-

nite information upon the point. As a rule, the abscess is *obscure in its origin*, and slow in its progress, as in its repair; some patients even profess to have been quite *unconscious of its existence* till it was about to burst. In other cases they are very acute in their action, and very painful." Had Mr. Bryant been writing of *thrush*, he might have used exactly the same description, with the exception of the abscess formation, which, of course, depends on different anatomical relations in the two cases. Like "thrush," fistula in ano is easily cured if it depend on a local cause. Heat and moisture long applied to the parts, either from the horse standing in his litter, or having his feet stuffed, or a sudden change from a low diet to a high liberal diet, perhaps consisting of beans, are what we may term local causes. In these cases, removal of the cause, physicing, dryness and warmth to the feet, and the application (after cleansing the cleft by see-sawing thick soft rope through it) of calomel, with tow to the bottom of the cleft, will affect a cure almost at once. Very different is it with thrush and with fistula in ano when it depends on a constitutional cause. If you are ever tempted to pass a horse with a thrush, and give a qualified certificate or opinion, see that it is not constitutional thrush. A "leggy," flat-sided horse having a thrush you should never either pass or recommend at any price higher than the value of the horse's hide. In the very early part of my career, I remember examining a "leggy," flat-sided horse, with one slight thrush, at York, for a personal friend. It so

happened that the gentleman who was selling the horse was an old acquaintance of my friend, and persuaded him, in spite of my warning, to purchase the brute. When the horse arrived in Leeds I was requested to give him an alterative ball, which I did, containing two drachms each of powdered nitre, rosin, ginger, and purging mass, beat up into a ball; and super-purgation followed its exhibition. We could hardly believe that so little aloes—less than two drachms—could have such an effect; therefore a like ball was administered again one Saturday night, when our “leggy,” flat-sided friend with the thrush was in his best condition, and in less than six hours he was nearly raked to death. The thrushes in his fore feet kept discharging, with slight intervals, all the twelve months I knew him, and left the back part of his fore feet a complete wreck. I have seen so many cases of the above description that, if I am ever so certain in my own mind that the thrush is local and not constitutional, on no account will I pass such a horse or recommend him to be purchased.

There is just one other case I must mention, because it was a most remarkable case in itself, and lost me one of my best employers. I examined two horses on the Yorkshire wolds in one day for a gentleman at Halifax. One was a three-year-old, the other, I think, was seven or eight. Both horses were quite well known to my employer's friend Sir G. W.; but the latter was especially well and favourably known to this gentleman. I thought him just a little flat-sided, but that I had nothing

to do with; and I remarked his fine open feet and perfect frogs to the farmer who was selling him. I thought I had never seen two such beautiful feet. On arriving at Halifax, I heard on good authority that the gentleman's head groom struck the horse on the ribs, and exclaimed, "What's 'e passed sich a flat-sided brute as this for?" About a month, or less, afterwards, I was sent for to see the horse, and found him a complete wreck. He had thrushes on both fore feet, which had both contracted (collapsed) at the heels, a large bone spavin on the off-side hock, a large splint on his near fore leg; he was "hide-bound," had a staring coat, and I could count his ribs ten yards off. All this change in less than a month. He cost one hundred and fifty pounds; and was sent in about a fortnight afterwards to Tattersall's, and sold for thirty-three guineas. I was assured that a thrush was found immediately upon his arrival at Halifax; but be this as it may, what a frightful constitutional change he had undergone in five weeks or less.

Suppose again that you really have thrush from local causes; the discharge is so *acrid* that it has a great tendency to destroy the horny frog—a thing of no mean importance.

Having now gone through a thorough review of the phalanges, including the foot, I beg to refer you to the place at which we began to digress.

You will remember we were examining the *front* of the leg, and had got down to the fetlock joint. Grasp

the joint with your right hand, then the pasterns, and screw your hand round the parts to feel if there be any ringbone. Do the same to the top of the coronet; then lift the foot *forward*, resting it above, and in front of, the opposite knee, when you will have a good view of its inner wall; and now lift the fringe of hair from the coronet, and look for sandcrack. Being satisfied, drop the foot, and examine the back of the leg, beginning at the elbow.

The elbow joint is frequently the seat of fibrous tumour, from injury with the heel of the shoe in lying down, or the subcutaneous bursa may be enlarged. If the tumour becomes large it is very unsightly; so that with a small tumour, with or without scar, you ought to caution the purchaser. It is no unsoundness, so far as I know, however large the tumour, as it does not interfere with his usefulness, but is an eyesore, and an attendant has to buckle on a pad to cover the heel of the shoe at night to prevent crushing of the elbow. I have known such tumours give rise to much inconvenience and anxiety, and after removal to recur.

From the elbow to the heel we have flexor muscles, ending in long tendons, which have to glide easily, and without friction, through well lubricated sheaths; and, as both the tendons and the sheaths through which they glide are liable to overstretching and other accidents setting up inflammation, we have to look for some of the

- (1) Effects of inflammation;
- (2) Natural attempts at repair.

When a tendon and any synovial sheath through which it glides suffers injury, which sets up inflammation, however slight, the first effect of the inflammation is to arrest the function of the synovial membrane—that is to say, to arrest the secretion of joint oil—and we feel the parts swollen, hot and tender to the touch; and just as an engineer on feeling a shaft revolving in a collar getting hot would stop his engine, and apply cold water to cool the shaft, and re-oil the collar before again starting the engine, so have we to take means to let the machine rest, and subdue the inflammation which has arrested the secretion of oil. In our case, now, we have to follow the example of the engineer, who goes from time to time to feel the temperature of the various shafts which are revolving through collars, to feel that they are cool, by which he infers that the collar is well oiled. By the term well oiled an engineer means—

1. Sufficiency of oil;
2. Oil of good quality;
3. Covering evenly the entire surface of the shaft which is grasped by the collar.

The practical horseman does the same. The groom, on removing the leg bandages in a morning, runs his hand slowly and carefully down the back of the fore leg, from above the knee to the pastern, to feel that the synovial sheaths (collars) are cool. Perhaps the previous evening, when he put on the bandages, the synovial apparatus was hot, and a little swollen from overwork; but a night's rest and the gentle pressure of his bandage

has been sufficient to cool the parts, and the engine is fit to be started once more. By constant hard work, by-and-bye the time comes when he finds that he also has to apply cold water to reduce the heat; and this he does by means of bandages dipped in cold water applied through the night. After a time these means fail, and thickness occurs in various places; and it is only then that work is stopped altogether, which ought to have been done at the very time when cold water bandages had to be resorted to.

At the present time it remains to decide how much evidence of over-work of these parts, in the form of distended synovial membranes, glorying in the name of "wind gall," "thoropin," according to their situation, may we overlook, and still consider the horse sound. We are told that these are more a sign of over-work than of unsoundness. What is meant by this I never knew. There may be no local impediment to movement; but if movement cannot be repeated a reasonable number of times without heat and swelling of the parts, necessitating sedative means, surely the machine is unsound. You may, and very frequently, have œdema of the areolar tissue of the legs (filled legs), and *heat* with this; but then the swelling is not confined to one or two localities, but evenly spread over the whole of the leg down to the top of the hoof and *pits* on pressure. Then, again, you may have this œdema plus distended synovial sheaths; and when such is the case a little exercise will take down the "filled legs," and leave you free to judge

of the remaining condition. This being so, exercise, which will disperse the one—at least for a time—will aggravate the other; consequently, you have the horse thoroughly well exercised, and if the parts get too hot and swollen you reject him as unsound. In old chronic conditions, where over-heat is not induced in these so-called “wind galls” and “thoropins,” you have to see that they do not produce mechanical impediment.

General œdema of the legs (swelled legs) is a very grave unsoundness while it lasts, inasmuch as it denotes a deteriorated condition of the most important tissue of the body—the blood. While it lasts a horse is quite as unsound as a horse suffering from a blood disease. We naturally look for this disease in the autumn, when the blood is loaded with *débris*, at the time when the system is undergoing observable changes. *Impure* blood develops *dropsy*, with its ghastly train of evils, by *lessening arterial tension*. It does so in this way:—

1. The heart walls, fed with impure blood, contract *more feebly*.
2. Feeble heart contraction lessens aortic distension.
3. Lessened aortic distension
4. Lessens aortic recoil (the propelling power of the coronary arteries), which
5. Lessens the coronary circulation, and so the heart walls become weakened for want of a due amount, and proper quality, of blood, and become too weak to contract thoroughly upon their contents. They never fairly empty themselves; so that the right heart, never

being fairly emptied, keeps the veins overloaded ; and the veins, in holding their liquid load unduly long, and not being relieved of it in time, allow some of its more watery portions to filter through their coats into the surrounding cellular tissue ; the greatest amount escaping, as you might expect, through the parts subject to the greatest pressure, the most dependent parts—the legs.

If, then, you have filled legs, recollect that the horse has an enfeebled heart, and therefore *lessened arterial tension*, which shows itself by sweating on exertion and distressed breathing ; and that the horse cannot do the work of a healthy horse without the risk of congested lungs, cardiac asthenia, and death itself.

We shall resume our subject to-morrow.

LECTURE XIII.

Mallanders—The Back Tendon—Signs of Injury to the Back Tendon—Suspensary Ligament—Its Signs of Injury—The Sesamoid Bones—Splints—The Foot Lifted.

GENTLEMEN,—Having satisfied yourselves that there is no tendency to filled legs, which condition you must remember passes away with exercise, and of itself shows the folly of examining a horse while warm, you now proceed down the limb and examine each part separately. We are now supposed to have found no enlarged bursæ, so that the skin at the back of the knee claims our attention. Here we look for what we seldom find, namely, “mallanders,” a skin disease occurring only from shameful neglect. It is a very trifling ailment, but is an unsoundness while it lasts. If neglected, the skin cracks and a most intractable sore results, necessitating absence of motion (rest) for a longer or shorter period. Withhold your certificate until the malady, a most trivial one under proper treatment, disappears.

If the limbs are clean and cool, your left thumb and fore-finger grasps the back tendon and slides down it from the knee to the fetlock. It ought to be quite free

from all enlargements whatever. Should any *elongated* enlargement be encountered you have to determine its nature and extent. In horses having long oblique pasterns, the strain on these back tendons is very great, Sometimes cicatrices on the skin give you at first an impression of knots on the tendon, but these cicatrices you can move from side to side, plainly showing they have no connection with the tendon. Should you meet with a thickening and filling of the bursæ of some considerable length, depend upon it there has at some time been a severe injury to these parts, and you must reject such a one as unsound.

Next make another sweep with the same parts of your hand over the suspensary ligament. The outline of this should be very clear, if sound, and the horse be bearing his weight on the limb. *Knotty* enlargements encountered on this in any part of its course indicate previous injury. Please notice the difference of the remains of the injury upon the tendon and the suspensary ligament. In the former the enlargement is *elongated from above downwards*, in the latter a *knotty* enlargement remains. Injuries to the suspensary ligament are usually on its lower fourth pretty near the sesamoid bones. It, like the tendon, has enormous stretching when the horse has long oblique pasterns. The sesamoid bones should claim your attention simultaneously with the tendon and ligament. You frequently find them enlarged, which gives the whole joint an enlarged appearance, when their duties as *mainstays* of the fetlock joints are made too onerous by long

oblique pasterns. Increased functional requirements in giving rise to hypertrophy usually stop short of inflammation, but when they do not, of course lameness results. When you have no lameness, but have extreme hypertrophy, which is on the verge of inflammation, you will do well to reject such a one as unsound, and leave the onus of proving that there is only hypertrophy and no inflammation to others. You can scarcely call a house a sound house whose end wall is bulging, and has to have a wooden stay to prop it up.

Next, slide your left fore-finger and thumb down the cannon bone and feel for splints. Splints most often occur on the inside, but are found on the outside, or scattered over the bone indefinitely. They are—

1. Of two kinds.
2. Variously situated.
3. Varied in size.
4. Recent.
5. Old.
6. Single.
7. Multiple.
8. May interfere with the functions of other parts.

Splints are of two kinds, the first kind being due to irritation of the cartilage between the large and small metacarpal bones at a time when this cartilage is being converted into bone. The second kind is periosteal entirely, and due to excitation of the periosteum, which

throws out a deposit that becomes roughened and spreads over a large area, and is known by the elegant name of "sore shin" when it attacks the front of the cannon bone, as it is apt to do in race-horses from concussion; but retains the name of splint when situated at the back of the bone where the periosteum is dragged upon and irritated by the suspensary ligament.

You will have all or most of these points to bear in mind in judging of splints, for reasons I shall name, also because while technically and in law splints are *unsoundness*, yet you will give great dissatisfaction by rejecting every horse because he has a splint. I believe the law to be quite right in regarding all splints as unsoundness, because by doing so it puts a well-defined limit to what would be a chaos of opinion. Seeing that you have a far higher function to perform than merely to say whether or not the horse you are examining is sound or unsound in the eye of the law, we must dwell on the consideration of splints awhile.

Splints may be situated so high up as actually to interfere with the lower bones of the knee. When so situated they are, whether recent or old, of grave importance, and render the horse unsound under any circumstances. It is often a most difficult matter to detect them when so situated. The late Professor Dick used to tell of such a case in his lectures. He was sent for to examine a lame horse which three or four veterinarians had seen, and had failed to localize the lameness. The ill-defined angle formed by the upper part of the cannon bone and

the lower part of the knee was, as he pointed out to them, *filled up*, so that instead of there being a slight depression, as in sound horses, the lower part of the knee had no well-defined border. On running the hand over these parts you will, under such circumstances, fail to detect a splint if you are not careful, but a comparison of the two knees, seen from the front, always discloses the ailment. Splints, in their usual situation, in the upper two-thirds of the cannon bone on the inside, are to be judged according to their age, but more especially according to the age of the horse. I never yet heard of a good horseman thinking any worse of a horse because of his having a single splint favourably situated and thoroughly formed, provided the horse was sound in every other point, and *not less than seven years old*. Splints, wherever situated, lame horses during their formation, but after they are once well formed, they hardly ever cause lameness, unless they encroach upon an important structure. Their sizes are various, being often no larger than a small split bean, but are occasionally seen the size of half an orange; when situated at the back of the bone and between the two small splint bones they are often moulded by the parts which press upon them, and so interfere with these parts less than one would at first suppose. Their being single or multiple on the same bone is of little importance if well situated and fully formed. Should they encroach upon and interfere with either the tendon or ligament, they are a grave defect.

You are supposed to have run your fingers down the tendon, the ligament, and the cannon bone successively, while the horse has been bearing his weight upon the limb; you are now to lift the limb and hold it by the pastern with your right hand, and by pushing aside the tendon with your left thumb, you will be enabled to feel the back of the cannon bone. Occasionally splints occur in this situation, and do not appear on the outer aspect at all. You will now be enabled also to feel the upper part of the suspensary ligament before it bifurcates.

We now pass on to the fetlock joint; look for evidence of neurotomy; the back of the pasterns; and come down upon the top of the back of the foot and try the lateral ligaments; observe the width of the heel, then lift the foot and hold it with the sole looking well upwards and observe—

1. If the shoe is evenly worn.
2. The amount of concavity of the sole.
3. The frog, its size, shape, etc.
4. The cleft of the frog, for thrush.

Seeing that all matters pertaining to the foot, and therefore these last conditions, have had a full share of attention, we now pass on to other parts.

LECTURE XIV.

Fractured Ribs—Hernia—Down in the Hip or Fractured Ilium—
The Stifle Joint—The Tibia—Fracture of Tibia—The Hocks
—Curbs in Human Beings—Mechanism of the Hocks—Coarse
Hocks—Spavin.

GENTLEMEN,—Having now finished the “fore hand” we pass along the trunk to the hind limb.

The walls of the chest are usually free from disease, but occasionally we find evidences of broken ribs. Some shoeing smiths have a vicious habit of striking a horse with a hammer with which they are nailing on the shoe when he happens to be restless during the process. Should a rib have been fractured and have healed, well and good, the only evidence remaining will most likely be an enlargement on the rib which is of little consequence if the injury is of old standing. It sometimes happens, however, that you have disease of the rib remaining, and a discharging sinus leading to it, which is rather serious, inasmuch as remedial measures may have to be adopted that will endanger the horse's life, or at least that will lay him off work.

Herniæ are the next things you look for. We frequently

find them, but they are mostly umbilical or ventral—scrotal hernia being seldom met with on account of the custom of castrating the horse in this country. Umbilical and ventral herniae are objectionable,—

1. From their unsightly appearance.

2. From the bowel being more exposed to external injury.

3. From their liability to become strangulated.

If they are of large size their appearance is highly objectionable; but in any case you will do well to reduce them and notice

1. The size of the aperture, and

2. Its situation.

If the appearance of the hernia is no objection to the purchaser you ascertain how much danger there is of strangulation by the size and situation of the aperture. If there be a large aperture, larger than a half-crown piece, and it be placed in the centre of the hernial tumour, the chances of its ever becoming strangulated are very remote indeed, but on the other hand these conditions are favourable to its becoming larger. If the aperture be small and not in the centre of the hernial tumour, the risk of strangulation is somewhat greater, whilst the chance of its getting larger is less. Should the hernia be irreducible this is another great objection. Scrotal hernia will claim your attention when examining entire horses. If you find one, on no account should you pass the horse. Should you have scrotal enlargement you will have to determine whether it is hernia or hydrocele. If

it be a hernia and you gently grasp it whilst someone "coughs" the horse, you feel it momentarily enlarging; to test for hydrocele you hold a candle in a dark place, close to the scrotum, and you find the scrotum semi-transparent.

In passing along the near side of the body you now come to the prominent point of the ilium (anterior iliac spine), and not unfrequently find some of it fractured. When it is whole you can grasp its two ends and feel that both points are *in situ*, or you can, on standing square behind the horse, compare these prominences on each side. When this prominence is knocked off it gives the horse's quarter a comely rotund appearance. When it is fresh done it sometimes causes lameness for a few days, but it rarely does so afterwards,—indeed I never heard of it being any detriment in any way beyond giving the horse an odd appearance when viewed from behind.

See that the large glutéal muscles are well-developed and are all right, then pass over the front part of the thigh occupied by the quadrati muscles down to the stifle joint. This is the largest joint in the body, and is frequently the seat of disease, but when it is so lameness results, which prevents our ever having to examine such a subject for soundness. The patella has over it a large bursa, which sometimes, but rarely, is found enlarged. This may be filled with serum and so require a trifling operation before being considered sound. Whilst at this part cast another glance at the scrotum, sheath, and inside of the thigh, and pass down to examine the part

between the stifle joint and the hock. There is one peculiarity of this region you should not overlook, namely the exposed condition of the whole length of the tibia on account of its being covered by skin only. Were it not that it is more on the inside than in front, or the outside of the limb, doubtless it would often come to grief. As it is, it is frequently the seat of undisplaced fracture received from the blow of another horse standing in the next stall. When this is so the late Professor Dick strongly advised rest for six weeks, although there might only be the least possible mark upon the skin over it, if there was lameness too. You can, if need be, feel the entire length of this subcutaneous surface of the bone and so detect any evidence of injury, should there be such, and an absence of lameness, which, fortunately for all concerned, there seldom is, then in all probability there is no material injury.

We now come to the hock, which is one of the four principal points we have to see are sound. It is difficult to say which of the four points (eyesight, fore feet, wind, and hock) is of most importance; but I rather think the above order represents their relative importance, so that the hocks, though of least importance of the four points, are still one of the most important parts of a horse. It will be best for us to take a survey of the hock before going into any description of its diseases, and treat it much in the same way as we did the foot. The hock and the structure below it, judging from their homologue, the human foot, are one structure. In other words, the

parts below the lower end of the tibia are one in structure and function, and bear the same relation to the tibia and parts above them that the human foot does to the tibia and parts above it. The long axis of the human foot is horizontal, and the tibia is placed about perpendicular to this. The bones of the foot form an arch on which the tibia rests. This arch has a strong set of ligaments stretched between its two extremities as a string binds together the ends of a bow, by one structure (the strong plantar fascia), which has no homologue in the horse. This is marked by dotted lines in the figure (Fig. 5). Otherwise both structures have like ligaments, binding like structures, and have the same names. Now I wish to draw your attention to one ligament (the calcaneo cuboid), which in both subjects is the frequent seat of disease, and from the same cause. You know what a "curb" is, but you may not have heard that human beings "spring curbs;" and yet they do. Poor growing boys and girls standing for hours together at the loom "spring curbs;" their calcaneo cuboid ligaments inflame and soften and let down the arch of the foot, and they have to be taken to hospitals and have repeated blisters applied while they are resting in bed, when in many cases the inflammatory softening gives way and the arch is either fully restored or nearly so; but if not, they remain flat-footed; and if they are boys and wish when they grow up to become soldiers, they are particularly examined as to the *arch* of the foot, and if found flat-footed (to have curbs), they are rejected, because it is

well known that a march of any length would lame them by "springing a curb" afresh. Now I have told you all this in order to draw your attention to the fact that the nearer to a right angle the tibia makes with the parts below it in the human being and the horse, the more does the line of weight pass through the calcaneo cuboid ligament (the ligament which is sprained and inflamed to constitute a curb), and it follows that the more this condition exists the more you must look for results at the *back* of the hock in the one case, and under surface of the foot in the other case. Then again, you will have heard judges of horses say they like a *big, flat, square hock*, (they mean the *inner aspect* of the hock, and not the outer),—and they are quite right too, as I shall show you presently. Let us draw a *big, flat, square hock* (Fig 6). It will be

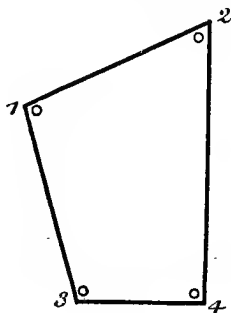


FIG. 6.

seen that the squareness is only approximate, and the flatness, if you look at such a hock, you will also find is not

absolute flatness, but it is what gives you an impression of flatness. The bigness is really so. Now to all squares there are four sides and four angles, and so in our square hock. Take the four angles as in our diagram, and you find them formed by—

1. The internal maleolus (Fig. 6,¹).
2. The point of the hock (Fig. 6,²).
3. Head of tibia (inner anterior aspect) (Fig. 6,³).
4. Head of inner splint-bone (Fig. 6,⁴).

Please to notice that the last three of these never alter their relative positions. You do not find the point of the hock approaching or receding from the head of the inner splint bone; neither do you find the head of the inner splint bone approaching or receding from the inner anterior aspect of the head of the tibia. These points are always the same distance from one another. The remaining point, however, formed by the internal maleolus, approaches ³ and recedes from ², whenever the hock bends (*see* Fig. 7), when our square disappears. So that

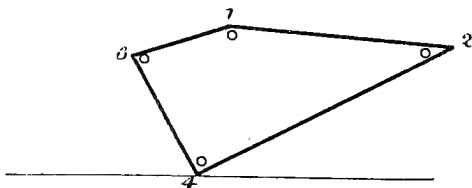


FIG. 7.

you see when the horseman speaks of his admiration of

a big, flat, square hock, he means a hock having these qualities when it is not bent or flexed. What is it that allows our point number ¹ to alter its relative position so much? It is as your anatomy teaches you, the comparatively small articular lower end of the tibia which glides over the large wide and deep articular surface of the astragalus.

Just one other point to which I must draw your attention. I have told you that all the parts below the lower end of the tibia may be regarded as one structure; the relative positions of these parts are always the same, hence the articular surface of the astragalus always has the same relative position to the other structures, of which it forms a part—that is to say, it never looks more up or more down, more inside or more outside, without *all* its belongings altering their positions with it (except in the curby hock); so that it follows that when you have not a square hock our point number ¹ approaches point number ² by the lower articular end of the tibia having glided more or less over the large articular surface of the astragalus, and it follows that the more it does so the nearer does the long axis of the tibia approach the parts beneath it at a right angle.

In the next place, I wish you to notice what it is that gives size to the hock, or perhaps I ought rather to have said, gives it apparent size. Doubtless you will see that the apparent size depends upon the relative position of our point number ¹ to point number ², or in other words, if the articular lower end of the tibia be well

up and back on the larger articular surface over which it glides, and so exposes this latter surface, then the apparent larger size is manifest,—indeed the front of the hock is very largely made up of this large articular surface.

What is the lesson which all these considerations teach us? Is it not this, that all hocks are of the *same size*, or nearly so, relatively to the size of the animal, and their difference is apparent only, and not real, in more cases than at first sight appears? That they differ in size in relation to the horse is quite true, but not nearly so much as do the feet.

I hope by the above to have made it clear why straight hocks are preferred to crooked ones by all using horses except for cavalry purposes; for these it is needful that the hind legs be well under the belly, that the movement, consisting of turning short round, called “wheeling,” be the more rapidly and easily accomplished; but for all other purposes that I know (fast trotting perhaps excepted), the hocks cannot be too straight, because, as has been shown, the straighter they are the more advantageously are they placed, as has been shown.

The diseases of the hock are due to concussion and sprain entirely if we except capped hock, and this is just what we should expect. They are—

1. Bone Spavin.
2. Bog ”

3. Thoropin or Thorough Pin.
4. Curb.
5. Capped Hock.

Bone spavin is perhaps the commonest of all diseases for which a purchased horse is returned to those who have sold it. This is rather a bold assertion, but it is the result of experience. I am sure again that there is no prejudice in the horse universe of such strength with such slender foundations. From the first year of my apprenticeship (1860) to this day, I have kept this particular matter ever before me, because in that year my attention was so strongly drawn to the subject by reading the notes of the late Professor Barlow's lectures. Gentlemen, you may not have heard of Professor Barlow. He, I may tell you, taught anatomy in this college many years ago, and he was without doubt perhaps the most promising member this profession has ever had. He killed himself by his devotion to his profession. His principal tool was the microscope—the instrument without which no sound pathology can be established—the trowel which alone can surely lay the medical science foundation-stone, which a sound pathology surely is. From Professor Barlow's notes I feel sure that he held a very liberal opinion with regard to the hock joint. He pointed out strongly, and Professor Dick agreed with him, that hocks might be very coarse at their lower parts without being necessarily spavined. The bones involved in spavin—give them what names you please—are made

up of a light spongy open texture, highly elastic, and which we know as cancellated tissue. They are subject to much *occasional* pressure, which as you know as surely tends to enlargement (hypertrophy) of any structure as *constant* pressure tends to the diminution (atrophy) of any structure. When these lower bones are well developed, the hock is said to be "coarse." Horses use their hocks as they do their fore feet in making one do more work than its fellow, in which case its lower, spongy bones will be larger—further developed. Hence we so often find in cases where we have this coarseness that these hyper-developed bones are larger in one hock than the other. The very fact of their coarseness shows their propensity to accommodate themselves to their requirements. Where we find coarse hocks, I again repeat, we find structures that both can and do accommodate themselves to exigencies. The process of nature to which we give the name "spavin," is neither more nor less than one of nature's attempts at ankylosis *disturbed during the attempt*. The cure which she begins she is very frequently indeed not able to finish on account of the forced exercise of the parts. What she aims at is to glue the bones at the bottom of the hock together by means of an ulcero-plastic inflammation. Now I have got to explain what I mean by this inflammation, seeing that the College of Physicians only enumerates six inflammations, viz. :—1. Ulcerative ; 2. Suppurative ; 3. Plastic ; 4. Rheumatic ; 5. Gouty ; and 6. Gonorrhœal. To these veterinarians may add

the ulcero-plastic. You find the best example of it occasionally on macerating bones to make up a skeleton. You find the cuneiform bones, as it were, glued to the tibial without any outgrowth soever. This takes place first by removal by ulceration of the cartilage, when the blood-vessels from the respective surfaces throw out lymph, which in turn gets tunnelled by blood-vessels and so organized. There is a very strong tendency for the parts in question to undergo this change. The first skeleton I ever put up when I was an apprentice was the skeleton of a pony we knew to be over thirty years old, which had spent an easy life. The cuneiform bones and the scaphoide of one hock were as I have described, and no doubt this was due to the animal being at liberty to rest the part whilst this change was proceeding. Rest of the parts must have been perfect during this time, because movement would have so disturbed the plastic lymph that some of it would undoubtedly have oozed out between the bones, and we then should have had spavin. We have plenty of instances of this form of inflammation (?). The vertebræ are very prone to become glued together (ankylosed) on account of their limited mobility, more especially the lumbar vertebræ. The lower bones of the hock have no movements one on the other to make it worth the while, so to speak, of nature to maintain these joints with their synovial membranes, cartilage, etc., so that these parts, like the lumbar vertebræ, have a very strong tendency, like the little-used lumbar joints,

to be removed by absorption and ankylosed in the manner above described. I have no doubt that in the course of time—and here I refer to time as counted by the geologist rather than as counted by the historian—these lower bones of the hock will become one and lose their light spongy texture, and a more perfect hock will result. *It is during this transformation stage that spavin is produced.* All the parts are then more vascular and more susceptible to the effects produced by being pushed and pulled from here to there. Whenever we find a part changing the character of its life—whether it be from a lower-form to a higher, or from a higher to a lower form—we find in it *extra activity* of the parts whose office it is to build it up and to pull it down (the blood-vessels and the absorbents). And if these builders and carriers are unduly meddled with they at once revolt. Let us take one striking example. Let us look at the mammary gland immediately its owner becomes a mother, and notice how the least extra excitement induces abscess in the generous gland, which is already in the full height of its activity. Then again look at the mammary gland and the uterus in womankind, how extremely prone these structures are to become the seat of cancer at the end of child-bearing, or, in other words, when the need for their activity is past, and when they are therefore passing from a higher to a lower life. Of the several forms of exostosis to which we ourselves are liable, the one which is most like in its nature to splint occurs

almost always in the epiphysal cartilage at the lower end of the femur in young men and women at a time—according to anatomical text-books—when the epiphysal cartilage is being converted into bone (Gray gives it at the twentieth year). We could easily multiply these examples, but you will already have learned the fact as one of the fundamental principles in physiology. Then if you find that these bones have little movement one on the other, and have a tendency to become consolidated, as has been abundantly proved; and that during the process of consolidation the functional activity of their nutrient parts is intensified, and that under full functional activity a part is soon thrown into a state of disease,—I say, if you grant all this, why need we look for “concussion” acting upon healthy bones as the cause of spavin, as is usually done? You will perhaps have heard of the theory that spavin is produced by the concussion to which these parts are subjected when the horse sets his foot down, and that it occurs on the inner rather than on the outer side, because the inner side is more under the centre of gravity. Now this is just nonsense. Look at any hock, and you will find that the direction of weight is from *within outwards*, and not from *without inwards*. This is evident to all who examine the hip joint, also direction of the articular surface of the astragalus; but most evident of all when you watch a horse that is either standing or moving. Gentlemen, spavin is caused by concussion, but it is *the concussion of extreme flexion*; and this is why we find

it most in horses that have the most hock action, and are so bent as to admit of extreme flexion; hence our big, flat, square hock, which we have before seen is necessarily a straight hock, and therefore one not subject to extreme flexion, is *rarely*, very *rarely*, the subject of spavin.

LECTURE XV.

SPAVIN (*continued*).

GENTLEMEN,—It is to be sincerely hoped that you give the subject of each lecture room in your already much occupied thoughts after leaving this theatre. If you have done so with regard to the subject of our last discourse, I venture to assert that you will have concluded that if “concussion” were the cause of spavin—I mean the concussion produced when the horse puts his foot to the ground—then the *straight* hock, and not the *bent* one, ought to be the more frequent subject of spavin. Now this is not so, as any judge of “horse flesh” will tell you. It is your bent hock that is alike the most frequent subject of spavin and of curb—the hock that can be *extremely* flexed.

We come next to the important question—what spavins lame horses? This to some of you may seem an absurd question. Most horsemen think that *all* spavins lame horses. And yet they do not, as all veterinarians and all really good judges of horses will tell you. We know, for a certainty, that it is the spavin that is

situated *well forward* that lames a horse. And why? How is it, if the pain, and therefore the lameness, is caused by the concussion which is produced when the foot is brought to the ground, how is it that spavins situated far back do not cause lameness? Are the parts so situated less concussed? Most certainly not, as a moment's thought will convince you. But how is it with the concussion of flexion? Flex a hock-joint and you will see at once where the concussion comes. You will see that the bones at the back of the hock are actually less compressed in extreme flexion than in any other position, and that is why spavin situated well back never lames a horse of itself. I say, of itself, because, if you have spavin well forward at the same time, which you often have, then of course you may have lameness, and no doubt will have lameness, if the process before described is not completed.

These considerations lead us to the detection of spavin. Upon this subject the late Professor Dick held very strong opinions. I don't know anything that irritated him more than to see a pupil *look* for spavin. He trusted to the sense of *touch* alone, and he was quite right. I believe that if hocks were never viewed at a less distance than fifteen yards; but instead, were always handled by the *tactus eruditus*, we should have far less "Horse Causes" in our courts of justice than we have—on this subject at least. It is the looking, and the prying, and the comparing of the two hocks, that lead us wrong; that lead us to give decisions which end in an unjust

lawsuit. Here is a drawing of a hock, having upon it a spavin that, until treated, will always lame a horse. If there be an absence of this neat little enlargement which you can *feel* with the tips of your index and middle fingers (using none other), and the horse goes sound, the less you say about his being spavined the better. By all

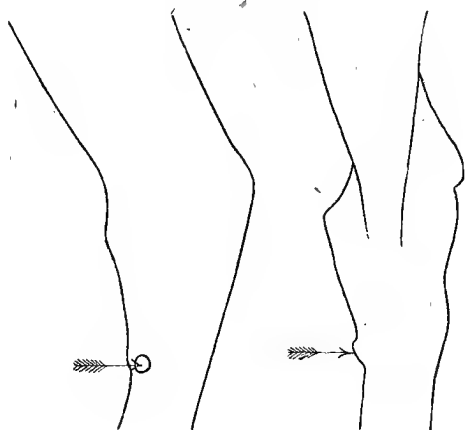


FIG. 8.

means compare the *feel* of this locality with the *same* locality on the opposite hock, but mind you do it with the *same parts* of the *same hand*. Do not go behind the horse and make a pretence of placing hands on the spavin place of each hock and comparing them simultaneously; because, let me tell you, no one can do this.

The senses of the two sides of your body are always, at best, a little dissimilar. No physician would attach much weight to your opinion if he caught you comparing the respiratory murmurs of the two sides of the chest, one side with one ear, the other side with the other ear. No. Compare the spavin place of the two hocks always by the *touch*, but let it be by the *same* touch. Recollect, of course, that it is the small spavin you have need to do this in the case of—not in the case of the spavin on which you can hang your hat. And you will find that it is the small, just perceptible spavin, which lames a horse. *The spavin that is forming.* In comparing the two spavin places use a gentle touch, and at once pass your same touch to the opposite spavin place. By the same touch I not only mean the same part of your person, but let it be *from* the index *to* the middle finger in each case. I saw one of you the other day trying to accomplish a tremendous physiological feat. He felt the right hock very properly with the fingers I have named of his right hand, and then *went round* to the other side of the horse and felt the other hock with his other hand. This at once led me to the conclusion that he and Kirke were not boon companions. The larger spavins can, of course, be quite well seen, and we frequently do see them the first thing, but in the all-important spavins, the very small spavins situated far forward, never trust to your sense of sight, as the very least deviation in the aspect of the two limbs you are comparing will lead you wrong. The wearing away of the toe of the shoe is also a mis-

leading symptom. And yet some attach much importance to it. If the toe of the hind shoe is more worn than common it may be from

1. Spavin causing pain and stiffness.
2. Spavin causing stiffness but no pain.
3. Slight contraction of hind tendons and ligaments.
4. Habitual "near" action.

There are other causes, but if you are satisfied that other causes than spavin will cause the toe of the shoe to be unduly worn, then it is at best only a symptom and needs much further evidence. Some horses with good clean hocks are very liable to wear their shoes at the toe, and you must not forget that the hind shoe is always worn more in this situation, and that shoeing smiths always make extra provision for it by putting an extra quantity of iron in this part or upon it. When however the toe of the foot itself is worn, then the defective action is very pronounced; but still, this is a symptom and not a sign of spavin. I cannot too strongly impress upon you the advantage of the sense of touch on which nine-tenths of your evidence should be placed. Throughout my professional life there is one operation for the cure of spavin which has always been a favourite with me, believing as I do that it is almost a certainty that a three months' rest in a loose box will of itself "cure" spavin; and I should not mention it here except to warn you that this operation is performed on the *sound* hock to induce an enlargement over the seat of spavin so as to make both hocks

alike. I shall explain this operation that you may know how to perform it, and by that means learn to detect the appearance a hock presents after it has been successfully accomplished. The operation is neither more nor less than a *rowel* placed over the seat of spavin in a neat way, but goes by the name of "causticking." It was, I believe, performed first, and I know very extensively, by the late Mr. Fryer, of Kirkby Fleetham, in Yorkshire, who got such a reputation in the performance of this operation that his services were sought far and near. The "caustic" he used, so far as I know, was never made known even to his profession, but I have always used a simple digestive made of equal parts of oil of cantharides, oil of turpentine, and oil of thyme. After the horse has been cast and secured properly, an incision through the skin and cellular tissue only is made, about an inch in length, in the long axis of the limb, about an inch and a half *behind* the spavin place, and an inch *below* this again. You then take a probe-pointed seton needle, and push it *upwards* and *forwards*, and sweep it all over the site of spavin, taking care in doing so that your needle is well under the cellular tissue as well as the skin, because, as you know, the cellular tissue contains the blood-vessels and nerves which nourish the skin and holds the same relation to the skin that the periosteum does to bone, and therefore, as the bone beneath the stripped-off periosteum must die, so does the skin separated from its cellular tissue. Take care then in doing this operation not to fall into such an error, or a "slough" of the skin may result. Having

swept the seton needle over the part freely, you will have made a pear-shaped separation of the parts. Now, by means of a fine probe, introduce two or three small pledgits of tow dipped in the "caustic," taking care that the end of each pledgit hangs well out of the wound, that it may be caught hold of and withdrawn on the third day. Neglect of this latter precaution I have twice known to lead to unsightly blemishes from a piece of tow being left in the cavity. The neglect of this simple precaution has made one eminent veterinarian I know, discard the operation in favour of the common seton. When it has been successfully done, in a proper case, the size of the spavin is very materially lessened if not altogether removed, and the only evidence left is the cicatrix of a clean incision, which has, however, been of necessity the seat of some granulation. The strength and endurance of the granulation tissue "proud flesh" will determine the character of the cicatrix which remains. When this operation has been performed for roguish purposes on a sound hock to make it like its spavined fellow in size, to succeed, the incision has to be *immediately over* the lower part of the seat of spavin, and not behind and beneath it as is done for honest curative purposes. Low class horse-dealers often try to persuade you that "the 'jack' is owin' to a kick from another 'os," even when *no mark* is present over the parts; so that you see how extremely plausible such an explanation would appear when you have the mark left by the operation of causticking over an otherwise sound hock.

When both hocks have been causticked, and only one of them has had a spavin, and the incisions have both been behind and below the spavin place, you will still have the two cicatrices and enlargements over the seat of spavin in one or other if not both hocks. Indeed I scarcely see how you can be deceived, after you have once had your suspicions awakened, and your minds educated what to look for. Firing is always obvious. Setons, to be of use, it is thought, ought to remain in three weeks, and if so, you have thickened cicatrices in two places—above and beneath the spavin place. Blistering leaves the hair stronger over the place, if it does nothing further. The hair is seen not to lie well over the parts. There is nothing in the way of active treatment for spavin that does not leave evidences, always to be found when looked for by one who knows what to look for.

We frequently come across clean hocks that have been fired; hocks having not the faintest trace of spavin; then what are we to do? What I have always done, when the horse is sound in other respects and has well-formed hocks, has been to pass the horse without even a comment on the firing marks. Some really practical veterinarians, in firing a spavined hock, fire—but more slightly—its fellow hock at the same time, although it may have no spavin; because, they say, horses so often throw out spavin on the sound hock during the time the fired, spavined hock is being pained and rested, on account of their resting too much on the sound leg at

this time, so they fire both, that he may not unduly rest upon the sound limb. That horses throw out spavins in their sound hocks during the few days or few weeks that first elapse after the spavined hock has been fired, is matter of common observation. Professor Dick used to condemn the practice, in the early part of his career, of firing a sound hock at the time its spavined fellow was undergoing the ordeal. His motto was, "Let sleeping dogs lie." Now, gentlemen, that is just what one would like to do, only they *won't lie* when trodden upon. When a spavin is thrown out upon a hock, it is not necessarily because that hock is inferior in form and quality to its fellow, neither is it on account of its having been more *used* than its fellow, but rather that the lower bones of each hock are in the *transition* (functionally active) *state* I have before pointed out to you. The lower bones of each hock are alike preparing to become glued together; and in this sensitive state, the least extra weight thrown on them wakes up a process which at best is only lightly sleeping. This being so, the custom of firing what, to all outward appearance, is a sound hock, is an empirical proceeding based on true observation, but which is, after all, a scientific, as it most certainly is a most useful, proceeding, which can only be condemned on the plea that firing is an extremely painful operation, or that we have no physical evidence of the hock being on the verge of disease. I cannot leave this subject without adverting to the rather prevalent notion that is abroad among horsemen in many parts.

You will hear numbers say they actually prefer a horse that has been fired, especially one who has been fired on the hock, because, they say, he is not so likely to fall lame. So far as I have observed, such is really the case. It may be from either or both of two causes,—either that the irritation set up hastens the consolidation of the bones involved in spavin, or that fired parts act as a bandage to the parts beneath. I have no doubt the former is the reason in the case of spavin, but most undoubtedly the latter is the reason in the case of injured back tendons of either fore or hind legs, inasmuch as firing, if sufficiently deep, causes more or less destruction of the highly elastic subcutaneous tissue, which is replaced by white fibrous (inelastic) tissue. You know how impossible it is to “skin” such a part without cutting into the skin on the one hand, or scooping out pieces of the tissue to which the skin is, as it were, glued, on the other.

I have perhaps encroached too much on your time by entering, it may be, at too great a length on the two subjects of “causticking” and “firing;” but I trust that you will be the better able to estimate each at its just value, remembering that a horse may be and often is even technically as well as practically sound, who has been the subject of either operation.

LECTURE XVI.

Spavin (continued)—Bog-spavin—How the term Blood-spavin arose
—Thoropin—Curb—“Sprung Hock”—“Occult Spavin.”

GENTLEMEN,—I cannot leave the subject of spavin without adding a few more words. You will often be called upon to pronounce an opinion as to the presence or absence of spavin, in which case it does not follow that the enlargement should be of a trifling character, and that a doubt should exist as to the presence of any enlargement; for strange as it may appear, the less the spavin the more certain can you be that it is a spavin and not merely a hypertrophy. In cases where the enlargement is of some considerable size, and in which the enlargement is well rounded and extends as far forward as a typical spavin, but also extends well back, or in other words seems to involve both cuneiform bones, should there be an absence of lameness or stiffness, it is impossible for any one to say “this is a case of spavin; it is not a case of hypertrophy of the bones involved in spavin.” It would be to the last degree unscientific to pronounce such a case spavin, although

you have two odd hocks. In such cases, however, you always have—so far as my experience goes—distinct coarseness of the fellow bones on the opposite hock. That is to say the horse has coarse, odd hocks, with which he neither goes lame nor stiff. Where spavins occur on hocks that are coarse to begin with, they must be larger than they need be on clean hocks before you can say positively that you have spavin; because in the one case all is coarseness together, but in the other you have the spavin standing out clearly to be defined on a clean, flat surface. When we have clean hocks to do with, we can easily say for certain that we have spavin, however small or however large; the enlargement is a sign of itself; but with coarse hocks any enlargement not common to the two hocks, unless it is very pronounced indeed, is at best only a symptom, and as such requires other symptoms of spavin—such as lameness or stiffness, or wearing of the toe of the foot before you can be sure about it.

Then, again, suppose your opinion to be asked where spavin in some form is known to exist. Of course, in this case, your opinion is asked regarding a “sound screw,” as these blemished but practically sound horses are called. In such cases much depends on the evidence you may have as to the consolidation of the bones involved, and this is more likely to be completed if the hock has been fired, or punched and blistered,—which latter, I ought to have before told you, frequently leaves a mark over the seat of spavin similar to and

not to be distinguished from "causticking" badly performed, or the blow from another horse. If hocks have been well fired, not too early in life, they are far less likely to become lame from spavin than those which have not been treated at all.

Spavins situated very far back on the hock I have never known to produce lameness. I have again and again passed such, and have never had occasion to regret it. Perhaps you had better mention it in your certificate; or what is better, write a note with your certificate and let your employer know you have not overlooked the fact.

Bog-spavin is one of the most wretched terms in our nosology. It used to be called blood-spavin, from an error in observation. You know the true hock joint is a very large joint, and the bag, bursa, or purse which secretes and contains the oil for its lubrication, is apt to secrete and therefore to contain a little more oil than is perhaps needful, and when this is so the bursa is distended and tense. A very large vein, called the saphena vein (from the Greek *σαφής*, manifest or conspicuous), passes directly over it and close to it and between it and the skin. So that when the bursa distends, it presses upon this vein and distends it, and makes it more conspicuous; hence the older anatomists, with the feeble light of their day, thought that it was the bursting of this vein into the joint which caused the distended bursa, and so they named it blood-spavin. It afterwards came to be known as bog-spavin, on

account no doubt of its puffy, boggy feel. Bog-spavin may be due to

1. Habit of the secreting membrane.
2. Formation of the hock.
3. Disease in the joint.

So that you see it may be an unsoundness, or it may not. When a joint works at a disadvantage, no matter from what cause, it requires more lubrication. If this disadvantage arises from conformation, it is evident that it is permanent, so that the hock will always require more lubrication; and as you know, there are few parts of the body which do not yield in response to extra calls upon their powers, whether it is a muscle that has to lift more weight, as the blacksmith's biceps; a skin that has to stand more pressure, as a blacksmith's hoofy hand; or a membrane that has to endure more friction, as the synovial membrane in question. In this case then you have to determine upon the cause that is giving rise to the increased supply of oil, and if there be no actual disease present, which cannot fail to be indicated by lameness, but only mechanical disadvantage, he may be quite sound, however long he may remain so, with which you have nothing to do.

Formation of hock has much to do with *an appearance* of bog-spavin. It is self-evident that, in a very straight hock, the ends of the bursa will be wider apart and the bursa stretched more than in a bent hock. In the bent hock there is, as you see by the diagram

(Fig. 9), greater liberty to bag or bulge forward. Now there must be a comfortable filling of the parts at all times, so that, the pressure being alike in both cases, a bent hock will always allow of a more pronounced appearance of bog-spavin than a straight hock without undue filling of the bursa.

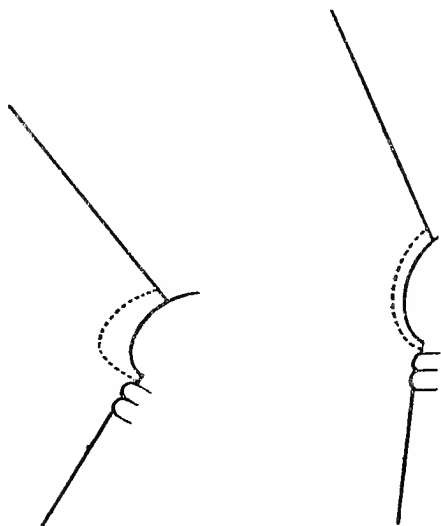


FIG. 9.

Next to the presence or absence of lameness, I always judge of these cases by the *amount of resistance* they present on pressure. If I find them soft and yielding, and not tense and unyielding, I am satisfied that there is a normal condition of the parts, and that there is no disease in the joint calling for an increased secretion

of oil, in which case the parts must necessarily be tense from over-distension.

Lastly, if there is disease of the joint you will have lameness, heat, and over-distension; but as a matter of course your test lies in setting the machine in motion and seeing what effects are produced, which will be most visible, not *immediately after* the motion, but when the horse has stood awhile and cooled.

Thorough-pin is precisely of the same nature as bog-spavin; only instead of a joint, it is a tendon surrounded by a lubricating sheath, that has to act like a pulley, and requires well lubricating. This sheath gets over-distended with oil (synovia). The perforating flexor of the foot has its origin quite *externally* at the back of the tibia, and becomes tendinous *above* the hock and passes over the *inside* of the hock, and again gains the *middle* line after it has got well below the hock, so that it has quite a spiral course, which makes it lie close to the internal surface of the *os calcis*, which is rendered concave to receive it and over which it glides. In passing thus obliquely from without inwards, it has to pass *between* the point of the *os calcis* and the back of the tibia, and the straighter the hock the nearer does the point of the *os calcis* approach the back of the tibia, therefore the more does this synovial sheath get pressed upon in straight hocks. This explains its more frequent appearance on good upright hocks, whose *ossa calces* are usually shorter on account of less leverage being required, and whose *ossa calces* are necessarily closer to

the back of the tibiæ, and so unduly press upon the synovial sheath. In these cases the very least increase of the oil in the sheath is shown. Where the hocks are bent, and this lubricating sheath is not unduly pressed between the *os calcis* and the back of the tibia from their being well apart, should there be a large thoropin, then the sheath must be much distended; and this is very likely owing to some injury to the tendon of the flexor pedis perforans, which in bent hocks has necessarily more stress thrown upon it. You will do well to reject such as unsound. There are other appearances similar to thoropin, of which the most common is bog-spavin, showing itself at the back of the joint as well as in front, in which case unsoundness must be your verdict, as it indicates a grave defect somewhere in the joint.

Curb is a disease due to strain upon the back of the hock when the hind-foot is advanced far under the body, as in the rearing and momentary poise during the preparatory act of leaping a height, and in other conditions such as fast trotting. The hocks may be so bent as to protrude the feet beneath the body during ordinary movement, in which case liability to curb is great. The liability to curb is greatest, however, in "curby" hocks; hence the name. "Curby" hocks may or may not be the subjects of curb. If they are free, no one can tell how long they will remain so. A "curby" hock is an extremely defective hock, having its front lower bones small, also the head of the large metatarsal small, and

the head of the external small metatarsal bone and the back of the cuboid bone enlarged from hypertrophy, as there is from birth undue stress on the ligaments which bind the lower end of the *os calcis* down to the cuboid and head of the external small metatarsal. This conformation gives to the hock joint the appearance of forming an angle with the phalanges beneath it.

The point of the hock down to the fetlock joint is usually a straight line as viewed from the side; but in strong hocks the head of the external small metatarsal is large, and encroaches at the curb place upon this line, giving the hock when so viewed somewhat the appearance of having curbs; but manipulation detects the straight line in the middle line of the hock behind, and so dispels the illusion. You will always find a straight line between the point of the hock and the fetlock, where no curb is present. Now, whilst you can and always do reject a curby hock having upon it a curb, although curby hocks are not necessarily unsoundness, you will find much difference of opinion regarding old standing curbs on otherwise good hocks. In law all curbs are regarded as unsoundness, so that you can never regard such as *legally* sound, or give a certificate of soundness. If, however, you are trusted by your employer, as you ought to be, and you are examining a seasoned horse with a pair of good hocks, though one has an old curb visible upon it, you will do well to pass the horse; but be sure you secure for your employer a *special* warranty of the curb to stand sound for a defined

period—six months at least. A foalish frolic may spring a curb on any hock, and the chances are great that the enlargement will be visible through life ; but such parts, when a long time has elapsed, are stronger than they would otherwise have been. Even a curby hock, having upon it a curb, is a stronger hock than it was before ; if sufficient time has elapsed to allow of completed organization of the lymph, which has been thrown out in the process of repair, an extra back stay has been put where one was needed.

“Sprung hock” I know nothing about, neither do I know anything about “occult” spavin.

Capped hock is an enlargement at the point of the hock from a blow or blows, and, except when fresh done, seldom causes lameness, but rather points to the vice of kicking in the stall, and is more frequently found on females than on males, because the former during œstrum frequently kick and knock their hocks against their stalls.

LECTURE XVII.

Sallanders—Ring-bone—Sandcrack—Tuberosity of Ischium knocked off—Go over the off side like the near side, but look under the Mane for Poll-evil—Case—Time required for the whole of these Movements Five Minutes—Advised to Practise these Movements on a Sound Horse—The Third Part of the Examination—Testing for Lameness—Testing the “Wind”—How best accomplished.

GENTLEMEN,—I trust that our survey of the hock and its defects and diseases—such as you would have to grapple with in an examination for soundness—has been sufficiently perfect to enable you to do justice to so important a part.

We next proceed downwards in front of the leg, having looked for and not found “sallanders,” a skin disease affecting the skin in front of the hock that is creased during flexion of the joint. I have already spoken of its analogue, “mallanders,” and the same remarks very well apply to both. We proceed just in the same way below the hock in front as below the knee in front, but expect to find any important disease, such as ring-bone and sandcrack, in *front* of the limb, as it is on the front of the limb that most pressure comes in its function of body *propeller*.

The hind foot has not a tithe of the number of accidents and diseases as the fore foot ; but the pasterns are more prone to ring-bone, especially in blood-stock. Ring-bone under all aspects is an unsoundness, and does not admit of any words in mitigation of our verdict of unsoundness for obvious reasons. Look for sandcrack in front of the hoof.

We now turn to the back of the limb, and notice a prominence near the tail (tuberosity of the ischium), which, like the other prominence on the innominate bone, is liable to be knocked off by the horse "backing" against a post. When this prominence is knocked off, the part has a flattened, indented appearance, which can be felt, but which is best seen on lifting the tail well up, and comparing it with its fellow on the opposite side. This bony prominence is the homologue of the bony parts we bipeds sit upon. Should the injury be of old standing no objection need be taken, as the injury after being once healed never causes lameness or defect in action.

Next proceed down the back of the thigh to the hock. This distance is usually free from ordinary disease. The hock we have considered ; and the back tendons, ligaments, foot, shoe, etc., require examining as in the fore limb.

We have now finished the examination of the near side of the body, and examine the off side exactly in the same way, *beginning at the head and going backwards*, as I have already advised, and given you my reasons for so doing.

There is an extra point to be observed on the *off* side, on account of the mane usually lying over on that side. Lift the mane, and look for "poll-evil," and of course any skin disease. A year ago a most amusing instance of the neglect of this precaution and its consequences presented itself to my notice. Two most experienced horse-dealers, brothers, bought a weight-carrying, good-looking pony at a fair held in Borobridge, in Yorkshire. They both noticed that the pony carried its nose out; but this they thought arose from the idle habits and leisure of the pony, whose only duty it had been to carry an old gentleman leisurely about a small farm. This pony had a large, long mane; and after getting it home, the mane being lifted in search of a most disagreeable odour, perceived on taking off the bridle, a "poll-evil" of enormous size was discovered. Next morning I was sent for by the aged father, who was using choice language (of its kind), to look at the bargain, and found three very large suppurating sinuses. In this case the parts had been cleaned at the time of sale, and all stench removed, and the mane nicely covered over the sore. What a glaring and unusual mistake, you may say. Not at all. Horse-dealers are as little infallible as any class I know. I have not finished the story yet. On my telling them that it would take months to cure this case, they did as they had been done by, and took the pony to York Christmas show, and sold him to two dealers, partners, from London. How extremely careful veterinary surgeons

ought to be, and methodical, in their examinations of horses as to soundness.

From commencing at the near side nostril to the terminating at the off hind limb, with very little practice, you ought not in any case to be longer than five minutes. Practise going through the movements on some horse in a quiet place for half an hour a day for a fortnight; but let it be a sound horse, if possible, in order that you may educate your sense of touch, and train your mind to recognising, through the touch, the

1. Normal form,
2. Size,
3. Warmth,
4. Hardness,
5. Softness,
6. Elasticity,
7. Non-elasticity

or the various structures; and when you have learned this, and acquired this *tactus eruditus*, or educated touch, you will have nothing to fear, provided you always apply the *tactus eruditus* with method. Nothing convinces me more, next to my own experience of the value of this educated touch, than the readiness and accuracy with which all good grooms detect undue heat in a part, or any swelling or other abnormality. They detect it *at once* by their educated touch; but in their case they are for the most part unacquainted with the structure and functions of the mechanism, so that they can act as beacons only.

The third and last part of the examination consists in

1. Testing for lameness.
2. Testing the "wind."
3. Removing the fore shoes.

I shall not dwell much on these points, because, as regards the third, all considerations involved have already been gone over in treating of the fore foot ; and as regards the first, I have only to make one or two remarks as to the mode of applying the tests, because were I to enumerate the different forms of lameness, and their seats and causes, I should encroach upon the domain of surgery and pathology, and here we are considering the state of animals supposed to be in comparative health.

In testing for lameness, it is needful that you bear in mind that you have hard and soft parts to deal with. The hard parts, such as the bones, best exhibit any disease, by being jarred and concussed ; and the soft parts, as the muscles, whose duty it is to shorten and lengthen alternately, to pull and be pulled, are best tested by these functions being put into active exertion ; so that you require your examinee to

1. Trot on hard ground ;
2. Gallop on soft ground.

And in going through these movements, you must not forget that the machine ought to be able to

1. Go forwards ;
2. Backwards ;
3. Turn round and round both ways on the same area of ground he stands upon.

The trot on hard ground cannot be too slow ; and the servant at this time should take a long hold of the bridle, so as to let the horse have his head. It ought to be on level ground, and on very hard ground. By level ground I mean there ought not to be holes and hillocks in the ground, such as one finds in badly-paved streets.

If you are satisfied with his trot, and have discovered no lameness, or stringhalt, or stiffness, etc., then proceed to try his soft parts, by galloping him on soft ground. The effects of this are to be looked for afterwards ; but during this part of the test you are also testing his wind. In doing so, you have to bring your hearing in as an examining agent, also your eyesight ; therefore it is essential that the horse is never out of the range of these senses. During this time you must *hear every breath he takes*, and you must either ride him yourself, or you must have him ridden or handed round you *in a circle* such as you find in a horse-rider's circus. It must be soft, so that the hoofs make as little noise as possible, or the noise of the breathing will not be well heard. A grass field is the best place, and it is far preferable to have the horse run round you than for you to get upon him. You hear the exact character of the breathing better than if you were on him, by far. I usually do both. Your employers are better satisfied, because they, for one thing, like to have your opinion as to his mouth, if he has a hard mouth or not, or a hard side and a soft side to his mouth. A horse with a hard and soft side to his mouth is always objectionable ; but a horse with a

very hard mouth is absolutely dangerous to those who ride and drive him. If you do mount the horse, do not venture to do so until some of the stored-up muscular energy has had time to discharge itself—"freshness," as it is called. Dr. Alexander Bain, in his great work, "The Senses and the Intellect," will give you much information on this subject. He reviews the feelings of muscular exercise, first on their physical side, then on their mental side. In reviewing the mental side, he says: "Observation shows that this (feeling) is pleasurable, indifferent, or painful, according to the condition of the system. The first outburst of muscular vigour in a healthy frame, after rest and nourishment, is highly pleasurable. The intensity of the pleasure gradually subsides into indifference; and if the exercise is prolonged beyond a certain time, pain ensues." During rest all the tissues get repaired, and in the muscles there is an accumulation of muscular energy with which the nervous system is mainly involved. The outburst of the first expenditure of this is accompanied by *uncontrollable*, pleasurable excitement, which, through continued movement, gradually subsides into indifference. I would earnestly recommend you to beware of this dangerous stored-up muscular energy. The more breeding and condition a horse has, the more can this muscular energy be stored up in him, "the better will he carry corn." This is nowhere better seen than in the race-horse and hunter,—the former especially. In both cases enormous quantities of muscular energy can be stored.

These noble creatures are trained to resist the enormously powerful impulses to expend this energy on first coming out of the stable ; but you will have to examine horses not practised in restraint, and who “ cannot carry corn ; ” therefore, if you do mount such a subject, be sure this first outburst has subsided into *indifference*, but never be guilty of pushing your trial to the third stage, when *pain* ensues. If you require to take a horse into a fallow field you will induce pain, and when the horse comes to stand and cool stiffness must be evinced, and if there is no lameness it is no fault of yours. No man would take a horse belonging to me into a fallow field to try his wind twice. If a horse is being trotted round you in a circle on grass, stop the process immediately you see signs of distress approaching ; by this time you have heard him breathe scores of times, and you ought to have a fair estimate of his breathing capabilities. After you have listened attentively to the breathing, have him brought up to a standstill, and notice how long the breathing is in quieting down to the normal. This is of very great importance, as I shall show you at our next meeting. At present I shall close these remarks with a protest against the unscientific practice of allowing a horse to go out of earshot, and having him galloped past you or up to you. It is a most unreliable and unscientific proceeding.

LECTURE XVIII.

The "Wind" or Respiration—The Respiration and Circulation Interdependent—Mechanism of Respiration—"High Blowers"—"Whistlers"—Snoring—Nasal Polypi—Distended Guttural Pouches—Roaring, Grunting, Trumpeting—Warts on Vocal Cords—Tumours in the Ventricles of the Larynx—Chronic Laryngitis—Ulceration of the Larynx—Chronic Cough—Thick Wind—Broken Wind—"A Wheezer"—Conclusion—Backing the Horse—Turn him round Quickly on the Ground he Stands upon—Lastly, Remove his Fore Shoes.

GENTLEMEN,—Having come to the fourth most important point in horse examination—namely, that which usually is known as the "wind," we will proceed much in the same way as with the fore foot and the hock, and endeavour to arrive at practical results by a logical method and compare them with the results arrived at empirically.

The "wind," or as we term it, the *respiration*, is a function going on by night and by day—now, then, and always, from the animal's birth to his death.

It is that process by which air is admitted within the horse's lungs, there to yield up some of its oxygen to the oxygen carriers (the red blood corpuscles), and in return for this purity, to be loaded with impurities which it

receives from the blood, and then to be expelled the chest.

This rhythm begins at the creature's birth and ends only at its death. It must always be going on, but not necessarily at the same rate. No rhythms in the body are more variable than those of the respiration and circulation, and so dependent are those two rhythms the one on the other, that disturbance of either instantly affects the other. In a state of health, and during tranquil moments, these rhythms bear almost an exact proportion to one another, the rhythm of the lungs being to the rhythm of the heart as one is to four, or in other words, one respiration to four pulsations. We are sadly too apt to overlook the interdependence of the two rhythms ; but as I shall show you, we cannot afford to do so in the present instance. The blood of the entire body has to pass through the lungs each time after it has been sent through an organ or tissue, because its oxygen carriers, the red corpuscles, have given up their oxygen (which they can only get on passing through the lungs) to the tissues, and the blood has received the waste material which the tissue has done with. Seeing then that the blood of the entire body must constantly, at incredibly short intervals, be transmitted through the lungs, and in the lungs exposed to the air, it is essential that it should pass through them with *ease* and *rapidity*. In the fleet subjects we are considering this is the more necessary on account of the accelerated rhythm of the heart and lungs induced by quickened motion of the

body. In order that this vast volume of blood may be purified by the air it is essential that the air should get to it, and it is only separated from it by the thinnest possible layer of epithelium lying upon a delicately-thin basement membrane. The blood has therefore to be *spread out*, as it were, in the thinnest possible stream, or sheet, and the air gets to both sides of it. In order that so vast a volume may be so spread out into a stream sufficiently thin the area of the stream is enormous. Lieberkühn has estimated the respiratory surface in the human lung at fourteen hundred square feet, and if we regard the human lungs as one-third the size of those of the horse, we then have the vast area of four thousand two hundred square feet. It is clear, then, that if this interchange between the air and the blood is to go on with *ease and rapidity, the air must find easy access*

1. To the lungs.
2. Over the respiratory area.
3. Away from the lungs.

And at the same time *the blood must find easy access*

1. To its airing ground.
2. Through its airing ground.
3. Away from its airing ground.

The air gets to the lungs and into the numerous recesses by virtue of its own pressure, which, as you are aware, is fifteen pounds to the square inch. With such enormous pressure and gifted with great elasticity (compressibility), it is ever ready to rush in and fill a vacuum. A vacuum

is attempted when the cavity of the chest is expanding in all directions, by the receding of the diaphragm, and by the ribs being pulled *outwards* and *forwards* by the intercostal muscles.

Now let us stop to enquire why this air rushing into this would-be vacuum does not do so with violence and concussion as when it rushes into the mouth and cavity of a fired cannon? Because it meets with a pressure or resistance *nearly equal to its own*, namely, the elastic force of the elastic tissue (yellow elastic tissue) which pervades the whole lungs. It has to stretch this concourse of elastic tissue. If we take a piece of elastic and grasp each end of it, we find that the more we stretch it the more it pulls and tries to resume its unstretched length. So it is with the lungs. The air stretches them out by its even pressure in all directions, then a limit is put to this by the walls of the chest, and the elastic force in the lung, which was so able to offer such steady resistance to the ingress of air, gets supplemented by *two very trivial forces* which, *together*, amount to very little, and so the air is expelled from the chest. These forces are the pressure of the residual gas in the intestines which has been compressed by the receding diaphragm, and a less force still, namely, the straightening of the costal cartilages, which have been *bent* when the ribs were moved outwards and forwards. These two supplementary forces being of the most trivial character, it follows that the elastic force of the lung tissue is of itself nearly equal to the pressure of the atmosphere.

Active. . .	Broncheoles.
Passive.	{ Residual air in air cells.
	{ Elastic walls of air cells.
Active.	{ Diaphragm.
	{ Intercostal muscles.

Nostrils.—These should have a wide enough *opening*, and the muscles ought to be in good tone, otherwise a flapping noise like a sheet in a wind takes place. When they are rigidly open they are somewhat cone-shaped—the base of the cone being the opening and the apex of the cone being at the part where the fleshy structure gives place to the bony canal. When this cone is too small and the nostrils consequently thrown into rigid contraction, a loud blowing noise results, and the horse is then known as a “high blower.”

Turbinated bones.—These and others form a rigid channel through which all the air must pass, and their lining is so frequently involved in inflammation during catarrh and other diseases, when inflammatory thickening results. This gives rise to a whistling noise during inspiration and expiration, and the horse is said to be a “whistler.” If the membrane (schneiderian) is active at the time and the parts well lined with thick mucous, it gives rise to a *moist rattling whistle*. Should there be ulceration and loss of the turbinated bones, and the channel by this means widened, a loud snoring results, which can be heard when the horse is standing quietly in his stall. Nasal polypi are sometimes present in this neighbourhood, which discover their presence by

an increased secretion of mucous and by an occasional hemorrhage.

Pharynx.—This active muscular cavity may give rise to impediment in breathing by paralysis of its dilator muscles, but in this case disease of the brain is most likely to be the cause and so prevent our having such a case brought for our examination as to soundness. The guttural pouches may also be the seat of distension. Practically the pharynx is seldom the seat of disease giving rise to defect in the wind, but as I have pointed out it may be.

The Larynx is an extremely common seat of unsoundness in horses. It is liable to

1. Wasting of the muscles of its left side.
2. Warty growths on the vocal cords.
3. Tumours in its ventricles.
4. Chronic laryngitis.

The wasting or atrophy of the muscles of one side of the larynx (always the left side) gives rise to "roaring," and its modifications, "grunting" and "trumpeting." This form of unsoundness is almost as bad as "whistling," and is a great obstacle at times to fast paces. It is due to loss of motion of the left side of the larynx through wasting of its muscles. The muscles on both sides of the larynx are supplied by the recurrent or ascending laryngeal nerve. This nerve leaves the pneumogastric at different places for the two sides. On the right it leaves the pneumogastric opposite the first rib, and turns

round the dorsal artery, which, as you know, is a small artery. On the left side the recurrent nerve leaves the pneumogastric very much further back, and turns round the posterior aorta, the largest of arteries. In doing so it bears the same relation to the artery that a sling bears to a lame arm, or, in other words, the artery is slung by the nerve. The artery, as you know, is constantly expanding and contracting, and so encroaching upon the nerve, which may or may not resist this, at all times, adverse influence. Where blood pressure is very great and prolonged it can seldom escape. If you wish to hear a typical roarer, you can do so almost at any time by going to Dr. George Balfour's wards at the Infirmary, and listening to the breathing of poor creatures there with aortic aneurism. The nerve in some of these cases is almost pressed out to a ribbon shape.

The noise takes place *during inspiration*—please remember that; and it can be induced by frightening the horse into taking a sudden forced inspiration by the old custom of threatening him with a stick as he stands in his stall, or up against a wall. To the practised ear the sound he then makes is unmistakable, whether it be a “roar” or a “grunt.” Warty growths on the vocal cords give rise to distressed breathing only when large. In this case a noise is heard at both inspiration and expiration. Tumours in the ventricles of the larynx are rare, but the same may be said of them as of those on the vocal cords. Chronic laryngitis is a very fruitful source of mischief, as it is accompanied by thickening

of the mucous membrane, and not unfrequently by ulceration, either of which may give rise to chronic cough that may end in "broken wind." When these conditions are present, if you pinch the larynx at its lower part, and "cough" the horse, he will not just give one or two hearty good coughs, as he would in health, but he will keep on coughing; and the cough is short and wanting in strength, and will be sepulchral or hollow, and accompanied by a distressing noise, if there is "broken wind." A chronic thickening of the lining of the larynx and vocal cords gives rise to what is termed thick wind.

All these affections, and indeed nearly every affection of the larynx, is almost of necessity of grave import, and amounts to unsoundness.

The trachea and bronchii are always patent, especially the former, which cannot very well be the seat of such constriction as would lead to unsoundness. Sometimes, however, when it has been the subject of tracheotomy badly performed, and has worn the tube too long, a thickening, giving rise to a stricture, has been known to result. The bronchii are the common seats of inflammation (bronchitis), which leads sometimes to the following sequences:—

1. Thickened mucous membrane.
2. Stricture of the tubes affected.
3. Dilated air cells.
4. Thinning of their walls, and obliteration of their capillaries.

5. Diminished area for blood aëration.
6. Hypertrophied right heart.
7. Pulmonary hemorrhage.
8. Dropsy.

It is evident that this train of evils will not be presented to your notice at these times, but to the fourth degree inclusive you will find them.

The thickened mucous membrane gives rise to "thick wind" and distress in breathing, shown clearly in the facial expression, and the *long continuance* of violent breathing effort after exertion, from the strictures of the tubes giving passage to diminished streams of air. The third and fourth degrees render the lungs unable to contract, as we have before seen they are wont to do when in health. And this, as we have before seen, keeps the diaphragm unduly pressed backwards upon the bowels, filled as they are with residual gas, which causes the animal to pass flatus frequently, and this the more after eating, when the area of the residual gas is further encroached upon. Then again the chest is more or less barrel-shaped and fixed, also from the lungs being kept unduly distended, and the ribs being pushed outwards and forwards. These are very grave defects, and commonly are easily found out. On placing your ear against the sides of the chest, in such cases you hear a whining sound on expiration. The bronchioles, or smaller bronchial tubes, are muscular structures, whose nervous supply is apt, through various causes, to occa-

sional derangement, causing spasm, and the emission of a wheezing sound, and much distress in breathing. The horse is then called a "wheezer." If this is long continued, it is always followed by the same train of dismal symptoms as we have seen follows stricture of the larger tubes.

With this outline, I hope you will have a good foundation on which to build your diagnostic structures; and if you think out the matter for yourselves, and so make it your own, you ought never to make any glaring mistakes in this extremely intricate part of the examination.

In conclusion, I may add that after trying the "wind," you are to have the horse backed towards you, whilst you stand twenty yards away, which will test the muscles of the back. Next have him turned round and round, on the same ground on which he is standing, to test his hind limbs. Let him now stand in a cool place for a time, and see him move afterwards. Finally, have his fore shoes removed.

Now, gentlemen, I hope you have received a clear outline of how a horse may be tested for soundness; and it will remain for you to omit any part of it you please, when you are so circumstanced (as at a fair or at a sale) as to be unable to carry it out in its integrity; but under all circumstances, when you cannot carry it out to the extent I have named, you will do well to let your employer know how much to expect from your examination, if such it can be called.

CERTIFICATES.

A good certificate ought to contain three paragraphs, namely :—

The first to clearly define the horse.

The second should set forth what is found.

The third should contain the opinion.

Example :

ALPHABETA STREET, EDINBURGH,

June 2nd, 1874.

To-day I have examined a chestnut cob gelding, having two white hind stockings, and named Tom, the property of Mr. Squeers, of Dotheboy's Hall, Yorkshire.

I find he is six years old : that he has curby hocks ; and has wind-galls on his fore legs.

I am of opinion he is sound.

FLEXOR T. ENDON, M.R.C.V.S.

The certificate may be regarded as belonging to the horse at the date on which it is written, and your client's name kept out of it. In all cases you must clearly define the horse by his breed, peculiarities, and name (if he have one), and if possible always his present owner's name. In case of disputed ownership, as when a horse is sought to be returned, you may say, "At the request of Mr. So-and-So." If your second paragraph contain mention of a known *legal* unsoundness, then you have to state in your third paragraph, "The horse is therefore unsound," and leave out the word opinion

altogether, because it is not only your opinion which makes the defect unsoundness in a Court of Law. Should your second paragraph contain a host of adverse conditions, the whole of these put together will not constitute legal unsoundness, if some *one* of them does not. In such a case you state it as your opinion that the horse is sound.

Again, should you find anything about the horse which is a *legal* unsoundness, but which gives rise to no detriment, and is not likely to give rise to any detriment, you may state that the horse is in your opinion *practically* sound.

Finally, let me advise you to use a copying press, and keep copies of your certificates, and never use printed forms.

APPENDIX.

APPENDIX.

I. UNSOUNDNESS.

Legal Interpretation of the Term.

“If at the time of sale the horse has any *disease* which either actually *does diminish* the natural usefulness of the animal, so as to make him less capable of work of any description, or which in its ordinary progress *will diminish* the natural usefulness of the animal, this is unsoundness; if the horse has, either from *disease* or *accident*, undergone any *alteration of structure* that either actually *does* at the time or in its ordinary effects *will* diminish the natural usefulness of the horse, such a horse is unsound.” (Lord Ellenborough in the case of *Elton v. Brogden*, 4 Camp. 31.)

II. VICE.

DEFINITION.—A horse is said to be vicious which has a habit dangerous to itself or to those who have the usual dealings with it; or any habit which either does or may render the horse itself less useful.

Examples :—Rearing, running away, kicking, restiveness, saving, cribbing, wind-sucking, etc., etc.

III. FRAUD.

No definition of fraud is attempted by the English law, because of its many-sidedness.

Fraud Annuls all Contracts.

Any contract may be rescinded if either party to the contract has been induced to enter into it by *fraud*, for fraud renders all contracts void, both at law and in equity.

Fraud by One Person.

Fraud committed by one person is an imposition, but not a criminal offence.

Fraud by Combination.

Where two or more persons combine together to cheat in the sale of a horse, it is a criminal offence, and renders such persons liable to be indicted for a conspiracy (R. *v.* Sheppard, 9 C. and P. 123); but it must be shown that all the parties charged knew of the fraud (R. *v.* Pagwell, 2 Starkie N. P. C. 402).

IV. MALFORMATION.

DEFINITION.—A malformation is an irregular or anomalous formation or structure of a part or parts.

Not Unsoundness.

A malformation or any number of malformations do not constitute unsoundness, although they may be quite well known to lead to unsoundness. Case—Brown *v.* Elkin, Court of Exchequer Sittings in Banco, before Lord Abinger. In this case a horse was sold with a warranty, having curby

hocks, but having no curb upon either at the time of sale. After hunting three times he threw out a curb.

“His Lordship intimated to the jury that the sole question was whether the horse was unsound at the time of sale—proof of liability *to become unsound was not enough*” (*Veterinarian*, vol. xiv., 296).

V. WARRANTY.

DEFINITION.—A warranty is a written or an oral guarantee given by the seller or his agent to the buyer or his agent that the article exchanged answers, at the time of sale, to certain defined qualities and quantities.

In horse warranty the following are the usual qualities and quantities specified :—

1. Soundness of wind and limb.
2. Freedom from vice.
3. Age.
4. Breed.
5. Uses.

NOTE.—Dealers usually mix up the warranty with the written receipt they give for the price of the horse—thus :—

Received of Joseph Wardle, Esq., the sum of fifty pounds sterling for a bay carriage gelding, warranted sound.

TONY WELLER.

Bowbridge, June 3rd, 1874.

A Proper Warranty

Ought to specify :—

1. The time and place of sale.
2. A brief but clear definition of the horse sold.
3. The qualities and quantities warranted.

It is clear that the fewer the qualities and quantities warranted the less are the chances that the horse will be returned.

There are few horses that could not be legally returned on a warranty such as the following :—

“Warranted five years old, sound and free from vice, quiet to ride and drive and to carry a lady.”

AGE from three to six is not always the easy thing to be sure about that most horsemen imagine. After ten it is impossible to tell to a year.

SOUND horses are notoriously scarce.

VICE is frequently seen (?) by timid persons unused to horses where none exists.

Duration of Warranty.

Ordinary warranties are usually considered to extend to twenty-eight days. This is when no time is mentioned in the warranty.

The *shortest warranties* are those given by auctioneers, either in their printed bills or on painted boards put up in a conspicuous part of their premises, which usually are for twelve or twenty-four hours, from the time of sale. Thus—“Horses not answering the description must be returned within twenty-four hours, otherwise the purchaser shall be obliged to keep the lot with all faults.”

The *longest warranties* are what are known as *special* warranties, as in the case of an apparent blemish which is warranted to be of no detriment for three, six, or even twelve months. For example, a curby hock may be warranted to stand sound for twelve months. A curb or a splint from which the horse is not at the present time suffering is warranted not to give trouble, and so forth.

Time of warranty.—The warranty in whatever form must be given *before* the conclusion of the bargain.

The bargain may be concluded by :—

1. Paying for the lot.
2. Paying something on account.
3. Shaking hands.
4. The seller administering a blow with his hand upon the open hand of the buyer.
5. Any local, if well understood, custom of concluding a bargain.

Conversion of Warranty.

When an oral warranty is followed by a written one, as is frequently the case, the oral warranty is then legally superceded by the written one. This is too frequently the cause of atrocious deceit : thus, a seller lauds his wares clamorously, and so effects a sale. He then gives a written receipt and warranty, taking care to limit the warranty to the narrowest bounds. The spoken representation has set forth the horse as five years old, sound as a bell of brass, quiet as a lamb, would rather carry petticoats than eat a feed of corn ; up to sixteen stone ; never refused a fence in his life ; looks on six-barred gates and stone walls as nothing at all ; and so on.

The vendor knows quite well that he can avoid the consequences of his superlaudation by simply putting in writing the barest warranty the buyer will take, and very often confines himself to writing that the horse is warranted sound. The lamb may be found to kick and bite ; shudder and sweat at the approach of petticoats ; but to do neither at the approach of a feed of corn ; to have no idea of leaping, and indeed to be utterly unlike the animal represented.

Spoken Warranties.

An affirmation at the time of sale is a warranty, provided that it can be proved to have been so intended. Whether or not a warranty is intended, is a question for a jury to

décide. Spoken warranties are so difficult to prove that most buyers tamely submit to receive in writing a warranty in its barest form rather than be obliged to prove what was said.

Warranty by Representation.

Otway Cave, M.P., v. Colman.—Mr. Cave wanted a horse to carry him pleasantly in the parks. He saw and admired one (Atticus) in Mr. Colman's stables, and inquired whether he was suited for that purpose. Colman said that he could not have a more showy or a finer horse, and that it would suit him well.

At Mr. Cave's request Atticus was taken into the yard and mounted by one of the boys, when he kicked and plunged furiously. Colman expressed much surprise at this bad conduct of Atticus, and said that it must be owing to the curb bridle, as he had never shown such symptoms before. A snaffle-bridle was then tried, but he was as unmanageable as ever. Colman then, seemingly, displayed more astonishment. "It must have been occasioned," he said, "by the horse not having been worked for two or three days."

Mr. Cave declared that he could not comfortably or safely ride a horse so viciously disposed. Colman assured him that the horse was perfectly quiet and safe, and that his present ill-humour was caused by tight girthing, or some accidental thing, and was of no consequence.

On the faith of this representation Mr. Cave bought the horse; and on the first day of his being taken into the park he began to rear and plunge, and was accordingly returned.

Colman refused to refund on two grounds: *that he had not given a warranty; or, that if he had, it was of no use, as it was given on a Sunday.*

No warranty seemed to be proved, but the Judge (Baron Garrow) ruled, that the representation made by the plaintiff was a sufficient warranty, and a verdict was accordingly given for the plaintiff (*Veterinarian*, vol. i. 344).

Warranty in Scotland.

Warranties are less common in Scotland on account of *price* being there a warranty in itself, which is not the case in England.

Warranty in Ireland

Is hardly ever heard of. The buyer usually protects himself, as far as possible, by the advice of a veterinary surgeon's examination. The most expert veterinarians there are in the habit of attending the large horse fairs and duly protecting all who wish for their advice for the modest fee of half-a-guinea. In Ireland, properly qualified veterinary surgeons may be found at all fairs of any magnitude. Irishmen make little trouble over a bad bargain, their facilities for getting rid of bargains of any kind being very great, owing to the frequency of Irish fairs and the unequalled knack they have of showing off a horse to the best advantage.

Warranty by Agent or Servant.

Mr. Benjamin, in his work on Sale, says that "the agent is authorised to do whatever is usual to carry out the object of his agency, and it is a question for the jury to determine what is usual."

An auctioneer can, and does, give warranties on behalf of his employers. A horse dealer's servant *used to assisting his master in selling horses* can also give a warranty on behalf of his master, though unauthorised to do so, or even instructed not to do so.

With regard to agents or servants holding positions more anomalous, Chief Justice Erle said, in the case *Fen v. Harrison*: "If we laid down for the first time that the servant of a private owner, entrusted to sell and deliver a horse on one particular occasion, is therefore, by law, authorised to bind his master by a warranty, we should

establish a precedent of dangerous consequence. For the liability created by a warranty extending to unknown as well as known defects, is greater than is expected by persons inexperienced in law, and as everything said by the seller in bargaining may be evidence of warranty to the effect of what he said, an unguarded conversation with an illiterate man sent to deliver a horse may be found to have created a liability which would be a surprise equally to the servant and the master. We therefore hold that the buyer, taking a warranty from such an agent as was employed in this case, takes it at the risk of being able to prove that he had the principal's authority, and if there was no authority in fact, the law does not, in our opinion, create it from the circumstances."

Warranty and Patent Defects.

"A general warranty does not usually extend to defects apparent on simple inspection, requiring no skill to discover them, nor to defects known to the buyer." (Benjamin on Sales, 2nd Ed., 502.)

NOTE.—In *horse cases* the above holds good in very few cases indeed, and is not at all to be relied on.

Warranty and Skill in Buying.

A buyer is not bound to exercise his skill when a warranty is given. In *Tye v. Fynmore* (3 Camp. 462), Lord Ellenborough said :—"He (the buyer) was not bound to exercise his skill, having an express undertaking from the vendor as to the quality of the commodity."

VI. THE MODE OR CUSTOM OF RETURNING A HORSE.

A person wishing to return a horse that has turned out not as warranted, ought to proceed as follows :—

Immediately upon finding that his purchase is not as warranted he should *write* to the vendor to that effect. If the vendor live next door plaintiff must *write*, and he must keep a copy of the letter so written and sent. He must keep a copy of all his letters. The letters must contain no friendly sentiments whatever, but must be cool, straightforward, business letters. This golden rule is sadly too often unheeded in the case of friends and relations. The letters ought not to deal with any other subject than the one. It is a matter of common experience, that the best of friends are turned into the bitterest enemies over a horse deal, therefore the author repeats, with emphasis, *let all communications be in black and white, and keep copies of them, and don't be soft-headed through fear of being thought hard-hearted.* In a deal with a dear friend or a relative, that has turned out badly, it is all the more necessary to employ a solicitor from the first.

Again, as soon as you have found out that your deal does not answer to the warranty, place the horse out of your possession at the best livery stables you know. This is highly essential, or a question as to injury, accident, or mismanagement may arise after the horse has left your possession, and before it has been claimed by the vendor. All this should be, irrespective of price of horse, price of keep, or any other matter.

If the reply from the vendor is unfavourable, that is to say, if he refuses to take back the horse and refund the money, the horse should be sold by public auction, taking care that the vendor is duly informed of the fact, also of the place,

day, and hour of sale. The plaintiff, or his solicitor, must see that defendant is duly informed of this, that he (defendant) may have a chance of being present at the sale, or being duly represented. It is best, and indeed usual, to send a printed bill. Every care must be taken to thoroughly advertise the horse in the leading journals of the district, and in any other way thought desirable, so as to procure the best price for the horse. All evidence of having duly and effectively advertised the horse should be collected, as in case of trial in any court the defendant is very likely to closely investigate the means used in selling the horse. It is in defendant's power to watch the sale personally, or by agent; but not in his power to command a good attendance of likely purchasers; for this the plaintiff is wholly responsible, and therefore the matter should be executed so as to be above suspicion. The auctioneer ought also to be carefully chosen, and if possible one having large opportunities in selling horses. In such a case there is little danger of reproach of the horse being unduly advertised. The plaintiff ought also to be present, or be represented at the sale.

The services of the plaintiff's veterinarian are called in when the case is one of unsoundness, and he in turn should advise the plaintiff as to a second veterinarian being called in to give a confirmatory opinion.

The plaintiff, or his solicitor, has then to sue the defendant for money out of pocket. If this be £50, or under, in the County Court. If over £50 it must be in a superior Court.

The author strongly urges the same advice to intending plaintiffs in horse causes that *Punch* gives to those about to marry—"Don't." In horse causes, if the pecuniary loss, the worry, and the thousand and one disagreeables are put into the balance, they far outweigh any or every gain of whatever form. Arbitration would be far less expensive and more satisfactory. If each party would appoint his veterinary surgeon and a farmer (who, if possible, should be

a breeder of horses), justice or something approaching it would result, provided the bare facts only were submitted to the four. It is foolish and illogical to expect a judge and a common jury to judge between experts. Each side can bring expert veterinarians who give, and that conscientiously, the most polemic evidence. Most Englishmen think they know something about horses, therefore most English juries are likely to contain one or more men who "know a horse when they see one." Granted that they are judges of "horseflesh," unless they are medical men, or veterinary surgeons, they know nothing of horse pathology; and, in cases of unsoundness, they have to decide questions into which pathology enters largely. In questions as to vice it is different, and even then it is desirable that a jury should know something of the ordinary habits of horses, in order that they may judge of habits extraordinary.

VII. TRIAL IN COUNTY COURT.

For sums of £50, and under, the aggrieved party usually seeks redress in the County Court, because it is a quicker and less expensive procedure. He may employ a solicitor, or not, as he thinks fit.

If he does not employ a solicitor he should proceed as follows:—

First. He must write out three clear copies of his claims, giving in detail each item; for instance, the amount he has lost in buying the horse and in selling him; the cost of the horse's keep, reckoned at half-a-crown to three shillings and sixpence a day; veterinary surgeon's expenses, and any reasonable expenses he may have incurred in advertising and selling the horse. These copies must be exactly alike. One he keeps for his own use; the other two he takes with him to the Court.

Arrived at the Court a plaint-note is produced which is to be filled up. The two copies of his claims are taken by the officers of the Court, who send one copy to the defendant along with the summons, and the other copy they pin to the plaint-note, which is for the use of the Judge. Whilst at the Court he should give his opponent notice to produce all documents or letters which may have been sent to him having bearing on the case in hand. Again, whilst at the Court he must direct the officers to issue subpoenas to any witness or witnesses he may require, whom he has reason to think would not come forward without being legally obliged to do so. The Court's officers serve the subpoenas.

When a written warranty can be produced, expressed in proper terms, no witnesses need be summoned. If the warranty was by word of mouth, all hearing it should be summoned, to bear witness as to the words used; also that the words amounting to warranty were used BEFORE the bargain was struck. The exact words used ought, as far as possible, to be called to remembrance, which is, as a rule, easily done. Great care must be taken to give the words as they occurred—that is to say, not to add anything on the one hand or leave out anything on the other. In all cases of unsoundness a veterinary surgeon ought to be employed to examine the horse, and he will have to give his evidence in Court—his certificate alone will not do, as the writer is not present, and therefore cannot be cross-examined upon it. Should, however, the case be one of vice, then almost any one with common sense can enter the witness-box—indeed, veterinarians are here seldom called for.

Much trouble can be saved when the purchaser can bring proof that the vendor knew at the time of sale that the horse was unsound or vicious. The case then turns on a question of fraud or no fraud. If fraud can be thus proved to have taken place—that is to say, if it can be proved that the seller knew that the horse was unsound or vicious at the

time of sale, then warranty or no warranty, the sale is rescinded.

If the plaintiff recovers less than £20 he must take care to ask the Judge for his costs and his witnesses' expenses.

A recovery of £20 or over carries costs.

The plaintiff will learn the day and hour of hearing from the officers at the Court when he goes to enter his case.

The defendant may try to get out of it by declaring that the horse was sound and free from vice at the time of sale.

Again, he may deny warranty, and will be most likely to do so when no *written* warranty has been given.

Or he may put questions to the plaintiff before the Court. If the sum be over £20, either party has a right to put questions to the other before the Court. Should defendant employ a solicitor the plaintiff need not expect extra danger or embarrassment provided he keep his temper and be not too anxious.

Finally, the plaintiff ought to bear in mind that after he and his witnesses have told the Court their version of the affair, they will be *followed* by the defendant and his witnesses. This ought to be ever present in the mind of the plaintiff, so that he and his witnesses may give evidence of the *time, place, and circumstance* of everything having the *least* bearing on the case.

VIII. TRIAL AT ASSIZES.

Subpœnas, Fact, Opinion.

It need hardly be observed that every witness is bound to obey a subpœna, when with it his reasonable expenses for the journey, etc., are tendered to him, but he is not bound to attend at the trial except upon a subpœna. There are some questions connected with

this subject which it will be proper to consider in this place. *If a subpoena is served on an ordinary or skilled veterinary witness, is he bound to obey it?* In *Betts v. Clifford* (Warwick Lent Assizes, 1858) the late Lord Campbell stated, in answer to a question, that a *scientific witness* was not bound to attend upon being served with a subpoena, and that he ought not to be subpoenaed. If the witness knew any question of *fact* he might be compelled to attend, but he could not be compelled to give his attendance to speak to matters of *opinion*.

In *Rich v. Pierpoint*, an action for malapraxis, Dr. Lee was summoned against his will to give evidence on the part of the plaintiff. He stated that on the evening before the trial a solicitor called on him and left a subpoena with him. Dr. Lee would not hear any account of the case which the solicitor proposed to give, and expressed his resolution to have nothing to do with the trial. The solicitor informed him that he would be required to pay the usual penalty if he did not attend. He went down to Kingston, and was warned not to leave the Court until the trial was over. He heard the evidence on the part of the plaintiff, and upon this and the medical evidence he gave his opinion—not much in favour of the party who summoned him, and not much against him. Dr. Lee considered that he could not avoid attending the trial under these circumstances. (*Medical Times and Gazette*, April 12, 1862, p. 389.)

In the case of *Webb v. Page* ("Carrington and Kirwan's Reports," p. 23), the late Mr. Justice Maule ruled as follows:—"There is a distinction," said his Lordship, "between the case of a man who sees a *fact* and is called to prove it in a Court of justice, and that of a man who is selected by a party to give his *opinion* on a matter on which he is peculiarly conversant from the nature of his employment in life. The former is bound, as a matter of public duty, to speak to a *fact* which happens to have fallen within his own knowledge

for without such testimony the course of justice must be stopped. *The latter is under no such obligation*; there is no such necessity for his evidence, and the party who selects him must pay him." In the case referred to by Mr. Justice Maule, a skilled witness had been subpœnaed, but he refused to give evidence unless first paid for his services and loss of time (*Medical Times and Gazette*, April 26, 1862, p. 432). A barrister, who quotes this ruling, goes on to say: "There is one reason why I should not advise any person in the position of a skilled witness totally to disregard a subpœna. It is quite clear that should such a person fail to attend a trial no attachment could issue, even if he were called as is usual upon the subpœna, because the party subpœnaing him could not make the requisite affidavits that he was damnified by the witness's absence and in what respect. But such party might bring an action for damages; and although he would recover none, he might not only worry, but might even put the defendant to a considerable expense, as taxed costs by no means include the entire costs in such cases. Although, therefore, I could not advise a total neglect of the subpœna, the safest course would be to obey it, and demand expenses before giving evidence. Such expenses would be only those allowed for a professional witness (not special fees); but if the person so subpœnaed were willing to run the risk of an action, he might safely absent himself without any fear of an attachment from the Court for contempt." With regard to the question whether a skilled witness would be permitted to demand a high fee for his attendance under such circumstances, the writer adds: "To permit him legally to demand a high fee would perhaps look somewhat like legally countenancing a bribe." At all events there is no such legal recognition.

In a case which came before the Court of Exchequer in May 1868 (*Maxted v. Morris*), a witness wilfully disobeyed a subpœna. In consequence of this the trial was postponed

and the parties were put to great expense. An arrangement was made by which the witness bound himself to pay a part of the expenses. The Chief Baron said: It must be distinctly understood that in all cases where it appeared to the Court that there had been a wilful disobedience of a subpoena after proper service, such a contempt of Court would be visited with the punishment it deserved. Martin, B.: It was not to be tolerated that a man should exercise any discretion as to whether he would or would not attend a Court in pursuance of subpoena. Enormous costs were incurred in preparing a case and bringing it down to trial, the whole of which were to be thrown away and wasted, because a man refused to obey a lawful summons to attend as a witness. Pigott, B.: A subpoena was not to be treated as mere waste paper. Public justice required that persons wilfully committing contempt of Court should be dealt with in such a manner as to teach them that they could not commit a contempt of Court with impunity.

Lord Campbell's dictum in reference to the distinction between fact and opinion confers no practical benefit on witnesses. It is at all times difficult in science, and in the medical sciences particularly, to separate them; and if a man appears to testify to a medical or scientific fact, he cannot avoid giving an opinion arising out of the fact.

Expenses.

In a case tried at the Carnarvon Assizes, August 1872, a medical man had refused to sign the depositions which had been taken before the magistrates without being guaranteed a higher fee than that allowed by the county tariff. Bovill, C.J., told the witness that the Act of Parliament imposed an obligation upon him, and he had no power to refuse; and if he did so on another occasion, he would be liable to be indicted for disobedience. The judge held that a medical

man has no right to fix the amount of his expenses, but must always take the allowance which the law gives him. (*Lancet*, 1872, vol. ii., p. 204.)

Veterinary Witnesses.

Assuming that the veterinarian has obeyed a subpoena, he will now be required to attend before the Court, and to state, in the face of adverse counsel, the opinions which he has formed from the medical facts of the case, as well as the grounds for these opinions. He will then undergo the ordeal of a public examination.

Some medico-legal writers have considered it necessary to lay down rules respecting the manner in which a medical witness should give his evidence; how he is to act on a cross-examination, and in what way he is to recover himself on re-examination. Any advice upon this head appears to me to be quite superfluous, since experience shows that these rules, like those given to prevent drowning, are invariably forgotten at the very moment when a person is most in need of them. A man who goes to testify to the truth to the best of his ability should bear in mind two points:—1. That he should be well prepared on all parts of the subject on which he is about to give evidence. He should act on these occasions upon the advice contained in the Latin motto, *ne tentes aut perlice*. 2. That his demeanour should be that of an educated man, and suited to the serious occasion on which he appears, even although he may feel himself provoked or irritated by the course of examination adopted. A medical witness must not show a testy disposition in having his professional qualifications, his experience, his means of knowledge, or the grounds for his opinions very closely investigated: he should rather prepare himself to meet with good humour the attempts of an adverse counsel to involve him in contradiction, and show by his answers that he has only a desire to state the truth. Law and custom have long

established that a barrister, in defending a case, has a right to make use of all fair and even what may appear to the witness unfair means for the defence. Nothing can tend more to lower a witness in the opinion of the Court and jury, or diminish the value of his evidence, than the manifestation of a disposition to deal with his examiner as if he were a personal enemy, to evade the questions put, or to answer them with flippancy or anger. All such exhibitions invariably end in the discomfiture of the witness. It has been suggested that medical men on these occasions might take a lesson from lawyers, and observe how little they allow forensic differences, which they put on with their professional costume, to influence them in their intercourse with each other or with an adverse judge or jury.

License of Counsel.

Medical men have complained, and on many occasions justly, of the *license of counsel*. On this subject it may be well to consider what has been said by one of the highest authorities on the Bench, Chief Justice Erle:—"The law trusts the advocate with a privilege in respect to the liberty of speech which is in practice bounded only by his own sense of duty; and he may have to speak upon subjects concerning the deepest interests of social life, and the innermost feelings of the soul. The law also trusts him with a power of insisting upon answers to the most painful questioning, and this power again is in practice only controlled by his own view of the interests of truth." (Judgment in *Kennedy v. Broun*, 1862.) Thus it will be seen that almost unlimited powers of interrogation are intrusted to counsel by the law, and it is a serious question whether the unrestricted use (which it has been justly remarked means only the frequent abuse) of these enormous powers, is necessary or even favourable to the administration of justice.

One of the most severe reprimands on this abuse came

from the same learned judge in a case which was before him in 1857 ; it was addressed to a learned serjeant, now deceased, and was to this effect:—A question had been put throwing on the witness an imputation for which there was really no foundation. The learned judge then said : “The freedom of question allowed to the bar was a public nuisance, and the barrister who made such an imputation ought to be prosecuted. If a question had relation to the truth, he was most anxious it should be put ; but to cast haphazard imputations at the suggestion of a person (an attorney) who might have no scruples as to what he did, was a degree of mischief that made him wish that a party should be prosecuted. He begged leave to say that in his experience he had seen counsel so abuse their privilege, that he had cordially wished a power could be instituted that they might be prosecuted for a misdemeanour.” It is the general practice to say that the obnoxious questions are in the instructions, but a barrister can always exercise a power of putting or not putting a question which may be found there. By putting it he clearly adopts it, and frequently to the great damage of his own case. This is at present the only check upon the practice, for learned judges seldom interfere unless directly appealed to by the witness.

Privilege.

Some medical men have claimed a privilege not to answer certain questions which are put to them. No man is bound to reply to any question if the answer would tend in any way to incriminate himself—for no man is compelled to be a witness against himself. With this exception all questions must be answered, provided they are relevant to the case, and their relevancy is a matter for the consideration of the learned judge who presides.

Sometimes a witness makes a frivolous objection and refuses to answer an ordinary question, thus bringing only

ridicule upon himself. A skilled expert, at an important trial, was asked his age. Instead of answering so simple a question at once, he angrily appealed to the judge to know whether he was bound to give an answer on a matter which, as he said, could have nothing to do with the case. The judge informed him that unless he had some very strong reasons for concealing it, he had better state it. At a trial for murder by poison, when, in the course of a cross-examination, counsel for the prisoner asked the medical witness what remedy or antidote he had employed when he was first called to attend the deceased. He appealed to the judge to know whether he was bound to answer such a question as that. Judge: "Yes, unless you have reason to believe that your antidote killed the deceased. In that case you are not bound to answer it." The question was immediately answered.

As there is no special privilege granted to members of the profession, a witness must remember that there are *no medical secrets*.

In *Wright v. Wilkin* (June 1865), a suit involving the validity of the will of a lady, the only question before the Vice-Chancellor (Kindersley) was as to the costs, occasioned by the refusal of a medical witness to answer a question in reference to the disease of which the testatrix had died. The witness had attended the testatrix, and on being asked, of what disease she died, he refused to answer, on the ground of professional privilege and also that the question was irrelevant. The Vice-Chancellor said that he could not possibly see the relevancy of the question, and further, of what use it was to examine witnesses at all in the cause. No reason was given for so doing. The question of costs would, *primâ facie*, have been left till the hearing but that it was a dangerous precedent to allow a witness to decline answering on such grounds. His Honour was clearly of opinion that the witness could not claim professional con-

fidence or irrelevancy, as an excuse for not answering the question, and he must pay the costs. From this judgment it will be perceived that even the refusing to answer an irrelevant question may lead to the infliction of a heavy penalty on a medical practitioner. A man who refuses to answer a question which the Court considers to be relevant and proper, may render himself liable to imprisonment for contempt of Court.

Examination-in-Chief.

The ordinary course of proceeding is as follows:—After opening the case, the counsel for the prosecution calls the witnesses, and examines them according to the rules of evidence—that is, he brings out, by questions *which do not suggest their answers*, the facts relevant to the issue to be tried which are within his personal knowledge. Those questions which do suggest the answers, are called “leading” questions. With one exception it is not the practice to allow these to be put in this part of the examination. The exception, according to Mr. Stephen, is: “When the judge is satisfied, either by a witness’s demeanour or by contradictions between the evidence and the depositions, that he is trying to keep back the truth and favour the prisoner, he may, in his discretion, allow the counsel for the Crown to ask leading questions and, as the phrase is, to treat the witness as hostile.” When the examination-in-chief is closed, the next step is the cross-examination.

Cross-examination.

In this, the second stage, the counsel for the defence extracts from the veterinary witness, by questions *which may suggest the answers in the strongest form*, any facts that may appear to be favourable to his client, and which he believes to be within the witness’s knowledge. Leading

questions are not only allowable in this part of the examination, but, according to good authority, a counsel for the defence can hardly lead too much. The theory of the law is that the witness is unfavourable to the defendant, and has come to bear evidence against him. The more he has shown himself by conduct or conversation a partisan in the case, the more severely will he be treated. Anything which he may have said in the hearing of others, or published in journals, or even written in private letters (if the contents transpire), in reference to the case, is now brought to light, although he may have supposed that what he did say was in perfect confidence. It is at this stage of the case that any exaggerations which may have been most favourably received by the counsel for the prosecution, are reduced to their true proportions. Any bias by which the mind of a witness may have been influenced, or any imperfection or confusion of memory as to facts, is here brought out. It is in this part of his examination that a witness will be closely questioned as to his qualifications, his age, the time during which he has been engaged in practice, the accuracy of his judgment, his general professional knowledge, and his special experience in reference to the matter in issue, the number of cases he has seen, etc. Straightforward answers should be given to all these questions. No harm can be done to the witness by the answers unless they are given evasively, since it is not to be supposed that a witness wishes to represent himself differently from what he is. If he does make the attempt he will assuredly fail. The most striking distinction between the examination-in-chief and cross-examination is in reference to leading questions. It rests upon the assumption that there is a danger that a witness will say whatever is suggested to him by the one side, and conceal everything that is not extorted from him on the other. It need scarcely be observed that witnesses whose evidence is of little im-

portance in the case, are rarely cross-examined. This is reserved in its most stringent form for those whose facts and opinions are likely to affect the case. In dealing with a skilled witness whose evidence may be of importance, the questions in cross-examination are usually put by the counsel for the defence with great caution, or the answers brought out may be even more adverse to his own case than those elicited in the examination-in-chief.

Re-examination.

The cross-examination is usually followed by a re-examination on the part of the counsel for the prosecution, or of the counsel by whom the witness has been called. The object of this is to clear up or explain any portion of the evidence which may have been rendered obscure or doubtful by the cross-examination. It is sometimes unnecessary to put a question, and if the witness has given his evidence consistently and fairly, no questions may be asked. As a rule, the re-examination must be confined to those matters which have arisen out of the cross-examination. Any questions upon new subjects may render a further cross-examination on them necessary. In reference to *facts*, a veterinary witness must bear in mind that he should not allow his testimony to be influenced by the consequences which may follow from his statement of them, or their probable effect on any case which is under trial. In reference to *opinions*, when once formed should be honestly and candidly stated without regard to consequences. It will be well to remember, in reference to each stage of the examination, what a great medical authority has said:—"To make a show and appear learned and ingenious in natural knowledge may flatter vanity. To know facts, to separate them from supposition, to arrange and connect them, to make them plain to ordinary capacities, and above all to point out their useful applications, should be the chief object of ambition." (William Hunter.)

Quotations from Books.

It is a not unfrequent custom with counsel to refer to veterinary works during the examination of a witness. He is expected to have a fair knowledge of the writings of professional men on the subject of inquiry. The authority is mentioned, the passage is quoted, and the witness may be then asked whether he agrees with the views of the author or whether he differs, and if so, his reasons. In cases connected with medical treatment, the views of the profession are and have been so various, that a barrister would have no great difficulty in finding some book to oppose to the opinions of a witness. Standard works of recent date are so well known to the profession, that there are few men engaged in practice who are not well acquainted with and able to explain the views of the writers, and how far they agree or conflict with his own. The witness must be on his guard that the quotation is fairly made, and that it is properly taken with the context, or he may unexpectedly find himself involved in a difficulty. On one occasion a learned gentleman stopped in his quotation at a comma, and on another occasion the quotation ended at a colon, the remainder of the sentence in each case materially weakening the inference which it was intended to draw with the apparent sanction of the witness.

When a quotation from a standard work is thus opposed to the evidence of a veterinary witness, he should take care by reference to the work itself to see that the passage is correctly quoted. A reference at the time to the work which is quoted, is always necessary if any use is to be made of a quotation. Without suggesting that there is intentional misrepresentation to bear out a particular view of the case, a barrister, in dealing with the medical facts, may wholly misunderstand the author's views and statements, and in

some instances wrongly assign to the author himself opinions which he has merely quoted from other authorities for comment or illustration.

Presence in Court.

In England scientific witnesses, except under special circumstances, are allowed to be present in court and hear the whole of the evidence in a case. This is in some instances absolutely necessary if the Court requires medical opinions, for unless the witnesses are fully acquainted with the facts they can give no opinions, and they can only become well acquainted with the facts by being allowed to be present and hearing the evidence in court. If excluded, the judge or counsel will be compelled to read to the witness notes of the evidence before an opinion can be given, and it may then appear that some small point which counsel did not think of importance, has been omitted; this, if known to the witness, might, however, materially affect his opinion. A failure of justice is likely to occur when medical witnesses are excluded, and it is generally when there is no defence or a false defence that the right of excluding them is exercised. The rule in Scotland is similar; scientific witnesses are allowed to be in court during the trial.

Browbeating and Intimidation—Wilful Misstatement of Witness's Evidence.

There are many obligations which affect each side equally. Neither is at liberty to attempt to browbeat, intimidate, or confuse a witness, although they may expose any real confusion which exists in his mind, or test, by the strictest cross-examination, the accuracy of his statements. Neither is at liberty wilfully to misunderstand a witness, or to *misstate, in his address to the jury*, the effect of what he has said, either by distortion or suppression. The neglect or

observation of these and other rules of the same kind practically establishes a wide distinction, and one which is easily recognized between those who exercise a noble profession and those who disgrace it.

The treatment of a veterinary witness, in passing through the ordeal of an examination, will depend very much upon the class of counsel who is opposed to him. Assuming that he is properly prepared for the discharge of his duties, and that the questions put to him are answered fairly and truly, according to his knowledge and experience, without exaggeration or concealment, he has no reason to fear any attempt at intimidation. Barristers, for the most part, know that by this line of conduct they lose more with the jury than they gain by the attempt to confuse the witness; and as their ultimate and sole object is a favourable verdict, they will generally avoid conduct which must necessarily place this verdict in jeopardy.

The normal barrister, as depicted by Mr. Fitzjames Stephen, is not at liberty, in his address to the jury, to misrepresent, either by distortion or suppression, the medical facts or opinions given in a case. According to my experience, however, misrepresentation is a not unfrequent practice, and one of which veterinary witnesses have very strong reason to complain. Whether such misstatements are wilful or not it may be difficult to determine, but their effect on the jury is well known to those who employ them; and they frequently escape the observation of the counsel on the other side, and even of the learned judge, unless he is well versed in veterinary subjects. It is also worthy of remark, that if a misstatement is thus made, it is, by a remarkable coincidence, always in favour of the view of the counsel who makes it, when a proper examination of his notes would, in general, show him that he was wrong.

Then, as to the question of intimidation, this is sometimes carried very far. "On your oath, sir, and in the face of the

whole profession, will you venture to persist in that statement?" etc. Again, the intimidating modes of address—"Do you mean to swear?" "Will you pledge your professional character?" etc., intermingled with the admonitions, "Pray be careful," "Be cautious," etc.—of course suggest to the witness that his examiner already regards him as perjured, and that however truly he may state the facts within his knowledge, he will not be believed.

A public writer, in commenting on this subject, says, "But the hardest and most unfair part of the system (of cross-examination) is when witnesses have to bear a loud and insulting tone or gesture without remonstrance or retaliation. A counsel may very plainly imply that a respectable witness is a person of doubtful character, and not to be believed on his oath, or that he is ignorant, and a bungler in his profession; but if the witness retorts that the barrister's eloquence and sympathies are hired, or if he gives vent to any other words of retaliation in his natural indignation, the Court is against him." At the trial of Kelly for the murder of Police Constable Talbot (*Reg. v. Kelly*, Dublin Commission Court, November 1871), Mr. Tuffnell, a surgeon of repute, and formerly Professor of Surgery, was summoned as a witness for the prosecution. Having deposed to the nature of the wounds, and that the deceased had died from the effects, he was subjected to the usual ordeal of a cross-examination, but in a somewhat unusual form. Counsel for prisoner having begun by addressing him in a loud and offensive tone, he turned to the Chief Baron, and said, "My Lord, I am very excitable, and if this gentleman has a right to roar at me, I consider that I have a right to roar too." The Court expressed a hope that it would not be necessary for him to roar, and intimated, after a short trial of vocal strength between the two opponents, that counsel's manner to the witness was not what it ought to be. Counsel disclaimed any intention of being offensive, but claimed the

liberty which is usually conceded in cases of importance. Whatever may be the importance of a case to a prisoner, *nothing can justify the putting of questions in a loud and insulting tone to a skilled professional witness.* The very mild rebuke administered to counsel on this occasion was not likely to produce much effect, and accordingly this trial presents, in a concentrated form, all the defects of our method of getting at truth by cross-examination. The result is seen in the unsatisfactory nature of the verdict, which was against the medical and general evidence in the case.

**Witness should be Master of his Subject, and
clear in his own Mind.**

However anxious an incompetent witness may be to appear learned, and however hard he may labour to show it, he will ever find it a difficult business to make the Court and counsel believe that he is really so. To appear really learned he must be able to make the subject on which he gives an opinion *clear*, and to give *satisfactory reasons* for this opinion. He must be not only a thinker, but must satisfy others that he is master of the subject. Take almost any one of the important scientific questions upon which a professional witness is called to pass an opinion, and unless he has *looked at the subject before with a purpose to understand it*—comprehending its extent, weight, and relations—he will find it to have suddenly assumed an importance he has not suspected, just at the time when the discovery will add to his confusion. It is better to make this discovery in the quiet stillness and security of solitude, than under the eye of a judge and the severe scrutiny of counsel. A man, whether learned or not—whether in court or out of court—will talk clearly upon a subject he well understands, whether it is scientific or otherwise; but *unless it is clear*

in his own mind his account of it will be confused and unsatisfactory. This is undoubtedly the test to which every man should rigorously submit himself before entering the witness-box. The case should be viewed in all possible aspects; and if an opinion has been formed, it should be dealt with and criticised as if it were that of an adversary. As in controversy, a disputant should place himself as much as possible in the position of his antagonist, and see the question from his point of view. In this kind of self-examination it may be well to remember two points—first, that there is no opinion so certain as that the human mind, if left to itself, will not infallibly raise a difference of opinion upon it; and secondly, that a man is never so near an error as when he claims a complete immunity from error.

Rules for the Delivery of Evidence.

There are a few rules bearing upon medical evidence which, if observed, may save the witness from interruption or reproof and place him in a favourable position with the Court.

Direct Answers.

The questions put on either side should receive *direct* answers, and the manner of the witness should not be perceptibly different, whether he is replying to a question put by the counsel for the prosecution or for the defence.

Most of the questions put by counsel in cross-examination will admit of an answer "yes" or "no." If, from the ingenious or casuistical mode in which the question is framed, the witness should feel that the simple affirmative or negative might mislead the Court, then, after giving the answer, he can appeal to the judge to allow him to qualify it, or add to it any matter within *his own knowledge* and which is at the same time relevant to the case. The witness must remember

that he takes an oath to state the truth, *the whole truth*, and nothing but the truth. On the other hand, while the counsel for the defence is bound not to introduce falsehood, his object is *not* the discovery or development of truth. Unless the witness is on his guard, he may find, when the learned counsel who has cross-examined him addresses the jury, that his affirmatives and negatives may be worked into a shape representing the reverse of what he intended.

Counsel's dodge of putting more than one question at the same time.

Some counsel adopt the ingenious plan of compressing two or three questions into one. A witness unthinkingly answers the last, or that which most fixes his attention. The same answer may not be strictly applicable to all, but the witness may find, when too late, that it is made so in the defence. In this case he should ask for a severance of the questions and give separate replies.

Direct answers are necessary, because it is only by them that the case can be brought clearly before the Court and jury in all its details. Medical witnesses sometimes forget this, and fall into answers to questions floating in their own minds, or which they think are likely to be put to them. They are also sometimes disposed to anticipate many questions by one general answer. This simply creates confusion, and the witness will be told by counsel to keep to the question, and that he is coming to the other matters presently.

Argument not Evidence.

Care should be taken by a medical witness not to argue with the learned counsel. Argument is not evidence, and the entering into it disturbs the order of the proceedings. Arguments between counsel and witnesses, and even between

medical witnesses themselves, are freely allowed in the French Courts, but in England such a practice is not recognised. The mode in which questions are put by counsel in cross-examination sometimes tends to the introduction of argument, but the witness should avoid the temptation to enter into it. What he says under such circumstances is not evidence, except in the form of answers to questions, and he is there only for the purpose of stating what is relevant to the case.

Evidence not Testimony.

There is a difference between evidence and testimony. A medical witness sometimes gives much in the form of testimony which amounts to very little as evidence. When he does not attend to the questions, he testifies to a variety of subjects which have no bearing on the case, and do not constitute evidence. The decision on what is and what is not evidence lies with the judge.

Slow and Distinct Speaking Essential.

The replies should be concise, distinct, and audible, and, except where explanation may be necessary, they should be confined strictly to the terms of the questions. The learned judge who tries the case, generally takes full notes of the medical evidence—hence the necessity for a slow and distinct delivery of the evidence. Some witnesses have a singular habit of not answering the question which is asked, but one which is not asked. Others give an answer in such a voluble form, in the shape of a small speech or lecture, that there is great difficulty in reducing it to its proper proportions. A witness who is so profuse of information generally supplies abundant matter for a long and troublesome cross-examination.

Volunteered Evidence.

It has been a question whether a witness should volunteer evidence, assuming that the examination-in-chief and cross-examination have failed to bring out all that he knows of the case. If that which he has to state is some matter of fact within his own knowledge, or an opinion based on facts within his knowledge, he will be allowed, on application to the judge, to make the statement in spite of the efforts of counsel on either side to shut it out.

Avoid Technical Terms and Ambiguous Matters.

It is scarcely necessary to observe that the language in which the answers are returned should neither be technical nor metaphorical. Counsel who are unacquainted with veterinary medical terms frequently misapply them, or use them in a wrong sense. A judicious witness will avoid anything like a triumph over his examiner under such circumstances, and simply put him right.

An ambiguous answer necessarily leaves the witness's meaning doubtful, and calls for an explanation. An undecided answer—indicated by the words "I believe," or "I think," or "It might be," is not sufficient for evidence. If, by a proper consideration of all the medical facts, the witness has come to a conclusion on the subject, his answer should be expressed in plain and decided language, either in the affirmative or negative. A man who has formed no conclusion is not in a position to give evidence. No opinion should be given for which the witness is not prepared to assign reasons; and, except by permission of the Court, no medical opinion should be expressed on facts or circumstances observed by others. A hesitating witness will be met with the question, Have you any doubt about it? or, Was it so or not?—to which a reply in the affirmative or negative must be given. If the witness fairly entertains

doubts about the matter at issue, it is his duty to express them, and not allow them to be extorted from him piecemeal by a series of questions.

The replies should be made in simple language, free from technicality. If medical men could be made aware of the ridicule which they thus bring on their evidence, otherwise good, they would at once strive to dispense with such language. A witness is perhaps unconsciously led to speak as if he were addressing a medical debating club, instead of plain men like the members of a common jury, who are wholly ignorant of the meaning of medical terms, and barristers who are but imperfectly acquainted with them. There are few Assizes which do not afford many illustrations of the injury done to scientific evidence and the clear understanding of a case, by the technical language in which it is given. A Court may be told that the "*integuments* were *reflected* from the thorax, and the *costal* cartilages laid bare, when a wound was found which had penetrated through the anterior *mediastinum*," and had involved the arch of the aorta, etc. A simple cut in the skin is described as "an incision in the integuments." In a case of alleged child murder, a medical witness being asked for a plain opinion of the cause of death, said that it was owing "to atelectasis and a general engorgement of the pulmonary tissue." On a trial for an assault which took place at the Assizes, some years since, a surgeon, in giving his evidence, informed the Court that, on examining the prosecutor, he found him suffering from a severe contusion of the integuments under the left orbit, with great extravasation of blood and ecchymosis in the surrounding cellular tissue, which was in a tumefied state. There was also considerable abrasion of the cuticle. "*Judge*: You mean, I suppose, that the man had a bad black eye? *Witness*: Yes. *Judge*: Then why not say so at once?"

This is not science but pedantry, and if such language is

employed by a witness with a view of impressing the Court with some idea of his learning, it wholly fails of its effect. Barristers and reporters put down their pens in despair, and the time of the Court is wasted until the witness has condescended to translate his ideas into ordinary language. Lord Hatherley well observes that "a scientific witness, in giving his evidence, should avoid as much as possible the use of technical scientific language, if the case is before a jury. This is especially desirable when the evidence is medical, for really many technical words in medicine seem to be invented to cover ignorance. But be this as it may, a witness is always suspected of affectation, and the Court and jury are but little instructed when a vast amount of learned phraseology is poured forth instead of a clear statement of the witness's opinion."

Medical Opinion is not to be Based on the Statements of Others or Public Rumour.

In giving evidence of *opinion* a medical witness must take care not to base it on any statements made by others, or on circumstances which may have come to his knowledge by public rumour. Again, his evidence should be confined only to subjects properly within the range of medical science, and on which, as a professional man, he is competent to speak.

Use of Exaggerated Language to be Avoided.

There is a great tendency among some medical witnesses to express their views in the superlative degree. If a part is simply inflamed, it is frequently described as "intensely" inflamed. One witness may speak of patches of ulceration in the intestines, another will describe the same condition an "extensive ulceration."

THE END.

A FEW OF THE PUBLICATIONS
OF
BAILLIERE, TINDALL, AND COX.

THE VETERINARY JOURNAL,

And Annals of Comparative Pathology.

Edited by GEORGE FLEMING, Veterinary Surgeon, 2nd Life Guards.
Established to promote the interests of the Veterinary Profession, independent of every school or party. Published on the 1st of each month. Price 1s. 6d.

NEW WORK FOR STOCK-BREEDERS.

About 800 pages, royal 8vo, with 212 Illustrations, price 30s.

A Text-Book of Veterinary Obstetrics, including the diseases and accidents incidental to pregnancy, parturition, and early age in the Domesticated Animals. By GEORGE FLEMING, F.R.C.V.S., F.G.S., Editor of *The Veterinary Journal*, Member of Council and of the Examining Board Royal College of Veterinary Surgeons, etc.

By the same Author.

The Contagious Diseases of Animals: their influence on the health and wealth of the nation. Read before the Society of Arts. Price 6d.

The Management and Diseases of the Dog. By J. W. HILL, M.R.C.V.S. Price 10s. 6d.

An Introduction to Practical Histology. By GEORGE THIN, M.D. Price 5s.

"This is by far the best text-book for the veterinary microscopist that has yet been issued."—*Veterinary Journal*.

Field Geology, with a Section on Palæontology. By W. HY. PENNING, F.G.S., of H.M. Geological Survey, and A. J. JUKES-BROWNE, B.A., F.G.S., of H.M. Geological Survey. Illustrated with wood-cuts and coloured map. Price 6s.

The Text-Book of (113) Anatomical Plates, designed under the direction of Professor MASSE, with Descriptive Text. By E. BELLAMY, F.R.C.S., Professor of Anatomy, Science and Art Department, South Kensington; Senior Assistant Surgeon and Lecturer in Anatomy and Operative Surgery, Charing Cross Hospital. Second Edition, plain, 21s.; coloured, 42s.

A Treatise on Pharmacy, designed as a Text-book for Students, and as a Guide for the Physician and Pharmacist, containing the officinal and many unofficinal Formulas, and numerous examples of extemporaneous Prescriptions. By EDWARD PARRISH, late Professor of the Theory and Practice of Pharmacy, Philadelphia College. Fourth Edition, enlarged and revised by THOMAS S. WIEGAND. With 280 Illustrations, half-bound morocco, 30s.

Chemistry in its application to the Arts and Manufactures. A Text-book by RICHARDSON and WATTS.

Vol. I. : Parts 1 and 2.—Fuel and its Applications. 433 Engravings, and 4 Plates 71 16s.

Part 3.—Acids, Alkalies, Salts, Soap, Soda, Chlorine and its Bleaching Compounds, Iodine, Bromine, Alkalimentary, Glycerine, Railway Grease, etc., their Manufacture and Applications 11 13s.

Part 4.—Phosphorous, Mineral Waters, Gunpowder, Gun-cotton, Fireworks, Aluminium, Stannates, Tungstates, Chromates and Silicates of Potash and Soda, Lucifer Matches 11 1s.

Part 5.—Prussiate of Potash, Oxalic Acid, Tartaric Acid. Many Tables, Plates, and Wood Engravings 11 16s.

Parts 3, 4, and 5 separately, forming a complete

Practical Treatise on Acids, Alkalies, and Salts; their manufacture and application. In 3 vols. £4 10s.

The Principles of Theoretical Chemistry, with special reference to the constitution of Chemical Compounds. By IRA REMSON, M.D., PH.D. Price 6s.

New Manual of Physiology. By PROFESSORS KUSS and DUVAL, of Strasbourg. Translated by Professor Amory, M.D. Illustrated with 150 Engravings, 10s. 6d.

Our Trip to Burmah, with Notes on that country, by Surgeon-General GORDON, C.B., M.D., Principal Medical Officer Madras Presidency, Physician to H.M. the Queen. Illustrated with Photographs, Coloured Lithographs, and Sketches by native Artists. Price 21s.

Works by the same Author.

Lessons in Hygiène and Surgery, from the Franco-Prussian War. Reports prepared while on Special Service, on behalf of Her Majesty's Government, with the Army in Paris. Illustrated, 10s. 6d.

- A Manual of Sanitation**; or, First Help in Sickness and when Wounded. A pocket companion for officers and privates of the regular and volunteer services at home and abroad, in peace and in war. Cloth, 2s. 6*d.*; or paper wrapper, 1s.
- Life on the Gold Coast.** Being a Full and Accurate Description of the Inhabitants, their Modes and Habits of Life; interspersed with amusing Anecdotes, Hints to Travellers and others in Western Africa. Price 2s. 6*d.*
- A Manual of Hygiène, Public and Private,** and Compendium of Sanitary Laws, for the information and guidance of Public Health Authorities and Sanitarians generally. By CHARLES A. CAMERON, M.D., F.R.C.S., Professor of Hygiène, Royal College of Surgeons, Medical Officer of Health and Analyst for the city of Dublin. With Illustrations, 10s. 6*d.*
- The Sewage Question:** a Series of Reports. Being Investigations into the condition of the Principal Sewage Farms and Sewage Works of the Kingdom from Dr. LETHEBY'S Notes and Chemical Analyses. Price 4s. 6*d.*
- Short Lectures on Sanitary Subjects.** By RICHARD J. HALTON, L.K.Q.C.P., L.R.C.P. Edinburgh, L.R.C.S.I., etc., Medical Officer of Health to Kells. Price 5s.
- Notes on Nuisances, Drains, and Dwellings:** their Detection and Cure. By W. H. PENNING, F.G.S. Second Edition, 6*d.*
- Food; its Varieties, Chemical Composition, Nutritive Value, Comparative Digestibility, Physical Functions and Uses, Preparation, Culinary Treatment, Preservation, Adulterations, etc.** By the late HENRY LETHEBY, M.B., M.A., Ph.D., etc., Professor of Chemistry at London Hospital, Food Analyst and Medical Officer of Health to the City of London. Second Edition, enlarged, 5s.
- Affections of the Throat and Larynx.** By ARTHUR TREHERN NORTON, F.R.C.S. Second Edition, Illustrated, 6s.
- Overwork and Premature Mental Decay:** its Treatment. By C. H. F. ROUTH, M.D., M.R.C.P., London, President of the Medical Society of London, Senior Physician to the Samaritan Hospital for Women and Children. Third Edition, 2s. 6*d.*

The Philosophy of Voice. An Essay upon the Physiological and Physical Action of the Breath and Vocal Cords in the Production of Articulate Speech, conjoined with Vocal Utterance. By CHARLES LUNN. Fourth Edition, 1s. 6d.

Consumption, its True Nature and Successful Treatment, with Appendix of Cases. By GODWIN TIMMS, M.D. London, M.R.C.P., Senior Physician to the North London Consumption Hospital, Consulting Physician to the Western City Dispensary, etc. 2nd edition. Price 10s. 6d.

Third Grade Perspective, comprising Angles and Oblique Perspective, Shadows and Reflections, specially prepared for the use of Art Students by R. J. DENNIS, Art Master Lambeth School of Art, First Assistant Drawing Master Dulwich College, etc. With Introduction by J. SPARKES, Head Master of National Art Schools, South Kensington. Half-bound, 15s., or in 12 parts, 1s. each.

In preparation.

Artistic Anatomy for the use of Students in Schools of Art. By JOHN SPARKES, Head Master of the National Art Schools, South Kensington.

Anatomy of the External Forms of Man: designed for the use of Artists, Sculptors, etc. By Dr. J. FAU. Twenty-nine Plates. Folio. Plain, 24s., coloured, 42s.

Practical Guide for the Young Mother. Translated from the French of Dr. BROCHARD, late Director-General of Nurseries and Crèches in France, Edited with Notes and Hints for the English Mother. Crown 8vo., 2s.

The Building of a Brain. By the Author of "Sex in Education." Crown 8vo, price 6s.

The Breath, and the Diseases which give it a Fœtid Odour. By J. W. HOWE, M.D., Clinical Professor of Surgery in the University of New York. Price 4s. 6d.

The Body and its Ailments: a (family) hand-book of familiar directions for care and medical aid in the more usual complaints and injuries. By GEORGE A. NAPHEYS, A.M., M.D. With over 100 Illustrations. Price 6s.

Medical Men and Manners of the Nineteenth Century. By Αιθιάσσεινιτος. Price 2s.

Revelations of Quacks and Quackery. A Directory of the London and Provincial Quack Doctors; with Facts and Cases in Illustration of their Nefarious Practices. By F. B. COURTENAY, M.R.C.S. Eng. Twenty-fifth thousand. Price 1s. 6d.

