THE

VETERINARY RECORD

AND

TRANSACTIONS

OF THE

VETERINARY

MEDICAL ASSOCIATION.

VOL. VI.

PRICE 10*s*.

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VETERINARY RECORD,

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TRANSACTIONS

OF THE

VETERINARY MEDICAL ASSOCIATION.

EDITED BY

PROFESSORS SPOONER, SIMONDS, AND MORTON,
ROYAL VETERINARY COLLEGE.

VOLUME VI.

ILLUSTRATED BY ENGRAVINGS AND WOODCUTS.

"PRÆSTAT IN OMNIBUS EXPERIENTIAM STRICTE PREMERE; UT ET, NATURÆ ORDINEM SEQUI."

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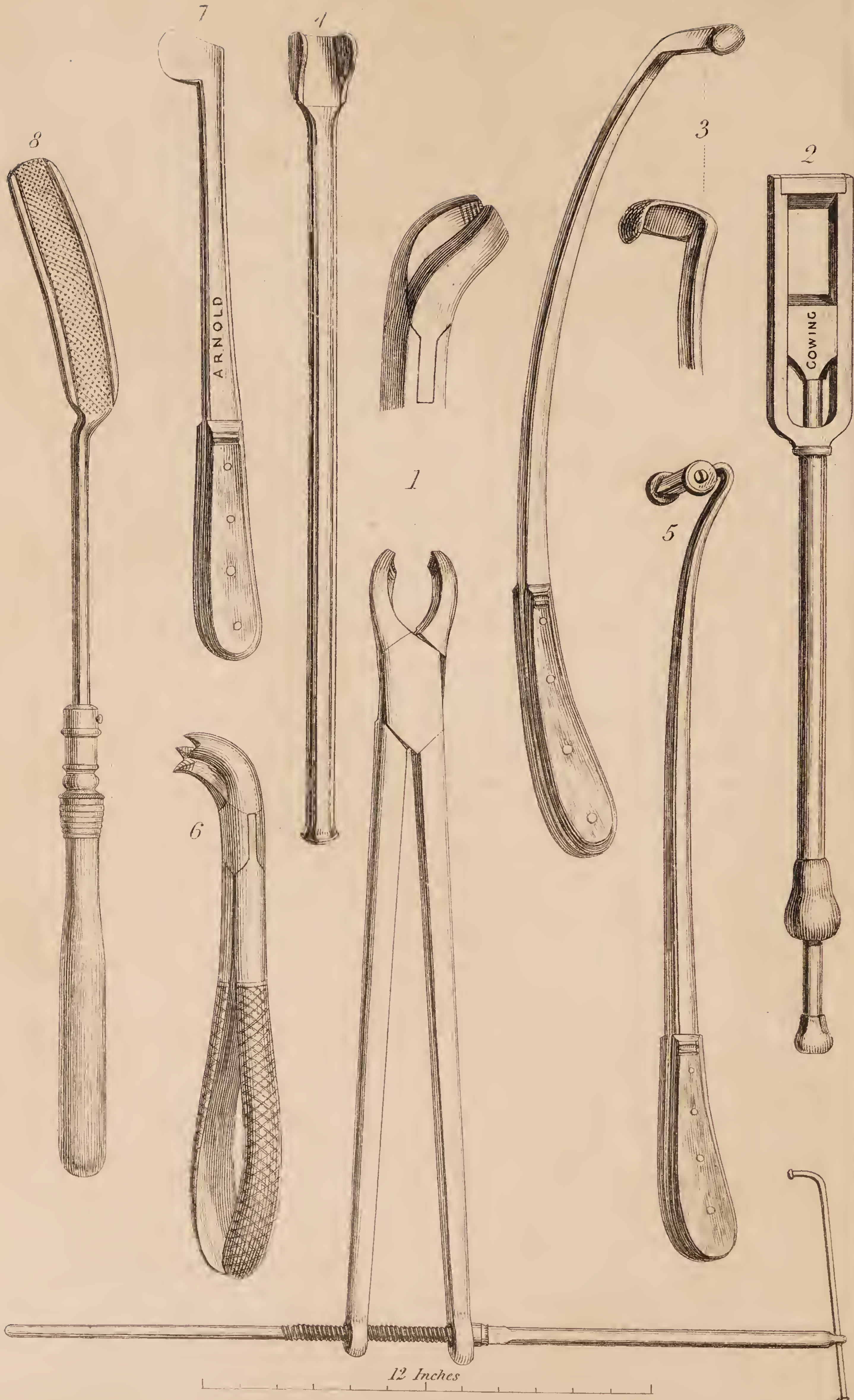

Cowing's Dental Instruments for the H

THE

VETERINARY RECORD, &c.

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ROYAL VETERINARY COLLEGE.

THE Medical Session at this Institution was opened on Monday, October 8, 1849. The Introductory Lecture was delivered by Professor Spooner to a very full class. Many visitors and members of the profession were also present, the theatre being filled to overflowing.

INTRODUCTORY LECTURE.

By Professor Spooner.

Gentlemen,

The first day which introduces the teacher to his future class is always one of some anxiety on his part, though not unmingled with the most pleasing anticipations; whilst, if I may interpret your feelings by my own when I was a student, the opening of a fresh session is to you also a time, not, indeed, without its anxieties, but one of lively hopes and good determinations. You have, it is true, quitted your homes and put away holiday things; but this is the lot of us all. Throughout our career in this world we are destined to be constantly going out into public usefulness, and making pleasure subservient to business. Holidays and leisure-days are intended to be nothing more than times of refreshment between our honourable toils. This conviction, I trust, will be deeply stamped upon your minds. Among you I see many new faces, and many also with whom I am already acquainted. The latter—our old and respected pupils—must introduce us to our younger class. The important labours of your teachers, gentlemen, will be rendered lighter and easier from their having the ear, in the first place, of those who have well conducted themselves in this Institution for one or two preceding sessions, and I would impress upon the old pupil this responsibility: example is his function, and, whether for good or evil, it cannot fail to be very influential. On the other hand, I would conjure the new pupil to follow none but the best. By taking heed to these duties and precautions, we shall all, professors and pupils, have a pleasant and profitable session.

You are come here to learn the veterinary art, and the sciences on which it reposes. The word "veterinary" is derived from the Latin verb *veho*, signifying to carry; whence the adjective *veheterinus* or *veterinus*, applied to beasts of burden or of carriage. This was the first signification: the term "veterinary," however, has long been used in a much wider sense; and we now mean by the veterinary science whatever pertains to the curative treatment, and even to the preservation of the health, of any or of all the domesticated animals. The horse, the cow, sheep, swine, and dogs, are the principal subjects with which our profession has to deal in Europe: in other continents various other animals, as the elephant and the camel, are also objects of veterinary skill. The field then, gentlemen, before us is wide, and there is no amount of intelligence or of industry which will be too great for its cultivation. Bear this in mind, and do not imagine that you are come here to learn any narrow or low calling.

The practice of your profession is what may be termed the veterinary art; and of this you must lay the foundation by an unwearied observation of the practice of the College. Doubtless many of you are already not unacquainted with practice; you will, however, within these walls enjoy frequent opportunities of extending your knowledge in this department. You will be able to profit by the remarks and practice of your Professors; and by taking notes, and comparing them among yourselves, of the cases under treatment in the Infirmary, and participating with your teachers in their feelings of responsibility as to the well-doing of the patients, you will also be very materially benefitted. Let me entreat you diligently to cultivate that faculty of observation with which you are all endowed; and very important for this purpose you will find punctuality in your attendance at the College. A punctual pupil gives the first evidence of a determination to learn; a regular pupil loses no opportunity, but watches the cases from day to day, and leaves out nothing which experience can teach him, but carries away a bright copy of it in his head, useful for his future career in life. Therefore, gentlemen, I repeat, be punctual to the hour of College instructions, and also be regular from day to day.

If there be any old pupil who now hears me, and whose conscience accuses him of deficiencies in these respects, let him henceforth turn over a new leaf; let him determine to be honest to his time; let the opening of this new session be to him the opening of a new mind and a new course of action. It is not too late for amendment. The vigorous decision to do better will go far to enable him to make double use of time, and to accumulate useful information with double rapidity.

I have spoken of the veterinary art as meaning the practice of our profession: let us now say a few words on veterinary science. Science is the support of art. Knowledge makes practice sound. The difference between the uneducated farrier and the veterinary surgeon is, that the farrier has, it is true, to a certain extent, the art, but it is unsupported by the science, and the practice of any art under such circumstances must indeed be both poor and dangerous; while the latter, by combining science with art, is enabled to pursue his professional avocations with that confidence and success which cannot fail to insure to him the respect and support of those by whom he is employed. The science, then, must be wedded to the art, and safe practice will be the offspring. If I am asked, what are the sciences on which the proper cultivation of veterinary medicine depends? my answer is, anatomy, physiology, and pathology, supported by materia medica and chemistry, and, I may also add, the science of agriculture. Of these various divisions, pathology, to my mind, stands foremost: it means the science of disease, and its study embraces all those signs and symptoms which belong to peculiar diseases, and which distinguish them from each other. When you are good pathologists, you will read the disease in the symptoms; and by careful observation you will avoid the often serious error of confounding one malady with another. Any particular disease, may be likened to some instrument out of repair; for diseases are not abstractions, but animal instruments or organs out of order. In this case it is clearly important that the part which is deranged should be taken to the right person to be mended;

as it is, for instance, that my snuff-box should not go to the watchmaker's, nor my watch to the ironmonger's. Now pathology, with practice, is the science which will directly teach you to what particular treatment or mode of cure you are to take your disease so as to get your patients relieved.

Pathology, however, is not to be learned by a mere observance of the outward signs and general appearances of our patients. You will readily believe, gentlemen, that we want to know disease more thoroughly than such means could alone by possibility inform us. The inside of our patients is frequently the seat of disease; and we cannot learn the inside of any machine, be it ever so simple, by confining our examination of it to its outer case. What then, I would ask, can we be expected to know of the nature of the disarrangement incidental to the complicated machinery of an animal body, if we do not carefully and minutely inspect its internal parts, or, in other words, acquaint ourselves with the structure and functions of the various tissues of which it is made up, by bringing to our aid anatomy and physiology? Anatomy, to the scientific mind, is one of the most comprehensive, delicate, and beautiful of all the arts and sciences—fit work for the understandings of men, and the taper fingers of ladies. You must not, however, make a plaything of anatomy, but always study it in its important bearings upon physiology, pathology, and practice. The mind in its pursuits should go with every movement of the finger and of the scalpel. Anatomy is either *pathological* or *healthy*, according as you inspect those animals that have died of disease, or those which have been killed for scientific purposes. Pathological anatomy enables you to extend your knowledge of symptoms, to compare signs during life with the appearances after death, to observe whether your diagnosis or view of the nature of the disease, has been true or not, and to correct your future practice accordingly. Healthy anatomy, on the other hand, teaches you what are the appearances of parts during life, without which you would be unable to say when they were diseased. Anatomy is also of the utmost importance in all surgical operations; for great indeed must be the temerity of that man who would dare to thrust his knife into a living machine without knowing well the parts that he was cutting. You perceive then, gentlemen, already that there is a chain of these sciences, that they are useful to each other, and that if you neglect any one of them you will be but bungling practitioners.

Gentlemen, there is one other branch of veterinary science of which I have not yet spoken, but without which the rest would be quite incomplete ;—I allude to materia medica and pharmacy. Materia medica is properly *the matter of medicine;* it is medicine in the shop ; the administration, action, and doses of medicine are the lessons of this science. It teaches you, as it were, to put disease and cure together in a sound practice. For this purpose you must know the name, nature, and appearance of all your drugs ; you must become acquainted with their preparation, and their action upon the animal body ; and you should never cease to observe and to experiment, in order to increase your knowledge on this subject. Every case in the College to which you do justice will improve your acquaintance with materia medica, and leave you abler practitioners than it found you.

Then, there is chemistry also. Chemistry is to materia medica what anatomy is to pathology : it leads you into the very interior of the various substances you use in your practice ; and it teaches you, moreover, what are the particular elements and parts in the different agents you employ in the treatment of disease : indeed, many of our most valuable drugs are artificial chemicals, and would never have been known but for the cultivation of this science. Besides which, chemistry is a study which cannot fail to improve your minds, give you larger and more comprehensive views, and educate you for that station which the scientific practitioner ought to fill. Neglect, therefore, no opportunity to give chemistry its due attention.

Now, though I ought to speak with modesty on this topic, yet I hesitate not to state my conviction that the students of this Institution will have themselves to blame, if, when they are prepared to leave these walls for the more active and arduous duties of the practice of their profession, they do not carry away with them a good stock of sound knowledge upon these various branches of veterinary science. I am happy to have to announce to you, that Professor Sewell (although for some years past, in consequence of the state of his health, he has vacated the lecture chair) still continues to preside over this Institution. He will at all times be found accessible to the pupil, and ready, as heretofore, to supply him with those valuable clinical instructions for which his long experience so peculiarly fits him. I am proud to be numbered among Mr. Sewell's colleagues. Half a century of honest industry and useful service is the simple crown which adorns his brow. I know not what citizen could look for a better; I only wish the same for myself and every one of you, as our lives draw on. To my colleague, Professor Simonds, is committed the task of delivering the lectures upon that part of our science which applies to cattle and the domesticated animals generally, excepting the horse. Of his instructions I need only say that they have received the high stamp of the approbation of *the Royal Agricultural Society of England,* which body signifies its satisfaction with Professor Simonds, by requesting him to lecture before its members at their annual meetings. It is valuable that we enjoy so lively a testimony to the Professor's efficiency upon a subject of such vast extent and difficulty, and which may be said to be comparatively new to the College; for until his appointment it must be admitted that this very useful branch of our art had not been cultivated as its importance deserved.

Professor Morton will instruct you in chemistry and materia medica. It is fortunate for the College that it possesses a teacher who may be said, to a great extent, to have created the science he expounds. What the veterinary materia medica was before Mr. Morton touched it, and what it is now, are two very different things. The subject forms a clear and compact piece of knowledge in Mr. Morton's admirable *Manual.* It may seem invidious to speak of the graces and manners of any of my colleagues at the lecture-table; yet I imagine I speak all your sentiments when I say that our friend Mr. Morton possesses in an eminent degree the qualifications of an attractive as well as a solid teacher. You will also have an opportunity from him of pursuing your chemical studies, and of watching the excellent experiments with which he illustrates his lectures. I have not said much of chemistry, for it will receive at least its proper advocacy from his eloquent tongue.

The dissecting-room must claim a good portion of your time: it is there especially that you will acquire the knowledge that will broadly distinguish you from the empiric in your profession. I have many times, on former occasions, when addressing my class, emphatically said that which I now repeat,—Gentlemen, *you must dissect.* I have the fullest confidence in the ability and good-will of our demonstrator, Mr. Varnell, to give you assistance in practical anatomy, and to smooth the difficulties attendant upon dissection. Mr. Varnell also further assists me by extending his anatomical instructions to the theatre, where, I trust, for your own sakes, and for the sake of the body you aspire to represent, you will be diligent in your attendance on him. I have observed Mr. Varnell's career for several sessions, and I should be wanting in expressing my feelings if I did not tender to him my public thanks for his uniform straight-forwardness and capacity. The industrious student has ever found a friend in him.

The lectures on the anatomy and physiology and on the diseases of the horse will be delivered by myself.

Gentlemen, the importance of your profession has been recognized from the earliest ages; and no wonder, for the domestic animals have always been the friends and helpers of man. The primitive history of the veterinary art is involved in the same obscurity which clouds the beginning of all the arts; and I feel that I cannot profitably dwell upon a subject where there is so little knowledge and so much mere conjecture. I may, however, observe that the geographical history of the subject is more satisfactory and interesting. Let us look at it for a few moments.

A considerable part of the earth, as you well know, is still inhabited by savage tribes; and it is one of the peculiarities of the savage that he keeps no domestic animals: he hunts, shoots, and kills, but he does not tame. Animal life ceases before his destructive footsteps. He does not want our noble art, for he has nothing alive to keep or to cure. There may be some exceptions, but I am speaking of the rule.

Another order of society opens, and we discern man many grades higher, existing in the patriarchal state: there he is, living in clans, and surrounded with flocks and herds. Asia still affords us specimens of patriarchal life. If you wish to know what it is, you will have only to read your Bibles. Abraham, Isaac, and Jacob, were patriarchs, whose wealth consisted in cattle. Agriculture and the breeding of stock are the distinguishing branches of industry cultivated by men in such a state. Now, however, the horse is in some request among patriarchal clans. The stock-keeper visits his herds on their wide pastures, and the horse is probably his locomotive. Something like this state of things exists in our own Australian colonies. The veterinary art is at a low ebb there. The breeder of stock speculates upon casualties of death and increase, and strikes his balance between them. He thinks but little of art or of medicine.

Turning over a new leaf in the natural history of our species, we come to another form of society. Those great barbarian empires of which China, India, and I might almost say Russia, are prominent specimens. Force and war are the spirit of barbarism, and the war-horse is its noblest emblem. What a difference from the patriarchal state!—the stock-keeper on the one hand visiting his peaceful pasture-lands; the conqueror, on the other, on plains resounding with cavalry, caparisoned horses, and chariots, and the stern front of war. Barbarism is a powerful form of society, lasting sometimes for thousands of years; and a good part of its wealth consists in its herds and flocks, while its horses are absolutely necessary to its political state. There is no reason why veterinary science should not have some cultivation in such empires, excepting this important one,—that the spirit of war or of barbarism is opposed to progress, which is the spirit of science; and without science the veterinary art cannot thrive.

One more geographical page, and I dismiss this subject. Civilization, gentlemen, is to us and to our art the most important leaf to which we can turn: it has created *our* science, and *all* the sciences. Now civilization has two opposite ends,—the lords of the soil and the people at large. In other words, civilization is a contest between town and country, landed and commercial interests, and in this contest or competition it lives and moves. The lords had the best of it at the beginning of civilization, when the people were under their sway. Barons and knights, you know, were fond of good horses: they rode at forays, and tilted at tournaments; and the steed and the man were almost as close friends as when, of old, they were welded together in the centaur. One large period in civilization actually takes its name from the horse,—the age of *chivalry*, which means the age of horsemanship. Our favourite animal has been sponsor at the baptism of the brightest period of civilization. During the chivalric and feudal ages all the domesticated animals are clustered around the baronial castles, which resemble both the patriarchal and barbarian states on a small scale. But veterinary science exists not yet; for feudalism and science are not good friends.

The other branch of civilization is now put forward; the people and the townsmen have their day; the age of chivalry is gone, and the age of commerce is advancing. England is the pattern of this commercial civilization. We are, indeed, "a nation of shop-keepers." One might have thought that when chivalry languished, horses would be but little valued; but different motives often produce the same result. The nobles bred splendid horses merely to ride then; we, in our day, breed them to improve thereby the equine race generally, and to make the value of the horseflesh of the kingdom greater in the market. This object is mainly effected by the maintenance of racing and hunting studs, and our cavalry, assisted by the national interest in the turf and the hunting field, which are the festivals of chivalry that remain among us. This commercial spirit leads us to investigate the best means of breeding and rearing, and also to discover the methods of preserving, our valuable animals against disease and contingencies. It is this spirit, unlikely as it may appear, which has likewise produced the veterinary science; and the free competition to which we are all exposed forces us continually to discover better curative means, in order that we may not be under-sold and eaten up by each other. The greater part of our present art dates from the time when chivalry left us, and all things became matters of business and subjects of barter and dealing. Profit and loss, once fairly set up as the standard, are the beacons that will conduct to us many of the sciences; for permanent profits are only to be had on nature's terms.

It was, then, in the last century, when the tide was turning, that a few gentlemen, catching the spirit of the age, set about to found the excellent institution in which I now address you. Among the honoured names of our founders I may mention Mr. Granville Penn, of Stoke Park, near Wymondham; Arthur Young, Secretary to the Board of Agriculture; the late Earl Grosvenor, Sir Charles Bunbury, and Mr. Holmes Sumner. By the persevering efforts of these gentlemen and others, this Institution was at length established. M. St. Bel was appointed its first Professor. After two years of office this gentleman died, and was succeeded by the joint professorship of Messrs. Morecroft and Coleman. Mr. Morecroft shortly afterwards retired, and subsequently became known to the world as an enterprising traveller in central Asia. As for Professor Coleman, his name is classical among us. He may be said to have been the leading-star in the profession for nearly half a century. Who that has attended his instructions does not owe him a debt of gratitude? It is impossible to say how much the elevation of the profession to the place which it now occupies is due to the urbanity and scientific knowledge of that distinguished individual. But I need not further trace the line of our teachers, or ask on whom the mantle of past worth has fallen.

The objects of the institution were, and are, of the widest kind. It was contemplated to include the treatment of all the domesticated animals; and this plan has now been fulfilled, so far as we are at present able to do so. Whatever remains to be done will not be neglected by us, so soon as the road is clear to accomplish it. We stand against no sound reforms; and there is not an institution in the world that will ever cease to want them.

Veterinary science, I contend, is not becoming less, but more important, as civilization developes itself. Railroads, the bugbears of horse-keepers, have not, I think, diminished the number of our horses. One class they may have, perhaps, lessened, but only to make the other classes larger. It is reckoned that there are at present not much under three millions of horses in the united kingdom. What must this be in commercial figures! What a vast national stake it represents! The over-seeing of this great amount of property belongs, of right, to the skilful veterinarian. It is clear, then, that our profession is of great importance to the state.

When, however, we extend our view to the flocks and herds which constitute so large a part of our national wealth, the field of veterinary exertions becomes magnified in proportion. And here I recal to mind the labours of a most important body—I mean *the Royal Agricultural Society of England*, which cannot fail to be a fellow-worker with this College, even should there be no direct connexion between the two institutions. Gentlemen, there is a close relation between scientific agriculture, the breeding of stock, and scientific veterinarianism. Again I remark to you, that it is the competitive spirit of the age which calls forth the energy of all the three. If the soil of one farm has to compete with a naturally richer soil in another locality, we must find out what is wanting, and supply it. Nay, we must go further; we must beat our competitors by making our land, if possible, the better of the two. The effort to do this is the main-spring of scientific agriculture, and the science of chemistry will not be long in coming to the aid of the agriculturist, when his determination reaches this point. "Where there is a will there is a way." Better lands will support more stock; for science will make England larger, will virtually stretch it out; and increased stock will require additional care and fresh veterinary aid. We have no conception, as yet, either of the size of this country, of the number of head of cattle that it will maintain, or of the improvement to which our noble art may arrive. Meantime we trust, as heretofore, to enjoy the friendship of *the Royal Agricultural Society*, and to merit, as at present, its good opinion of the instructions delivered within these walls regarding its own more immediate objects.

We trust, indeed, that the members of that influential Society will become convinced that one of the noble objects set forth in their prospectus—namely, "*the improvement of the veterinary art as applied to cattle, sheep, and swine*," is not to be accomplished by popular addresses delivered at their annual meetings, or by a few scattered lectures at agricultural schools, nor by the publication of prize-essays and recipes for special diseases. To my mind, this system is like making a dangerous plaything of that which should receive from them graver consideration. I say dangerous, because I consider that the trite expression, "a little knowledge is a dangerous thing," strictly applies here. It is, I contend, to the recognized veterinary schools that *the Royal Agricultural Society* must look for the full and efficient carrying out of the noble and praiseworthy intention of its founders.

I would now say a few words to you upon the prospects of our profession, and upon your responsibilities as connected therewith. Every profession depends to a large extent for its credit to the public, and its usefulness, upon the personal character of its members. For instance, if the medical men of this country were a vulgar-minded and illiterate set of persons, they would, it is true, still be called to the bed-side; but society would cease to respect them, would look upon their services as a necessary evil, and would not reap half the benefit which confidence necessarily procures. Now veterinary medicine is in a far more critical position than human medicine in this respect. It is a comparatively new calling, and is not so much sustained as created by favourable public opinion. A man *must* have medical advice for his wife and family: but whether he shall have veterinary advice for his stables or his stock is a matter of his own choice. If he cannot rely upon the veterinarian, he may on an emergency send for the farrier, or leave the case to his groom; he easily reasons that the good to be obtained from the practitioner is costly and uncertain, and the practitioner himself, perhaps, not to be trusted. Nothing can remedy this state of things but a vigilant care on the part of our profession to be upright, skilful, and trustworthy. It is no use competing with the farrier. If you compete, he will beat you with your own weapons. You must make yourselves received on your rounds as men of honour and men of science. You must take care to stand as gentlemen with your employers. This is the only way in which you can build up your profession; this is the only way to escape competition with the farrier.

Our profession, is one that is exposed to considerable temptations. I here address myself particularly to my elder pupils, who will soon, I trust, obtain their diplomas, and enter upon practice for themselves. I tell them that their career is beset with dangers which it is their duty, and will, I trust, be their good fortune, to surmount. When they leave this Institution they will depart, I hope, as professional men. Let them bear their position in mind. Their daily occupations will at once throw them in the way of associates whose friendship they cannot consistently cultivate. I do not mean that they should give themselves airs, or look down upon any man; but I do say that the company of the stable is not fit for a professional man. Let him study to be a gentleman in his feelings and his actions, and that alone will establish a sufficient demarcation between the veterinarian and the coachman or groom. It will gradually, but effectively, repel familiarity; it will engender respect from those whom it keeps at a distance; and as the connexion with the groom becomes weaker, that between the practitioner and the master will be growing in strength and closeness. Proprietors and gentlemen are the proper friends of the veterinary surgeon, and not grooms or coachmen.

Unquestionably, the company you keep declares what you are. There is a reason in ourselves for our acquaintanceships, good or bad. Now I am not too delicate to mention one fault which has retarded our profession, in common with many others. I allude to the vice of drinking. Strong drink, gentlemen, is too often the cement between the practitioner and the attendants in the stable; it is the glue which fastens him down to bad associations; it fuddles the professional head, and leaves it no better than that of the groom. Nay, a half-intoxicated groom is a far more useful person than a professional man in a similar situation. Art and science give up the ghost long before the more rude operations of the hand. If you want to be drinkers, and still to be of some use, then at once take your place as grooms. I am not a tee-totaller myself: but if the members of our profession, as a body, were so to conduct themselves as to obtain the confidence of the public as men of temperance, I should be as certain of its rapid advancement as I am of my own existence. The number of impediments that are at once got rid of by an abjuration of low associations is surprising. Bad company cannot bear the presence of a water-drinker: the instinct of self-preservation, strong in them as in all of us, only leading them to preserve their vicious habits, will expel the water-drinker from their party. Civilized men rise more and more in their places in proportion as they can exercise these self-denials; the people who do not practise them force upwards those who do, as certainly as heavy bodies falling drive lighter ones uppermost. This is the way by which classes rise in the social scale, and this is the way in which our profession must rise. Strict temperance, pushed even to abstinence with most, will ensure clear heads and good company. You must never attempt to bribe fortune, or to penetrate into the parlour through the stable: but by your skill and your bearing become recognized as suitable associates for gentlemen and the professional classes everywhere.

I have before remarked, that these are the days of commerce and of business, where every thing is reduecd to its money value. It is hard to say how much your professional remuneration may depend upon the position that you win for yourselves in society. If you are friends of the groom or the coachman, the proprietor will dole out to you the rate of wages of the lower orders, to which, in spite of a parchment diploma, you will virtually belong. If you are the friends of the proprietor, he will remunerate you according to his own scale. If the consideration of cash, then, is to govern you, you know which to choose.

I have often had under my consideration the important question of the remuneration of our profession. It may, I think, be divided into two branches. Of course, there are intermediate stages; but perhaps I shall not be far wrong in separating them into these two—fees or particular charges, and general contracts. As a rule, where our patients are valuable, we are paid for our attendance upon them separately. The horse especially, the most valuable of the domesticated animals, bears easily the system of separate charges. Flocks of sheep, on the other hand, or kennels of dogs, are more properly attended by an annual contract; but upon the whole I incline to think that the remuneration by contract is that which is likely to be in the ascendant. The obvious tendency of the age is to throw stock together into large numbers. Now, I dwell upon this, because contracts of this kind depend, to a great degree, upon the personal character of the practitioner. In such contracts a veterinarian of improper principles will adopt the pound-foolish policy of giving as little of his time, medicine, and attendance to his employer as possible. What will be the consequence? Why, his employer, whose underlings will not unwillingly be his spies and his informers, will soon come to know the truth; the contract will then be offered on lower terms, or else it will fall back to the farrier; for the more you bring yourselves on a level with the farrier, the more he will invade your legitimate sphere. Then the veterinarian, who has only himself to blame, will, no doubt, exclaim that he is an injured man, or unfairly treated. All contract work depends, to a great extent, upon the honesty of the parties: there would be far more of it than there is if all men were honest. It partakes of the principle of assurance, and is the most convenient way of satisfying both parties; and in the long run, if not the most remunerative, is at least the most certain to the veterinarian. The largest part of that property to whose health we have to attend consists, of course, of animals, not of great value singly; these are estimated by the owner in the mass, and consequently you will have to furnish your skill to them in the mass.

I therefore reiterate, there are two branches of your professional remuneration; and that in both of them your moral and professional career will determine the amount of your fees. There are, I believe, few veterinary surgeons of experience who will not bear me out in these general remarks.

The medical profession is circumstanced much as our own in this respect. The upper and middle classes—the blood-horses and more favored stock of society—are attended singly by the fee system; the lower classes congregate in clubs and benefit societies, or are congregated in union workhouses, and are the subjects of medical contracts. It is not that contracts will pay you better, abstractedly, but rather that by associating your less valuable patients, you will be remunerated from a class that never paid before.

There is yet another reason why I think the contract system is destined to become prevalent in our profession. In our day disease has caught somewhat of a social tendency; it comes not so much in single cases as in epidemics and epizootics (the one term refers to the diseases of mankind, and the other to those of animals). Now, whether it is that our more extended information enables us to refer most of the acute disease to a common type, or whether diseases are really more sociable, or occur more in masses, I cannot say; but it certainly strikes me that isolated cases of acute disease are not so common as they used to be. The proverb says, "It never rains, but it pours;" and I need not tell you that pleuro-pneumonia, catarrhal fever, and other affections, have come upon our animals of late, not in single drops, but in a complete down-pour. Am I wrong, then, in supposing that this aggregate character of disease will incline owners of stock to the system of veterinary remuneration in the aggregate ?

The further this system is carried, the more it will lead to a very broad development in both the veterinary and medical profession—public health as maintained by the adoption of prophylactic measures is that to which I allude ; and the *preservation* of health ought, I think, to be considered by us a nobler art than the cure of disease. The rapid strides which agriculture is making in the draining of lands, the knowledge of crops, &c., all lead to this consideration. The flocks and herds that adorn our landscapes are as much crops, so far as their growth is concerned, as are the ears of wheat or blades of grass that flutter in the breeze. An extension of the same science that fattens the corn will fatten the cattle. The vegetable kingdom, also, has its diseases and its cures equally with the animal; but it is art and science on a large scale alone that can, by combatting with the one, furnish the other. I look upon the veterinarian as the inseparable companion of the farmer in the grand matter of the preservation of the health of his live stock ; and the contract system must ultimately, I think, lead to his being paid rather according to the health than according to the diseases of animals placed under his care.

I would here say a few words upon the breeding of horses ; and I deem it my duty to enforce upon you that, to my mind, too little attention is paid by breeders to the hereditary predisposition to disease that may exist on either side of the stock by which propagation is effected. Breeders look more to exterior form and make, and are satisfied with the mere surface of things. Now, it is a well-known fact, that diseases are often immediately inherited in animals bred from those which are diseased. The object then should be, if it is desirable to breed from a particular sire from his possession of certain qualities, to correct his morbid predispositions by putting him to one of the other sex which is exempt from disease, or possessing the required development in external form. By this means the breeder would ultimately procure a race of the best character for hardihood and endurance, as well as shapely and agreeable to the eye.

I have already said much, perhaps too much, upon the inestimable importance of high moral character for the members of our profession; but, with your leave, I will bring forward one other instance of it which has often come under my notice. In the state of horses known to the turf, you are well aware that the greatest secresy is often imperiously demanded by the owner. If the horse has a malady, it must not be divulged. Now, under these circumstances, none but a veterinarian who is most trustworthy will be called in by the anxious proprietor. Moreover, in such delicate matters the veterinarian should be a kind of overseer over the grooms and jockeys, and must be literally above suspicion: he must be of such sterling honesty, that a bribe would crumble away if it touched him, or fly back and wound the hand that proffered it. He will then be called in to many cases which otherwise he would never visit, and be a gentlemen among the best gentlemen of the turf.

We ought, however, to look with great indulgence upon the errors which may have been committed by our brethren, as well as upon their failure to reach the high standard I have attempted to set up. No profession has been more grievously tempted than ours; none has risen from a stock more full of the common frailties of mankind; yet none, I hope, has reared more honest citizens, or persons more useful in their calling. As a profession we are not yet seventy years old—a very short period of professional existence. Our medical brethren number the years of their art by centuries, and still they have much to accomplish both in their public and in their private standing; we, on the other hand, count ours by tens only: and beginning, as we have done, in a period of progress and enlightenment, I confidently expect that in no long time we shall be able to give as good an account of ourselves as the practitioners of any of the sister arts.

In the mean time the Government of the country has done as much, perhaps, as could fairly be expected of it to elevate the character and to recognise the services of veterinary practitioners. No statesman can fail to be impressed with the importance of our art, as it regards the prospects of agriculture, the equipment of the army, or the general wealth of this great nation. Accordingly the educated veterinary surgeon, on his appointment to the army, enjoys the rank of a commissioned officer, and acquires at once the position of a gentleman. The same is the case in the service of the Hon. the East India Company, where veterinary surgeons take the rank of lieutenants or assistant surgeons in the magnificent armies of Hindostan, and enjoy all the liberal provisions of that illustrious Company. I believe I am justified in asserting as a rule that the confidence of the Government and Company has been well placed, and that the members of our profession who have appointments under them have been useful additions, and indeed ornaments, to both these services.

We shall always have cause of gratitude and good feeling to our elder sister, the medical profession. I think I may venture to affirm, that, where the veterinary surgeons and medical men of the district are on good and familiar terms, it is a sign in favour of both parties. The two professions, though very distinct, have a common parentage in science: both grew at first from the same soil; and, with their roots intertwining, there must necessarily be an agreement in their development, and there ought to be harmony between their members. Comparative anatomy was the basis from which human anatomy sprang. The priests in their sacrifices were the first persons who saw the entrails and wonders of the animal body. The domestic animals were reckoned as appropriate offerings to the gods; the wild creatures of the forest were not thought acceptable sacrifices. The priests took omens from the entrails; you also must take omens from the same—omens of disease. Pathology and diagnosis are a system of scientific omens. The priests were the first anatomists, and the first physicians; this was among the Egyptians and the Greeks. Time wore on, and in the dark ages the little science that the heathen priests had accumulated was transmitted to the Christian monks. The ages of monkish science were called the dark ages, not that the monks were, after all, such stupid people; but they kept their science to themselves—they bottled it all up in Latin books and inaccessible monasteries. The candle was hidden under a bushel. But at length this large monkish extinguisher was lifted off, and science began to be a public light. Then, for a second time, the anatomists, now in possession of the printing press, began to resort to domestic animals for their anatomy and physiology. Twice over, therefore, human medicine has risen from a veterinary basis; it was only fair, then, that the medical profession should at length shelter the veterinary during the weakness of its infancy. Professor Coleman, as you well know, was originally a medical man—the fellow-student, and throughout life the intimate friend, of the late Sir Astley Cooper. Our first board of Examiners consisted entirely of medical men. Many of the lectures and classes of the medical schools of this metropolis have been thrown open gratuitously to the students of this Institution. Nearly every medical man of eminence in London has testified, at one time or another, his lively interest in the success and prospects of the Veterinary College. I do not think that, at first, we could possibly have dispensed with the assistance of the heads of the medical profession. The case may or may not be different now; but at any rate I hope, as a body, we shall always keep and cherish the friendship of eminent physicians, surgeons, and medical practitioners generally. They have much to learn from our research, and we may assuredly profit largely by theirs. It is the fashion to decry reasoning by analogy, but who can help it between two such similar professions? It is such reasoning alone that will make the one valuable to the other. A steady eye to practice, and a cultivated observation, will preserve us from the dangers incident to such reasoning, and enable us to reap from it important suggestions.

My time does not allow me to enter upon the interesting subject of the progress of our profession; but I can hardly omit a word, trite though it be, upon the various authors who have illustrated practice, or recorded the results of their observations. The names of Blaine, Coleman, Bracy Clark, Percivall, Youatt, White, Turner, Morton, Spooner, of Southampton, Simonds, and many others, will occur to you at once in this connexion. Our journals, also, have done good service; and I may be allowed to hope that in The Veterinary Record, published by some of my colleagues and myself, the pupils, and the profession generally, will find a useful body of information; the more acceptable to the students, because a considerable part of what is interesting in its pages records their own debates in the Veterinary Medical Association, which holds its meetings within these walls, and whose deliberations I hope the gentlemen before me will join in, and ensure for them in future that *éclat* which has attended them hitherto. Nor will I pass over *The Veterinarian*,—a publication which, though sometimes dipping its critical pen in ink which I think is rather too acid, yet contains a valuable transcript of opinions and experiments of our common profession. Facts are valuable wherever we find them; and this is the land of free speech and discussion, where we have found out that words, though sometimes harsh, break no bones; and, therefore, I will not quarrel with any fair liberty of attack that has been exercised in the pages of this or of any other journal.

A more immediate question with the student is the books that I would recommend to him for his college studies. I have often given the same advice before, and our veterinary literature does not multiply so fast but that I may repeat it again on the present occasion. Upon the anatomy and physiology of the horse, you will not fail to possess yourselves of Mr. Percivall's standard work on that subject. Time has not yet produced any thing more valuable for your studies. I also counsel you to make yourselves acquainted with the lectures on the anatomy, physiology, and pathology of the horse, by the same author. Blaine's "Veterinary Outlines," and his "Canine Pathology," must also form part of your library. By diligently perusing these works you will acquire a store of useful information. In the anatomical part, however, I would recommend you to follow Percivall rather than Blaine. The works of Youatt, also, you cannot afford to dispense with. On many subjects connected with domesticated animals generally, you will find the treatises of Youatt not only to be highly learned, but almost your only sources of information. You will read them again and again with pleasure; for Mr. Youatt was not only a man of great knowledge, but, I may say, of rare literary talent. Of course, you will also make yourselves acquainted with the work of Professor Simonds on "Variola Ovina," or small-pox, in sheep, which, though treating only of one disease, is a model of careful observation and correct expression, and reflects credit on the College, the profession, and the author. I have, last, to speak of the "Manual of Pharmacy," by Professor Morton. "Last, though not least," is a favourite phrase with many, whereby to escape the difficulty of postponing till too late the mention of some person whose merit deserved an earlier notice. It is not so, however, with me; for the phrase, as I use it, is perfectly honest. I mention this work last, because of its great importance. Our profession has produced no more careful work,—few more laborious. The proverb says, "a great book, a great evil." Here is the reverse,—a little book, a great good. You must both study *this* work, and *learn* it. I pay it no compliments:—that would be useless towards a book that has received the stamp of approbation from the whole profession, and attests its success by having already passed through several editions, each carried to greater perfection than its predecessor by the unwearied exertions of the author.

I do not mean to limit your studies to the works I have mentioned; but these seem to me to be indispensable to the pupil while pursuing his studies at the College.

In conclusion, gentlemen, I have to thank you for your indulgence, and to express a hope that I have not taken you over too rough a country or through too long a ramble. Our profession is becoming connected with so many kindred subjects, that, in saying a few words upon it, one is obliged to discuss topic after topic as it arises before the mind. Within the last few years the field of instruction within these walls has been doubled in extent; and in being made to include the domesticated animals generally, it has come into closer connexion with agriculture, and is linked afresh to important objects in the state. This is my excuse for touching upon so many points. I wish, however, to be always practical; and I hope I have been fully understood by every person who has heard me.

Gentlemen, as the wealth of the kingdom extends, I maintain that the prospects of our profession brighten, if we are only true to ourselves and united among each other. Union is a word that strikes a chord the most pleasing in the human heart. How ardently do I wish that from this day unanimity, like a bright star, might rise upon our body! I see before me old and respected practitioners sitting upon the same benches with those who are just entering upon their studies. May I venture to look upon this as a symbol of union? This anniversary day was long wont to be the festival of a united profession; and on this occasion may it happily be the commencement of new good-will between us all, which will heal whatever disagreements time may have introduced, enable us to put away self-seeking and private motives, and to labour with single hearts for the public good, and for the advancement of that noble and humane calling which, by our presence here to-day, we may, I trust, be said to have pledged ourselves to honour and extend!

COMMUNICATIONS.

Case of diseased Œsophagus, and Rupture of the Diaphragm of a Horse.

By Mr. W. Baker, *M.R.C.V.S.*

Dear Sir, *Sudbury, October* 12, 1849.

A short time since I lost one of my most valuable farm horses. It was a singular case: the animal was badly choked about three months before, and got well apparently; but in about a fortnight after was again affected in a similar manner. Both attacks occurred in the middle of the day when at work, he then not having had any food for three or four hours. I directed for the future that he should be fed entirely on cut food; upon which he appeared to do well, having no return of the symptoms until the day he died; a day or two previous to which the goom had foolishly, without mentioning it to me, ordered him to be fed with the other horses. On this occasion he had been at plough for four hours, and without having any food since he left the stable; when he became suddenly affected, and dropped dead at a place called the Landsend.

Post-mortem examination.—The vicera of the chest and abdomen generally were healthy, with the exception of a slight inflammatory blush around the cardiac portion of the stomach, the contents of which were very dry and hard. Upon examining the œsophagus, I found about nine inches of its cuticular membrane, at that part where it enters the chest between the first ribs, as soft and disgregated as if it had been boiled, or resembling saturated thin paper: above and below this it was in its usual state. Great efforts had evidently been made by all the muscles concerned in deglutition; much food was ejected from the nostrils at the time the animal fell, but of what it consisted I cannot inform you, as I did not see him until the following day. In addition to the above lesions, there was also an extensive laceration of the diaphragm, which, doubtless, was the proximate cause of death.

I am truly your's.

To Professor Spooner.

Case of Purpura Hæmorrhagica.

By Mr. R. Girling, *M.R.C.V.S.*

A black mare, of the carriage breed, six years old, and of rather a delicate constitution, belonging to Messrs. Cooper and Witehead, carriers, &c. of this town, had been under my treatment for a simple cold and sore throat, from which she was fast recovering. On the 27th of July last she was found to be in extreme pain, accompanied with accelerated respiration and an increased pulse, arising from an effusion having suddenly taken place in all four extremities, and also under the chest and belly, extending to the mammillary glands. The lips and nostrils were likewise very much tumefied, and spots of ecchymosis existed on the Schneiderian membrane.

Treatment.—I ordered her to be at once removed to a large loose box, and the tumefied parts to be continually fomented with warm water, and an alterative ball given, consisting of aloes Barbadoes ℥jss, pulv. digitalis ʒss, hydrarg. chlorid. ℈j, tereb. Venet. ʒiij. M.

July 28*th,* a.m.—I found my patient worse: pulse 68, and feeble; the tumefaction of the legs, thighs, and arms, painful; a sero-sanguineous discharge taking place from both nostrils; ecchymosis of the conjunctiva of both eyes; difficult respiration; appetite bad; and excretions scanty. The alterative ball was repeated; the tumefied parts were scarified, and the fomentations ordered to be repeated several times during the day; the parts afterwards to be wiped dry and sponged with vinegar and water, in the proportion of one to two, and gentle exercise given.

6 p.m. — Patient much the same: the alterative ball to be repeated; the tumefied parts to be again scarified; the use of fomentations to be persevered in, and the animal to be drenched with gruel.

29*th,* a.m.—On visiting my patient this morning I found her in a most deplorable state: pulse 76, intermittent and feeble; all four extremities immensely swollen and the skin tense, and she is almost incapable of extending them; lips, nose, and head, more tumefied, so much so that I was not able to examine the Schneiderian membrane, but small quantities of blood occasionally escaped from the nostrils. A sero-sanguineous discharge is escaping from several parts of the hind extremities, and ecchymosis exists on several parts of the body. To use the owner's phrase, " she is as gay as a butterfly." The respiration is difficult, approaching to threatened suffocation; the conjunctiva of the near eye is quite black; the fæces are covered with mucus, and the appetite gone. Repeat the ball; again scarify the tumefied parts; the fomentations to be applied every hour; and, in the intervals, the parts to be constantly moistened with vinegar and water, as before; the animal to be frequently drenched with gruel, and moved round the box.

6 P.M.—Pulse intermittent and feeble, varying from 72 to 78 beats in the minute; bowels relaxed; swelling of the thighs, legs, and arms, not quite so tense, but great prostration of strength is still present. The fomentations to be persevered in every hour during the night; and, in the intervals, the vinegar and water to be used as before.

30*th*, A.M.—Pulse 72 and feeble; bowels gently responding to the medicine, but not too much; swelling of the legs, thighs, arms, and belly, reduced; but extensive tumefaction of the lips, nostrils, and head, still present, extending down to the chest. The tumefied parts were again scarified; the fomentation to be persevered in; and the animal to be frequently drenched with gruel.

5 P.M.—My patient has eaten nothing during the day, and the symptoms generally remain as reported this morning: the lips, nostrils, and head, to be frequently fomented during the night, and, in the intervals, to be sponged with vinegar and water as before; and the animal to be again drenched with good thick gruel.

31*st*. A.M.—Pulse 65 and weak; prostration of strength extreme; the lips, nostrils, and head, not so much tumefied; and an absorption of the blood on the tunica conjunctiva of both eyes has taken place, particularly the near eye; but there is still a sero-sanguineous discharge from both nostrils, and I can detect petechial spots on the Schneiderian membrane; the respiration is more tranquil, and the alvine excretions are becoming natural. Half a drachm of the iodide of iron was given in the form of a ball, with the hand, for the first time; the lips, nostrils, &c. having been so much tumefied, it was impossible to get my hand into her mouth before. The animal to be drenched with gruel, and to take a little walking exercise three times in the day.

7 P.M.—The improvement is very marked: pulse 58, and fuller. The iodide of iron was again given in a ball; the lips, nostrils, and head, ordered to be sponged with vinegar and water; and the animal to be drenched with gruel as before.

Aug. 1*st*, A.M.—Pulse 56, and its tone evidently improved; the ecchymosis of the conjunctiva of both eyes has disappeared; the Schneiderian membrane is returning to its natural colour, and the respiration has become normal; but the sero-sanguineous deposit in the lips, chest, belly, and legs, is much the same as yesterday. The attendant informed me that, during the night, she drank about two gallons of water-gruel, and had eaten some hay and green meat. Iodide of iron ʒj was given in the form of ball; the animal to have walking exercise three times a-day, and the chest and belly to be sponged with vinegar and water.

6 P.M.—The mare is much better in every respect: pulse 51, and increased in volume; and the appetite is returning.

2*d*, A.M.—Patient still improving: the iodide of iron was given as before, with exercise, and this treatment was persevered in till the 11th of August, when the swellings had disappeared, and the mare had recovered her pristine form and health.

Case of Spasm and Chronic Disease of the Ileum, producing Vomiting.

By the same.

On the 27th of January last, I was summoned to attend an aged cart mare, the property of the Rev. M. G. Edgar, Red House, near Ipswich. The following symptoms presented themselves:—pulse 68, and feeble; animal constantly lying down and getting up; countenance haggard; respiration disturbed; much fetor from the nostrils, with frequent ejections by the mouth of dirty fluid and ingesta, and sudden contractions of the muscles of the neck. I gave tinct. opii ℥j, cum æther. sulph. ℥j, in haustus, and a blister was applied in front of the chest. In an hour's time the symptoms were greatly mitigated; but there being still present frequent slight contractions of the muscles of the neck, the blister was repeated, and the following draught given, tinct. opii. æther. sulph. āā ℥ss, ol. ricini ℥viij. In two hours' time all the unfavourable symptoms had quite disappeared, and on visiting my patient the next morning I found her to be perfectly recovered.

On the 2d of July I was sent for to attend her again, and found the spmptoms similar to those above described, but not so severe. The same treatment was adopted, with the exception of the blister, and the mare again soon got well.

On the 21st of October last she was turned out into the park as usual with the other horses after feeding time, and on the man going to fetch her up the next morning, about four o'clock, he found her dead. At nine o'clock I was requested by Mr. Edgar to examine her, so as to ascertain the cause of death. The following is the

Post-mortem examination.—On opening the abdominal cavity, I perceived a rupture of the larger curvature of the stomach to exist, and the greater part of the ingesta had escaped into the folds of the omentum. The stomach itself was slightly inflamed, and the intestinal canal much so. In tracing the ileum throughout its course, I found it to be in a state of chronic disease about a foot before its termination ; and just anterior to that there was spasm existing, about half a foot in length. The liver was of a pale ash colour, but the urinary organs were free from disease, as likewise were the viscera of the chest.

Case of Serous Encysted Tumour on the Epiglottis.

By Mr. J. Markham, *M.R.C.V.S.*

Sir, *Rugeley*, 14*th October*, 1849.

I have sent to you a larynx, with a tumour attached to the base of the epiglottis. The mare from which it was taken belonged to Mr. Brownson, of Blithbury, and was six years old.

On the 10th inst., while eating some hay in the stable, she reared up, fell over, and lay for some minutes without the breathing being perceptible ; soon after which she seemed all right again, and was thought to have been merely temporarily choked. She was then taken into a field to plough, when she again reared up and fell, and was taken home; and about two hours afterwards she had a third attack.

Such was the history of the case I received on visiting her in the evening of the 10th inst.

Symptoms.—Pulse 40, and weak; respiration slightly increased; Schneiderian membrane dark coloured, and a little blood trickling from the off nostril; the throat was swollen, and a tumour might be felt on the off side. I ordered a little sloppy mash to be given the animal; which, when she tried to swallow, made her stagger and gape for breath, but she did not fall. Immediately afterwards she broke out into a profuse perspiration. I did not see her when attacked with one of the violent fits, viz. rearing and then falling over; but they told me she had three on the 11th and one on the 12th; when, in rearing, she hit her head against a beam at the top of the stable, and fell down dead.

The treatment resorted to by me consisted in the performance of tracheotomy, the exhibition of febrifuge powders in a little sloppy mash, and stimulating the throat and steaming the nostrils, as I considered the only chance of recovery would be the bursting of the tumour.

Post-mortem examination.—The first part examined by me was the larynx, which immediately explained why hay, on being partaken of, should so effectually stop the breathing, as it would lodge against the tumour and hold down the epiglottis until a cough removed it. She could swallow four or five mouthfuls of gruel without taking her mouth from the pail. The lungs were congested, and there were several dark-coloured-spots on the right ventricle of the heart. The vessels of the pia mater were gorged with black blood, and several ounces of bloody serum had become effused into the cranial cavity. The head was much bruised from her repeated falls. I did not observe any other abnormal appearances worth mentioning.

The mare had influenza early in the month of March of the present year, and was taken to work before she had properly regained her strength. Mr. Brownson was then removing from one farm to another, and could not give her the rest he otherwise would have done; and he now tells me she had a cough ever since she came to Blithbury, but did her work very well until the 10th inst.

Most likely the tumour has been months forming; but it did not interfere with her general health until she began to have dry food; which, no doubt, irritated the parts over which it passed, and caused the tumour to become much larger during the last few days of her life.

I am, your's, &c.

To G. Varnell, Esq.

Second Letter.

Dear Sir, *Rugeley, 22d October*, 1849.

In answer to your's of the 15th inst., respecting the mare from which the morbid specimen I sent you was taken, I went to Blithbury the day I received your letter, but the owner was out, and I have not seen him till to-day. He says when she was driven hard that she made a noise in her breathing, and also coughed very much; but kept up her condition, and always worked well. He adds, she did not wheeze or roar, but that there was a kind of rattle in the throat when hard pressed.

When I first saw her, before opening the trachea, her breathing was tranquil, except when she tried to swallow; and on the morning of the 12th, the day she died, she seemed no worse, except hanging her head, which was very likely caused by the effusion into the cranial cavity.

I am, Sir,
Your's respectfully,
J. Markham.

To G. Varnell, Esq.

Observations on the above Case.

By Mr. G. Varnell.

The tumour described by Mr. Markham as being situated at the base of the epiglottis was about the size of a pullet's egg, its summit irregular in form, and its appearance opalescent, which at first sight led me to think it consisted of a cluster of hydatids;

but upon further consideration I came to the conclusion that it was a serous cyst, its precise situation being on the left side, and having a portion of its upper part immediately under the epiglottis, its base inwardly resting upon the hyo-epiglottideus muscle, and externally upon or resting against the inner border of the thyro-hyoideus muscle. Anteriorly it was in apposition to the root of the tongue and body of the os hyoides. Externally it was covered by the mucous membrane which is continuous from the posterior part of the mouth into the laryngeal opening. Anteriorly to the epiglottis this membrane is loose, with a large amount of areolar tissue beneath it; and from the anterior mesian line of the epiglottis vertically this membrane is in folds, which extend forwards to the posterior margin of the os hyoides. In these folds, particularly in the centre, are slips of yellow elastic tissue (fræna epiglottis, or hyo-epiglottic ligaments).

By this rough outline of the parts in apposition to the tumour, some of which, as the yellow elastic ligament, act mechanically, others, as the muscles, through their contractility, we can better understand the phenomena described by Mr. Markham prior to the death of the animal. For instance, the tumour, from its situation and connexion, would fix the epiglottis nearly in a vertical position, neither allowing it to close the glottal opening when a pellet of masticated food passed over it to the pharynx—and if accidentally arrested at this part would produce those violent paroxysms approaching to suffocation—nor, on the other hand, would it allow the epiglottis to be drawn forwards and downwards by the elasticity of the hyo-epiglottic ligaments, or the contraction of the hyo-epiglottideus muscle. Thus we can account for the abnormal sound mentioned by Mr. Markham in his second letter, the aperture of the air-passage being diminished by the fixed vertical position of the epiglottis.

The question for us to consider is, as to the cause and formation of this tumour. Mr. Markham thinks it may have been months forming. With this opinion I fully concur. The mare had influenza in the latter part of March of the present year, and was put to work before she had properly regained her strength; and it appears that the sequela of that affection was a chronic cough, which at first, no doubt, depended upon chronic inflammation existing at this part of the air-passages, but afterwards upon the production of the tumour displacing the epiglottis. And may we not consider that inflammatory effusion of serous fluid into the sub-mucous areolar tissue as the origin of the cyst, which, by further accumulation and distention, caused attenuation of the membrane clothing its summit, giving to it that whitish grey aspect which it possessed? The second question for us to consider is, that of being able to diagnose such as the above and similar cases. It is quite easy, after having heard the whole history of a case with its post-mortem appearances, to say we should have done this, that, or the other. This is all very well, and shews the advantage of examining post-mortem all cases that come under our notice, and especially those of which we can obtain a true history prior to death. It is in the stable, with our patient labouring under an acute and aggravated affection, with an anxious owner standing by our side, that the judgment of the veterinary surgeon is put to the test. In this instance we see with what promptness Mr. Markham acted, in order to combat those severe paroxysms that threatened suffocation, and which his judgment and experience assured him were caused by some abnormal condition of the larynx. He proceeded at once to relieve his patient by performing the operation of tracheotomy; and then resorted to other remedial measures calculated to allay the irritation of the parts which, in his opinion, were affected. And, no doubt, he would have done more in the way of ascertaining the seat of the affection had not the mare in one of her fits reared up and fell over, striking her head against a beam, which, in my opinion, was the immediate cause of death. But it may be said, the tracheotomy tube was in its place; and it may therefore be asked, why did a repetition of those severe attacks occur? The answer simply is, *the tumour was still there;* the glottal opening might have become morbidly sensitive, or, perhaps, from some cause or other, the passage through the inserted tube had become stopped.

We will now consider what further examinations should be made in those acute laryngeal affections as indicated by this morbid specimen. After the tracheotomy tube is inserted in the trachea, as was done in this case, although we cannot tell our patient to open its mouth while we press the dorsum of the tongue down with the handle of a silver spoon, and thus examine ocularly the posterior part of the mouth, yet, with a graduating balling-iron placed in the mouth, and the tongue being drawn a little forward, by passing the hand upwards over its root, with the ends of the fingers we can pretty well examine the glottal opening and its circumference; and in this case the tumour could have been distinctly felt. He who is well conversant with the normal condition of the parts can more readily detect, either by sight or touch, any deviation from health than those who have neglected this part of our education. Even simple œdema, or chronic thickening of the membrane which envelops the epiglottis and arytænoid cartilages, where it forms the aryteno-epiglottic folds, may in some cases be detected; as well as a falling inwards of one of the arytænoid cartilages, the result of atrophy of the dilator muscles: consequently there is a diminished caliber of the air-passage at this part, producing that abnormal sound commonly called roaring; and it is singular that, as far as my observation goes, it is generally the left cartilage thus affected. The parts being explored by the hand as described, that is, if the size of the patient and other circumstances admit of our doing so, and, as in this case, the tumour being felt, we are then better prepared to form our prognosis, and to decide as to what treatment can be adopted. If the tumour, when pressed upon, gives the sensation to the fingers of fluctuation, we may infer that it contains a fluid, which may be either pus, or, as it was here, serum: then the sooner it is evacuated the better; and the way to do this is by using an instrument similar to the one employed for embryotomy, only much smaller, and which consists of a cutting blade, within a guarded handle or sheath, that can be liberated or withdrawn at the pleasure of the operator. At one end there should be a hole, through which may be passed a small piece of whipcord, forming a loop, for the purpose of being passed over the wrist, and there secured by merely twisting the instrument, which will prevent it from being dropped into the mouth, as would probably be the case if it were not thus secured. With this the cyst may be punctured. But if this is not practicable, we should endeavour to break it by pressure, or perhaps, what would be better, by scratching through its walls with the finger-nail. This being done, make the opening sufficiently large so as to empty it entirely of its contents. In some cases we may meet with a solid fibrinous tumour, but moveable to a certain extent in its cellular bed. In either case it must, if possible, be removed; and in attempting this with the fibrinous tumour, after making an incision through the membrane with the above-named instrument, perhaps at its base, I would endeavour by torsion to tear it from its cellular connexion. Of the last-named operation I am not certain whether we should have sufficient power over the tumour with our fingers to accomplish our object; at any rate, I suggest a trial, should a case of the kind occur; but in the former case I have no doubt we should be able to remove the impediment to the action of the epiglottis.

Diseased Mesenteric Glands in a Horse.

By Mr. W. C. Sibbald, *M.R.C.V.S.*

Biggleswade, Nov. 11, 1849.

My dear Sir,—I shall forward to your address to-morrow (Monday) a small hamper, containing some morbid specimens. The history of the case from which they were taken is as follows:—The animal was a black, five-year-old, light made, cart-horse. During the months of July and August of the present year I was attending a very valuable colt, suffering under the then prevailing epidemic in a severe form, accompanied by the formation of many abscesses about the head and throat; when I was informed that the whole of the horses in the yard, numbering about twenty (my employer being an extensive agriculturist), suffered more or less from the same disease. My assistance, however, was not desired for any of them until the 29th of August, when the black horse was shewn to me, grazing in a field. It was stated that he had been one of the first attacked with the complaint, but from which he had apparently recovered. He subsequently became again affected with sore throat, cough, nasal discharge, &c.; but all these symptoms had passed away, leaving him emaciated, and feeding delicately. The only functional alteration I could detect, on a minute examination, was increase of the arterial pulsation, it numbering 60 in the minute. A dose of purgative medicine was prescribed and administered. It operated freely; and during a few days succeeding the animal appeared to be better; but he again relapsed.

On the 20th of September some tonic balls were sent, with directions for their daily administration; and on the 25th, the medicine being consumed, and no symptoms of amendment evinced, the animal was brought to me. The attendant reports, that, when the horse has fed a little more than usual, he appears uneasy, paws frequently with his fore feet, and turns round several times before lying down; the like symptoms are also observed previous to the evacuation of the fæces or urine. I had him placed in my stable, and remained with him. He soon commenced pawing with his fore foot, and in a minute or two stretched himself to urinate, when the penis was drawn, and the bladder evacuated, without any indication of pain. I immediately passed my hand up the rectum; found the bladder contracted, and perfectly empty; but pushing the hand gently onwards towards the left kidney, a little to the right of it, a hard substance, apparently about the magnitude of a child's head, was felt through the parietes of the intestine. The superior surface, upon which the hand could be placed, was apparently unattached. The cavity of the abdomen, towards the right side, was free from exploration; but, posteriorly to both the tumour and kidney, there appeared to be a thickened band, passing up towards the left side of the bodies of the lumbar vertebræ. The inferior and anterior surfaces of the tumour could not be reached. It was immoveable; the surface irregular; and pressure exerted over its surface caused the animal to crouch with pain, and to make violent efforts to expel the arm from the rectum. A dose of purging medicine was administered, in order that an examination might be made when the intestines were empty; and, such examination being made on the afternoon of the 27th,—the animal having been then purging thirty hours,—the tumour was found to be in the same situation, and undiminished in size or density. I then told the proprietor I was of opinion that an abscess had originally formed internally; and, from the well-known tendency of such abscesses to take on a scirrhous character, this tumour had resulted. The presence of abdominal pain inclined me to the belief that it had some communication with the intestines, which precluded any surgical operation; also that I considered medicines to be powerless; and, further, that the doom of the animal was inevitably sealed. He wished me, however, to continue to give the tonic medicine, and I acceded to his request.

On the 11th of October my employer asked me to meet a quack who practises some distance from here; and the said gentleman hit upon all forms of disease except the right one, until I pointed it out, when he declared that the horse must die. At this time the animal was much reduced in condition, so he was left to take his chance, being, however, provided with plenty of nutritious food.

Oct. 18th.—The horse still remains much as before. Try the effect of half-drachm doses of the iodide of potassium, given daily in powder mingled with a small quantity of food.

22d.—The horse has had four powders given him, and he appears a little better.

Nov. 3d.—He has improved very considerably; the pulse is 48; no pain is evinced; he feeds much better and regularly; has gained flesh, and neighs and gallops after his companions. He has had only four powders since last report. Resume them regularly now.

9th.—The horse is moribund. He had continued steadily to improve, and his owner was remarking on the previous day that he could scarcely recognise him as the same animal who but a few weeks before was so emaciated. On the afternoon of the 8th he fed bountifully with his companions, the provender being bruised beans and cut clover hay. In the early part of the night (he being loose in a large stable wherein was only one other animal tied up), the proprietor was aroused by a considerable noise, and desired the carter to go down and "tie the black horse up." He found him shewing symptoms of violent pain, but contented himself with fastening him up, and retired again to bed. Some three or four hours after he again came down, and, finding the horse worse, endeavoured to remove him from the stable; but he fell, and soon after died.

Post-mortem examination.—On opening the abdomen, some hours after death, a considerable quantity of fluid escaped. The food was scattered in all directions among the viscera of the abdomen, and it was evident that death had resulted from the rupture you will find in the stomach. I noticed an extravasation of blood in immediate contiguity to the rupture. There was about a tea-cupful of fluid in the pericardium, and the heart appeared hypertrophied. The left kidney contained a little pus in the pelvis; the right was bifurcate, having two lobes; but one of the canine species, who attended the post-mortem, helped himself to it as his share while my attention was otherwise engaged, or I would have forwarded it to you. The cæcum contained fæcal matter similar to that in the colon. The animal had purged a good deal just previous to death. The larger substance I have sent appears to me to consist of diseased mesenteric glands. The extensive abscess which you will find burst, was whole before it was taken from the carcass, but its parietes gave way during its removal. It contained a large quantity of inspissated pus; and I have little doubt, on cutting into some of the larger tumours, you will find their contents precisely the same. I have contented myself by making a section of two of the smaller ones, as you will see by the sutures inserted. The portion of intestine connected with this mass is the ileum, within a few feet of its cæcal termination. The openings from the tumour into this intestine were present before I meddled with the parts, but I do not think that much of the contents of the abscess had passed by this route.

The smaller substance forwarded is, I think, the pancreas in a highly diseased state. The portion of intestine attached was from the colon, and you will notice that some of the substance remains adherent to the duodenum.

I am aware that cases of mesenteric disease are not unusual; still I thought, as the case was a complete one, and the manner of its termination so unlooked for, it might possess some interest to the members of the profession.

I remain, my dear Sir, ever yours truly.

To the Editor, &c.

[Mr. Sibbald has given so full and so correct a description of the morbid changes that had taken place, as to supersede the necessity of our adding a word in the way of further explanation.—Editors.]

Case of Abscesses in the Brain of a Pony.

By Mr. G. T. Brown, *M.R.C.V.S.*

Dear Sirs, *Infirmary, Park-crescent Mews, Regent's Park.*

On the 1st November, 1849, a grey pony was admitted to my infirmary, suffering from an abscess in the fauces. I obtained the following history from the owner:—About a fortnight previous the animal had given evidence of a catarrhal affection being present by a cough and submaxillary enlargement. The tumour was blistered, and it suppurated and discharged, and the animal was apparently doing well, until a few days prior to my seeing him, when considerable enlargements were observed on each side of the neck, occupying the site of the submaxillary gland. On examining the patient, I found great debility to exist, with much difficulty of respiration from the pressure of the enlargements on the larynx; in fact, so much so, that I had reason to fear asphyxia. The abscess on the right side was the largest by far, but there was no appearance of pointing, although fluctuation of an imprisoned fluid was readily felt.

From the urgency of the symptoms, I at once determined to open the abscess: accordingly a small lancet was passed laterally between the bifurcation of the vein, and directed a little forward to avoid the division of the carotid artery. The incision being completed, by cutting backwards, a large quantity of pus was evacuated (about a quart), and immediate relief was thus given to the animal. I next proceeded to operate on the left, or smaller tumour, in the same way; but while the lancet was in it, a sudden movement of the animal's head downwards caused the point to enter the superior bifurcation of the jugular vein. The quantity of pus was inconsiderable in this abscess, and to prevent hæmorrhage the opening was closed with a pin, which was removed in about three days after, and, the abscess having in the meanwhile become matured, about half a pint of pus escaped. The treatment now consisted of the administration of tonics with liberal feeding, and the animal became convalescent so rapidly, that I directed his discharge on Thursday, the 8th of November, on the morning of which day I saw him. Having occasion to leave town, I did not return till the following morning, when, on entering the box, I was startled to find the patient standing with his head pushed into a bundle of hay: the pulse was irregular, as was also the respiration; the eye amaurotic, and partial coma present. On inquiry, I learned that shortly after my departure the animal had been suddenly seized with vertigo. Some blood was abstracted, and cold applied to the head immediately, but without any apparent effect. He had continued during the night perfectly quiet, standing mostly in the position in which I found him.

That the brain was the seat of disease it was very evident. We had, however, no symptoms of inflammation, nor did the pulse warrant the inference of congestion being present; therefore, knowing the tendency to suppuration in the system, I came to the conclusion that abscess existed in the brain; this not from the absolute presence of any diagnostic symptoms, because such did not exist, but from a knowledge of the previous circumstances, combined with the absence of any indication of inflammation or congestion. Consistent with my inference, I could not adopt any treatment: as the patient, however, gave no evidence of acute suffering, I allowed him to remain till the following evening, when he was destroyed. I forgot to mention, that he fell down soon after my arrival, and continued in a state of coma.

Post-mortem examination.—The viscera of the abdomen and chest were found generally healthy. The head was sent to me for dissection. On removing the superior part of the cranial cavity, the membranes did not appear to possess any extraordinary vascularity; the substance of the brain was also natural in consistence; but, on cutting into the anterior lobe of the left hemisphere, an abscess was discovered, containing about an ounce of pus. In the same lobe of the right hemisphere an analogous one likewise existed, and another in the posterior lobe of the same side. The ventricles were normal in appearance, if we except a little pallor of the plexus choroides.

The principal feature of interest in the case appears to me to be, the rapid and unexpected supervention of symptoms indicating organic disease of the brain. It would appear that the pus accumulated to such an extent as to cause pressure to the base of that organ before any inconvenience was felt by the animal. The cause of the fatal termination arose doubtless, in the first instance, from the maltreatment of the animal, inducing debility; and, the tendency to the formation of pus once established in the system, it becomes a matter of impossibility to surmise in what structures it may become deposited.

I remain, Sirs,

Yours, very truly.

To the Editors, &c.

Case of erratic Metastasis occurring in a Horse.

By Mr. J. R. Cox, *M.R.C.V.S.*

My dear Sirs,—Whether the case I am about to give the particulars of be of sufficient interest to be presented to the notice of the members of the veterinary profession, through the medium of The Record, I submit to your superior discernment. I forward it in my anxiety to seize an early opportunity of adding—a dribblet though it be—to a stream flowing with the worthy object of veterinary advancement, being prompted by feelings of gratitude to render my feeble assistance in so good a cause; for with extreme pleasure I acknowledge myself indebted to the exertions of other contributors for a goodly amount of useful information, which I am now enabled to turn to account.

The case I am about to communicate is one of Metastasis; illustrating, in my humble opinion very markedly, that peculiar feature by no means uncommon in horse-pathology,—the translation of disease from one part to another. Having been solicited, temporarily, to conduct a country practice, I was, on Saturday the 8th inst., summoned to attend a bay gelding, five years old, the property of a dealer in the town, and of which I received the following history:—The horse was purchased by the present proprietor at Horncastle fair, and travelled with other horses partly by road, but the greatest distance by rail, to his own stables. On their arrival, to each of the new horses was given a dose of physic, which operated satisfactorily on all but the one which became ultimately my patient: in him superpurgation ensued to an extent which excited the worst apprehensions of the proprietor; it however was at length relieved by the measures he adopted, and almost as soon did acute ophthalmia in both eyes become manifest. To combat this the horse was bled, and again an aloetic ball had recourse to. It was a few days subsequently to all this that I was called in, and the horse placed under my care, being Saturday, Sept. 8th.

In addition to the foregoing history, I was told by the owner that the horse had partaken of no food for upwards of a week, a circumstance which appeared to occasion him much concern; and he remarked, "that he feared treatment could be of no avail from me at this time; for though the horse's eyes were better, he had become worse somewhere else:" the ailments being beyond the ken of his numerous attendants, who had unanimously booked him for a dead one; and, truly enough, he presented a most pitiable appearance.

I at once proceeded to examine into the condition of my patient, and found that the acute inflammation of the eyes had subsided, leaving great opacity of each cornea, especially the near one; that, in consequence of the second ball which had been administered, he had been purging profusely; and now the evacuations, though voided in small quantities, were watery, and associated with frequent tenesmus. To use a common expression, "the belly was much tucked up:" but to add to the sad picture, and account for his peculiar appearance which so bewildered my employer, I ascertained the existence of acute laminitis in both fore feet. I immediately had the shoes removed, though with no slight degree of difficulty, and the feet placed in warm poultices; for which, in a few hours, I substituted cold applications. On account of the previous history, existing unfavourable circumstances, and the state of the pulse, which was weak and irritable, I abstained from bleeding, and prescribed a draught consisting of tinct. opii, spt. æther. nit. āā ℥jss, aqua q.s.

Sept. 9th, Sunday morning.—The horse has lain down a good deal since yesterday, and moves better; the bowels are also in a less irritable state, but, in consequence of extreme rigors being present, I administered at once spt. æth. nit. ℥jss, in aqua q.s., ordering the man to watch the horse through the day, and so to regulate the clothing that the surface of his body might be kept warm. Continue cold applications to the feet.

Sept. 9th, P.M.—I am informed that my patient is not so well. I find great improvement in the state of the fore feet, but now the hinder ones are acutely affected, the plantar arteries of which throb violently. I proceeded in precisely the same way as with the fore feet yesterday, and gave in a draught tinct. opii ℥jss, spt. æth. nit. ℥j, aqua q.s.

10*th, Monday.*—The horse appears generally better; he voids but a small amount of fæces, and this is accompanied with straining. But little now seems amiss with the hind feet, which renders the tenderness before somewhat more apparent than it was yesterday. Ordered that both fore coronets be blistered, and the hind feet kept cool. Give in a draught tinct. opii, spt. æth. nit. āā ℥j, pot. nit. ʒij, aqua q.s.

On seeing my patient on Monday afternoon it was intimated that "another part had gone wrong," inasmuch as there is swelling around the place where he was bled, with the edges of the wound disunited and slightly everted. I applied the liniment tereb. to the part, and requested it might not be meddled with in my absence.

11*th, Tuesday.*—There is great amendment perceptible in the animal: he stands firmly on his feet, and does not lie down so much as heretofore; no fæces have been voided since yesterday morning, and there is a slight inclination to feed: there remains no opacity of the cornea of either eye, they having been daily pencilled with a weak solution of argent. nit. At the neck there has a little suppuration taken place at the lips of the wound, around which I repeated the application of the liniment: the pulse being excited, I conjoined with a febrifuge draught, ext. belladon. ʒij.

From this time, my patient making daily improvement, it is unnecessary I should enter into further details of the treatment adopted, it being such as would be at once indicated to every practitioner, conjointly with good nursing and attendance.

On Saturday the 15th I saw my patient for the last time, and had the satisfaction of leaving him perfectly convalescent in every respect: the bowels had naturally responded; the return of the appetite had taken place; and the wound in the neck had quite healed.

This case was interesting to me throughout; and the result could not fail to be alike highly gratifying to its owner, who, when he placed it in my hands, quite despaired of all success.

Although I have condensed as much as possible, I fear I shall be occupying almost too much space.

Believe me,
Dear Sirs,
Most respectfully yours.

To the Editors, &c.

P. S.—Since writing I have received a letter from the owner of my late patient, wherein he says "the bay horse is recovering fast; he feeds very well, and gets stronger every day."

On the Use of Chloroform during Castration.

By Mr. J. Barton, *V.S., Ashford, Kent.*

Dear Sir, *June* 21, 1849.

I feel greatly obliged for the information you were so kind as to give me respecting the use of chloroform; and, having applied it in the manner directed, I now proceed to give you an account of the result, as also my opinion regarding the utility of it, as far as my short experience will admit of.

The first subject was a yearling cart-colt for castration.

Having adjusted my hobbles, I applied the bladder, containing about one ounce of the chloroform, to the off nostril, my assistant closing the other one with his hand; when, in less than one minute, the animal staggered, and I believe would have fallen from the effect of it, but we drew the hobbles together, and secured his legs. I then commenced the operation (you are aware it is not a very long one), which lasted about three minutes, during which time there was not a struggle, and, having finished, we unfastened the ropes: the animal lay for about a minute, and then jumped up all right.

The next was a two-years-old half-bred colt for the same operation.

Two ounces of the chloroform were put in the bladder, and, on its being applied as in the former case, the animal shook his head, bounded forward nearly knocking us down, struck out with his fore legs, and appeared almost like a mad horse for some time (say four or five minutes), but shortly afterwards he stood more quietly, and the effect of the agent became very visible by his reeling about. In this case I was determined, if possible, to get my patient down without pulling the ropes. However, I found I could not succeed, as he continued reeling, as if to fall, and then recovered himself; so I pulled him down, and secured him.

After having cut through the scrotum, and divided the cremaster muscle of the lower testicle, which I did with perfect ease, and without any notice having been taken of it by the patient, I proceeded to take hold of the other, for the purpose of removing it; when I found it so withdrawn from my reach, that I was compelled to wait about a minute and a half for its re-appearance. Having then secured it as before, and cut into the scrotum, before I could divide the cremaster, he gave a struggle, and continued to do so for some little time, and, in fact, until I finished the operation. I am of opinion the struggles were more violent than if the chloroform had not been used; I, therefore, am of opinion that there is no certainty in its action, and scarcely any advantage, on the score of humanity, to the patient, especially during the operation of castration; but I will give it another trial upon some animal about to be fired. Should you see any thing in my description of the use of the agent that requires alteration, I should feel obliged by your making me acquainted with it, so that I may adopt it in my next case. Do you not think that the sensation which causes the appearance of madness must be more painful than even the operation itself?

Apologizing for trespassing on your valuable time, allow me to subscribe myself

Yours, very faithfully.

To C. Spooner, Esq.

Case of Spasm of the Muscles of the Glottis, threatening Suffocation, relieved by Tracheotomy

By Mr. C. Simpson, *V.S.*

Gentlemen, *Store-street, Manchester, Dec.* 11, 1849.

I think the details of the following case are of sufficient interest to warrant my laying it before the profession. I should have sent you an account of it earlier, but was desirous of watching it for a considerable time after recovery, in order to observe if any prejudicial consequences or a return of the complaint might ensue.

On the 17th March last, I was hastily summoned by Mr. Edward Morrison, carrier, of this place, to attend a valuable bay cart-horse, which my informant said was "dying from choking." I found the animal labouring under the most intense difficulty of breathing, as indicated especially by the extended head and congestion of its vessels, shrill inspiration, and rapid and flapping motion of the flanks. The whole surface of the body was covered with profuse perspiration; the pulse was stronger than might have been expected, and about 50 beats in the minute.

According to the information I received, and in order to lubricate the esophagus, and thereby to release the supposed foreign body, I poured a quantity of linseed oil down the throat. This was swallowed without difficulty, and also without causing any aggravation of the symptoms, which sufficiently proved that no obstruction in the gullet could cause the distress under which the animal was labouring. In order to relieve the congestion of the lungs and that of the venous system in general, I abstracted blood to the amount of five quarts. This, although dark in colour, flowed with great rapidity; indeed, I do not remember before seeing the same amount taken in so short a time. Its evacuation, however, afforded no relief; the distress of the horse, in fact, continued to increase, and it was evident that, unless summary means of relief were soon adopted, asphyxia would speedily supervene. He was led out of the stable, when he walked with a staggering gait for a short distance, and then fell down as though he had been shot. The owner still persisting the horse was choked, I passed a probang along the gullet to convince him to the contrary, and informed him that there was no other remedy than that of cutting into the windpipe; a course of procedure he could not comprehend as at all calculated to save an animal's life. Without delay I divided the integuments covering the trachea longitudinally, and at the lower part of the upper third of its length; they were then pushed aside, and the knife was plunged at once into the trachea. This was followed by such a forcible rush of air as to draw inwards the margins of the incisions, producing a loud vibrating noise. During this operation the owner evidently considered that I was adopting a summary mode of relieving the animal of his sufferings, and was infinitely surprised to see him immediately relieved, as well as to hear me say, "Let him up." The horse, however, at once rose without any difficulty, and was so much at ease in a few minutes as to eat a mash.

I now found that, owing to the altered position of the neck, the relationship of the incisions in the integuments did not correspond with those in the trachea; this was remedied by removing a portion of the windpipe corresponding with the external incision as now situated. The edges of the outer wound were held apart with the fingers till a hook was fixed in each side, and both hooks tied up by a cord going round the upper part of the neck. This was a very temporary provision for a tracheotomy tube, which was placed in the trachea during the evening. The horse then seemed perfectly easy, and to all appearance in perfect health.

He was brought to my yard on the following morning quite lively, and breathing so easily, that I put my hand over the orifice of the tube in order to see the effect. I was surprised to find this made no difference in the respiration, and I at once took the tube out, and placed a plaster over the wound. Still the animal breathed quite naturally, and, in fact, he never required any further attention except such as the wound needed in being dressed. This healed up kindly. The horse was at work in eight days, according to report "as well as ever he was in his life," and has continued in perfect health ever since.

It is worthy of remark that this horse was, to all appearance, quite well previous to this attack, which came on at a moment's notice. He was neither eating nor doing any thing else at the time which could lead us to suppose that a foreign body had got into the larynx; and, as tending to shew that this was not the case, he did not cough even during the utmost severity of his paroxysms of distress. The affection could not be an inflammatory one ~~intrinsically~~, for it passed away in a few hours; whereas cynanche laryngea, or inflammation of any organ in the vicinity of the larynx, would have been gradual in its attack and decline. And as shewing there was no material soreness in this region, the animal commenced to eat as soon as he arose. I cannot conceive the case to be any other than one of spasm of the laryngeal muscles, especially such of them as close the glottis. What the cause of the spasm might be, it is impossible to say; but having been once originated, it would, judging from appearances, very soon have proved fatal by inducing asphyxia.

If any of your numerous correspondents have met with cases similar to the above, it would be interesting to the profession if they were detailed in the pages of your Journal; for while we frequently meet with strangles, inflammatory affections of the fauces, throat, and larynx, and sometimes tumours, causing great distress in breathing, I am inclined to think that cases such as I have described but seldom occur.

I am, Gentlemen, yours truly.

To the Editors, &c.

Case of Scarlatina accompanying Strangles.

By Mr. J. Norris, *with Mr.* R. Read, *M.R.C.V.S.*

Dear Sirs, *Crediton, Dec.* 12, 1849.

If you think the following case worth a place in your valuable Journal, it is at your service.

I remain, &c.

Feb. 17, 1849.—I was requested to attend a six-year-old horse, which had been under a farrier's care for three weeks previous, labouring under strangles. The disease appeared to be progressing favourably until the day before, when he refused his food, was duller in spirits than usual, and his hind legs had become a little swollen. No further notice was taken of him before this morning, when he was found to be much worse. On examination I found him in the following state:—Pulse 56; respiration accelerated; appetite gone; both hind extremities much swollen, with a serous fluid exuding through the skin in front of the hocks, and, when the thighs were pressed, the animal would almost sink to the ground from pain. The under part of the chest, abdomen, lips, and nostrils, were also œdematous. Suppuration had taken place around one of the parotid and submaxillary glands. There was an indisposition to move, and, when compelled to do so, it was effected with great difficulty, from the hind legs being so stiff and sensitive. A small quantity of mucous discharge from the nose took place; the Schneiderian membrane was everywhere covered with scarlet spots and streaks; the urine was scanty and high-coloured; the fæces natural.

I immediately abstracted four quarts of blood; opened the abscess around the parotid and submaxillary glands, from which a quantity of pus escaped, and dressed it with the digestive ointment; after which his breathing became more tranquil. I gave a ball containing potass. nitras. ʒiij, resinæ ʒij, pulv. digitalis ʒss, twice a-day. Ordered large flannels to be dipped in a hot decoction of poppy-heads and camomile flowers, then wrung out, and applied o the hind extremities for half an hour three times a-day, and afterwards all the swollen parts to be stimulated with lin. saponis comp. Bandage the legs up to the knees and hocks; clothe the animal warmly, and allow cool gruel to drink.

18*th.*—Pulse 50; respiration less disturbed; swelling in the legs decreased. He will take a little hay and grass, and drinks his gruel freely; moves better; and a healthy discharge takes place from the abscess. Continue to give the same balls; foment as before; and allow a handful of grass and hay occasionally.

19*th.*—Pulse 44; respiration quieter; the animal feeds more heartily; and the swellings are still lessening. Give the same medicine. Exercise half an hour twice a-day, which he bears well. Increase his diet.

20*th.*—Pulse 40; respiration tranquillized; appetite good; swellings of all the parts much diminished, and the indentation of the finger is left on pressure. He moves about his stall, and neighs on any one approaching the stable. Continue medicine as before. Exercise three times a-day instead of twice.

21*st.*—Pulse 40; appetite good. I cannot perceive any difference in the swellings. Gave a ball consisting of pulv. gentian. ʒiij, potass. nitras ʒij, zingib. ʒij, resinæ ʒj, twice a-day. Exercise the same. Still increase his diet.

22*d.*—Animal much worse. Pulse 65; respiration very laborious; appetite none. The swellings have very much increased. He has fallen twice during the morning, and while down struggled and groaned as if death was near at hand. The Schneiderian membrane is very thickly covered with scarlet spots, which before this day had almost disappeared. The eyelids are become swollen and everted, caused by a fleshy-looking substance protruding from beneath both the top and under eyelids, and which quite prevents the globe of the eye being seen. Continue the same medicine. Foment the hind extremities and eyes, the latter of which were afterwards washed with a cooling collyrium. Ordered friction with the hand to the swellings under the chest and abdomen.

23*d*.—Pulse 55; appetite improved; respiration not so quick; swellings less. Give the same balls, and exercise a quarter of an hour three times a-day. Allow a quarter of a peck of oats, divided into two feeds in the day, mixed with a gallon of thick gruel, and a bran mash occasionally, with a moderate quantity of meadow hay and grass. Discontinue fomentations.

24*th*.—Pulse 48; appetite good; respiration tranquil; swellings decreasing. The fleshy substance from between the lids of one of the eyes is resolved; the cellular membrane under the lid of the other has very much the flabby appearance of a sheep that is affected with the rot. Continue the same treatment, with the exception of the exercise being increased.

25*th*.—Pulse 40; respiration natural; appetite very good; swellings fast diminishing. Give the balls as before; double the quantity of corn, and allow as much hay and grass as the animal likes.

From this time to the 5th of March he continued rapidly to amend, the same treatment being continued, at which time I last saw him; after which I heard he soon regained his former condition, and went to his usual work.

There is at this time a white film which beclouds the greater part of the eye that was affected worst, so that vision is very imperfect. Query, Was this the effect of the disease, or of an injury sustained while labouring under it?

I remain, Sirs, yours truly.

To the Editors, &c.

[In all probability the opacity of the cornea is the effect of the disease. We have seen the same result take place frequently.—EDITORS.]

A CIRCULAR

Has been received from the "National and Central Society of Veterinary Medicine," France, addressed to the members of the "Veterinary Medical Association," London, of which the following is a translation :—

To the Members of the Veterinary Medical Association, London.

Death has just removed from our ranks two veterans of science and the professorship,—the learned and venerable M. Alexis Dupuy, senior professor at the Alfort School and Director of the Veterinary School at Toulouse, and the industrious Professor Jean Baptiste Rodet.

Both, although holding different positions, are worthy of the acknowledgment and respect of the veterinary profession. Dupuy has contributed powerfully to elevate it to that height in public esteem which it has attained. United by friendship from an early period with men illustrious in medical science, whose names will always shed lustre on this age, he made them appreciate, by the variety and profundity of his knowledge, the utility of our profession, of which little was then known, and to which he had entirely devoted himself. And if the doors of the Academy of Medicine have been opened to veterinary surgeons from the foundation of that illustrious society, it may be said, to the honour of Dupuy, that his high reputation has not been without its influence in producing this happy result.

The learned Jean B. Rodet, although not occupying so elevated a position, was no less indefatigable in his devotion to our common science, and also the teaching of it, which he did even to the sacrifice of himself, and, at last, was overcome by the labour which he daily conscientiously performed.

The lives of both have been entirely that of self-denial to themselves and families, and of devotion to the public good; from which cause they have not left any thing to their widows and families.

After forty-five years of public service, M. Dupuy has died entirely without resources, and his widow has not even the right to a small pension, to which it was generally thought she would be entitled; a national decree requiring that, for these rights to be secured, it is necessary that marriage should have preceded the death of the functionary five years. Now Dupuy had been married but three years when his sudden decease took plaee. Besides his widow, Dupuy has left a son, about twelve years of age, by a former marriage.

With respect to Jean B. Rodet, he has just died from a sudden attack of a cerebral disease; and which arrested him in his labours at the period when his accumulated scientific knowledge rendered easier the duties of his professorship. He has been taken away after only fifteen years in the exercise of his function, and has left his family almost without resources of any kind. The former is composed of four persons—his widow, two daughters, and a son. His widow, according to the terms of the law, has the right to a pension amounting to only a little more than twelve pounds per annum.

On account of these unfortunate circumstances, affecting individuals so eminent in their profession, and in every way worthy of respect, the members of the National and Central Society of Veterinary Medicine of France think it belongs to them to take the initiative, and to make an appeal to all the members of the veterinary profession, to meet the misfortunes which have just overtaken the families of two of the most worthy of their brethren.

We therefore address ourselves to you, and solicit you to take part in this benevolent act. The members of almost all the professions in France have passed between them a contract of mutual assistance, to relieve any of their members who may be overtaken by any sudden misfortune. Unfortunately, in our profession so commendable an association does not exist. It is these circumstances which oblige us to make this appeal to you, and we address you, in order to unite all our efforts in this pious work of brotherly charity.

The National end Central Society of Veterinary Medicine has the firm hope that your donations will not inconvenience you. It does not ask a large sacrifice. It well knows the times in which we live, nor is it ignorant of the numerous misfortunes produced by the changes in society, and how frequently private charity is taxed; and this it is which has caused us to request so little from you The magnitude of the most majestic river is effected by the number of rivulets which bring their tribute to its waters. It is a result of this kind which we wish to obtain. We number in France 2500 veterinary surgeons; and venture to calculate, within a certain limit, upon a number of our foreign brethren, with whom the Society is in correspondence, to aid us. Let each of us give the moderate sum of a franc only, and we shall thus obtain an amount sufficient for the families of our learned colleagues; and, aided by the kind and prompt assistance of the National Academy of Medicine, the Veterinary Schools of France, and our Society, they will then have obtained a position which will guarantee them an existence.

In limiting the donation to the amount of a france only, and which it solicits from each member of the veterinary profession, the Society proposes it with the view that all may be permitted to take a part in this good work, whatever may be the means each may have at his disposal.

It, however, does not limit any one from presenting as much more as he may feel disposed to do.

The members of the National and Central Society of Veterinary Medicine have subscribed the sum of 360 francs (£15).

The Society reserves to itself the mode of disposing of the gathered sums according to the respective wants of the different families for whom it has made this appeal to your brotherly assistance.

Receive the assurance of our affectionate and devoted sentiments.

Bouley, Jun.
Crepin.
Rossignol.
H. Bouley, *General Secretary to the Association.*

On Tuesday, November 27, a meeting of the Veterinary Medical Association was held in the theatre of the College for the purpose of taking the above Circular into consideration.

The President, Professor Spooner, *in the Chair.*

It was moved by Mr. G. T. Brown, seconded by Mr. J. Broad, and carried unanimously,

"That this meeting, having heard the memorial read that has been received from the National and Central Society of Veterinary Medicine of France, do favourably receive the same; and, sympathizing with the parties whose misfortunes are therein detailed, do acquiesce in the wishes expressed by the memorialists."

Moved by Mr. J. Gamgee, seconded by Mr. T. W. Gowing, and carried unanimously,

"That the memorial having been thus favourably received, means be adopted to obtain subscriptions for the relief of the parties for whom the appeal has been made."

Moved by Mr. C. M. Baker, seconded by Mr. W. H. W. Toby, and carried,

"That for this purpose a Committee be appointed, consisting of the members of the Council of the Veterinary Medical Association, with power to add to their number."

Moved by Mr. G. Varnell, seconded by Mr. J. Gamgee, and carried unanimously,

"That the above resolutions be published in The Veterinarian and Veterinary Record; and it is hoped that the Editors of these Journals will insert the same gratuitously."

We fully anticipate a cordial co-operation in this work of charity from our professional brethren. It is the first appeal of the kind that has been made; and although it may not be desirable to ask for a large contribution from each donor,—for in this we perfectly concur in the sentiments expressed in the Circular,—still we would not be thought to wish to check the flow of the soul-refreshing and generous stream, and are convinced that the many might effectually assist the few without themselves experiencing any inconvenience or loss.

With no impatience, and with perfect confidence of success, we wait the result of this appeal.

Subscriptions will be received by the Committee or the Editors of this Journal.

OBITUARY.

Mr. Thomas Dean, the subject of the present brief notice, was one of the first who entered as a student at the Royal Veterinary College, about the year 1795. He had been brought up to the medical profession, and combined the practice of both at Windsor, Berks. He attended the royal stud of George the Third, attained to considerable eminence, and had an extensive practice, which was rapidly increased by a successful operation of œsophagotomy, which he performed upon a horse that was choked by swallowing a potatoe, and which he extracted by excision. This operation was so extraordinary and then unique, that it was noticed in several of the newspapers of the day, setting forth the value of anatomical skill and science connected with veterinary medicine. The communicant of this article well remembers the circumstance, and has often heard it spoken of both in public company and private society; and shortly after, when attending the surgical lectures of the late Sir A. Cooper, he heard him state that in the human subject no such operation had ever been performed successfully, nor had any wound of the œsophagus got well; and he instanced two cases, one inflicted by a bayonet, and another by a knife, in both of which the patients were starved to death. The writer of this article, wishing to confirm the safety of Mr. Dean's operation, has successfully performed similar operations, and the same has subsequently been done by other practitioners.

Mr. Dean, after a few years' practice, retired from the profession, and followed farming until the time of his decease, which took place at Waltham, Berks, in the seventy-fourth year of his age.

Mr. Dean was much attached to field sports, and he related to the writer an anecdote that occurred when shooting over a nobleman's manor, near Windsor. The gamekeeper came to warn him off, and requested his address; he replied, "Dean of Windsor." The keeper immediately apologised for his interruption, and said he was sure his lordship would be happy to permit his reverence to pursue his sport, and wished him success.

About three years before his decease, when out shooting, on stepping merely across a ditch—not jumping, as he himself averred —he broke his leg. It snapped like a rotten hedge-stake, as he described it. This shews that at an advanced period of life the proportions of the earthy constituents of bone—the salts of lime —are relatively increased in quantity, and perhaps altered in quality, and that persons in old age should be careful to adapt their exertions to their conditions and capabilities.

EXTRACTS FROM JOURNALS.

On the Mode in which Phosphate and Carbonate of Lime are conveyed into the Organs of Plants; and on the Influence which these Salts exercise on Vegetation.

M. J. L. Lassaigne observes that it has been long known that the alkaline and earthy salts which are found in the ashes of plants are derived from the soil on which they grow, and that manures contribute various gaseous compounds and fixed bodies necessary to vegetation; that water also is no less necessary, since except the roots of plants be kept moist they cannot extract from the earth some of the substances which they appropriate to assimilation. Theéodore de Saussure showed, by a series of interesting experiments, that various neutral, alkaline, earthy, and metalic salts in solution were absorbed unequally by the roots of plants. As the soil contains, under certain circumstances, many soluble neutral salts, we can understand how, by rain, dew, &c., they may be conveyed into the vegetable organism. But with regard to the various insoluble salts which are found in their structure, it is most likely that they are in some way rendered soluble before they can be absorbed, though the verification hereof was still wanting as to certain insoluable calcareous salts which are carried by the sap and fixed in the organs of plants.

Many facts have established the influence of the earthy phosphates on the cereal grasses: according to Liebig they cannot arrive at maturity without the presence of these salts; and, according to M. Gasparin, one of the most distinguished writers on agriculture, the earthy phosphates are always present in the lands where they grow; what is thus abstracted being annually restored by animal manures, the benefit of which, especially of bone manure, is thus explained by the influence of earthy phosphates on vegetation. M. Lassaigne's object, in the memoir presented to the Academy of Medicine, of which we here present our readers an abstract, has been to give the result of a series of experiments in which he has been engaged during the past year, with a view to determine the channel by which these mineral elements are transmitted to vegetable structure.

This inquiry M. Lassaigne has followed out in the following researches:—1st, whether basic phosphate of lime, as it exists in the bones of animals, can be dissolved in water charged with carbonic acid; 2d, the portion in which it is soluble; 3d, whether this solution is favourable or unfavourable to germination and growth of the *cereales*; 4th and lastly, whether this same phosphate can be detected in different parts of the full grown plant.

Experiments.—*Phosphate of Lime is soluble, at ordinary temperature, in water saturated with Carbonic Acid.*

This proposition, which has been demonstrated by direct experiment by M. Lassaigne, was advanced by Dumas some years before M. de Gasparin asserted it theoretically. Towards the end of 1846, about the time that Dumas commenced his researches on this subject, M. Lassaigne announced to the Academy of Sciences, that water saturated with carbonic acid at the temperature of F. 50°, and under the mean pressure of the atmosphere, dissolves the phosphate of bones in the proportion of $\frac{75}{100000}$ of its weight. He showed, also, that this solution was decomposed by heat, and the basic salt separated by saturating the carbonic acid with carbonate of potash or ammonia. He found that a solution of bicarbonate of lime in water dissolved the phosphatic basis, though in very minute quantity. Having established this fact, he experimented upon bones, both broken and partially decomposed by having remained a long time buried in the ground, and found, when broken into small pieces, that digestion for from eight to ten hours in water charged with carbonic acid abstracted a certain portion of their carbonate and phosphate of lime. When powdered, even coarsely, a much larger quantity was dissolved. The carbonate of lime thus dissolved held nearly the same proportion to the phosphate of lime as Berzelius found to exist in bone.

As a result of these experiments, M. Lassaigne considers it established, that the calcareous salts which enter into the composition of bone may, in consequence of their decomposition in the bosom of the earth, become dissolved by aid of the infiltration of rain-water, and by reason of the free carbonic acid thereby conveyed to them.

Second experiment.—The preceding facts lead to the investigation of the influence on germination and vegetation, of this solution of carbonate and phosphate of lime in carbonic acid. This question possesses considerable interest and importance, both in a physiological and agricultural point of view.

1st. M. Lassaigne sowed four grains of fine wheat in the harvest of 1846, in two glass vessels, each having a capacity of about seventy-eight square inches, and each containing nearly eight ounces of siliceous sand, purified by washing in hydrochloric acid. The sand in each vessel was watered; the one with water charged with carbonic acid, the other with the same water, holding in solution phosphate and carbonate of lime, extracted from bones disintegrated by decomposition in the earth.

2d. The two glass jars were placed in a porcelain trough, covered with a crystal bell, capable of holding about fourteen pints, in order to protect them from the dust floating in the air. This apparatus was placed on a wooden stand near a window, so as to be exposed to the light of the sun: the surrounding air being kept at a temperature of 50° to 60° Fahr. The grains of wheat all germinated in less than two days, and the plumule became developed, as in the open air, into two leaves of a bright green colour, and increased in size rather rapidly under these conditions. The growth of the grains watered with the solution of calcareous salts was more rapid than of those watered with solution of carbonic acid only. The leaves furnished by the former were larger, of a deeper colour, and generally more fully developed than those of the latter; but in twenty-five days after germination, vegetation languished in these abnormal conditions, the leaves acquired a yellowish tinge at their extremities, and this change in colour became gradually extended to nearly the whole limb. At this time the height of the stem from the grains sown in the sand moistened with carbonic acid was, on the average, nearly two inches, while the average height of the plants grown in the solution of calcareous salts was nearly three inches, or one-third more than that of the former.

As at this point these little plants seemed to be suffering, the experiment was arrested: they were taken up by the roots, washed to free them from adhering sand, and then dried in a steam bath. The plants grown in the calcareous solution, when completely desiccated, had an average weight of about three grains, while those grown in carbonic acid had an average of two grains and a half. Thus both the height and weight of the plants were different under the two conditions which have been stated, the difference being clearly in favour of the grain sown and developed in sand watered with the solution of calcareous salts of bones.

A third set of experiments gave precisely the same results.

M. Lassaigne then proceeds to determine by experiment whether these earthy salts had been absorbed during vegetation into the structure of the plants. With this view he separately incinerated each stem, after having first dried it in a plantinum capsule. The ashes obtained from the plants grown in the solution of the calcareous phosphates were five times as much as those obtained from the corn grown in solution of carbonic acid alone. Phosphate and a small quantity of carbonate of lime were found in the ashes of the first, while in those of the second they were only detected in the minutest quantities.

The results obtained by these experiments, by demonstrating the influence of carbonic acid in dissolving bone earth, serve to explain the mode of action of certain manures. It is thus shewn, that besides the various gaseous bodies disengaged during their decomposition, the calcareous salts contained in these animal substances, and thereby liberated, play a most important part in vegetation; and the question in vegetable physiology, of the mode in which these earthy salts are conveyed into the organs and tissues of plants, is now answered by the discovery of this solvent power of carbonic acid in water. At the same time, an additional confirmation is given to the truth, which observation and experience daily tend to confirm, that all organic creatures exist in a state of mutual dependence.

From the London Medical Gazette.

Mialhe on the Therapeutic Action of Metals and their Compounds.

The researches of Mialhe, in reference to arsenic, mercury, and other metals, fully establish the correctness of the general law in physiology laid down many years ago by Dr. Christison, "That metals do not act as such, but must first be converted into oxides or salts" ("Dispensatory," first edition, p. 503); but they shew, further, that the changes which are requisite for absorption may take place in the interior of the body.

There are many circumstances in connexion with the physiological action of calomel which admit of explanation on this theory, which attributes its absorption to a partial conversion into corrosive sublimate; such as the equal activity, in so far as absorption is concerned, of small and large doses, the quantity of bichloride formed being determined by the saline strength of the secretions, and not by the amount of calomel taken; the advantage of the frequent administration of small doses, and in this manner exposing the chloride to the agency of a large quantity of the secretions. Ptyalism is said to be readily induced in seamen. Is this owing to an excess of chloride of sodium in the gastric and intestinal fluids, on account of eating salted provisions? In cholera, and other enteritic affections, we know that the blood is exhausted of its saline constituents, and that the secretions consist of little more than water. Now, placing this fact in connexion with the action of large doses of calomel in these diseases, in which, instead of exciting violent mercurialism, or "of adding to the local irritation, as might be expected from the well-known effects of that drug on the healthy bowels in less doses, they have a tendency to soothe pain, allay spasm, abate redness, and lessen excessive secretion" ("Christison's Dispensatory," p. 512), is it not probable that this remarkable suspension of the physiological action of the medicine is dependent on the watery state of the secretions, and consequent non-production of corrosive sublimate? Unfortunately, this leaves the therapeutic action as far from comprehension as ever.

Having entered the circulation, our author supposes that the bichloride unites with the albumen of the blood; the combination thus formed, insoluble in water, is soluble when in a state of hydrate, in the solution of alkaline chloride, as the serum of the blood. Of the existence of mercury in the blood, and its passage into the secretions, there is now no doubt. Mialhe succeeded in detecting it in solution in the urine twelve hours after taking a dose of nine grains of calomel. The quadruple compound of albumen, chlorine, mercury, and the alkali, which results is very fluid and remarkably stable. It is not decomposed by hydrosulphuric acid, the alkalis, or the ordinary tests of mercury, which fact, we think, offers a probable explanation of the difficulty of detecting mercury in the blood, and the general necessity for that purpose of destructive distillation. Is the formation of this compound, and its circulation with the blood throughout the body, the cause of that remarkable combination of symptoms termed mercurialism? The diminution of the albumen effected in this way would account for the dissolution of the blood, and loss of its plasticity, as indicated by paleness and hæmorrhages, which is now generally recognized as the effect of mercurial action.

The general opinion, that corrosive sublimate in combining with animal matters is reduced to calomel, is denied by Mialhe; and the results obtained in his experiments have been subsequently confirmed by MM. Chantourelle, Lassaigne, and Selmi. When, for therapeutic use, it is allied to certain organic bodies, as, milk, sugar, or gum, its action is much milder, as it is thereby deprived of its irritant and caustic properties. Its absorption and general action on the system are not the less certain, as was pointed out by Soubeiran in 1840.

Edinburgh Monthly Journal.

On the Action of Antimony as a Therapeutic.

By the same.

As antimony undergoes oxidation when exposed to the combined influence of air and moisture, there is no difficulty in understanding its action when taken into the stomach in the metallic form. Further, as the oxide thus generated is, according to our author, in the state of hydrate, it is dissolved in a feebly acid menstruum, as the gastric juice, much more readily than the ordinary sesquioxide of antimony, more or less of which is probably anhydrous. Having digested equal parts of the pure metal in a state of fine division, and of the sesquioxide in separate portions of water very feebly acidulated, Mialhe ascertained that the quantity of antimonial salt produced with the metal was much greater than with the oxide, from which he infers that the activity of an antimonial preparation, of which the oxide forms the base, will be much increased when the latter is in the state of hydrate. It is not mentioned how the oxide used in this experiment was prepared. Gmelin (" Handbuch der Chemie," 1844) says, that the sesqui-oxide of antimony does not appear to form a hydrate, but, as Berzelius has shewn, it is to a slight extent soluble in water. The sesquioxide of antimony belongs to a small class of drugs which are soluble alike in the acids of the gastric juice and in the alkalies of the intestinal canal, comporting itself as a base in the one case, and as an acid in the other; but for easy solution in feebly acid or alkaline fluids, like the gastric and intestinal secretions, Mialhe affirms that it must be hydrated.

Of late years, in France, the kermes mineral has again come into vogue as an antimonial preparation, and, owing to the recommendations of Clusel, Trousseau, and others, has with many superseded the use of tartar-emetic. It is said that, while in its general therapeutic action it is quite equal to the double tartrate, it is much less apt to excite vomiting, local irritation, or inflammation. This compound seems worthy of a further trial in this country; but the circumstance to which we wish to direct attention here is the great difference in its strength, according as it is obtained by the moist method of Clusel (officinal in the Parisian Codex), when it is most active, or by the dry method of Thierry, when it is often nearly inert. Our author has ascertained, by experiment, that the officinal kermes contains a much larger proportion than the other of the hydrated oxide. May not the very irregular action of the sesquioxide itself, observed in the trials made with it by Professor Christison and Dr. Clark, be owing to its containing a variable proportion of hydrated oxide?

The following explanation is offered by Mialhe of the remarkable difference in the physiological effects of the same doses of tartar-emetic in health and disease. In the healthy stomach the tartrate is, in part, immediately decomposed by the free muriatic acid of the gastric juice, and a highly acrid compound, the hydrochlorate of the chloride of antimony, is formed. Hence the nausea, vomiting, and diarrhœa. In the course of an acute disease, as pneumonia or bronchitis, in consequence of the loss of appetite and abstinence from food, the gastric juice becomes very feebly acid, and frequently, indeed, presents no acid reaction whatever. There is little or no formation of the acrid chloride, while the passage of all the tartrate into the circulation fully accounts for its powerfully sedative or contra-stimulant action under these circumstances. Mialhe endeavours to account for the well-known fact, that vomiting which has been excited by small doses of tartar-emetic frequently disappears when the dose is increased, by supposing that an amount of hydrochloric acid in the gastric juice, capable of decomposing a quarter or half a grain of the medicine, may be insufficient to displace the tartaric acid when the quantity is larger. To these views it may be objected, that as the emetic action of antimony is obtained by injecting it into the veins or rectum, the vomiting should be regarded as the effect rather of a special modification of the nervous system, than of a local irritation of the mucous membrane of the stomach; and a still stronger objection is found in the results of several experiments in which we administered, along with one grain of tartar-emetic, thirty grains of calcined magnesia or prepared chalk, without interfering in any degree with its ordinary emetic action. The antacid was not given in one but in three separate doses; the first at the same time with the antimony, the second a quarter of an hour afterwards, and the third in half an hour.

While we reject M. Mialhe's explanation, we are not less opposed to that view which attributes the tolerance to the presence of inflammatory fever. In fact, the same tolerance is established, quite independently of acute febrile reaction, when the patient is confined to a spare diet; and it may be established as a general rule, that the more rigid the diet, so much the more marked will be the general action of antimony; and, on the contrary, when the quantity of food is considerable, its emetic action is more decided. *Ibid.*

TRANSACTIONS OF THE VETERINARY MEDICAL ASSOCIATION.

October 16, 1849.

The first Meeting of the Members of this Association, for the Fourteenth Session, took place in the Theatre of the College this evening,

The President, Professor Spooner, *in the Chair.*

The Secretary read his Annual Report, after which the President presented the Medals and Certificates of Merit to the successful competitors, accompanying the same with appropriate remarks.

Secretary's Report for the Thirteenth Session, 1848-9.

" Education is a glorious privilege, the birthright not merely of England's princes and peers, but of her people and her peasants."

The great object had in view in the formation of the Veterinary Medical Association was the advancement of veterinary science by the inculcation of sound principles and their diffusion among its members. And it is gratifying, on taking a retrospect of the past thirteen years, to be able to say that from this there has been no deviation. As year has succeeded year, the progressive steps can easily be traced. If each year has not been so productive as the antecedent one, and all has not been done that might have been, nevertheless much has unquestionably been accomplished. If we have lost some of the friends who were with us at the beginning, most of the others have stood firm, and many more have been added. We have at any rate attained to a certain *status*—we believe a high one ; and the same spirit which has hitherto actuated us, will, we trust, continue to do so, since we have in some little measure verified the hacknied but not less veracious proverb, " *Experientia docet.*" It is true that this loss of our first friends we have often given expression of sorrow to, and had hoped it would have awakened the sympathetic consideration of some of them ; that they would have evinced some little abnegation of self, and, sinking minor differences, again have entered an arena so admirably calculated to display those nobler feelings by which the body could not have failed to have been advantaged ; but having been disappointed here, it may be that this cloud, which hitherto has seemed to rest so heavily, darkening our prospects, will be only like that seen by the prophet,—the harbinger of good. But if it be not, must it of necessity for ever outspread its gloomy wings and sit incubus-like upon us? No: the storm with its murkiness will quickly pass away, and a yet brighter sun enlighten our pathway; and, light having been once enjoyed, darkness finds no more place for ever afterwards. Let it, therefore, prove the incentive to redoubled exertions on our part, by which we shall shew that there is not only an elastic and a recuperative power in the body, capable of resisting external pressure, and which, by regaining its pristine state surmounts opposing obstacles, but also one that will maintain the Association in its entirety and integrity to the last.

As in antecedent years, the earlier Meetings of the Association again gave proof of the continued remembrance of us by many of our friends. Many morbid specimens had been received during the vacation, with communications descriptive of the cases in which they had occurred; and likewise many others, most of which have appeared in the Journal of the Society. From Mr. Western, V.S., Calcutta, we had the pleasure of acknowledging the receipt of specimens of drugs employed by veterinary surgeons in India; also several books were received from their respective authors, and others were subsequently added to the library by purchase. Mr. Crundale presented to the Museum, through the Association, his prize preparation of the bloodvessels and nerves, &c., of the fore leg of the horse, as did Mr. Carter his, who likewise forwarded some of the alsike clover *(Trifolium Hybridum)* that had been the cause of an hepatic affection in a horse. Mr. W. Baker, V.S., also sent a sample of rye grass extensively affected with the ergot.

Communications and Cases.

To Mr. F. C. Cherry, Principal Army Veterinary Surgeon, we were indebted for a case of intussusception in the horse, forwarded by him from a practitioner in America. To Mr. Hurford, V.S. 15th Hussars, for cases of tetanus occurring to horses in India, with the mode of treatment adopted by him. To Mr. Lewis, of Monmouth, for a case of rupture of the bloodvessels of the meninges of the brain of a horse, and of death caused in a dog by the swallowing of an unusual substance—a knitted garter—which had become lodged in the pyloric orifice of the stomach. To Mr. E. Taylor, Bury St. Edmunds, for cases illustrative of the effects of alsike clover in horses, and corroborative of a case which had been previously recorded by Mr. Carter. To Mr. G. T. Brown, for a case of puerperal fever in a bitch. To Mr. H. King, of Morpeth, for an instance of hæmatocele in a horse. To Mr. G. T. Baldwin, for an account of œsophagotomy in a pony, having been successfully resorted to by him. To Mr. J. J. Hughes, for a case of poisoning in the horse by, as it was conjectured, some of the salts of iron and common salt. To Mr. G. T. Brown, for a highly interesting case of hydrothorax in the horse, successfully treated by him. To Mr. Copeman, Utica, New York, for a very uncommon instance of *lusus naturæ* in a cow, leading to a rupture of the uterus, and an escape of the small intestines into that viscus, which, under his care, terminated favourably. To Mr. W. Baker, for a case of laceration of the œsophagus in a horse, with rupture of the diaphragm. To Mr. R. Gray, for the history of bots existing in the stomach of a horse in such numbers as to completely close the pyloric opening, while they had likewise induced ulceration of the coats of this organ to a considerable degree. To Mr. G. Murray, for an account of a diseased heart in a cow, in the right ventricle of which was found a large brass pin. To Mr. J. Jekyll, for the history of a malignant form of influenza that had prevailed among many horses under his care. To Mr. T. W. Gowing, for a very valuable case of open parotid duct of a horse successfully treated by him with collodion. The same agent had been before as successfully employed in cases of open joints by Mr. T. Taylor, V.S., and subsequently by Mr. Cartledge. Thus the utility of this new compound appears to be now established.

PATHOLOGICAL CONTRIBUTIONS.

After those already referred to as having been received during the vacation, Mr. G. T. Brown directed the attention of the members to the fore feet of a horse that had been long affected with navicular disease, and for which the usual remedies had been unsuccessfully resorted to. The case elicited many valuable practical remarks. Also to the lungs of a horse affected with glanders, giving the history of the case. Mr. Broad presented two fractured ossa innominata, with a rupture of the ligamentum teres in one, and he likewise gave the history of the cases in which these lesions had occurred.

The highly interesting specimen of aneurism of the thoracic portion of the posterior aorta, accompanied with the history of the case in which it took place, sent by Mr. T. S. Parker, is replete with instruction. Closely allied to this were the diseased hearts sent by Mr. F. Silvester, V.S., and Mr. Edwin Taylor, V.S.; the one being an instance of dilatation of this organ, with atony and rupture of the pulmonary artery; the other of fibrinous tumour within the left ventricle, the peduncles of which were attached to both the auricles. An analogous case to this is recorded by Mr. Gowing in the Proceedings of the Association for 1848. To Mr. E. Taylor we were also indebted for a splendid specimen of hydrops pericardii in the dog.

Strange, indeed, was the mass of diseased viscera received from Mr. J. F. Shaw, in which the rumen of a heifer had become structurally altered, and contained a carcinomatous tumour closely resembling a kidney in appearance, for which organ it had been by him mistaken. The bladder was likewise found to be extensively ulcerated. Nor less unusual was the change the osseous tissue had undergone in the case related by Mr. Shave. Many of the affected bones were placed by him before the members, in which an interstitial deposit to so considerable an extent had taken place, that their thickness was more than quadrupled. The preputial calculi taken from a pig, forwarded by Mr. W. A. Cartwright, enabled us to place on record the constitution of concretions of a kind not usually met with, although their formation may be easily and clearly traced. Mr. Cartwright likewise forwarded most interesting specimens of disease in the kidneys and ureters of a cow. Under this head may also be placed the two large intestinal calculi forwarded by Mr. J. Jones, V.S., one being of the "oat-hair" formation, the other of the "mixed" kind. A splendid specimen of ovarian dropsy, taken from a mare, was received from Mr. T. W. Gowing, also a ruptured stomach of a horse; and a similar case, with one fractured fore leg, was sent by Mr. P. Wallis, accompanied with the histories of the cases in which these lesions had occurred. Mr. B. Cartledge sent a splendid specimen of ruptured colon and inverted cæcum of a horse, with the history of the case.

Mr. W. C. Sibbald forwarded a mass of tuberculous matter taken from a cow, the result, in all probability, of strumous diathesis; also a quantity of coagulated lymph, voided by a heifer, which had assumed a tubular form, and enclosed alimentary matter. Accompanying this was the history of two cases of rupture of the stomach of horses, and the other of hydatids existing in the heart of a cow. Subsequently he forwarded a very interesting specimen consisting of the ruptured heart of a pony. To Mr. G. Draper we were indebted for the stomach of a horse ruptured at its larger curvature in two places, the lining membrane of which, both villous and cuticular, being in a high state of disorganization, as if produced by some corrosive agent—it was thought the potassio tartrate of antimony, although analysis failed to demonstrate the existence of this agent.

Among the new instruments laid on the table at the weekly meetings, Mr. Gowing not only again takes the foremost place as a Contributor, but he stands alone, having introduced an apparatus to aid in parturition, called by him, "The Fœtal Crutch or Adjustor," and several others.

Here it will not be misplaced to notice the new adhesive material for wounds, termed Collodion, some of which was made in the presence of the members by Mr. Blakeway. Its value to the veterinary surgeon is proved by the cases already alluded to, although Mr. Varnell and Mr. Brown had previously, in the pages of the Veterinary Record, inserted proofs of its efficacy.

Mr. Markwick kindly forwarded a quantity of his "spongio piline;" an admirable material where warmth conjoined with moisture is required, or the former alone. A gutta-percha shoe was also received from the manufacturers. Mr. W. Plomley presented a set of horse-shoes made in accordance with a plan long advocated by him, and found in practice to answer well. Mr. J. D. Broad communicated that he had been in the habit of successfully giving the leaves of the box (*buxus sempervirens*) in cases of diarrhœa in cattle when other remedies appeared to have failed; and Mr. T. W. Webb acquainted us with his method of adjusting the fractured ends of bones.

ESSAYS.

Among the first papers for discussion was one from Mr. Gowing, "On the advantages derivable from the interposition of vulcanized caoutchouc between the shoe and the foot of the horse;" when Mr. Reeve readily communicated to the members his method of applying this material, and subsequently the further improvements he had made in its application to his "corn preventive shoe." To this succeeded the Essay by Mr. Gamgee, on "The Vitality of the Blood:" a thesis which greatly redounds to the credit of its author, as being inchoative of that which must take place if he only undeviatingly persevere in the course he has so nobly entered on. A love of investigation and of deep research marks all his attempts, which is an earnest of future proficiency in his profession. The short argument it awakened—the nature of the subject precluding its extension—was highly commendable, and bespoke an intimate acquaintance with the views entertained by different philosophers and physiologists on this interesting, although even as yet unsettled, question, which indeed may be said to be a *questio vexata.*

The Essay, by Mr. Yates, "On Wounds, their Nature, Consequences, and Treatment," was scientifically drawn up, and elicited a highly animated argument, in which the new views taken of augmented vascular action, with its consequences, usually denominated inflammation, were lucidly given by Mr. Gamgee, and as ably commented on by Mr. Brown. The succeeding paper, by Mr. W. Cox, "On the Causes of Lamenesses incidental to the Horse," was one of great practical utility. Allied to it in character was that by Mr. R. R. Blake, "On Diseases to which Horses are liable in certain mining Districts." He wrote from a personal acquaintance with these maladies, having had the veterinary superintendence of very large iron-works in South Wales for some time, and it awakened a corresponding discussion. Mr. Barford's Essay, "On the Physiology of Digestion," embraced the new views taken by chemico-physiologists on this all-important function in the animal economy. The succeeding paper, by Mr. Smith, "On the Anatomy, &c. of the Stomach," gave to this an entirety, and became the means of eliciting by argument much that is important and useful. The subject introduced by Mr. Brennan, "The Breeding and

Management of the Race-horse," not being, strictly speaking, a medical subject, neither admitted nor called forth so scientific a debate. Mr. Cunliffe directed the attention of the members to "Puerperal Apoplexy in the Cow," a disease in the treatment of which he had seen more than the average amount of success. The same observation will apply to the paper introduced by Mr. Shorten, "On Pleuro-pneumonia in Cattle." The session closed with a paper "On the Importance of Auscultation as applied to the Horse," by Mr. G. T. Brown. It contained the result of his experiments on the normal sounds, or those detectable in the chest of a healthy animal, and constitutes one of a series, the completion of which is confidently anticipated will take place, since they cannot fail to benefit veterinary science, and also to elevate it.

The Council have still to lament the absence of competition among the Prize Essayists. Only one Essay was received from a practitioner on the subject of Parturition in the Mare, and which, being of considerable moment to the profession, it was determined should again be the subject of the Prize Thesis for the coming session. In like manner, only one Essay was received from a student on the Anatomy of the Tongue, Pharynx, and Larynx of the Ox. The author of it was Mr. Gamgee, and to him was unanimously awarded the Silver Medal. The like reward was adjudicated to Mr. Alex. Ward, for his Anatomical Preparation of the Head of a Horse.

The subject of the Prize Essay for Students for the present session is, the Anatomy, general and minute, of the Lungs of the Horse, illustrated by diagrams and drawings. The Prize Anatomical Preparation,—the Ligaments of the Fore Extremity of the Horse, including the suspensory ligament.

We do not remember a session in which the Essays possessed so high a tone of character; and we have endeavoured to mark our estimation of them, by inserting the first and the last introduced by their respective authors in the Journal of the College, The Veterinary Record. This opinion is confirmed by the Council having reviewed these Essays at their closing meeting, and resolved that, to nearly all, the "Thanks of the Association" should be awarded. They are the following:—

Mr. Joseph S. Gamgee—On the Vitality of the Blood.

Mr. Whitfield Smith—On the Anatomy, &c., of the Stomach of the Horse.

Mr. Richard S. Blake—On Diseases incidental to Horses in mining Districts.

Mr. John R. Cox—On Lamenesses in Horses.

Mr. John Yates—On Wounds and their Treatment.

Mr. Alfred J. Shorten—On Pleuro-pneumonia in Cattle.

Mr. Thomas Cunliffe—On Puerperal Fever in the Cow.

Mr. T. D. Barford—On the Physiology of Digestion in the Horse.

Mr. G. T. Brown—Auscultation, as applied to the Horse in Health.

The possession of the Certificate of Thanks confers on the recipient the distinction of Honorary Fellow of the Association.

It is ardently hoped that this unprecedented act on the part of the Council—this liberality on their part—will excite a spirit of laudable emulation in the minds of succeeding Essayists, and eventuate in great good to the Society.

The following have been elected Honorary Associates of the Association during the session :—

Professor Armand Gouboux, l'Ecole d'Alfort.
Professor Raffaello Lannetti, Florence.
Professor Maurice Riviglio, Turin.

Again the fell tyrant has been laying his victims low, and from among the members of the profession the following have come to our knowledge as having been borne to their long last home :—

Mr. R. Carter,	late of	East Dereham.
Mr. J. Franklin,	,,	Kidderminster.
Mr. J. Ainslie,	,,	London.
Mr. J. Field,	,,	Hon. East India Co. Service.
Mr. W. Desfarges,	,,	ditto.
Mr. E. Templer,	,,	Calcutta.
Mr. T. F. Plomley	,,	Canterbury.
Mr. H. Nash,	,,	Dorchester.

" Alas! how quickly this our earthly part,
Wasted by time, from hour to hour doth fail;
And cherished names how soon swept down the vale!"

The progress of a society may be compared to the incursions made by the mighty waters. If we look at the ebb and flow of the tide, no encroachment on the land appears to be effected: the recession seems to be as great as the advance. But if we mark it after a considerable interval has elapsed, then is plainly to be seen what has taken place. So if we compare the existence of the Veterinary Medical Association as it now is with what it was at its beginning—in the opinions of some, it may be, this was feeble and even contemptible, and certainly it was assailed by many foes who boldly asserted they would soon overthrow it—gratification cannot but be felt by those who have aided in its establishment, while proof is at the same time afforded that it has alike merited and rewarded their support. Nor has its culminating point been yet attained. Within itself it has those elements which, carefully and assiduously worked out, cannot fail of still advancing the science of veterinary medicine; for as yet it is but the inception, the beginning, of that which it may hereafter be, if its advocates only prove true and honest to their cause. Much solicitude has been expressed for it; much kindly assistance has been received by it; and the fervent wish is, that as years increase so the Veterinary Medical Association may continue to increase in usefulness, and accomplish that to which allusion has been already made, namely, the dissemination of a knowledge of true principles of science among its members.

W. J. T. Morton, Sec.

The Rules of the Association were then read, and the following officers elected for the Session:—

President—Professor Spooner.

Treasurer — Professor Simonds.

Vice-Presidents:

Mr. J. Turner.	Mr. F. Blakeway.
Mr. J. Wilkinson.	Mr. R. Wilson.
Mr. G. Varnell.	Mr. T. W. Talbot.
Mr. T. W. Gowing.	Mr. G. Westropp.
Mr. J. Broad.	Mr. C. Hunting.
Mr. G. T. Brown.	Mr. J. Paradise.

Secretary for Foreign Correspondence—Mr. W. Ernes.

Secretary and Librarian—W. J. T. Morton.

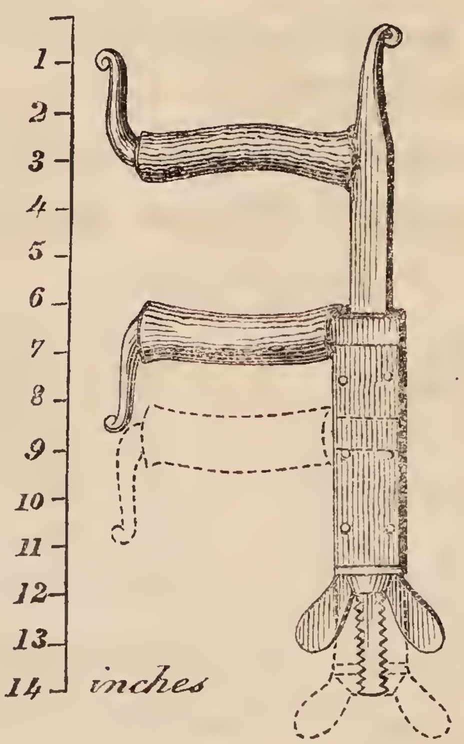
October 23, 1849.

Mr. F. Blakeway, V.P., in the Chair.

Mr. Gowing exhibited a compact and admirably arranged medicine-chest for the veterinary surgeon, formed so as to be taken by him in his chaise on his visits. Much judgment was manifested by Mr. Gowing both in the selection and the location of the different medicinal agents commonly in request in a general practice. He likewise exhibited his newly invented and highly ingenious dental instruments, giving a lucid description of their application, which is embodied in the subjoined essay; and subsequently directed the attention of the members to a very simple form of inhaler for the horse, and which might be used for the inhalation of watery vapour, either simple or medicated.

The plan recommended by Mr. Mavor for the employment of steam was shewn at a subsequent meeting. Of this a description has been given in the Proceedings of the Association for 1838-9, p. 199.

Mr. Varnell suggested a new form of the balling-iron, of which the woodcut will give the best idea; while of the advantages resulting from its use there can be no doubt. To obviate any injury to the mouth, the bars of the instrument are covered with vulcanized indian-rubber.



On the table were laid such morbid parts as could be preserved, that were received during the recess. They consisted of a diseased kidney and ureter, forwarded by Mr. W. A. Cartwright, V.S., accompanied by the following note :—

Gentlemen, *Whitchurch, Salop, 25th April,* 1849.

Herewith you will receive a beautiful specimen of diseased kidney and ureter.

It was brought to me this afternoon by a butcher, who took it from a fat pig weighing about 90 lbs.

The portion of ureter attached to the bladder, where the butcher cut it off, was impervious.

The bladder and other kidney with its ureter were sound.

The pig never indicated disease whilst living, and was killed as a "porker."

I am, Gentlemen,

Yours most respectfully.

To the Members of the Veterinary Medical Association.

And a tumour removed from the penis of a bull by Mr. J. Hazell, V.S.

Communications were read received from Mr. J. Tombs, V.S., descriptive of poisoning with arsenious acid, and which accompanied the morbid parts; of a case of laceration of the rectum of the horse, by W. Sweeting, Esq.; of scirrhous uterus in a mare, by Mr. W. Stanley, V.S.; of intestinal calculi, by Mr. B. Cartledge, V.S.; of metastasis, by Mr. W. Cox, V.S.; and of a tumour on the larynx, by Mr. J. Markham, V.S.

Some of these cases, our readers will remember, have appeared in previous numbers of the Journal, and the others are recorded in the present one.

The Journals received in exchange were likewise laid on the table, with several presents of works to the library.

A Descriptive and Pathological Essay on the Diseases incidental to the Teeth of the Horse; containing Remarks upon operative Dental Surgery and the Instruments required, with Observations respecting their Application.

By Mr. T. W. Gowing, *M.R.C.V.S.*

To the Members of the Veterinary Medical Association.

Gentlemen,

I am induced to bring this paper before you, because, having been now in practice for several years, I have, during that time, experienced great difficulties in many required operations on the teeth from the want of proper dental instruments: I have also been informed by some of my professional friends, that they, too, have had the same difficulties to contend with. These circumstances have led me to invent a set of instruments, which, I flatter myself, will be found useful. I have tested them in practice, and found them bear out my most sanguine expectations; and all the accounts I have received from those members of the profession to whom I have lent them have been highly satisfactory; and therefore I think I may venture to recommend them to you with confidence.

It is not to be expected that we shall find in the shop of the instrument-maker the many articles we require in practice; for although the cutler may possess mechanical genius, most commonly he is deficient in anatomical knowledge, and that knowledge, to a certain extent, must necessarily be coupled with the first named, to produce such instruments as are adapted to our purposes. We alone are able to judge of the length and proportionate bulk, as well as the peculiarities of construction, which the tools we are to use should possess. As illustrative of the foregoing remarks, I will just allude to the tooth-key which is in general use. It is copied from the human instrument, and, on account of its enlarged size and increased strength, at first sight appears to be all that we could desire. When, however, it is practically tested, its deficiencies become at once apparent; for there is so much greater distance to the posterior teeth of our patients than exists in the human subject, that the claw and bolster of the old instrument cannot be adjusted and retained in their situations.

Finding this to be the case, I have caused a pair of forceps to be made, of considerable magnitude, and on this account called by me the Larger Forceps. These I now exhibit to you *(see plate, fig.* 1). The two beaks of the instrument are serrated or cut for the purpose of giving them a firmer hold of the tooth ; the handles are 21½ inches in length, with an eye at the extreme end of one of them, and a female screw, as you see, is contained within the other. Through the eye is passed a shaft or lever, which, in its centre, has a male screw that fits the female one just alluded to, and which also, near to one end, has a shoulder that prevents the shaft passing through the eye. There is likewise attached to one end of the shaft or lever a smaller handle, to give additional power when screwing up the instrument ; thereby enabling us to obtain a secure and firm hold of the tooth we are desirous of extracting. It will be seen that, when we have such an additional leverage at command, caution will be necessary in the use of the screw, lest, from the tooth not being in a normal state, we should merely fracture that which it was our intention to extract. Neither must it be supposed that at all times we shall be enabled to extract the tooth, although it should be diseased, because its peculiar situation and length of fang may render vain all our efforts ; therefore, taking into consideration the power that you possess in such an instrument as this is, such force only should be applied as in the judgment of the operator would be sufficient to draw the tooth : for otherwise fracture of the jaw might ensue. Having tested the tooth, and finding its immediate extraction to be an impossibility, with the use of so much force or power as he may deem it prudent to apply, the operator must, nevertheless, not despair ; neither must he blame the forceps as being inefficient, but he must leave disease to work further havoc on the tooth, and then he will find that no difficulty will arise. But, as veterinary surgeons, it becomes our duty to alleviate the sufferings of our patients; and while decay and absorption are going on, we should recommend our employers to give the animal dietetic agents of the most nutritious kind, and in such a prepared form as will not require the full work of the masticatory apparatus. By such means we may support the animal through the progress of disease, without allowing him to be reduced to that state of emaciation in which we sometimes behold him.

And now, with your permission, we will consider some of the causes likely to produce disease of the molar teeth. To the anatomy of the teeth I shall not allude, or to the structures which compose them, but rather refer you to that excellent and recent work lately published by Mr. Mayhew, "On the Age of the Horse."

I am aware that the cause of disease of the teeth to a certain extent must always remain a mystery; yet, from observation and reflection, we may be able to deduce conclusions which practice will confirm. First, we must consider the two classes of horses that we are principally called upon to attend, namely, the cart or draft-horse and the hack or carriage-horse. The latter animals, so far as my observations have led me, appear to be less liable to diseases of the teeth than those of a coarser breed. Now, may not this be caused by the better attention which they meet with in stable management?—for we may observe that the good and efficient groom regularly sifts the provender previous to feeding his animal, and any foreign matters, such as stones, &c., are rejected, thereby preventing unequal concussion to the teeth. Now the cart-horse, and the machine-horse of our London omnibus proprietors, not receiving this attention, we find that they are more subject to diseases of the teeth; may not this, therefore, be one of the causes? Also, as the animal becomes aged, we find that we get divisions or interstices between the teeth, wherein the food that he has had for mastication becomes inserted or impacted, and is there left to undergo decomposition. Absorption of the gums may thus be produced, and the crusta petrosa exposed, which, being the most highly organized of all the structures entering into the composition of the teeth, will be the first to yield. I believe it is a fact which is generally admitted, that disease begins at the neck or fang of the tooth in our patients, and not usually at the crown; although there are some cases on record where the disease has first shewn itself on the last-mentioned part. These cases I consider are of rare occurrence; therefore it would, to a certain extent, go to shew that the causes I have enumerated would be likely to produce the injuries named.

It is also a common practice with carters to sprinkle the provender with sulphuric acid, and we well know what action the acids have on the teeth. If such practices are allowed, disease may be very readily accounted for.

Moreover, the teeth being lowly organized, they quickly lose their power of self-preservation, if the function of the stomach or alimentary track be deranged, from the general health of the animal being then interfered with, and through such local functional derangement the teeth, of all parts of the body, are the first to suffer or decay.

The symptoms that would indicate disease of the teeth to be present would be imperfect mastication; in consequence of which the stomach would have more to do, and, the food being then retained for a longer period in that viscus, its appropriative powers would be enfeebled or deranged, which would speedily be shewn by portions of the aliment passing through the digestive track entire. Associated with this would sometimes be a staring coat, with a harsh and unthrifty appearance of the animal; and what is designated hide-bound might also be present, accompanied with more or less emaciation, and a low febrile disturbance of the system. Besides all this, in some instances we shall have a portion of the corn, in a half-masticated state, from time to time thrown out of the mouth into the manger mixed with a quantity of saliva; also, the animal, if watched narrowly, would be observed suffering much pain during mastication, and suddenly stop and rest for a time, and then begin again to eat. Fœtor, likewise, when the mouth is examined, will be found present to a greater or less extent. Who that has witnessed these symptoms, and seen the horse hang his head by the side of the manger, with saliva dribbling from his mouth, can hesitate for a moment to acknowledge that the poor brute is suffering from pain; which, if we were to call tooth-ache, would not be believed by our employers?

The next thing that I beg leave to draw your attention to is the elongation of a tooth. Sometimes the tooth will grow to such an extent that it projects considerably above the other molars. Now this is produced by the want of resistance of the opposing tooth, death of which has taken place, and loss of substance has naturally resulted from the absence of that power of self-preservation natural to living structures; therefore it has no power to meet by growth the opposite tooth, and consequently the attrition necessary to keep those teeth on an acting level is lost. This overgrowth of the tooth has been for some time past a difficulty to remove, through the want of a proper instrument. The tools usually employed have been the ordinary smith's hammer and chisel, rude instruments for such a purpose, and their use not unattended with danger; for, the shock being received upon the posterior tooth, this it must be self-evident would have a tendency to produce disease, and perhaps even a more serious injury. For the same purpose the saw also has been used, but it has proved alike ineffectual; for who, having toiled with a saw, rubbing at the hard enamel of a horse's molar, making little or no impression, has not wished for an improvement in his instrument? To meet those difficulties, I have invented this which I now exhibit to you, designated by me the Dental Sliding Chisel *(see fig. 2)*. It consists of a cylindrical tube, which is attached to a guarded frame with an opposing or cutting chisel at the extremity so placed as to receive the concussion; so that when the working chisel is struck, it prevents the shock from being felt or sustained by the posterior teeth. The active chisel, as you perceive, moves in the cylindrical tube which forms the handle, the cutting part of it being guarded and protected by the frame of which I have spoken. The round part of the chisel plays or works through the cylinder, and to it is attached a steel head or button for the receiving of the blow or force necessary to be given. When we desire that it should cut through the hard and solid tooth of the horse, it will be seen that the rod of the chisel, working through the cylinder, would fall from any situation in which it might be adjusted, on account of the elevated and standing position in which the animal's head would necessarily be held by the operator. To guard against the chisel slipping backwards, and to render it steady, but not fixed, I have attached, as you will perceive, at this end of the cylinder a brass bulb, which gives to the handhold of the operator more security. The inside of the brass bulb, first mentioned, is hollow, so as to allow of some packing being placed within: when pressing upon the rod of the chisel, it acts on the same principle as it does in the piston box of a steam engine. To make this more clear, the brass bulb is screwed down upon the cylinder, thereby causing the packing to be so compressed as to retain the rod of the chisel in its desired situation. The mode of operating with this instrument will require some explanation from me, for I have been asked by some gentlemen whether the chisel is to be drawn back to the utmost range of the guard? I mention this, that others may not fall into the same error; for if it were so placed before the chisel reached the tooth, the force of the blow would be expended to a great extent, on account of the distance it would have to travel and the resistance it would naturally have to overcome. For these reasons we should, probably, be foiled in the performance of that which we were desirous of accomplishing, and the tooth would, in all likelihood, remain entire.

After a due examination of the mouth has been made, and we have selected the tooth to be operated upon, the animal should be restrained by means of a twitch, and a balling-iron ought then to be placed in the mouth. The common open balling-iron will answer the purpose, but the one I would recommend you to use is that invented by Mr. Varnell. It has a shifting bar, which is regulated by a screw nut at the bottom, that allows of its being readily adapted to any sized patient. And, for a better protection to the mouth of the horse, Mr. Varnell has caused the bars of his instrument to be covered with vulcanized Indian rubber.

The balling-iron being retained in its situation by an assistant, the chisel is to be drawn sufficiently back through the cylinder to allow the frame to be placed over the tooth, surrounding that portion we are desirous of removing. This will be better accomplished by the operator grasping the cylinder firmly close to the brass bulb, at the same time employing so much traction as will suffice to keep the chisel at the posterior part of the frame close to the back of the tooth. The tooth being closed in, laterally by the guards and posteriorly by the passive chisel, the active chisel is then to be brought in contact with the anterior part of the tooth. It will thus be seen that the tooth is imprisoned on all sides, and a hammer of about two and a half pounds weight is to be selected to give the blow with. The ordinary smith's hammer will answer, if of sufficient weight, should expense be a consideration; though I think, as a general rule, perfect instruments will pay for themselves in the long run, by a saving of much time and trouble, and also by causing us to be properly esteemed by our employers.

Having grasped the cylinder in the manner before described, a sharp blow is now to be given to the button or head of the chisel. But division of the tooth will not take place always at the first percussive action of the hammer. The blow will sometimes require to be repeated, and that once or even twice, so as to cut through the enamel. When that has been accomplished with a good smart blow, the cutting edge is driven right through the tooth. You will not have occasion at all times to repeat the blow, for I have often been successful at the first time.

This instrument I can recommend to you with perfect confidence, having not only tested it well myself, but I have also obtained a good character of it from my friends. The value of this instrument to us as professional men must be great, but it must be used for its worth to be appreciated.

Sometimes it will be necessary to cast the animal for the purpose of examination, and also for operation; but where we can accomplish our object, and the horse will submit to it, I prefer the standing position; for it is mostly aged horses we have to operate upon, and in such horses the joints have lost their yielding action, and sometimes ossific depositions have taken place, causing union of some of the bones of the spinal column. Although casting our patients for operations may be much safer to ourselves, it does not always conduce to their well-being. My observations more particularly allude to the heavy horse; for it is a well-known fact that some of that breed of horses never lie down voluntarily, but even sleep standing. By some accidental circumstance they do occasionally fall, and frequently after such an occurrence we are consulted professionally, on account of contusions which have been produced by the struggles the animal makes to regain his feet; therefore, inquiry ought generally to be made by us before we cast those horses for any minor operations. We should ascertain whether the animal duly takes his rest in the ordinary manner, lying down and getting up without difficulty; and if the reply is satisfactory, we may venture to cast the horse. But if, on the other hand, the owner informs us that he never willingly lies down, then we should proceed with caution. To exculpate you from any blame, the proprietor should be apprised of the probable cause that keeps his horse standing, and that you cannot be answerable for the injuries that might ensue from the restraint that you would have to subject him to.

Also, after removing the elongated portion of the tooth by means of the improved chisel, if the horse be cast, the hand should be inserted into the mouth, of course guarded by the balling-iron, and the excised part of the tooth removed; as otherwise it might be swallowed, and become the foundation for future intestinal disease. If it cannot be readily removed by the hand, your assistant should elevate the poll or back of the head, thereby bringing the animal's nose in apposition with the ground, when the piece of the tooth will readily escape. It is necessary sometimes to replace the balling-iron after having brought the head into this position, as often the portion of the tooth will be forcibly retained between the other molars, but which will be effectually separated by a second application of the iron. Having removed the piece, the head may again be elevated, and any irregularly fractured edges levelled by means of the flat rasp.

It cannot be expected that all the irregularities we meet with in the teeth can be overcome with one kind of instrument, as, owing to the peculiarities of situation and of growth, no one tool could always be brought to bear; therefore I have invented another instrument, to which I now beg leave to direct your attention. It is an instrument which you perceive is rather longer in the handle than the former one. It consists of a solid or entire piece of steel. At one end is the handle, which is encased on either side with pieces of wood, retained in their situation by rivets. The other end is shaped into a hook-like form, flattened and bevelled, with a guard on one side, for the purpose of retaining the instrument in its situation, and preventing its being displaced from the tooth. It possesses some of the advantages of the former sliding chisel: but this instrument is not meant to be used by itself; it is intended to prevent the concussion on the jaw, while the operator, with a chisel, strikes off any projecting angle of the tooth. The chisel I have employed is like the one I now exhibit, the GUARDED CHISEL (*see fig.* 4), which is of sufficient width or space to cover the table or upper surface of the molars. For the purpose of enabling it to pass readily over the teeth, without danger of its being dislodged by the motion, I have caused two guards to be made, by having a portion of the steel turned down on either side, in the form of lips. These effectually prevent the instrument from being thrown off the teeth during an operation, or by any struggles that might ensue when the blow is given, thereby anticipating even the possibility of injury to the mouth.

As I feel I shall be getting into difficulties in my description for the want of names to carry me on, and being at a loss for a better term, I have designated the first of these instruments a LATERAL REPELLER (*see fig.* 3). It is necessary for me to make this distinction, as I intend explaining to you the use of another instrument which bears some resemblance to the one I have just laid down, and which possesses some advantages in its construction, inasmuch as it can be used when the other could not be (*see fig.* 5). You perceive in the handle and shaft it is like the lateral repeller, but at the operating end it is turned down or necked; while on either edge it is bevelled and guarded on the sides by two circular shields, which, when used, will entirely prevent its displacement. This is intended to be used principally for the back or posterior teeth, the angle formed by the upper and lower jaw becoming less, as you are aware, towards the back of the mouth, and consequently any instrument requiring more space could not be so well applied.

In some instances, where necrosis has taken place, and the forceps cannot be used, and the tooth is sufficiently loose to allow you, with such an amount of traction as can be made by the aid of this instrument it may be displaced. It may also be applied, with the guarded chisel, for the reducing or chipping off of those irregularities which interfere with mastication. By its use much labour is saved, and the labour which is necessarily exerted when the rasp only is used is thus happily avoided. This instrument I have termed a Posterior Repeller.

It must not be supposed, although I am giving a code of instructions as to the manner in which those instruments ought to be applied, that they will all be able to be brought to bear in strict accordance with my explanations; for, of course, the irregularities encountered in the diseases and growth of the teeth will be various, and the instruments, therefore, must be selected by the operator for the required purpose, and his own judgment or tact must be exercised. But I have no doubt that, with the instruments I have this evening laid before the Association, you will be able to contend with, and to operate upon, such forms of disease as have hitherto baffled us. You will recollect I have before stated that it is necessary, in the removal of any portion of a tooth which has become elongated, to get a bearing or force behind; and it has been my particular study to make such instruments as would enable us to effect this object. The purpose of my present inventions is to prevent any injury or pressure being conveyed to the bloodvessels supplying the tooth, for without this precaution the vessels of the pulp might be so lacerated, that necrosis or death would follow. Such serious injury as this adverted to might be done not only to the tooth we are operating upon, but also to any other tooth that might receive the shock : inflammation, followed by suppuration and absorption of the alveolar process, would be likely to ensue, and consequently a loosening of the tooth.

The next instrument is a chisel, to which I lay little claim for merit, as it is like the common or ordinary one in use, with this slight difference,—it is somewhat longer and stronger than the common chisel known to veterinary practitioners, and is bevelled only on one side, so that its flattened surface is brought in contact with the tables of the teeth, thereby enabling us to make our fracture the closer. This chisel, however, must be used in conjunction with either of the two last-named instruments.

Having before explained the use of the large forceps, and their application, I now claim your attention to a pair of smaller dimensions (*see fig.* 6), which, although not so powerful in action, are, nevertheless, capable of doing good service. They are a pair of hand forceps, comparatively small, and yet of considerable size. They have not the cross lever the larger forceps possess, and they are billed or necked with a deep fosse or notch, which will enable the operator to get a firm hold of the tooth close to the gum.

Scarifications having been previously made with the gum lancet, such as the one I now exhibit (*see fig.* 7), which, as you see, is of considerable length, and has a handle of the same description as the other instruments. Now, from its length it will enable you to scarify the gum without inserting your hand through the balling-iron, and thereby obstructing your view of the part that you are desirous of cutting, which advantages would not be gained if a shorter instrument were employed.

The small forceps may now be applied and the tooth extracted ; but you will not be enabled to use them for such a purpose unless absorption has taken place to a very great extent ; nevertheless, they will be found serviceable when the larger ones have been employed and the tooth displaced, but left partly adherent. The small forceps may also be used to extract those teeth that, in the stable, are termed capped teeth, which are the temporary molars, the fangs and bodies of which have not been sufficiently absorbed so as to allow of their being shed, and which, if not extracted, may interfere with the masticatory process, and thus bring about debility in the animal.

There are instances where we find the teeth loose, although caries may not have gone on in the fang, but death of the more vascular parts and absorption of the investing membranes have occurred. This may arise from some remote cause, and, by the extreme length that they possess in their cavities, such teeth cannot be at all times extracted in the ordinary manner. It will be seen, by the great depth of the alveolar cavity, that an obtuse angle will be formed if the leverage be applied in the usual way; therefore, it will be found necessary to lift such teeth into an horizontal position previous to the turn being given for extraction. This may be done by locking the forceps upon the tooth and steadily raising it upwards, thereby forming a much shorter angle, and then no difficulty will present itself. There is, however, another thing we must take into consideration; that is, the position of the posterior and anterior teeth. The anterior teeth have a backward inclination, while the posterior ones incline forwards; these, therefore, will require to be raised in an oblique direction; and on account of the length of fang, should there not be space between the upper and lower jaws when the molars are thus lifted for extraction, the sliding chisel may be applied and the tooth shortened, after which we can effect our purpose. The only alteration I have made in the tooth-rasp (*fig.* 8) is the addition of a shifting handle of some length, whereby greater power is gained, besides the advantage of our being able to add a new rasp or any other instrument to it that the veterinary surgeon may deem expedient.

With this I conclude my brief and cursory remarks on Dental Surgery in the horse, sincerely hoping that the instruments thus laid before the Association, and through it before the profession, will be found by its members both useful and profitable in practice; this being the object I have constantly had in view.

EXPLANATION OF THE PLATE.

Fig. 1. The larger forceps to be used instead of the old key-instrument.
,, 2. The dental sliding chisel.
,, 3. The lateral repeller.
,, 4. The guarded chisel.
,, 5. The posterior repeller.
,, 6. The smaller forceps.
,, 7. The gum lancet.
,, 8. The tooth rasp.

The dotted lines (Figs. 1 and 3) direct to larger and other views of those portions of the instruments.

PRIZE ESSAY.

On the Anatomy of the Tongue, Larynx, and Pharynx of the Ox.

By Mr. Joseph Sampson Gamgee.

The tongue, a moveable organ endowed with the special sense of taste, is of very general, if not universal, existence in vertebrate animals. It is contained in the oral cavity, and is appended to the os hyoides, which at the same time is the supporter of the larynx and pharynx.

In the description of these organs and their component structures in the ox, I shall, so far as compatible with fidelity of detail and perspicuity of style, confine myself to the subject of this thesis. Strictly avoiding physiological comment, I shall alone digress in enumerating the general characters of the parts anatomically related with the structures which it is now my duty more especially to describe.

The os hyoides is the basis on which the tongue, larynx, and pharynx, depend for a fixity of position. The appellation of that bone in the singular number is in reality incorrect, since it is not single, but is composed of several osseous pieces, united together by synovial articulations.

The os hyoides is connected by a flexible and fibro-cartilaginous material, with a deep concavity in the temporal bone, at the root of, and external to, the styloid process. It is directed downwards and forwards, and, in addition to the organs abovementioned, it affords attachment to several muscles; which we shall distinguish into two pairs and a single intrinsic muscles, viz. the hyoidei magni and breves, and the hyoideus transversus; besides which there are eleven pairs and two single extrinsic muscles. The former of these consist of the stylo-genio and subscapulo-hyoidei; the sterno-thyro-hyoidei; the hyoglossi longi-breves and superiores; the genio-hyoglossi; the hyopharyngei (dilators); the hyopharyngei (constrictors), and the hyothyroidei; the two single extrinsic muscles are the lingualis and hyo-epiglottideus.

The os hyoides is composed of seven pieces, which form its body, and three pair of cornua; they are characterised as the greater, the middle, and inferior cornua.

The body of the os hyoides is semi-elliptical in figure, having its concavity directed towards the larynx. At its convex and anterior border is a tubercle of inconsiderable magnitude: to it is attached the substance of the tongue. On each side of and posterior to that tubercle are two spheroïdal elevations; these are synovial articulatory surfaces, corresponding to concavities in the inferior cornua.

The inferior surface of the body of the os hyoides is flat; but superiorly it presents an acute margin, which becomes more obtuse and rounded towards the extremities; where two ligaments, containing a large amount of yellow elastic tissue, affix the bone to the superior part of the anterior margin of the thyroid cartilage, which is likewise connected to the body of the hyoid bone on each side by an elastic ligamentous band.

The greater cornu is a long and flat bone, offering for description an external and an internal surface, a superior and an inferior extremity, and an anterior and a posterior border.

The superior extremity is flattened laterally, and consists of two projections. The superior of which is long and narrow, articulating with the temporal bone; whereas the inferior projection, looking downwards and backwards, is almost rectangular in figure. Between these two eminences the cornu is bounded by a concave margin in which is inserted the stylo-hyoid muscle.

The inferior extremity is irregular in figure, being prominent and rough on its external surface, concave and smooth internally: it articulates inferiorly with the middle cornu.

The external surface of the greater hyoideal cornu is concave, while a convex aspect is presented by the inner surface. Its anterior and posterior margins are almost parallel to about the middle of their length, but they diverge at either extremity, the anterior border being the most acute. Into one-half of the latter is inserted a yellow elastic expansion, which is likewise connected with the pterygoid process of the palatine bone.

The middle cornu is the shortest of the three; it articulates freely with the other two, and is almost perfectly cylindrical;

being, however, somewhat convex on its anterior surface, and concave on its posterior.

The inferior cornu is of greater bulk at either extremity than in the middle; and its internal concave and external convex surfaces join anteriorly in an acute margin. Inferiorly this cornu is related by diarthrosis with the body of the os hyoides.

Superiorly, the two greater cornua are implanted through the medium of elastic fibro-cartilage into deep concavities in the proximity of the styloid processes of the temporal bone. The two joints formed between the body and the inferior cornu, as likewise the other four articulatory connexions of the middle cornu, are lubricated by synovia and enclosed by appropriate capsules.

The tongue is a muscular organ. In its structure adipose tissue, glandular structure, bloodvessels, nerves, and mucous membrane enter as auxiliaries to its larger amount of muscular fibre. It is situated in the oral cavity, which is bounded inferiorly and laterally by the lower maxilla and molar teeth; anteriorly by the incisors; above by the anterior and superior maxilla and palatine bones; and posteriorly by the soft palate and fauces.

The shape of the tongue is that of a cone; but it is susceptible of a great variation according to the movements or position of the organ. Its base is attached to the hyoid bone, and laterally (immediately behind the last molars) by two folds of mucous membrane, which are continuous with the anterior palatine arches, constituting the lateral boundary of the isthmus faucium. Those folds are placed anteriorly to an aggregation of small glands opening into a common cavity, and are (from their situation and structure) comparable to the amygdalæ or tonsils of man and other animals.

The tongue is covered by mucous membrane which continues from the parietes of the mouth, and forms at the anterior and under surface of the organ a frenum admitting of great freedom of motion. Posteriorly the membrane is reflected over the velum palati; thence it is continuous into the pharynx and larynx, and also with the Schneiderian membrane, through the posterior nares.

The external mucous surface of the tongue is beset with papillæ, which, according to anatomical peculiarities, admit of division into three classes.

First, The papillæ vallatæ, vel circumvallatæ, from seven to thirteen in number, are arranged in two converging rows at the posterior part of the tongue. Each of them consists of a little eminence like an inverted cone, sunk into a depression in the mucous membrane; the point of the cone is fixed, and the base is turned upwards, and surrounded by a trench, which is bounded by a prominent ridge of mucous membrane. Microscopic investigators have demonstrated that numerous ascending papillæ exist on the summit of each papilla vallata.

Secondly, The papillæ fungiformes, or capitatæ, are small, and only seen on the sides of the tongue anteriorly. They resemble little inverted cones rising from the mucous membrane, having a red aspect, in consequence of the thinness of their epithelial covering.

Thirdly, The papillæ conicæ and filiformes present characters widely different from each other; but they admit of classification under one head, on account of the great development of their epithelium in the form of embricated scales. The papillæ conicæ are accumulated in an ellipsis on the medium part of the dorsum of the tongue; whereas the filiform papillæ are best seen at its apex, where they have a backward direction, and which gives rise to the feeling of roughness on passing the hand over the tongue from behind forwards.

On the posterior part of the organ are seen numerous follicles or recesses which are the openings of compound racemose muciparous glands. On each side of the frenum linguæ is a double row of conical papillæ, in the neighbourhood of which numerous little ducts pour forth the secretion of the sublingual glands. The Warthonian ducts, from the submaxillary glands, open more anteriorly than the former.

The three orders of papillæ above described are elevations of the epithelial and mucous covering of the tongue, including bloodvessels, which in the most complex papillæ form numberless loops.

As to the mode of the termination of nervous filaments in those papillæ into which they have been traced, I cannot offer a decided opinion; for the nervous loops which may be occasionally seen in a papilla under the microscope are, in all probability, not terminals of the filaments. The most recent examinations of Mr. Waller, of Kensington, are corroborative of the more probable opinion that the nervous filaments in the papillæ of the tongue are somewhat coiled and then end abruptly.

The muscular substance of the tongue is partly intrinsic, viz. proper to the organ itself; and in part extrinsic, being attached to other parts besides the tongue. M. Lavocat arranges the intrinsic fibres of the tongue into five pairs of muscles. We cannot admit this nominal distinction, since all those fibres present two fundamental characters in common. First, They are all enveloped in the mucous membrane of the tongue, and mainly depend for fixity on the hyoid bone. Secondly, They have the same function; since the tongue of the ox does not, like that of man, admit of the numerous variations in shape which are indispensable for the articulation of sound. We shall restrict ourselves to the classification of the muscular structure of the tongue into longitudinal, oblique, and transverse fibres.

Four pairs of extrinsic muscles belong to the tongue; these are the hyoglossi, longi, breves and superiores, also the genio-hyoglossi.

The hyoglossus longus extends from the base to the apex of the tongue. It arises from the inferior and external part of the greater cornu of the os hyoides, and in its progress forwards, becoming flattened and broader, it is attached to the sides of the tongue, being continuous as far as its apex, where it joins its fellow from the opposite side. At the superior and anterior part, this muscle is covered by the mucous membrane of the tongue. It is in contact inferiorly with the sublingual gland, internally with the hyoglossus brevis and genio-hyoglossus. It is crossed by the gustatory nerve, and at its origin it lies just above the lingual nerve and artery, while along its inferior border the ranine artery takes its course.

Hyoglossus brevis or *basioglossus*, is a flattened muscle, parallelogramical in figure, its coarse fasciculi run from the tubercle of the os hyoides forwards and upwards to the sides and base of the tongue.

At the origin its fibres are attached to the genio-hyoideus, and are in contact with the mylohyoideus. On the external surface of the basioglossus traverse the lingual and gustatory nerves; internally the muscle is related to the lingual artery, and also to the genio-hyoglossus.

Hyoglossus superior is fine in texture, in consequence of the minuteness of its fasciculi, which run forwards and upwards with a very slight obliquity. It consists of two flat strips of muscle inserted into the base of the tongue, but having different origins; the one arises from the inner part of the inferior hyoideal cornu, and is in close proximity with the origin of the hyoideus transversus muscle. The other strip or bundle proceeds from the external and superior part of the same cornu, and is only separated from the basioglossus by a small quantity of adipose tissue.

Genio-hyoglossus is a flat muscle composed of coarse bundles of fibres, which radiate from the symphisis of the lower maxilla and tendinous origin of the genio-hyoideus towards the free portion of the tongue, perpendicularly into its substance, and backwards into its base; the fibres acquiring a firm attachment to the middle and inferior cornu of the os hyoides.

Soon after the submaxillary artery has arisen from the external carotid, it gives origin to the lingual artery, which passes between the greater and lesser cornu of the os hyoides; and traverses the hyoideus parvus muscle, anteriorly to the lingual nerve. Beneath the substance of the hyoglossus brevis or basioglossus (to which it furnishes arterial twigs), the lingual gives off the sublingual artery.

From this vessel, immediately at its origin, a branch proceeds backwards, inwards, and upwards, supplying with blood the genio-hyoideus, genio-hyoglossus, and hyoglossus brevis, and expending its ultimate ramifications at the isthmus of the fauces and base of the epiglottis.

The sublingual artery then makes a curve downwards and forwards along the inferior border of the genio-hyoglossus; it furnishes a few branches to the sublingual gland, but supplies more especially the adjacent muscles, and ends in the mucous membrane on the sides of the tongue.

After giving off the sublingual, the lingual artery passes forwards anteriorly to the lingual nerve, and in its course is crossed by the gustatory. It is related internally to the genio-hyoglossus, externally to the hyoglossus longus, to both of which it supplies branches; but the greater part of the blood conveyed by it is distributed to the substance of the tongue, to the tip of which the lingual artery reaches, being here considerably decreased in caliber. This artery is often called "the ranine," on account of its tortuous course when the tongue is retracted into the mouth.

The tongue is supplied with nervous influence from the fifth, eighth and ninth pairs of cephalic nerves.

The gustatory nerve, springing from the inferior maxillary division of the fifth, passes between the internal masseter muscle and ramus of the inferior maxilla. At the base of the tongue it crosses the hyoglossus longus, and distributes a few filaments to the glandular structure in the vicinity, and to the genio-hyoglossus muscle.

Traversing the hyoglossus brevis, the gustatory furnishes a considerable branch to the sublingual gland, while its main trunk, in company with the lingual nerve, proceeds to the tip of the tongue.

The lingual or hypoglossal nerve (the ninth pair of Willis and twelfth of Soemmering) has its apparent origin from the medulla oblongata, by several scattered funiculi, issuing between the pyramidal and olivary bodies. Stilling has traced the deep origin of the lingual nerve to the floor of the fourth ventricle.

It makes its exit from the cranium through the foramen condyloid anterior, where the nerve is in proximity to the occipital artery; it next takes its course alongside the superior cervical ganglion, crosses the pneumogastric nerve, and the carotid artery. Posteriorly to the lingual artery, it sends filaments to the hyoglossus brevis and genio-hyoideus; and then divides into two branches, the least of which enters at once, in an oblique direction, into the substance of the tongue; while the principal division, after passing between the two genio-hyoglossi, also enters the substance of that organ.

The glosso pharyngeus (the origin and primary course of which we shall describe when treating of the pharynx) is one of the nerves of the tongue. At the supero-anterior part of the pharynx it crosses over the hyo-pharyngeus muscle, under the greater cornu of the hyoid bone, whence it proceeds to the base of the tongue, in the papillæ of which many of its ultimate fibres are traceable.

The larynx is situated at the superior part of the trachea and at the posterior part of the tongue; it is attached to the body of the os hyoides, and opens superiorly into the pharynx in a direct line with the posterior nasal apertures.

The functions which the larynx is destined to fulfil in the animal economy demand that it should maintain a definite shape, and yet admit of considerable movement. These two objects are attained by the cartilaginous structure of the organ rendering it at once solid and flexible, and by the subdivisions of the cartilaginous parietes into several pieces, admitting of a free movement; in effecting which, the active agents are appropriate muscles.

The larynx is separated from the longus colli muscle superiorly by the pharynx and origin of the esophagus. Inferiorly it is in relation with the subscapulo-hyoidei and sterno and thyro-hyoidei muscles, laterally with the parotid duct, the sub-maxillary and parotid glands, the external carotid artery, and the pneumogastric and sympathetic nerves.

Besides bloodvessels and nerves, muscles and mucous membrane, five cartilages enter into the composition of the larynx. These are the cricoid, thyroid, epiglottis, and two arytenoid.

The thyroid cartilage (so called from its shield-like form) is a broad plate, convex on its anterior and concave on its inner surface. On the inferior part of its convex margin it presents a prominence with a central depression for the insertion of muscles. Laterally it is quadrilateral and flat, being bounded by a concave border. Its superior margin presents three concavities and four convexities; the two posterior of these are united to the extremities of the body of the hyoid bone by ligamentous bands manifestly elastic, but also containing some white fibrous tissue, as denoted by their glistening aspect.

From the postero-inferior part of the thyroid cartilage, on each side, proceeds a cartilaginous cornu, curved downwards and backwards, so as to form with the cricoid two synovial articulations.

The thyroid cartilage is further united to the cricoid at its antero-inferior portion by an expansion of yellow elastic tissue; while two thyro-hyoid ligaments unite it to the body of the hyoid bone extending alongside the thyro-hyoid muscles.

The internal or superior surface of the thyroid is lined by mucous membrane; it is attached to the base of the epiglottis by the thyro-epiglottic ligament, and corresponds to the thyro-arytenoideus and crico-arytenoideus muscles.

The cricoid cartilage may be considered as the basis of the larynx, since it forms a perfect ring, and on it the arytenoid and thyroid cartilages move freely in virtue of their synovial articulations.

Posteriorly, the cricoid is broad and elevated into a prominent ridge on its median line, which is bounded by two lateral depressions, in which the crico-arytenoidei postici are firmly implanted. Superiorly and laterally the cricoid forms two synovial joints with the arytenoids, to which it is also attached by two small ligaments. Inferiorly and laterally two synovial joints are formed with the cornua projecting from the thyroid cartilage.

Tracing the cricoid from this broad and expanded portion forwards, we find that it gradually diminishes in magnitude, being attached at its superior border to the thyroid by the crico-thyroid elastic ligament, and at its inferior margin to the first tracheal ring by mucous membrane and yellow elastic tissue.

The two arytenoid cartilages articulating with the supero-posterior part of the cricoid, and united to each other by a thin lamina of white fibrous tissue, are small in comparison to the magnitude of the other cartilages entering into the composition of the larynx, and they form the boundaries of the superior laryngeal or glottal opening. These cartilages are lined anteriorly by the mucous membrane of the larynx; posteriorly, they are in contact with the arytenoid muscle, and are also connected anteriorly by muscle and elastic ligament to the thyroid and epiglottis.

Each arytenoid is irregular in shape, but may be compared to a pyramid, the apex of which is curved backwards. The internal or anterior surface is almost flat, merely presenting a slight convexity above and a concavity below. On the exterior of the arytenoids a prominent ridge separates two surfaces, the anterior of which is the smallest, triangular-shaped, and flat. The base of the arytenoid is a concave articulatory surface, bounded anteriorly and laterally by two projections of cartilage extending downwards. The borders of the arytenoids are thin, the anterior one being convex, the posterior concave.

The epiglottis is of a semi-ovoid shape, and presents for consideration a base, an apex, and two surfaces. The base (which is the point of insertion of the hyo-epiglottideus muscle) is attached to the thyroid cartilage by a short ligament.

The anterior surface corresponds to the inferior border of the velum palati: it is covered by a mucous membrane, and is concave in its longitudinal axis, but convex from side to side. The posterior surface, covered by the laryngeal mucous membrane, is convex from above downwards, but laterally it is concave. It is attached by ligamentous expansion to the anterior border of the arytenoid cartilages, and with which it contributes to the formation of the glottal opening.

The apex of the epiglottis is rounded off, and directed forwards towards the posterior surface of the velum palati.

The interior of the larynx in the ox is far more simple than in the horse; in it we do not perceive any lateral ventricles or vocal ligaments.

The glottal opening, which is situated at midway the length of the larynx, is bounded anteriorly by the thyro-cricoid ligament and base of the epiglottis, posteriorly by the arytenoid cartilages, and laterally by the margins of the epiglottis and arytenoids, and by the fibrous tissue uniting them.

To the larynx belong six pairs and two single muscles; viz. the thyro-hyoidei, crico-thyroidei, crico-arytenoidei laterales, crico-arytenoidei postici, thyro-arytenoidei, and the aryteno-epiglottidei, with the arytenoideus, and hyo-epiglottideus.

The thyro-hyoideus is a flat muscle placed on each side of the larynx, and is broader anteriorly than posteriorly. It is attached anteriorly to the postero-inferior and lateral parts of the body of the os hyoides; posteriorly it is inserted into the margin of the thyroid cartilage. It is related above to the thyro and hyo-pharyngeus, below to the sterno-thyroideus. Along the border of the thyro-hyoideus is a yellow elastic ligament, stretching from the inferior part of the hyoid bone to the extremity of the thyroid cartilage.

Crico-thyroideus is a short muscle attached to the external surface of the cricoid cartilage and the posterior border of the thyroid.

Crico-arytenoideus lateralis arises from the supero-anterior border of the cricoid cartilage; its fibres then spread out and re-assemble to gain insertion into the apophysis at the posterior part of the arytenoid cartilage.

Crico-arytenoideus posticus is attached to the posterior surface of the cricoid cartilage, and to the inferior portion of the arytenoidean apophysis.

The thyro-arytenoideus is thin and broad, placed on the interior of the wing of the thyroid cartilage, whence it originates, and is inserted into the apophysis and anterior border of the arytenoid.

Aryteno-epiglottideus is a narrow muscle, situated at the superior part of each thyro-arytenoideus, its fibres running backwards and upwards. It is inserted into the inferior part of the posterior border of the epiglottis and to the sides of the arytenoid cartilage.

The arytenoideus may be considered as a single muscle, its fibres extending from the excavated and lateral parts of the arytenoid cartilages, and uniting in a median line, which is distinguished by the accumulation of a little fibrous tissue.

The hyo-epiglottideus is essentially a single, although its appearance at the supero-anterior part is that of a bifid, muscle. We may describe it as originating from the inner surface of the lesser cornu of the hyoid bone, by two fleshy bundles, which gain a common attachment to the inner surface of the body of the os hyoides, whence one muscle, partially cleft superiorly, proceeds to the base of the epiglottis.

The mucous membrane of the larynx is peculiar for its remarkable vascularity and sensibility, and likewise for the number of the muciparous glands imbedded within it. It is a prolongation of the buccal membrane, which is reflected over the anterior surface of the epiglottis, and lines the whole of the laryngeal box, being thence continuous into the minute ramifications of the air-tubes in the lungs: forming, in fact, a part of the great system of the gastro-pulmonary mucous membranes.

The larynx is in part supplied with blood by a vessel proceeding to the base of the epiglottis from the lingual artery arising near to its origin.

The pharyngeal likewise furnishes a few arterial twigs to the larynx; but the principal vessel which supplies this organ is the laryngeal artery, derived from the carotid, which gives off a branch to the thyroid body before it pierces the crico-thyroid ligament, to ramify on the mucous membrane lining the larynx.

Nervous filaments are distributed to the larynx from the sympathetic, but its chief sources of nervous supply are the superior and inferior laryngeal recurrent nerves, both of which are derived from the pneumogastric.

The superior laryngeal nerve, after its separation from the pneumogastric, runs under the lingual and glosso-pharyngeal nerves, and pierces the postero-superior angle of the thyroid cartilage, distributing a few filaments to the thyro-arytenoid muscle, but principally to the mucous lining of the larynx. On the inner surface of the thyroid cartilage a remarkable interchange of fibres is effected between the superior and inferior laryngeal nerves.

The inferior laryngeal or recurrent nerves are ramifications of the pneumogastrics within the thorax, each of them originating at a different situation. Thus the recurrent laryngeal on the right side separates from the pneumogastric opposite the first intercostal space, whereas the left recurrent originates opposite the fourth rib; thence, taking a direction, first backwards, to embrace the aorta, and next forwards, to reach, with its fellow, the posterior part of the trachea, along which both nerves take an upward course: being related, superiorly, to the longus colli; inferiorly, to the trachea; internally, to the esophagus (to which they supply a few filaments); and externally to the carotid artery, and to the pneumogastric and sympathetic nerves. At the inferior part of the larynx the two recurrents interchange a few fibres, underneath the alæ of the thyroid cartilage, with the superior laryngeals; they are then indiscriminately distributed to the laryngeal muscles. It only remains further to add, that a considerable branch proceeds to the pharynx from each of the inferior laryngeal nerves.

The Pharynx.—The commonly accepted definition that the pharynx is a musculo-membranous sac, of a conical shape, is not strictly correct; since the floor of that organ is formed by the larynx, from the cartilaginous parietes of which the pharyngeal muscles gain their fixed attachment.

Laterally, it is bounded by the hyoideal cornua, and anteriorly and posteriorly it communicates with the mouth and esophagus. The pharynx is related superiorly to the cuneiform process of the occiput and to the origin of the longus colli; its sides are in contact with the submaxillary artery, the gustatory, glosso-pharyngeus and lingual nerves, while the internal carotid, the pneumogastric, and superior cervical ganglion of the sympathetic nerve, are situated in its roof. Although this organ is fixed by muscular insertions to the hyoid bone and to the laryngeal cartilages, still it enjoys considerable freedom of motion by virtue of the looseness of its surrounding connexion, and the large amount of yellow elastic tissue which envelops its roof and sides.

In the interior of the pharynx we observe seven openings; viz. the aperture into the mouth, and that into the esophagus; the laryngeal and the two posterior nasal openings, besides the two apertures of the Eustachian tubes. If, however, the term pharynx be restricted to that space which, during the act of deglutition, is bounded superiorly by the soft palate (drawn backwards and rendered tense to meet the anterior dilators of the pharynx), then only three openings into that cavity deserve to be mentioned; viz., the oral, esophageal, and the glottal aperture. The last named, during deglutition, is closed by the epiglottis; the pellet of food travelling over it as crossing a bridge.

The pharyngeal muscles admit of a physiological distinction into three pairs of dilators and three pairs and one single constrictors. The former are named the stylo-pterygo, and hyo-pharyngei, and the latter the hyo, thyro, crico, and aryteno-pharyngei.

The stylo-pharyngeus is narrow and pointed at its origin; in its descent the fibres diverge, so that the terminal portion of the muscle is broad and flat. It arises from the root of the styloid process of the temporal bone, and is inserted into the posterior part of the velum palati and supero-anterior portion of the pharynx.

This muscle passes downwards from its origin at an acute angle from the tensor palati, and meets inferiorly with the pterygo-pharyngeus; so that these three muscles may be described as forming a triangle, of which the two former are the sides and the latter the base.

The pterygo-pharyngeus is a flat muscle, comparatively thin in texture, its fibres being directed obliquely from above downwards and backwards: on its exterior we perceive a thin stratum of yellow elastic tissue. It is attached anteriorly to the pterygoid process and crista of the palatine bones, and posteriorly into the antero-lateral part of the pharyngeal parietes.

Superiorly it is covered by the origin of the masseter internus;

anteriorly it is in contact with the glandular structure of the velum palati; and, internally, with the insertion of the stylo-pharyngeus.

The hyo-pharyngeus (dilator) arises from the under surface of the greater cornu of the os-hyoides just above its middle. It bifurcates in its downward course; one portion becomes implanted into the upper and anterior part of the thyroid cartilage, while the other slip of the muscle passes downwards and forwards to the under part of the pharynx.

This muscle is related internally to the glosso-pharyngeus nerve, and anterior constrictor of the pharynx; inferiorly and externally with the hyoideus parvus, and the tendinous insertion of the hyoideus magnus.

Of the three pairs of pharyngeal constrictors the first is the hyo-pharyngeus. This muscle may be distinguished into one main portion and several accessory fasciculi. The main portion of the muscle arises from the body of the os hyoides, and passes in a slightly oblique line upwards and forwards, to meet its fellow on a median line at the posterior part of the pharynx, where it receives some secondary fasciculi; one fasciculus proceeds upwards and backwards from the posterior margin of the middle and greater cornu across the hyoideus parvus, and then bifurcates, one portion of which goes to the under surface of the hyo-pharyngeus, while the other continues along its anterior border. The three other fasciculi, arising from the lower surface of the greater cornu of the hyoid bone, continue to the under part of the hyo-pharyngeus.

This muscle is related at its origin to the hyoideus parvus and magnus; and internally to the hyo-pharyngeus (dilator) and glosso-pharyngeal nerve.

Thyro-pharyngeus.—From the upper and outer surface of the thyroid cartilage its fibres ascend to blend with those of the opposite muscle. From its relative situation with the two other constrictors, the thyro-pharyngeus is also called the constrictor pharyngeus medius.

The crico-pharyngeus, or posterior constrictor of the pharynx, arises from the cricoid cartilage, and converges towards the raphé on the roof of the pharynx. It is in connexion posteriorly and laterally with the thyroid body; and postero-superiorly with the commencement of the esophogus, with the fibres of which it has, however, no direct communication.

Beneath these constrictor muscles is a layer of yellow elastic tissue, which extends from the under part of the hyoid bone to the thyroid cartilage, and separates the constrictors from the aryteno-pharyngeus.

Aryteno-pharyngeus is a single flat muscle remarkably developed in the ox; it proceeds from the inner border of the arytenoid cartilages to the superior and anterior part of the pharynx; superiorly it is covered by a layer of yellow elastic tissue, while its under surface is lined by the pharyngeal mucous membrane.

The mucous membrane of the pharynx abounds in muciparous follicles; it is continuous posteriorly and inferiorly with the lining of the esophagus and trachea, superiorly and anteriorly it is extended into the mouth, nasal cavities, and Eustachian tubes. It is but slightly adherent by submucous cellular tissue, so that in consequence of the folds which it forms it admits of varieties in the caliber of the pharynx.

The main artery proper to the pharynx is the pharyngeal, a branch of the submaxillary. It supplies with blood the lymphatic glands in the vicinity and the hyo-pharyngeus (constrictor); it likewise ramifies among the muscles of the pharynx, and terminates on its lining mucous membrane.

It may have been remarked that I have omitted to describe the veins which return the blood from the tongue, larynx, and pharynx. This I have purposely done, being of opinion that in consequence of all the blood from the head being returned by the jugular veins, a cursory description of the venous branches by which the arteries before described conduct their blood would suffice.

Beneath the mucous membrane of the tongue is a net-work of veins, assembled at the inferior surface of that organ, as seen more particularly at its frenum; extending thence into the submaxillary vein, and which in its course backwards receives tributary branches from the larynx and pharynx, and then terminates in the external jugular vein. A few of the posterior laryngeal veins convey their blood into the internal jugulars.

The nerves of the pharynx are a few filaments from the superior laryngeal, also the pharyngeal branch of the pneumogastric, the glosso-pharyngeus, and a large branch from the superior cervical ganglion of the sympathetic.

The pharyngeal branch of the pneumogastric passes downwards and forwards in company with the pharyngeal artery. Between the hyo-pharyngeus (dilator) and constrictor pharyngeus anticus, it enters the pharynx to ramify on its mucous membrane.

The glosso-pharyngeus, or eighth cephalic nerve, emerges apparently from between the restiform and olivary bodies; but its fibres may be traced back to a little collection of grey matter in the floor of the fourth ventricle.

It issues from the cranium through the foramen lacerum basis cranii, together with the pneumogastric and spinal accessory, and crossing in is passage the internal carotid artery, it gives a loop or anastomosing branch to the pharyngeal division of the sympathetic. After this it takes a course downwards and forwards under the greater cornu of the os hyoides, and sends off filaments to the upper parts of the pharynx. It next crosses over the hyo-pharyngeus, and proceeds to the base of the tongue, as already described.

From the inferior part of the superior cervical ganglion issues a nerve of considerable magnitude, which descends backwards in conjunction with the trunk of the sympathetic and pneumogastric nerves and carotid artery; it then divides into several ramifications, which supply the four constrictors of the pharynx.

"Nullum sine labore natura dedit mortali homini."

MISCELLANEA.

Nutritive Properties of Bran.

M. Millon has communicated to the Academy of Sciences the result of some interesting investigations of his concerning the ligneous matter of wheat, whence it would appear that bran is a very nutritive substance. Though bran, doubtless, contains from five to six per cent. more ligneous substance than flour, it possesses more nitrogenous matter, twice as much fatty matter, and, moreover, two distinct aromatic principles, one of which has the fragrance of honey: these are both wanting in flour. M. Millon, therefore, thinks that bran and meal ought to be ground over again and mixed with the pure flour; and he has found, by repeated experiments, that this mixture yields a superior kind of bread, and free from the inconveniences of that bread which, in some countries, and particularly in Belgium, is made with coarse meal.

TO CORRESPONDENTS,

AND SHORT NOTICES OF COMMUNICATIONS, &c., RECEIVED.

We have been favoured with "*The Spirit of the Times*" from New York. It contains, under the head "Veterinary Department" a well-written paper on the *Ventilation of Stables*, by Mr. Charles Wills, M.R.C.V.S. We know not that we can extract from it any thing that is really new, but there is an earnestness of manner, and a familiar acquaintance with the subject manifested by him, which commend the article to our favourable notice. But what shall we say to the following advertisements, that also appear in the same Journal?

'Can such things be, and not excite our sorrow?'

We are contented to let our readers answer this question.

"WILLS' SPECIFIC LOTION."

ONE TRIAL SUFFICIENT TO PROVE!!

"THE great efficacy of this Lotion over every other article of the kind in the market, for Sprains, Cuts, Bruises, Pricks of Nails, Swelling of the Joints, Burns, Scalds, Chilblains, Frost Bites, Soreness of any of the Cords or Muscles, Inflammation of the Eyes, or other parts in either Man or Horse.

CHEAPEST IN THE WORLD! $1 PER BOTTLE!

Concentrated sufficient to make a quart, with which the part affected is to be bathed several times a day; when used for a prick of a nail in a horse's foot, apply the full strength, and if the nail has been in for any length of time, saturate a piece of lint, and keep in contact for 24 hours, wetting it every sixth.

It never fails to remove the pain and swelling caused by a kick or blow in one or two days, and NEVER takes off the hair, no matter how long or how often applied: this is a desideratum not to be overlooked, as all other Liniments and Lotions invariably do.

This lotion will be found a specific for stings of insects, poisons of plants, headaches, rheumatic pains, &c., black eyes will always be prevented if applied immediately after a blow on the face; when used for the human subject, a tea-spoonful of the mixture to be taken night and morning.

None is genuine unless prepared and signed by CHAS. WILLS.

A host of names could here be enumerated, who have proved the superior merit of this lotion: in fact, it acts more like a charm than a medicinal agent, and only requires to be known to drive all others into oblivion.

To be had at 127, Grand St.. and Veterinary Institution, 32d Street and 3d Avenue."

"DR. WILLS, VETERINARY SURGEON,"

"GRADUATE of the Royal Veterinary College of Surgeons, London; Hon. Fellow of the Veterinary Medical Association, (a distinction which no other man in America can boast of); Inspector here for the New England Live Stock Insurance Company; may be consulted as to the soundness of horses with confidence, both as regards correctness and integrity, the most respectable reference can be given.

The diseases of horses, and all other animals, treated on the Homœopathic principle.

Dr. Wills' unprecedented success has created great jealousy amongst his professional brethren, who are not backward to insinuate that it was a want of knowledge of the ancient practice that induced him to adopt the new mode. Now for the test:—

"CHALLENGE."

"Any Veterinary Surgeon, or person calling himself such, who thinks he can compete with me, with his tongue or pen, on any pathological subject, or with his instruments, in the performance of five of the most intricate operations on the horse, before a number of medical men and others, will find me morning and evening at the Veterinary Institution, 32d St., 3d Avenue, during the day at 127 Grand St., ready to back my own performance to whatever amount may suit their convenience." "CHARLES WILLS."

Proh pudor.

Our opinion has been asked respecting a disease affecting horses at the Cape of Good Hope, of which the following extract contains all the information we have received. It will be observed, that it is not written by a professional man.

"The horses in this part of the country are nearly all swept off by what is called the horse sickness, a kind of epidemic which attacks these useful animals about once in seven years, and for which no cure has as yet been discovered; the deaths averaging 99 out of every 100 attacked. The disease generally terminates in a day or a day-and-a-half from the time they are first seized. The first indication is, the hollow above the eye fills up and becomes rather prominent; next takes place a running at the nose; and, lastly, a heavy cough, after which the horses die in a few hours."

We thank Mr. P. Toll for the morbid specimen of an abscess taken from the liver of a horse, with the history of the case, and his improved form of balling-iron: of which a further notice shall be taken in the next number of the Journal, it being received too late for the present one.

Also, Mr. G. Lewis, for his communications. In a case of hepatitis occurring in a heifer the following were the post-mortem appearances:—All the abdominal viscera appeared healthy, except the liver and duodenum. The latter was much inflamed, the mucous coat of which had disappeared for nearly a third of its length. The liver had become scirrhous in places. The peritoneal covering was much inflamed in patches, and upon making a section into the large lobe, a quantity of viscid fluid escaped, much resembling rotten apples beaten to a pulp. In fact, this lobe was so decayed that it would not support its own weight. The small lobe was of a pale ashy colour, and easily broken down. The biliary ducts contained an innumerable quantity of hydatids, and a considerable portion of a cinder-like substance, which blackened the fingers and destroyed the edge of the knife. As far as I could learn of the previous history of the animal, it had, when a calf, been brought up with broths, &c. instead of the mother's milk; and that she, with several others upon the same fare, fell ill, some of which died; that she was very low in condition when purchased by her present owner, about fourteen months ago; and that soon after purchase she had a "slight attack of the yellows." She had been observed (some time prior to my seeing her) lying apart from the rest, "not seeming ill nor very well."

In a letter received from Mr. J. Gutteridge, he informs us that he has found the Ext. Taraxici one of the best alteratives and tonics he can employ in cattle practice. To the ox tribe he gives it in doses of from one to two ounces, two or three times a day; and to the sheep, in doses of a drachm similarly repeated.

THE

VETERINARY RECORD, &c.

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A Lecture on the Anatomy, Physiology, and Pathology of the Organs of Respiration and Circulation; with especial Reference to the Nature and Treatment of Pleuro-Pneumonia in the Ox.

Reprinted from the Journal of the Royal Agricultural Society of England.

By James Beart Simonds.

My Lord,

PURSUING the course which I have heretofore adopted in addressing the members of this Society at their annual *réunions*, I shall not venture to trespass upon your time by a lengthy exordium. To speak of the great and rapidly increasing benefits which arise from these periodic meetings, however inviting the theme, is but a work of supererogation; for all are ready to admit, from the prince of royal blood to the humble plebeian, that they exercise an important influence, both socially and morally, over our rural population, and contribute in no small degree to our national welfare and independence. The subject which has been selected for this lecture is one of considerable importance to the agriculturist, as it relates to "the Anatomy, Physiology, and Diseases of the Organs of Respiration of Domesticated Animals," and to an investigation, in particular, of the nature of that destructive malady affecting the Ox tribe, termed Pleuro-pneumonia.

In directing your attention to the general structure and functions of these important parts of the animal organism, it will be necessary, first, to take a somewhat rapid glance at the processes of digestion and assimilation, for the purpose of placing the office of the lungs in a clearer view. The propriety of this course will, doubtless, be admitted when we state that here are to be traced the various changes which the nutritious part of the food passes through prior to entering the circulating fluid, the blood, to contribute to the support of the frame. During life the repeated demand for new materials to supply the constant waste of the tissues, which arises from a multiplicity of causes, gives origin to those sensations which are designated *hunger* and *thirst*. The former of these shews the requirement of solid, and the latter of fluid alimentary matters; and they only yield to the proper amount of food and drink being received. Notwithstanding that both the quantity and the quality of the food which is partaken of will depend on the habits and conformation of each particular animal, still, in all it undergoes a successive and similar series of changes before it ministers to the wants of the system. In the mouth it is masticated, or divided by the operation of the teeth into smaller masses, and while this reduction in size is being accomplished, it is mixed with the saliva, a fluid abundantly furnished by the ducts of the contiguous glandular structures. This insalivation of the food produces both a chemical and mechanical effect; by the former the mass is fitted for digestion by the alkaline action of the saliva, and by the latter for deglutition by being rendered soft or pulpy. Thus prepared, the food descends the gullet, and enters the stomach, where, uniting with the gastric juice, it is subjected to a second chemical change, in which lactic and hydrochloric acid are chiefly concerned. This process, commonly called the digestive, is effected, as we have seen, by the *succus gastricus;* a fluid which is secreted within the follicles of the stomach, whence it is poured on the reception of alimentary or other matters.

Digestion thus converts the aliment into a *chymous* mass, and portions of this are alternately passed out of the stomach into the intestinal canal, where they are mingled with the hepatic and pancreatic secretions furnished by the liver and pancreas. The result of the commingling of these fluids with the chyme is the speedy separation into its nutritious and non-nutritious parts, to which is given the name of *chylification;* and, like the other changes we have described, this separation is most probably produced by chemical agency*. The chyle thus formed is next precipitated upon the *villous* coat of the intestines, to be absorbed or

* For fuller particulars of these various processes, see "Lecture on the Digestive Organs," Society's Journal, vol. ix, part i.

conveyed into the general circulation, while the effete matter is passed onwards in the canal, to be expelled from the system.

The vessels which transmit the chyle are designated the lacteals; and as its entrance into them is one of the most interesting and instructive phenomena in the animal economy, we shall describe it somewhat at length. The absorption of chyle taking place in the small intestines, the lacteals are freely distributed here, and consequently a different development of their internal lining membrane exists compared with that of the large intestines. In the former it is thickly studded with shaggy projections, *villi;* hence the name, the villous or velvety tunic. Each *villus* is plentifully supplied with bloodvessels, besides which it contains nerves and the radicles of the lacteal absorbents. The minuteness of these tubes, added to other physical causes, has however prevented their precise arrangement being demonstrated; but it is generally believed that they are formed into loops more or less perfect, as shewn in the annexed diagram*. The several component parts of a villus are united together by areolar tissue, and are protected by a scaly epithelial covering. This epithelium is analogous to the cuticle of the true skin, and is formed after a like manner, and performs a similar office by defending the sensible structures beneath it from injury. By some physiologists the epithelium is supposed to be cast off from the surface of the *villi* during the activity of chylification and absorption, and to be reproduced in the intervals of their suspension; by others, however, this shedding is not regarded as an essential step in either process. Immediately beneath the epithelial scales lies a great number of cells varying in size from the $\frac{1}{1000}$ to the $\frac{1}{2000}$ of an inch, whose office it is to imbibe the chyle and transmit it to the radicles of the lacteals. The transmission of the chyle to these minute tubes is effected by the bursting or deliquescence of the cells after acquiring their full size; but its entrance into them is due to the law of *endosmose* and *exosmose*. The imbibition, however, of chyle alone by the cells, as they are surrounded by other

Fig. 1.

* From Kirkes and Paget's "Handbook of Physiology."

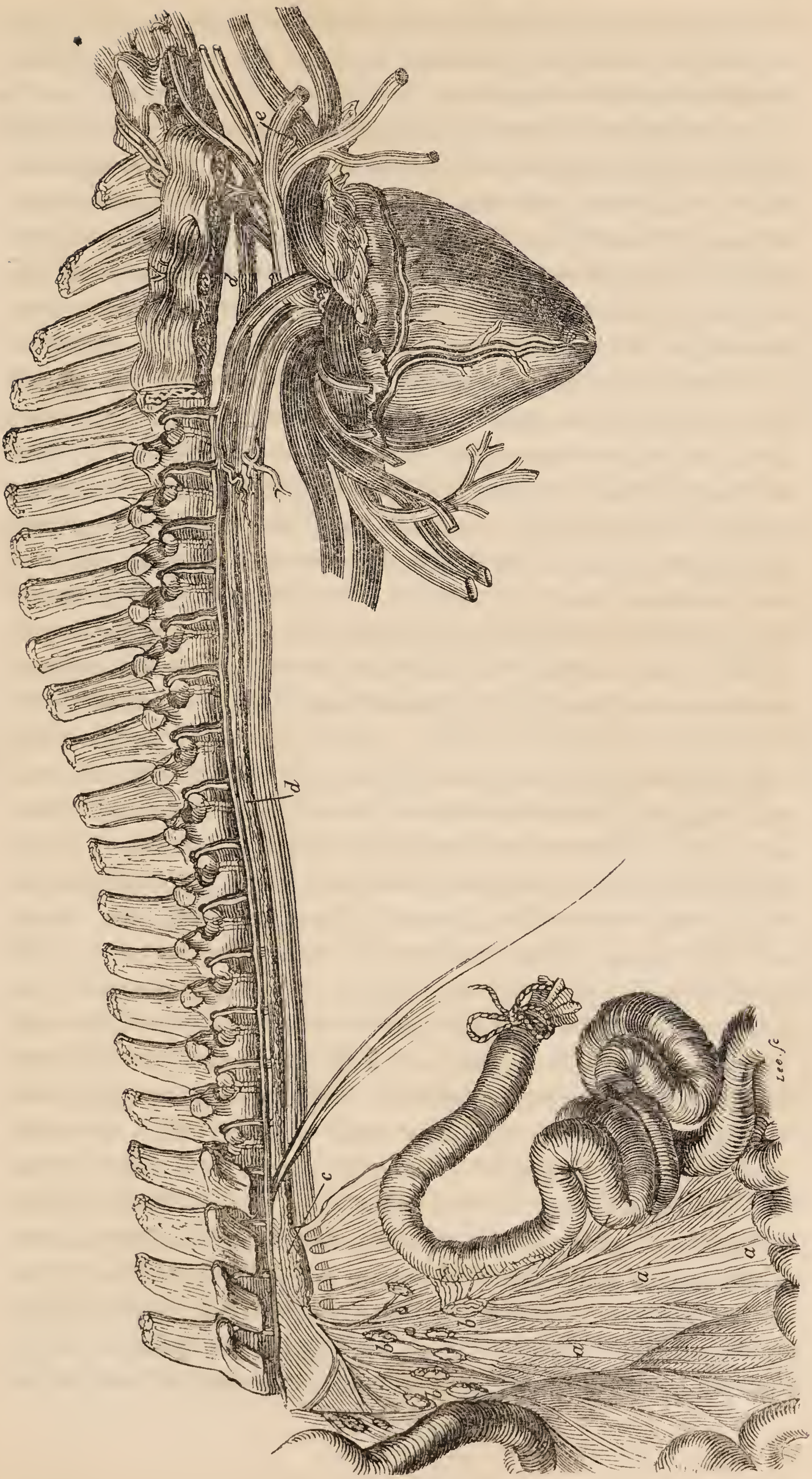
matters, some of which are even necessary to the well-being of the various organs, shews a power of selection by them, which, doubtless, is an act of vitality.

We cannot now speak of the means provided for a constant development of new cells; but it is right to add a few words on *endosmose* and *exosmose*, and which we prefer to do in the appropriate language of Dr. Carpenter. He says, that "when two fluids differing in density are separated by a thin animal or vegetable membrane, there is a tendency to mutual admixture through the pores of the membrane; but the less dense fluid will transude with much greater facility than the more dense: and consequently there will be an increase on the side of the denser fluid; whilst very little of this, in comparison, will have passed towards the less dense. When one of the fluids is contained in a sac or cavity, the flow of the other towards it is termed *endosmose*, or *flow-inwards;* whilst the contrary current is termed *exosmose*, or *flow-outwards*. Thus, if the cæcum of a fowl filled with syrup or gum-water be tied to the end of a tube, and be immersed in pure water, the latter will penetrate the cæcum by endosmose, and will so increase the volume of its contents as to cause the fluid to rise to a considerable height in the attached tube. On the other hand, a small proportion of the gum or syrup will find its way into the surrounding fluid by exosmose. But if the cæcum were filled with water, and were immersed in a solution of gum or syrup, it would soon be nearly emptied—the exosmose being much stronger than the endosmose*."

The chyle, by the operation of this law being conveyed into the lacteals, is carried by them into a receptacle, marked *c* in *fig.* 2, situated near to the lumbar vertebræ, and in its course it passes through the mesenteric glands, where it is further elaborated and fitted for its conversion into blood. For the purpose of making this better understood, it is necessary to state that the intestines are attached to the spine by a double reflection of the serous membrane which lines the abdomen, termed the mesentery, and that the lacteals travel upon this to reach the *receptaculum chyli.* These several parts are depicted in *fig.* 2, where *the lacteals* are marked *a*, *the mesenteric glands b*, and *the chyle-receptacle c.*

* Carpenter's "Manual of Physiology," p. 284.

Fig. 2.



Represents the lacteals and thoracic duct of the horse, with the heart and its principal vessels *in situ*.

To enter into a description of the particular changes which are wrought in the chyle by passing through the mesenteric glands would encroach too much on the subject of this lecture, and it will be sufficient to observe that, quitting the glands, it is found to contain a large number of spherical corpuscules, and to possess a power of clotting, like the fibrin of the blood. These corpuscules are formed from the lining membrane of the chyle-conveying tubes: they average in size about the 4600th of an inch, and are probably identical with the white corpuscules of the blood, as these latter are well known to be chiefly concerned in nutrition. The lacteals form frequent unions with each other, by which their size is increased, but their number diminished, so that they ultimately enter the receptacle by a very few trunks. (See *fig*. 2.) The mesenteric glands are composed of coils of these tubes, ramifying among a minute network of bloodvessels; they are likewise dilated or enlarged within the glands, and make their exit from them in fewer numbers than they entered. Thus the *vasa afferentia* are more numerous than the *vasa efferentia*.

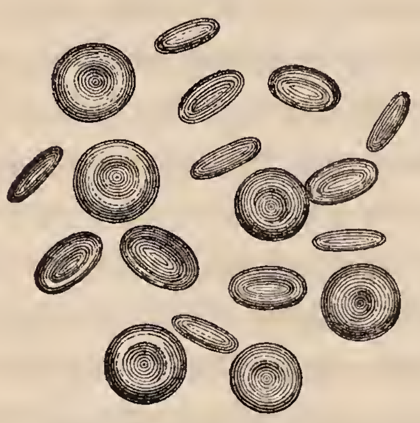
Within the receptacle the chyle unites with the lymph, a fluid which is carried there by the *lymphatic* absorbents, which are freely distributed throughout the body. The lymph is chiefly composed of the excess of the materials of the blood which had been exuded by the capillary bloodvessels proper to each organ for its nutrition, and which is thus conveyed back to the general circulation. This fluid in its passage undergoes a series of changes, like the chyle, by traversing the *lymphatic* glands in its course; and the vessels carrying it make frequent unions with each other, so as to end, like the lacteals, in a very few trunks. It is thus seen that the supply of new blood takes place from two sources, the chyle and the lymph, and which, in health, is sufficient to compensate for its continued waste. The contents of the receptaculum chyli are conducted into the circulation through a canal, called the thoracic duct. (See *d*, *fig*. 2.) This duct passes through the chest (hence its name) very near to the spine, and empties itself into the left jugular or auxiliary vein: in the accompanying sketch it is represented as joining the former at the point marked *e*. The new materials are thus mingled with venous blood, which of itself is unfitted for the support of life until it receives fresh elements of nutrition, and is re-oxygenated by its transmission through the lungs. It is also probable that the chyle and lymph, being almost immediately after their entrance into the circulation exposed to the action of the atmospheric air in the lungs, thus pass through the last stage in the process of converting them into pure blood.

We proceed to speak of the blood, the changes which it undergoes during its circulation, the constituents of which it is composed, and the vessels by which it is conducted throughout the system, as without this we cannot explain the function of the lungs. Blood may be defined to be a fluid circulating through the heart, arteries, and veins, carrying the materials necessary for the support of vitality, nutrition, and secretion, to every organ of the body; building up the frame of the young, and supporting that of the old animal. It not only circulates for the purposes of nutrition or renovation, but also to maintain the heat of the frame—all animals possessing a power of keeping up a heat within themselves, independent of the temperature of the atmosphere they inhabit, be it higher or lower than their own. This is designated animal heat; and its *modus operandi* will hereafter be explained. The heart may be viewed as the central pump from which the system derives the fluid; the arteries the transmitting, and the veins the returning conduits.

In vertebrated animals the blood is of a red colour, but it is colourless in the invertebrated. While circulating it not only appears to be red, but of a homogeneous character; however, on investigating it after being removed from the vessels, it is found to be composed of dissimilar parts. Its chief components are four—fibrin, albumen or serum, corpuscules, and salts; and each of these contributes to the maintenance of the varied functions of the body. The redness of the blood is owing to the presence of red particles or corpuscules, a fact which is demonstrated by their removal, when a colourless fluid, the *liquor sanguinis*, remains behind. Thousands of these bodies exist in a few drops of blood, and consequently they are so minute as to require the aid of the microscope to detect them. It was formerly supposed that the vessels in many parts of the system, of which those of the eye were adduced as an example, did not contain red corpuscules; modern research has, however, disproved this position; and the true explanation of the white appearance of the eye is, that its vessels are so small as not to transmit a sufficient number of these corpuscules at one time to give colour to the circulating fluid. We have frequent means of ascertaining this; for when inflammation of this organ takes place, these minute vessels are then enlarged, and consequently the red particles, entering in greater numbers, colour the fluid. Hence the cause of the "blood-shot eye."

The microscope, as before stated, is necessary to develop the existence of the red particles, and when thus examined they are found to be flattened discs, of a round form (see *fig.* 3), varying in size from the 4500th to the 2800th of an inch. We may state their average size as being near to the 3000th of an inch. Bulk of animal seems not to influence their dimensions, and they differ but little in this respect if taken from the elephant or the mouse. As a rule, they may be said to be small in the herbivorous mammal, larger in the carnivorous, and largest in omnivorous. They are of greater specific gravity than the other constituents of the blood, and hence, when blood is kept in a fluid state, after being drawn, they will be found to sink towards the bottom of the vessel, and thus tend to give that peculiar appearance which is called its buffy coat or inflammatory crust; the blood in general being longer in clotting when inflammation exists. The red particles are intimately connected with the health, strength, and vigour of an animal; and are found in fewer numbers in ill-health. Wild animals are said to possess a greater quantity than domesticated, and those which are fat less than those which are lean. The redness of these corpuscules is due to the presence of a red pigment, *hæmatosin,* which is diffused in the fluid which distends their walls; and it is in consequence of this pigment being chemically acted upon in the minute vessels of the system by the carbonic acid, and in those of the lungs by the oxygen, that the difference in the colour of arterial and venous blood is observed. The change in the colour of the blood is likewise connected with the process which generates animal heat—facts which we shall again advert to.

Fig. 3.



These figures represent the blood-discs of the ox highly magnified, and placed in different positions to shew their form.

We pass onwards to speak of the fibrin of the blood. It is generally known that very shortly after the withdrawal of blood, it clots or coagulates into a tolerably firm mass : this is owing to its fibrin, and in no way depends on any other of its constituents. This peculiar quality of the fibrin has led to its being called self-coagulating lymph—a term very rarely employed in the present day. It is only by abstracting blood that we are enabled to obtain this material, and to investigate its properties. Various means are had recourse to for this purpose, such as filtering the blood while it is fluid, washing the crassamentum or clot, or stirring the blood while it is undergoing coagulation. The latter is the plan usually adopted; and if a small bundle of twigs be used for the purpose, it will be observed that the fibrin will adhere to them more or less in a colourless condition, leaving behind the serum and red particles*. Washing the mass thus obtained renders it white, by removing the colouring matter from the few red particles which were entangled in its meshes while coagulating. An examination of the fibrin shews not only that it is white, but also that it is very tough and elastic, and, when viewed by a magnifying lens, it is found to be made up of fibres which intersect each other in every possible direction. The fibrillating or self-coagulating power of this material serves most important purposes in the animal economy. It forms the temporary bond of union between broken bones, and plugs to arrest the flow of blood from vessels which have been lacerated or torn asunder: and were it not for this, death would frequently result from causes which are now nearly inoperative. Fibrin may justly be described as the basis of the animal machine; and as its appropriation takes place during its circulation through the capillary bloodvessels, and as these form the connecting link between the arteries and the veins, so it will be apparent that venous blood must contain a smaller portion of it than the arterial. The relative quantity in these vessels is calculated by Müller to be in the proportion of 29 to 24. In health, about 3 parts of fibrin exist in every 1000 of blood; but it becomes increased in inflammatory affections, and often rises to 8 or 10 parts in the same quantity. This fact explains why a larger amount of blood can be abstracted during the acute stage of inflammation than in health, without the system suffering to an equal extent.

* Some fibrin thus obtained was exhibited at the lecture.

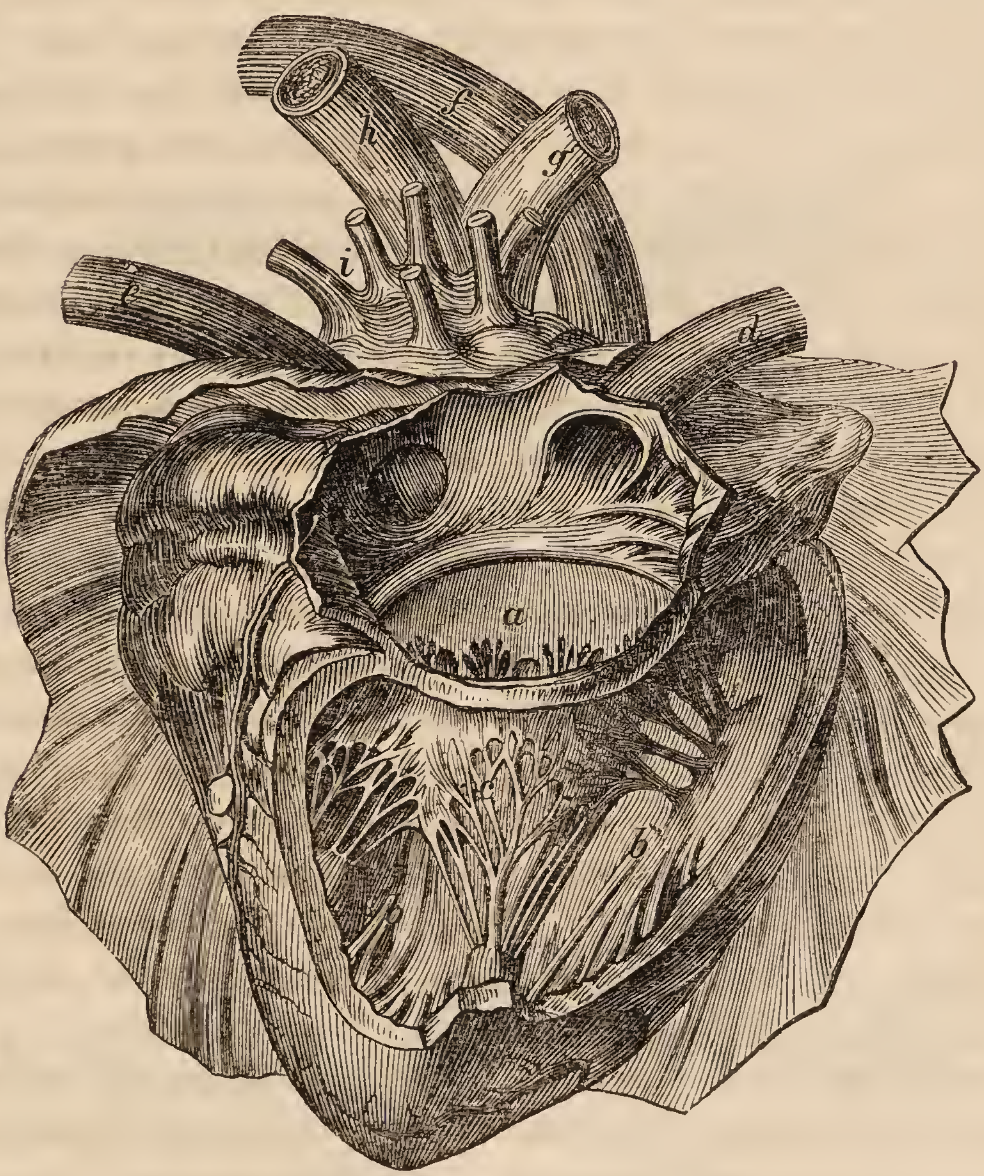
We pass on to consider the serum. After the coagulum of blood has stood at rest for a short time, a fluid of a pale straw-colour appears on its surface: this is the serum. The separation of the serum from the clot is due to the contraction of the fibrin, which continues long after the blood has coagulated. The fluid, therefore, is forcibly expelled; being, prior to its separation, mechanically retained in the coagulum, as water may be said to be in a sponge. Serum holds in solution the albumen and salts of the blood, and it is chiefly composed of these matters with the addition of water. Its viscosity will depend on the relative amount of albumen, which, in health, has been estimated at about 8 per cent. An alteration in the specific gravity of serum will likewise indicate the proportion of its albumen, as in healthy subjects its specific gravity is about 1030. Under disease, and more especially when of a debilitating nature, such as dropsy, the watery parts of the serum are increased, and become effused into various cavities of the body, as the chest, abdomen, or ventricles of the brain. Ordinary serum is also quickly transuded through the thin coats of the capillary vessels, of which we have daily proofs in local inflammation of the external structures, where the swelling is referrible to that cause. Unlike fibrin, serum, whether in or out of the body, remains fluid; but as it contains albumen, this is capable of being solidified by heat, and likewise by the admixture of mineral acids, or alcohol*. The heat required to accomplish this is 162° of Fahrenheit—a temperature the body never attains to. Albumen is believed to be converted into fibrin, and thus to minister to nutrition; and it is also thought that the white corpuscules of the blood, of which the limits of this lecture will not allow of a further mention, are the agents which effect the conversion. The salts can be only incidentally alluded to; they amount to between 6 and 7 parts in 1000, and are chiefly composed of the chlorides of sodium and potassium, and the phosphates of lime, magnesia, and soda.

Having described the constituents of the blood, we shall now explain its circulation, and the changes which take place during its passage from one part of the system to another. We have before likened the heart to a central pump, as it is by the contrac-

* The solidification of the albumen of serum was demonstrated in the lecture by the employment of hydrochloric acid.

tion of the muscular walls of this organ that the blood is driven into the arteries that arise from two of its cavities, to be conveyed throughout the body. The heart is a double organ, and usually described as having two sides, a right and left. It is also divided into four cavities; the right auricle and ventricle, and the left auricle and ventricle. The two auricles, and also the ventricles, are separated from each other by a muscular partition, so that the right side has no direct communication with the left. In the accompanying sketch (*fig.* 4) the cavities of the right side are laid open to illustrate the course of the blood. The two venæ cavæ, marked *d* and *e*, receive the blood from the veins of the system

Fig. 4.



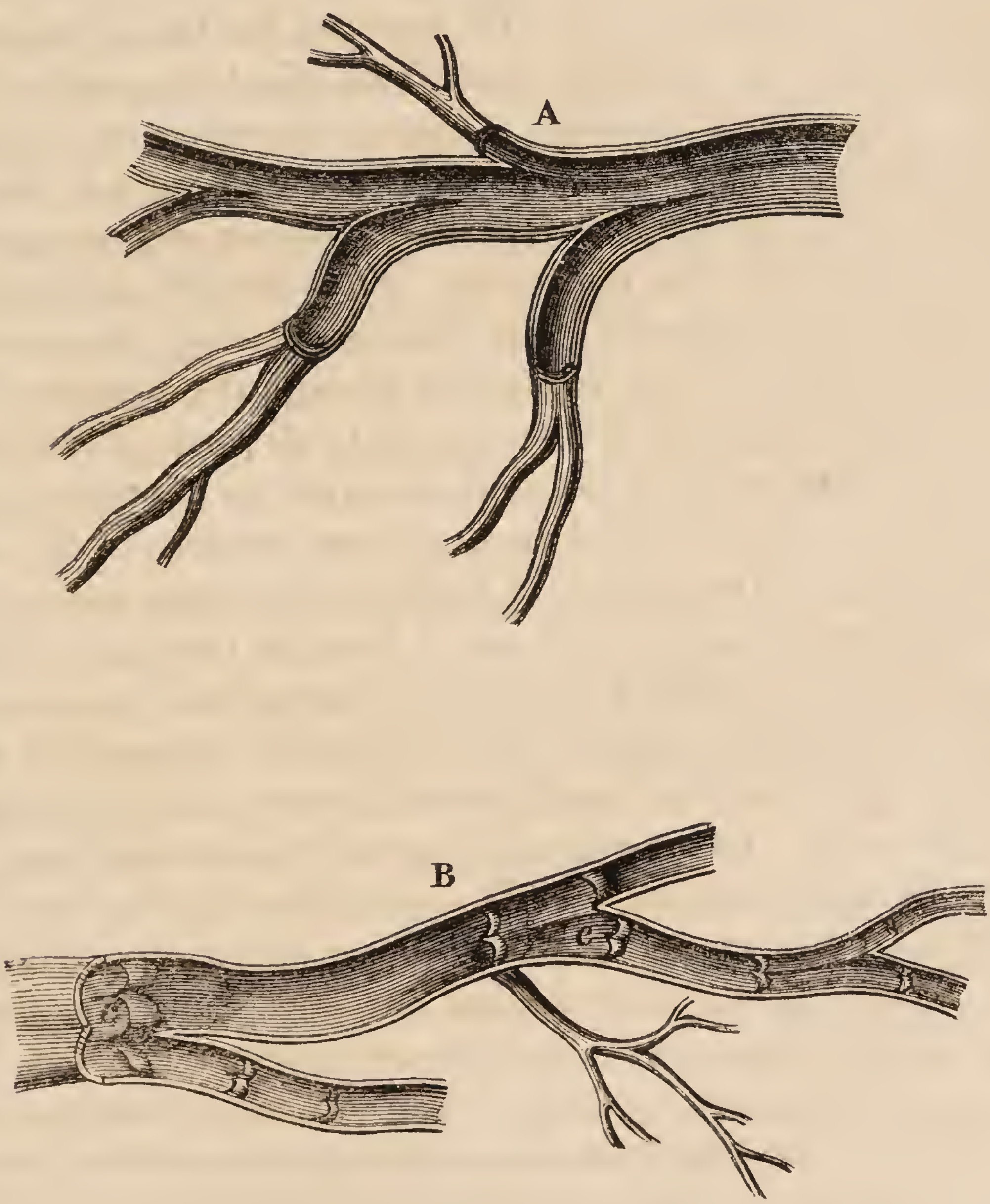
a. The auricle. *b, b.* The ventricle.
c. The valves which prevent the return of the blood from the ventricle to the auricle.
d. The anterior vena cava. *e.* The posterior cava.
f. The pulmonary artery. *g.* The anterior aorta.
h. The posterior aorta. *i.* The pulmonary veins.

which unite to form these vessels, and they empty themselves into *a*, the auricle. From this cavity, by the contraction of its muscular sides, the blood is driven into *b*, the ventricle. The filling of this second cavity leads likewise to the contraction of its walls, by which the blood is propelled into *f*, the pulmonary artery; for the rising of the valve *c* prevents the blood passing back into the auricle by closing the auriculo-ventricular opening. This valve is called the *valvula tricuspis*, being divided into three portions, each of which tends from its base, which is attached to the sides of the ventricle, towards a loose or floating apex. From the pulmonary artery the blood enters the capillaries of the lungs, where it undergoes a peculiar change, hereafter to be explained, and is thence conducted back again to the heart by the pulmonary veins. The action of the artery in assisting the onward course of the blood would drive a portion of it into the ventricle, but this is prevented by three valves of a semilunar form which guard the mouth of the vessel. The pulmonary veins, *i*, empty themselves into the left auricle, and this into the left ventricle; a similar valve to that of the right side, the *valvula bicuspis*, preventing any retrograde motion of the fluid into the auricle. From the left ventricle the blood passes into the aorta, which, bifurcating into *g*, the anterior, and *h*, the posterior aorta, conducts it through the medium of the arteries branching off from these vessels to all parts of the body. Semilunar valves are also placed at the origin of the aorta from the heart, and serve a like purpose to those existing in the pulmonary artery. The arteries of the system in their course give off many branches, all of which end in hair-like vessels, *capillaries* (*see figs*. 6 *and* 7), by which the blood is appropriated to the maintenance of the several tissues; here it likewise undergoes a chemical change (which we shall presently describe), and is afterwards returned to the heart by the veins which unite and form the two cavæ before spoken of. This circulation of the blood is divided into *the pulmonic*, or that which conveys it from the right to the left side of the heart through the lungs, and *the systemic*, or that which takes it from the left to the right side, through the arteries and veins of the system. The contraction of each auricle is simultaneous, and precedes a little that of the ventricles, which likewise contract together. This action of the heart produces the pulse, and the number of its pulsations within a given time materially assists the surgeon in arriving at a correct diagnosis when an animal is suffering from disease.

Having explained "the general round of circulation," we shall add some further remarks on the arteries and veins, and afterwards speak of the chemical changes of blood. These vessels are represented in *fig.* 5, the artery being marked A, and the vein B: it will also be seen that their inner structure is exposed by a section being carried through their coats.

It has already been stated that the arteries arising from the heart are two, namely, the aorta and the pulmonary, and that valves are placed at their origin to prevent a retrograde movement of the blood; from which it will be inferred that these vessels are

Fig. 5.



A. An artery partly cut open to shew its inner coat.
B. A vein also opened, and shewing *c*, its valves.

not mere passive conduits for the fluid. The amount of their action in assisting the circulation is a vexed question among physiologists, but no doubt it is very considerable. The simple fact of these vessels being found empty after death, goes very far to prove their importance as active auxiliaries to the heart; for were they passive tubes merely, they would then be in the opposite condition, viz., full. The early anatomists were acquainted with the circumstances of these vessels being void of blood after death, and consequently they were led to suppose that the "animal spirits, being of an aëriform nature," were conveyed by them; hence the name *artery*, or air-carrying tube. At their origin these vessels are large, but they gradually decrease in size as they proceed from the heart, which is produced in part by the number of the branches they give off in their course. It has been rightly said that the capacity of the arterial system is rather increased than diminished by this subdivision, and therefore no mechanical obstruction from that cause can interfere with the flow of the blood in the small arteries. The rapid splitting up of these vessels into smaller ones is in proportion to the nearness of the organ they are going to, and in every part, as before stated, they end in tubes so minute as to be named capillaries. As the blood which traverses the arteries is destined to supply the system with the materials necessary for the support of life and development, so do we find that they usually take the most direct course to each particular organ. They also run in parts which are most protected from injury, such as the inner side of limbs and bend of joints. Occasionally also they gain security by passing through canals formed in bones—a fact which can be demonstrated in the skull, vertebræ, feet, &c. of several of our domesticated animals. In number the arteries are considerably less than veins, it being necessary that due provision for the return of blood should be made to balance the circulation, as from the situation of veins the current through them is frequently obstructed. The section of an artery (see *fig.* 5) shews that its inner coat, or epithelial membrane, is, unlike that of a vein, perfectly smooth. Besides this coat, these vessels have four others—a serous, a muscular, an elastic, and a cellular. These tunics are not of equal thickness throughout the course of the artery; and especially do we find that the elastic is increased in substance the nearer the vessel approaches the heart; but, on the contrary, that the muscular is most developed at a distance from that organ. The elastic coat gives strength to the vessel, and yields to the distending force of the blood at each stroke of the heart; but as soon as the volume of the blood has passed, it returns by its inherent property to its former condition. The expansion and recoil of the elastic coat converts these jets of blood into a continuous stream; but this stream is still augmented in volume at each contraction of the heart. Hence we observe that, when an artery is divided, the flow of blood from its cut end is alternately increased both in quantity and force, synchronously with the heart's action. Under these circumstances we likewise perceive that the vessel rises in its bed with a peculiar vermiform action, which proves that the elastic coat is not simply distended, but also elongated by the passing current. The elongation is always greater than the expansion, and the two actions combined produce the arterial pulse. Thus we feel the pulse of the artery when its caliber and length are increasing, and that of the heart when its ventricular cavities are contracting. In the language of the anatomist, the heart is in a state of *systole*, and the artery of *diastole*, during their respective pulsations. It is not to be inferred from the foregoing remarks that the elastic coat exerts any propulsive power on the passage of the blood, as this can only be effected by lessening the area of the arterial tube, and must consequently depend on its muscular or contractile coat. It is right that I should state that the muscularity of arteries, although strongly insisted upon by the immortal John Hunter, has since his time not been generally admitted. A multiplicity of facts could be adduced, were it necessary, to prove the correctness of Hunter's views, but I content myself by stating that I am of the number of his disciples*.

As the arteries everywhere terminate in capillaries, so do we find that the veins arise from them. A vein (see B, *fig*. 5) differs materially from an artery, first in the thickness of its coats, and, secondly, in having its internal lining thrown into folds here and

* Since this lecture was delivered, an opportunity has been afforded the author, by the death of the rhinoceros in the gardens of the Zoological Society, of confirming these opinions. He examined a portion of the carotid artery, and found its muscular coat extensively developed. The fibres were arranged more or less in a circular order.

there, forming thereby its valves, marked *c*, *fig.* 5. These valves perform the office of such structures in general, namely, that of allowing a fluid to pass but in one direction; and as their free edges are directed towards the heart, it follows that they prevent any retrograde motion in the blood by rising and closing the canal. This arrangement is rendered the more necessary in consequence of veins not exerting any power *per se* in the return of the blood, this being chiefly effected by their being pressed upon by the various muscular movements of the body. Veins are also non-pulsatory, and the stream of the blood through them is continuous and even. They are far more numerous than arteries, and are divisible into a superficial and deep-seated set, which freely communicate by anastomosing branches. They likewise increase in size, but diminish in number as they approach the heart, near to which those of the system ultimately terminate in the two cavæ. The blood which they carry is dark in colour, unlike that of the arteries, in which vessels it is of a scarlet hue. This change in the colour of the fluid is produced in the capillaries; the cause and the consequence of which we shall now consider. *Fig.* 6 shews an artery, *a*, terminating in a capillary rete of vessels, and a vein, *b*, arising therefrom; it will also be observed that, in accordance with the facts we have described, the former is represented light and the latter dark in colour.

Fig. 6.

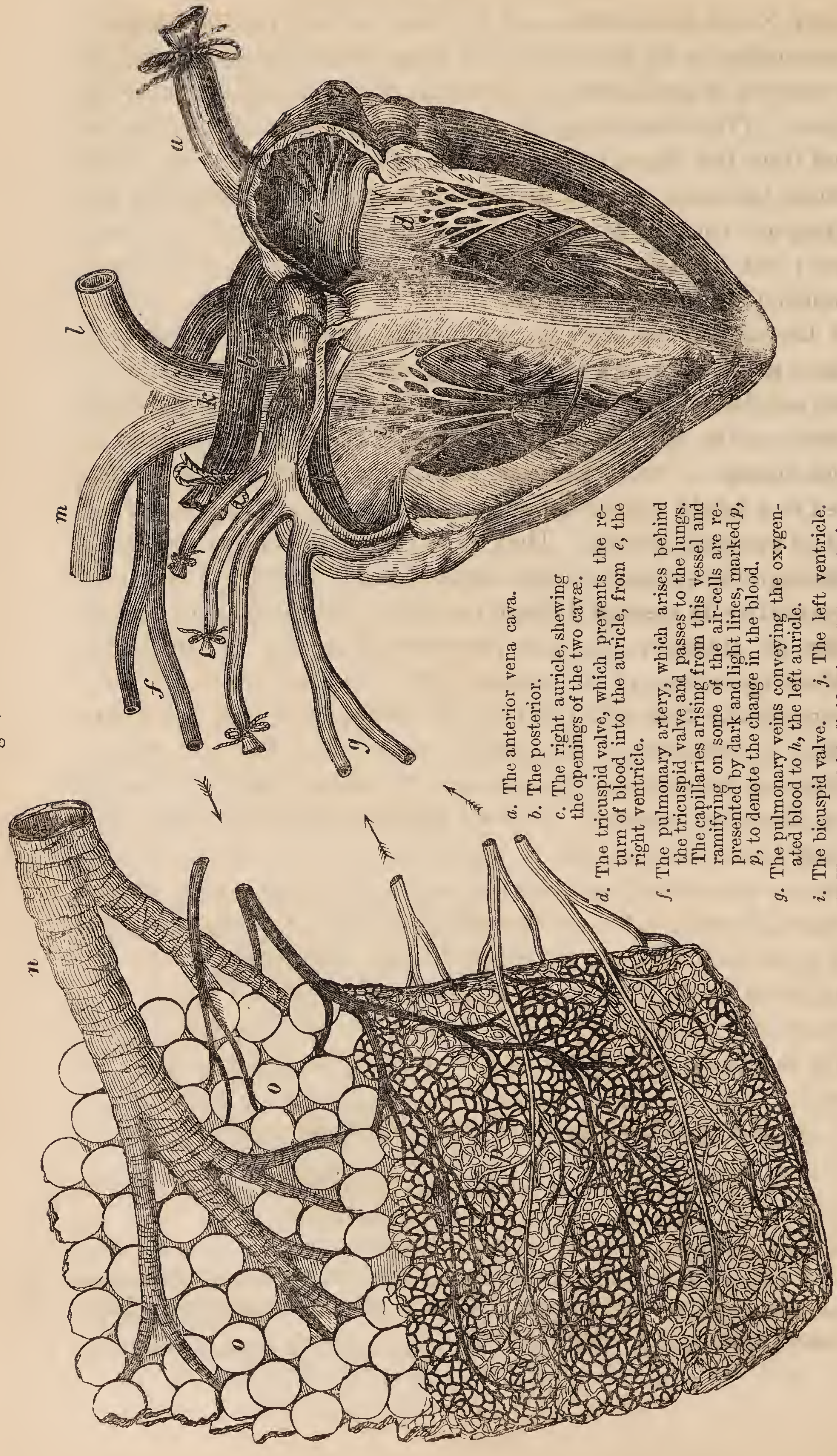
Capillaries of fat. *a*. The terminal artery. *b*. The primitive vein.
(From Todd and Bowman's "Physiological Anatomy.")

The brightness of the arterial blood is due to the presence of the oxygen of the air acting on its coloured corpuscules, and which it receives while passing through the vessels of the lungs ; and the darkness of the venous blood, to the influence of the carbonic acid of the system on the same bodies. These gases, however, affect only the pigment of the red corpuscules to produce this altered appearance of the circulating fluid; and consequently the corpuscules are to be viewed as the indirect carriers of the oxygen into, and the carbonic acid out of, the body.

It has been before stated that the various tissues of the frame are undergoing a continual waste or change, and therefore they need a constant reparation, which is provided for by the appropriation of the blood by the capillaries. The thinness of the walls of these vessels allows of a transudation of the liquid fibrin, which being imbibed by the surrounding structures administers to their support; while any excess is carried back into the circulation by the lymphatic absorbents. The metamorphosis, however, of the tissues furnishes both carbon and hydrogen, and with these the oxygen, which has been conveyed into the capillaries by the red corpuscules, unites, forming thereby carbonic acid and watery vapour. In this process heat is evolved ; and as it takes place in every part of the system, so it follows that the temperature of the body is everywhere kept up to its standard, viz., about 99° of Fahrenheit, independent of external causes. An animal may thus be said to carry with him a self-supplying furnace, which continues in active operation so long as health and vigour of constitution remain. It is this generation of heat by chemical union which is designated animal heat. By the loss of some of its fibrin, and by the presence of carbonic acid, the blood is now rendered unfit for the purposes of life, and in this condition it returns to the heart by the veins (see *fig*. 6). Near to this organ it receives a fresh supply of nutritive matter through the medium of the thoracic duct (see *fig*. 2), and passing from the heart to the lungs it again obtains the required oxygen, and parts with the carbonic acid and watery vapour (see *fig*. 7).

The function thus performed by the lungs, of which we must speak more at length, will be better understood by again referring to the diagrim, *fig*. 7. One portion of this diagram represents the four cavities of the heart laid open, and the vessels which are

Fig. 7.



a. The anterior vena cava.
b. The posterior.
c. The right auricle, shewing the openings of the two cavæ.
d. The tricuspid valve, which prevents the return of blood into the auricle, from *e*, the right ventricle.
f. The pulmonary artery, which arises behind the tricuspid valve and passes to the lungs. The capillaries arising from this vessel and ramifying on some of the air-cells are represented by dark and light lines, marked *p*, *p*, to denote the change in the blood.
g. The pulmonary veins conveying the oxygenated blood to *h*, the left auricle.
i. The bicuspid valve. *j.* The left ventricle.
k. The aorta, which divides into *l*, the anterior, and *m*, the posterior aorta, to conduct the blood throughout the body.
n. A bronchial tube, surrounded by *o*, the air-cell of the lungs.

going to and from them; and the other a branch of the windpipe terminating in the air-cells of the lungs, which are surrounded by a network of capillaries indicating the change in the colour of the blood. [The intervening arrows shew the course of the blood to and from the lungs to the heart.] The atmospheric air which enters the lungs at each inspiration through the medium of the windpipe, contains by weight 77 parts of nitrogen and 23 of oxygen; but the expired air is deficient of oxygen, its place being supplied by carbonic acid gas*. An interchange of the oxygen of the air and the carbonic acid of the system is thus effected, these gases displacing each other by permeating the thin walls of the capillaries, which are everywhere spread out as a minute network on the surface of the air-cells. The immediate result of this change is the conversion of the blood from a dark Modena red to a bright scarlet colour, and the fitting of it again for the chief purposes of life†. Thus we see that the blood in circulating through the system becomes unsuited to life, and that it is re-invigorated by its passage through the lungs. The function of respiration is, therefore, no less important than that of circulation. Many operations of the animal system may be suspended for a considerable time with but little ill consequence, but respiration must be continued, or life quickly ceases. It is true that respiration may be increased or diminished even at pleasure, but it cannot be altogether arrested; for if we attempt to hold the breath for a long time, we experience so much inconvenience, that irresistibly we are compelled to resume the act of breathing. This, without doubt, depends on the circumstance that during its suspension there is an accumulation of carbonic acid in the system, the continuance of which would produce asphyxia or suffocation. We have here another proof of the wisdom and design of the omnipotent Creator in making respiration, like the circulation, independent of our will.

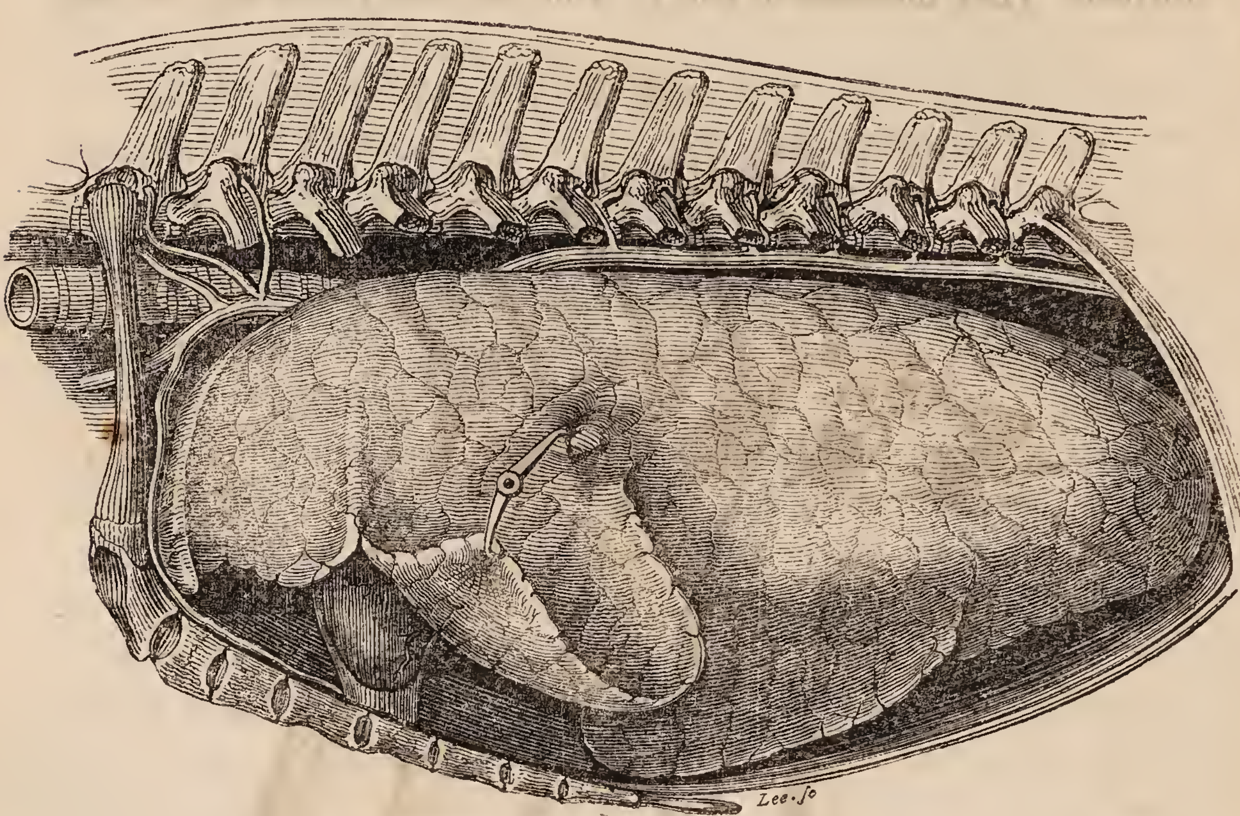
As the circulation has its central organ, the heart, so has re-

* This fact was illustrated by breathing into some pellucid lime-water, by which it was rendered turbid; the carbonic acid uniting with the lime, and forming thereby an insoluble carbonate of lime.

† The experiment of pouring some dark or carbonized blood into a vessel of oxygen gas was introduced; by which it was shewn that the blood immediately became of a bright red colour.

spiration—namely, the lungs, which are situated within the same cavity, where they are secure from external injury or impediment to their function. We may in this place observe that the osseous portion of the body of an animal forms three important cavities: an interior, called the skull, which contains the brain and the nerves of special sense; a middle, the thorax, in which is lodged the heart and lungs (*see Fig.* 8); and a posterior, the pelvis, hold-

Fig. 8.



Represents the heart and left lung *in situ*, the side of the chest being cut away.

ing the uterus and its appendages, the chief of the female organs of generation. The thorax, however, is constructed on a different plan from the other cavities; for there is an all-important necessity that its area should be capable of being enlarged and diminished, in accordance with the altered volume of the lungs during respiration. Such not being needed in the skull or pelvis, the bones forming these cavities are firmly and immovably united together. The thorax is bounded above by the spine, on the sides by the ribs, below by the breast-bone or *sternum*, and behind by the *diaphragm;* a muscular tendinous partition separating it from the abdomen.

The form of the thorax is that of a truncated cone placed horizontally, having its apex formed by the near approximation and shortness of the first pair of ribs, and is based by the diaphragm. The dimensions of the cavity are consequently increased from before backwards ; while the hinder part, or base of the cone, is cut off obliquely from above downwards and forwards. The first pair of ribs are situated nearly perpendicular, and more especially in the ox, where they form a right angle with the spine: one of these is represented *in situ* in *fig.* 8. The ribs of the horse number eighteen on either side, but in the ox and sheep they are only thirteen. They increase in length from the first to the eighth, and

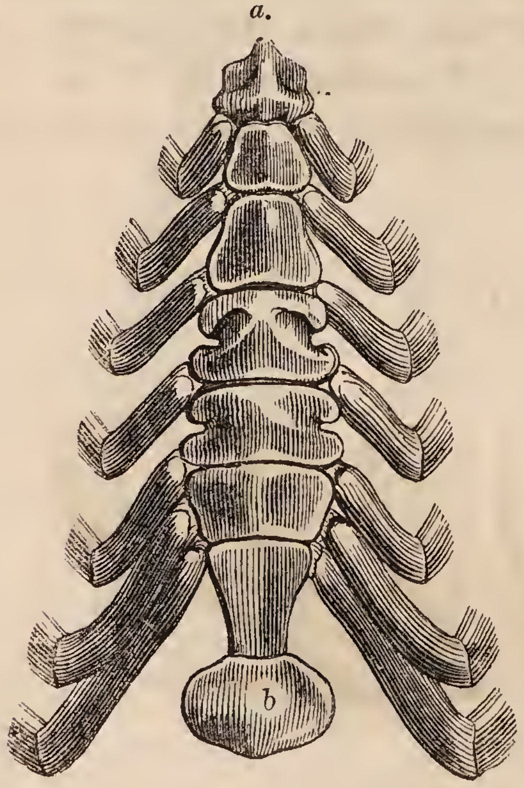
Fig. 9.

a. The cavities in the vertebra which receive *b*. The head and tubercle of the rib. c. The surfaces of the synovial joint uniting the rib to the cartilage. *d*. The joint formed by the cartilage and sternum.

likewise in their curve obliquely backwards from the spine, from the first to the thirteenth; but they gradually diminish in length from the eighth to the last. Their interspaces are filled up by muscular fibres, the *intercostal* muscles, which are active agents in inspiration. The ribs, therefore, with the diaphragm, form the moveable boundaries of the chest; the spine and the sternum being more or less the fixed points from which they act.

As seen in *figure* 9 (page 121), the ribs are united to the spine above by moveable joints, and to the sternum below by means of their cartilages. The inferior attachment is not, however, in all of them directly to the sternum, some being joined by their cartilages to each other, and thus indirectly to that bone; hence their division into *sternal* or true, and *asternal* or false, ribs. [In the sketch the hindermost rib is a false one.] Each rib articulates by its rounded head and tubercle, marked *b*, with corresponding hollows in the vertebræ, marked *a*, forming the moveable joints alluded to. These distinct articulations by the head and tubercle are found, however, to be less perfect as we proceed from before backwards. That every facility may be given to the movements of the chest while the ox is recumbent—a position, as is well known, he frequently assumes during rumination—the attachment of the ribs to the sternum, as well as the development of that bone, differ considerably from the horse. These peculiarities will be at once recognised by a reference to the annexed *figures*, 10 to 13. In the first-named *figure* the under surface of the sternum of the ox is depicted, and it will be observed that it is perfectly flat; consequently it can be subjected to pressure without inconvenience to the animal when he is resting on the ground. On the contrary, this part

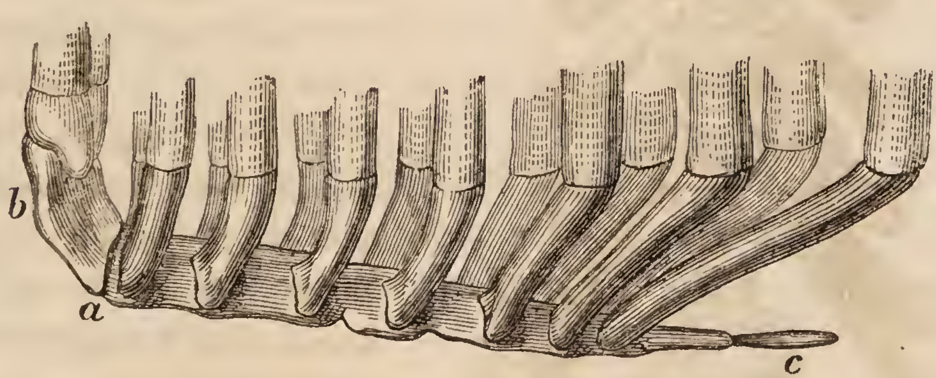
Fig. 10.



Sternum of ox, inferior view. *a.* The manubrium. *b.* The ensiform cartilage.

of the sternum of the horse has a thin cartilaginous edge, similar in appearance as well as in position to the keel of a boat (see *fig.* 12), which ill adapts it to receive a similar pressure. In both animals the sternum is originally composed of several bony pieces, which as age advances are more or less perfectly united together: these pieces are, however, very differently arranged, so that, in the ox, *bone* supplies the place of cartilage in the horse, and forms the flat surface beforementioned. The loss of elasticity, and consequently of motion, cartilage being highly elastic, is, however, more than compensated for by the manner in which the first bone is united to the second in the ox. In this animal, the first bone, *manubrium*, is attached by a synovial joint, which allows of a free motion in various directions, but more particularly from side to side: see *a*, *fig.* 11. The cariniform cartilage in the horse (*a*, *fig.* 12) is substituted for the manubrium with its synovial joint. The arrangement here spoken of allows the anterior portion of the thorax of the ox to yield the more readily to the respiratory movements, and likewise facilitates the curving of the lower part of the neck upon the front of the chest when the animal's head is directed towards his side. The posterior portion of the sternum in both animals presents fewer differences for observation, being terminated by a cartilage called the ensiform, lettered *c*, *fig.* 11, and *b*, *fig.* 12. The attachments of the ribs to their cartilages also vary considerably, as seen in the sub-

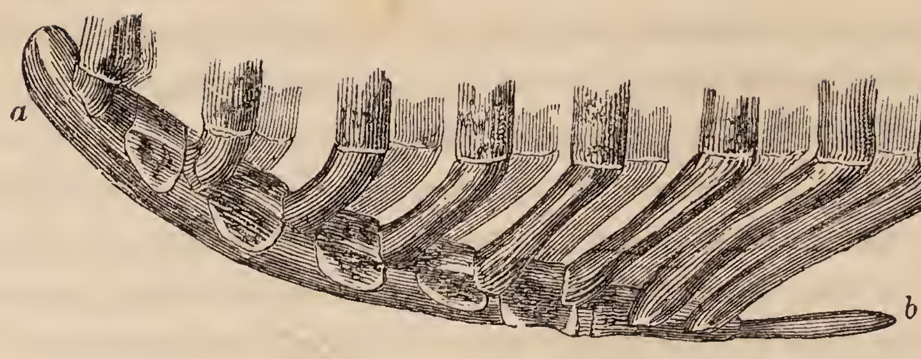
Fig. 11.



Lateral representation of the sternum of the ox:—

a. The joint formed by the union of the first bone, *manubrium;* the cartilage of the rib being partly removed to bring it into view. *b*. The manubrium. *c*. The ensiform cartilage.

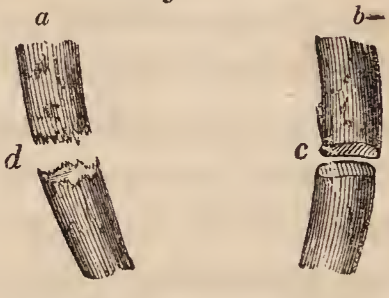
Fig. 12.



Lateral view of the sternum of the horse, shewing its keel-like shape:—
a. The cariniform cartilage. *b.* The ensiform cartilage.

joined sketch, *fig.* 13, where *a* represents a portion of the rib of the horse, with its cartilage, and *b* the same parts of the ox. In the former the lower end of the rib is received into a cup-like cavity in the upper part of the cartilage; a union which is further strengthened by indentations of their edges, locking into each other, but greatly limiting the extent of the motion between them: *d, fig.* 13. In the latter, however, we meet with a true synovial articulation in this place, marked *c*, in *figs.* 9 and 13. The nature of this attachment was several years since pointed out by Mr. Varnell, Demonstrator of Anatomy in the Royal Veterinary College. Besides the facility for motion hereby obtained, the cartilages at their lower extremities are united to the sternum, as in the horse, by synovial joints: see *d, fig.* 9.

Fig. 13.

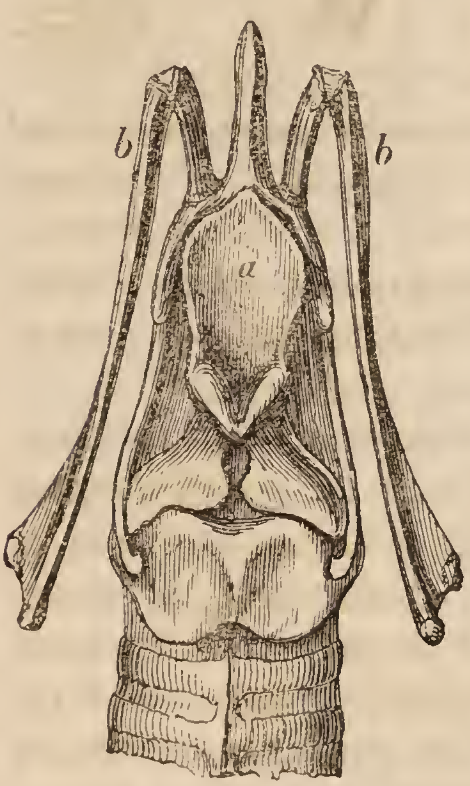


Portions of the ribs and their cartilages of the horse and ox:—
a. Rib of horse, shewing *d*, its indented union with the cartilage.
b. Rib of ox. *c.* Its synovial articulation with the cartilage.

Having described the mechanical arrangements of the walls of the thoracic cavity, we proceed to speak of the principal organs which are concerned in respiration: they are the larynx, the windpipe with its branches, and the lungs. At the upper part of the windpipe, which, as its name implies, is the conduit of the air to the lungs, we observe a peculiarly constructed organ, called the larynx. It differs in many particulars in nearly every variety of animal, and is more complicated in man than in any of the inferior creatures. The larynx discharges a double office, being the organ of voice, as well as the conduit for the air in breathing; and in proportion as the voice is incapable of modification, so do we find simplicity in its structure. It presents the same general appearance in all animals, being slightly altered to suit the tones uttered by each; this will be observed on comparing *figs.* 14 and 15, which represent the larynx of the horse and the ox.

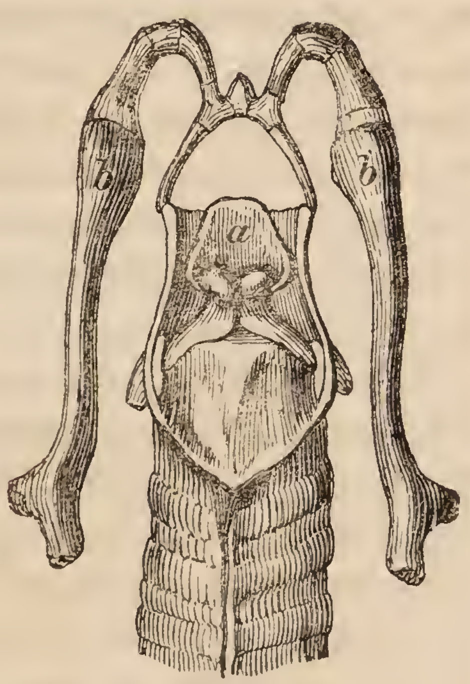
The larynx is composed of a number of cartilages which are united to each other more or less firmly. One of these, the epiglottis, *a, figs.* 14 and 15, defends the entrance into the wind-pipe, and in the act of swallowing it rises and closes over the opening of that tube, thereby preventing the passage of the food into it. Except in deglutition the epiglottis is always depressed to preserve a free and open conduit for the air to and from the lungs. The larynx is held in its situation through the medium of a singularly shaped bone, the os hyoides, *b, figs.* 14 and 15, which is united to the under and back part of the skull. The os hyoides gives attachment also to the muscles of the tongue, and, as this organ possesses a great freedom of action in ruminants, we find the bone to be composed of more pieces in these animals than in many others: these pieces are likewise connected to each

Fig. 14.



The larynx of the horse:—
a. The epiglottis. *b.* The os hyoides.

Fig. 15.



The larynx of the ox:—
The references are the same as in Fig. 14.

other by synovial joints. (Compare the os hyoides in the horse and ox.) The necessity for a modification of the cartilages of the larynx is apparent when we reflect on the varieties of the voice of our domesticated animals. We recognise the horse by neighing, the ox by lowing, the dog by barking, the sheep by bleating, the pig by grunting, &c., &c. Many of these sounds are influenced by the existence of folds in the lining membrane of the larynx, called vocal cords. In the ox and the sheep we have the simplest form of the organ, for lowing and bleating are little more than long-continued expiratory acts.

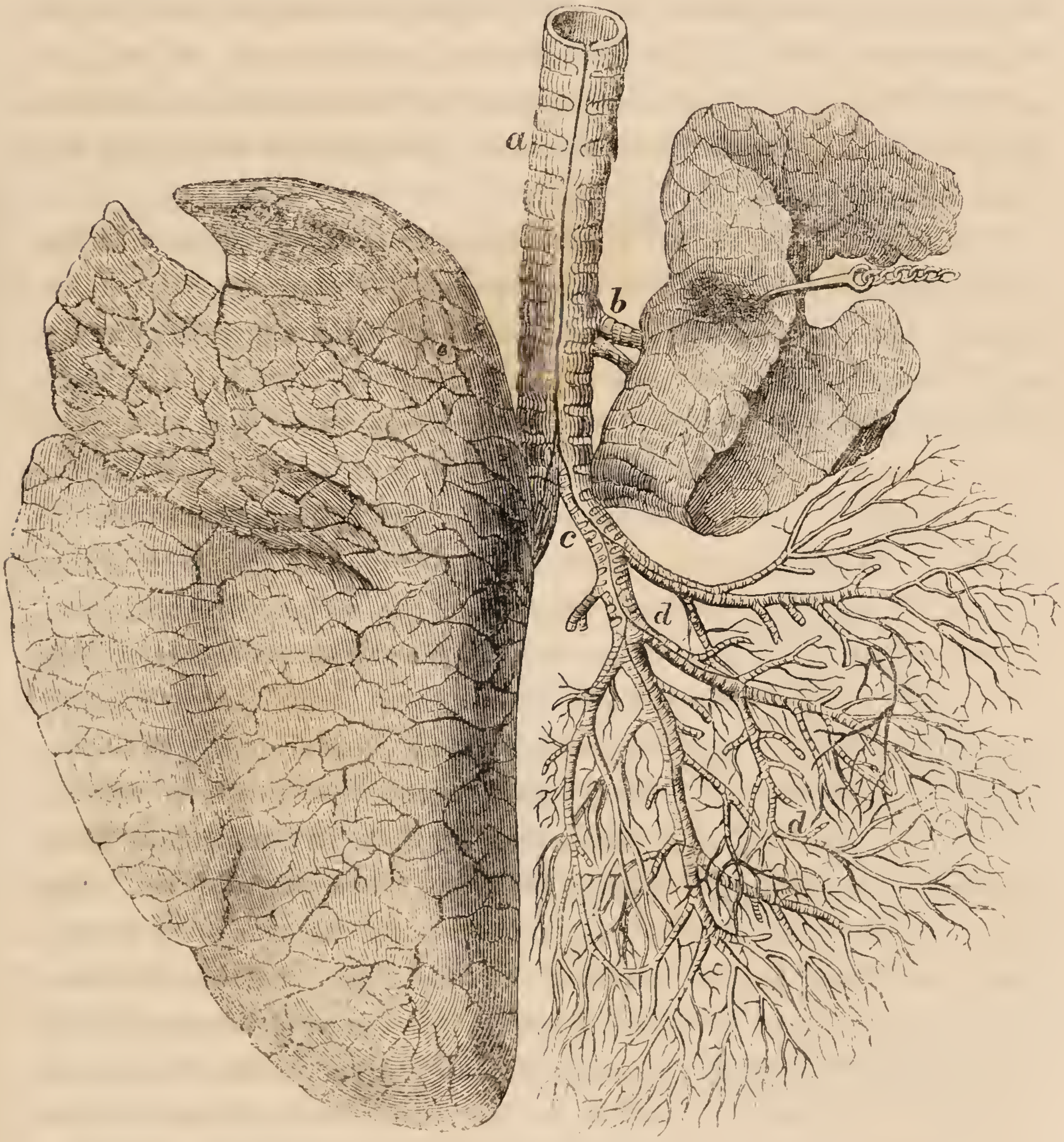
The ingress and egress of the air in respiration also differs. In the horse each is carried on through the nasal passages, except in coughing, when a portion of the air is expelled by the mouth. But in the ox and sheep the air enters and escapes both by the mouth and nostrils. This variation in part depends on the situation of the larynx with reference to the *velum palati*, and also on the length and position of the *velum;* peculiarities which can only be alluded to.

The lower part of the larynx is continuous with the windpipe, which is likewise composed of a series of cartilages arranged in a circular order. The windpipe, in common with the other portions of the respiratory passages, is lined with a mucous membrane, the secretion of which defends these parts from the irritation of the atmospheric air. This membrane not unfrequently suffers from a change of temperature, &c., and is the seat of those diseases recognised as catarrh, laryngitis, bronchitis, &c. The number of the rings of the windpipe will of course be governed by the length of neck: in the ox we usually find from 55 to 60. These rings are greater in substance at their front, being here more exposed to external injuries, than at their hinder part. They are united to each other by elastic tissue, which allows the windpipe without inconvenience to accommodate itself to the various movements of the neck. On the inner and back part of the rings, lying between them and the mucous membrane, is a thin layer of muscular fibres, the use of which is one of the vexed questions of physiology. The late Mr. Youatt denied the existence of this muscle in the ox*; I have found, however, that it not only exists in this animal, but in every other which hitherto I have examined. It is a singular fact, and one which I am desirous

* See "Cattle," p. 374, Society for the Diffusion of Useful Knowledge.

of naming in this place, that in the dog the muscle is situated on the outer, and not on the inner, part of the windpipe. Mr. Percivall is of opinion that the muscle resists the tendency of the elastic cartilaginous rings to form an elliptical-shaped canal, and, by converting the ellipsis into a circle, may thus tend to expand and not to contract the caliber of the tube*. Whether it be so in moderate action of the muscle or not, it is clear that when its fibres are contracting with energy, or are unduly stimulated, it must diminish the area of the canal. I would ask if it be not specially employed in the lower animals, in whom the vocal

Fig. 16.



a. The windpipe. *b.* The third bronchus. *c.* The two principal bronchi. *d, d.* The ramification of the bronchial tubes throughout the lung.

* Anatomy of the Horse, p. 225.

apparatus is exceedingly simple, compared with man, for producing the voice, by regulating the volume of the exhaled air, entering the larynx from the lungs; and also whether some of their intonations do not depend on the amount of its action?

The windpipe, passing down the neck, enters the chest between the first pair of ribs (see *fig.* 8); and, in the ox and sheep, it almost immediately afterwards sends a branch to the anterior part of the right lung (*b*, *fig.* 16, p. 127):—this is called the *third bronchus*, and does not exist in the horse. A little below this, the windpipe divides into the two main bronchial tubes; one of which penetrates the substance of each lung, dividing and re-dividing into smaller and innumerable branches, which ultimately communicate with the air-cells (*figs.* 16 and 17).

It may here be mentioned that the chest is divided into two cavities by a membranous partition, *the mediastinum*, extending from before backwards, by which the right and left lung are separated from each other: hence, an explanation in part of the fact that pleuro-pneumonia, and also other diseases, are frequently confined to one lung. The air-cells are clustered around each terminal bronchus somewhat after the manner of grapes upon their stalk (*fig.* 17); and "it has been calculated by M. Rochaux, that in the human subject about 18,000 surround each bronchus, and that the total number in the lungs amounts to *six hundred millions*." "If this estimate," says Dr. Carpenter, "be even a remote approximation to the truth, it is evident that the amount of surface exposed by the walls of those minute cavities must be many times greater than that of the exterior of the body"*. The air-cells follow no definite shape: they are for the most part flattened against each other, and are said to vary in size in the human subject from about the 200th to the 70th of an inch. In the ox the air-cells are many times smaller than in man, and even more minute than those of the horse; and in-

Fig. 17.

d. Terminal bronchus, communicating with *e*, the air-cells. The parts are highly magnified.

* Manual of Physiology, p. 389.

jected preparations of their capillaries shew that the rete formed by these vessels is likewise finer, or more closely woven. This circumstance throws some light on the peculiar appearances met with in pleuro-pneumonia, and will hereafter be alluded to.

From the foregoing remarks it is apparent that the chief bulk of the lungs is made up of air-cells, surrounded by their network of vessels, and communicating with the minute ramifications of the bronchial tubes. Through the medium of these structures both elastic and contractile tissue enter into the composition of the lungs, by which they possess a certain amount of action independent of the expansion and contraction of the boundaries of the chest, and are thus enabled of themselves to assist in the process of respiration. The various structures forming the lungs are united together by areolar tissue; they are also collected into small masses, termed lobules, which are joined to each other by the same material. Hence the expressions *interstitial* and *interlobular* areolar tissue; the former being applied to the bond of union between the different structures, and the latter to that connecting the lobules to each other. In the ox the lobules are very distinct, and the amount of areolar tissue is proportionably large (see *fig.* 19); thus again accounting for the appearances produced by pleuro-pneumonia.

Each lung is divided into lobes by deep fissures:—the number of these lobes varies, although not to any great extent, in different classes of animals. In the ox and sheep the right lung consists of four and the left of three lobes. The lungs are held in their situation principally by the large vessels which are going to and from them, and also by the windpipe: they are covered externally with a serous membrane, the pleura, which is reflected upon the sides of the thoracic cavity, and forms also the mediastinum before spoken of. The lungs are everywhere free in the chest, except along their middle and upper surface, which is connected by the large vessels, &c., beforementioned, to the spine. They may be said to completely fill the cavity, their external covering of pleura being in contact with the reflection of the membrane which lines the chest.

Respiration consists of inspiration and expiration, and the bulk of the lungs will accord with the dilatation or contraction of the cavity; nevertheless, they are not, as elsewhere stated, mere passive agents in the process. Many of the muscles which lie externally to the ribs, as well as those filling the spaces between them—the musculo-tendinous partition between the thorax and the abdomen, *the diaphragm,* and the abdominal muscles—are concerned in breathing. In expiration a portion only of the air contained in the air-cells is forced out by the pressing forwards of the viscera of the abdomen upon the thoracic cavity, through the contraction of the abdominal muscles, the diaphragm being at that time in a relaxed condition; the sides are also compressed at the same instant by the fall of the ribs, which is aided in part by their cartilages. This action ceasing, the diaphragm contracts, and assumes a flatter aspect; the viscera of the abdomen recede, and the ribs, the motion being assisted by their synovial joints, are drawn forwards and outwards, thus enlarging the cavity. To fill the vacuum which would thus be occasioned, a rush of fresh atmospheric air down the windpipe takes place: this equalizes the density of that portion of the air which had not been expelled, and which by its retention had become rarefied, and thereby assists the expansion of the lungs, the pressure to which they were subjected in expiration being now removed. As the chief use of this function is to eject carbonic acid gas from the system and produce oxygenated blood, so the quantity of air respired in a given time will be regulated accordingly. In a state of quietude, and in health, the number of respirations in the ox are about 12 in the minute; being in proportion of 1 to 4½ of the pulsations. The quantity of carbonic acid evolved varies from four to even eight per cent.; the rapidity of its production depending, amongst other causes, on the amount of exertion an animal undergoes. To supply the necessary quantity of oxygen to combine with the carbon, an increase of breathing must take place, otherwise death will quickly ensue. This rapid combustion of the carbon would, however, raise the temperature of the body far too high compatible with the maintenance of its functions; and consequently, as the circulation is increased, so will be the secretion from the follicles of the skin, bedewing the surface with a copious perspiration, which, by its evaporation, tends to regulate the amount of heat by depriving the system of its excess of caloric.

I might dwell at far greater length on this part of my subject; but, having to speak of an important disease to which the respiratory organs are subject, I pass to its consideration.

[*To be concluded in our next.*]

On some of the Deposits from the Urine of the Horse.

By W. J. T. Morton.

The function of the kidneys, we are told, is to preserve the equilibrium in the quality of the contents of the blood, by the removal of products resulting from the change of matter making up the organism, as well as other substances that would affect the normal character of this fluid if retained in it. Hence, in the urine the soluble salts of the ashes of the constituents of the frame are met with, the insoluble salts being excreted with the egesta.

This fact will account for the complex nature of the urinary secretion ; although it is less so, generally speaking, in those animals that commonly come under the notice of the veterinary surgeon than in man, if we except the carnivora.

The separation of this fluid from the blood is as important to the animal economy as that of the bile. Its essential constituent, too, results from a metamorphosis of the tissues, as does that of bile ; the nitrogenized principle, *urea,* giving to urine its leading or characteristic properties. Nevertheless, other principles are also met with. Thus it is stated, should the amount of oxygenation going on in the system be low in degree, that uric acid is formed in man and the carnivora, whereas in the horse and ox we find the hippuric acid to exist, and this by labour in these animals becomes converted into the benzoic. Oxalic acid has also been occasionally met with, which Liebig regards as a morbid product, the result of an access of oxygen insufficient to change the urea into uric acid.

In man and the carnivora this secretion has generally an acid reaction, the immediate cause of which is still a disputed point, although the majority refer it to the presence of the alkaline phosphates. Liebig states that "the acid reaction of the urine of the human subject depends upon the presence of the phosphate of soda, which is also the solvent for the uric and hippuric acids in that fluid."

If this last position be correct, we have in the phosphate of soda an agent for dissolving uric and hippuric acid calculi ; and although we have not yet been made acquainted with deposits of either of these kinds from the urine of our patients, except the dog, we do not know but what we may; and it is as well to be able to point to a remedy. The phosphate of soda is quickly excreted by the kidneys, and may be given in doses of two or more drachms, two or three times daily.

In the horse, the ox, and the sheep the urine is alkaline, arising from the presence of the carbonate of soda or potash; and we need be at no loss to account for this alkalinity, if, for a moment we reflect on the food they partake of, it abounding with these salts. In the urine of the purely herbivora the phosphates are but seldom met with; but in the graminivora they may be present, as the phosphates exist in all the cerealia.

The more common deposit met with in the urine of the horse is the carbonate of lime; and this forms accumulations, varying from sabulous matter, which is often voided with the urinary fluid giving to it opalescence, to soft amorphous concretions or otherwise. In these we often meet with variable arrangements. Sometimes the saline matters exist in concentric circles superposited upon a central portion which is rudely radiated, of which a representation is given in the "Transactions of the Veterinary Medical Association for 1843-44," illustrative of an Essay by me on Urinary Calculi.

This concretion weighs very nearly three pounds troy: its form is that of a flattened oval, the length of the longer axis being 5½ inches, that of the shorter axis 4½ inches, and its thickness 2¾ inches. Its structure is now extremely dense, although when first obtained its outer surface was soft and compressible.

By far the greater number of calculi that have been removed from the bladder of the horse by operation at the College resemble the central portion; but now and then we find these concretions made up of more closely aggregated particles, the mass being very compact.

Although carbonate of lime is a normal constituent of urine, yet, when occurring in such quantities as to give rise to either of the conditions I have adverted to, it must be considered as abnormal. Its origin may be thus traced. When urine has been kept for some time, it acquires an ammoniacal odour: this arises from the conversion of one atom of urea into carbonate of ammonia by the intervention of two atoms of water. If the soluble salts of lime come into contact with this compound of ammonia, mutual decomposition occurs, and a carbonate of lime is thrown down. This may be voided, as already stated, with the urine, or, being retained either in the pelvis of the kidney or the bladder, it becomes, by the exertion of the molecular forces, a renal or a cystic calculus. "We know," says Dr. Bence Jones, "that this change of the urea may take place in the bladder, and even in the pelvis of the kidney, and that this occurs most commonly in cases in which there is inflammation of the mucous membrane of the urinary organs. The mucus effused from an inflamed mucous membrane more readily effects the change of the urea into carbonate of ammonia than healthy mucus does."

Dr. Golding Bird, speaking of these concretions, says, "Deposits of carbonate of lime are, as is well known, of constant occurrence in the urine of herbivora. These may be readily collected for examination from the urine of the horse, in which they occur spontaneously. When examined by the microscope, after being washed with water, the particles of the carbonate are observed to be small transparent spheres, like globules of glass, and strongly refracting light (*Fig.* 4). Allowed to dry, and examined after immersion in Canada balsam, their structure is beautifully distinct. Each sphere being made up of myriads of minute needles radiating from a common centre. With polarized light, these interesting objects present a series of concentric coloured rings traversed by a black cross."

The woodcut overleaf, the drawing for which was taken from a preparation in the collection of my colleague, Mr. Simonds, shews the beautiful forms sometimes assumed by this salt in the urine of the horse, more particularly after he has been at work.

Besides the carbonate of lime, occasionally phosphatic deposits are met with, and sometimes non-crystallizable matters, as bile, the elements of blood, mucus, pus, &c.

But the object I have more particularly in view in this paper is to record two instances of the urinary secretion being in an abnormal state that have lately fallen under my notice, the one constituting an instance of OXALURIA in the horse, the other of HÆMATURIA. Probably we do not sufficiently take cognizance of this index to diseased action going on in the animal frame; since the condition of the urine often shews the formation of a calculus, *Fig.* 1.

Shews the varied forms of carbonate of lime.

renal or cystic, to be taking place, and we are thus enabled to prevent it becoming perfected; or other pathological changes may be commencing or set up in the organism. Rarely is it the case with us that beyond the quantity voided and its colour, any inquiries are instituted: no chemical investigation of the secretion is ever attempted, and yet the deposits that take place from it may direct us to the organ that is implicated, whether it be the stomach, the liver, or the kidneys themselves that are undergoing disorganisation.

1.—Case of Oxaluria.

The subject was a fine two-year-old thorough-bred colt. He was reported to be labouring under a disease of the kidneys, and for which treatment of some kind had been resorted to, as a sheep-skin was over the loins, although the groom stated the animal had had no medicine given to him. When first examined the pulse was found to be 32 in the minute, tone feeble, a peculiarly anxious countenance was observed, and a looking from time to time to the loins with an expression indicative of pain; the appetite was impaired and capricious, although there was but little loss of flesh. On walking the animal out of the stable, considerable languor and listlessness were evinced, and the slightest exertion produced great fatigue. On his being returned to the stable, he immediately placed himself in the position to urinate, and, after making several ineffectual attempts to do so, a few ounces of urine were voided, having a very peculiar smell and being somewhat viscid. The bladder was explored, and found in a collapsed state, and the fæcal matter in the rectum singularly dry and friable.

The treatment consisted in restricting the diet to mashes, and giving aloës ʒiij, cum hyd. chlorid. ʒss, in ball. The sheepskin was removed, and a liniment consisting of mustard and water of ammonia freely applied over the loins instead. Simple enemata were also directed to be frequently thrown up.

On the following day the bowels responded to the purgative, and the urinary secretion was increased in quantity and less viscid. Sodæ carbonas ℥ss was ordered to be given in the animal's water daily, and perfect rest enjoined. After this treatment had been continued for some time the unfavourable symptoms disappeared, and the animal was again put into training, when he soon experienced a relapse. The exhibition, however, of another dose of aloes and calomel, with rest of longer duration, and the use of sulphate of iron with the vegetable bitters, again appeared to be attended with beneficial results; but whether another attack will be experienced, of course, cannot be said; should it, we shall then be warranted in the adoption of other and more decisive measures, as we are now acquainted with the character of the urinary secretion, some of it having been sent to the College for the purpose of examining it.

Characters of the Urine.

General appearance.—A light amber-coloured and nearly pellucid fluid.

Reaction.—Acid.

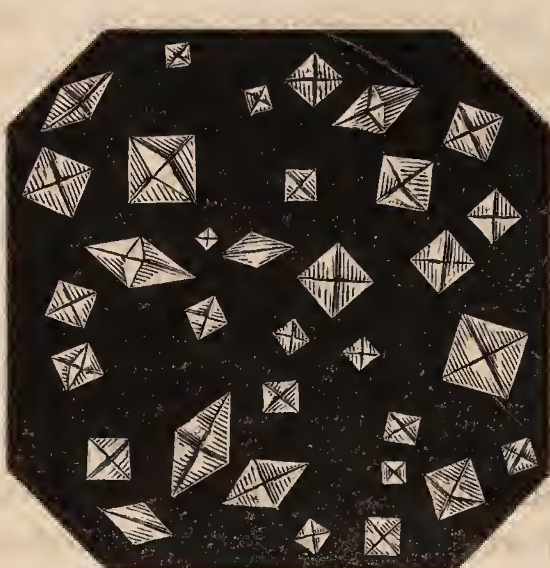
Smell.—Urinous, but not disagreeable.

Specific gravity.—1·0045.

Heat being applied to it, produced no perceptible change in it. Nitric acid rendered it a little higher-coloured, and, the solution of corrosive sublimate being added, caused a very slight turbescence only to take place.

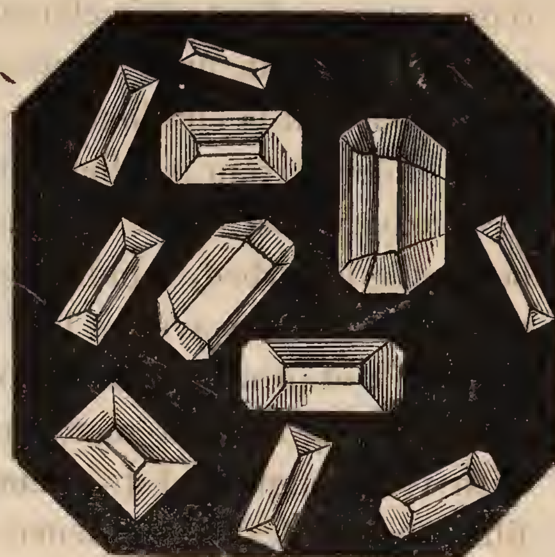
A little of the urine being placed under the microscope by Mr. Simonds, beautiful crystals of oxalate of lime (*Fig.* 2) were seen in considerable numbers to exist in it, accompanied with extremely minute and less perfectly formed crystals. On heating the urine in a test tube, and adding a few drops of alcohol to it, when cold, the neutral phosphates (*Fig.* 3) were also found in great numbers. Spontaneous evaporation of the fluid afforded stellated crystals of the phosphates.

Fig. 2.



Octohedra of oxalate of lime.

Fig. 3.



Prisms of neutral triple phosphate.

Oxalate of lime calculi are by no means common in the horse; nevertheless they have been occasionally met with. In THE VETERINARY RECORD for 1846, page 163 et seq., will be found an account of two cystic calculi, forwarded to the Veterinary Medical Association by Mr. T. H. Hurford, V.S., which were analysed by me, and found to consist of carbonate of lime with the oxalate, constituting the mulberry calculus. Dr. Golding Bird's views of the formation of this deposit are also appended, and to this the reader is referred.

It has been thought that probably the origin of this acid—the oxalic—is from the provender or hay on which the animal has been feeding abounding with the *rumex acetosa;* but although it may be accepted as an occasional source, it is, I think, more consonant with science to accept the acid as being the result of a mal-assimilation of the ingesta.

The author before alluded to, referring to the pathological origin of the oxalate of lime, says,—

"This question is one of great interest, and becomes the more important since the discovery of the very frequent existence of this salt in the urine ; so that, instead of being very rare, it really is considerably more frequent than many other deposits. It is scarcely possible to avoid being impressed with the very probable physiological relation between oxalic acid and sugar : we know that the latter substance forms a considerable item in our list of aliments ; we know that the great majority of farinaceous matters are partially converted into this element during the act of digestion. It is indisputable that, under certain circumstances, it finds its way into the blood, and is eliminated by the kidneys ; and, lastly, we know that, under certain morbid influences, the great proportion of our food may, whilst in the stomach, be converted into sugar, which becoming absorbed, rapidly passes through the circulation, and is thrown out of the system by the kidneys as an effete matter, with the effect of producing more or less rapid emaciation, and in most cases leading to fatal marasmus. Then, recollecting the facility with which sugar and its chemical allies, as starch, gum, and wood fibre, are, under the influence of oxydizing agents, converted into oxalic acid, and having sufficient amount of evidence to prove that, when oxalic acid is really found in the urine, symptoms bearing no distant relation to those of a diabetic character are met with, we are almost inevitably led to draw the induction that the oxalate of lime found in the secretion owes its origin to sugar, and to locate the *fons et origo malorum* in the digestive organs. This appears to be nearly the view adopted by that very excellent authority in these matters, Dr. Prout."

Now, although it cannot be said that our patients partake of sugar, nevertheless the bulk of their aliment is amylaceous matter, which is readily converted into it, and such a change we know does take place during the digestive process. According to Majendie, horses that have been fed exclusively on oats will be found to possess sugar in their blood, and this will be excreted by the kidneys with the urine, giving to it characteristic properties. So, if a solution of starch be injected into the veins of an herbivorous animal, it quickly undergoes transmutation into sugar until the whole entirely disappears ; iodine giving no proof whatever of its existence.

2.—Case of Hæmaturia.

I am indebted to Mr. Ramsbottom for the history of this case, which is as follows :—

Sir, *Islington, March* 9, 1850.

The urine I have forwarded to you for examination was voided by a bay gelding, seven years old. The animal came into our possession about four months since. When I first saw him, he shewed symptoms of catarrhal fever, accompanied with sore throat. He was treated for that disease by laxative and febrifuge medicines ; stimulants were also applied to the throat, and he soon got apparently well. He was then put to work on one of our omnibusses, but had only been so employed for a few weeks before my attention was again directed to him by the groom, who stated that the horse was staling blood. On examining him I found he was, to all outward appearance, well; he drank a moderate quantity of water, ate his regular allowance of corn and chaff, and took his natural rest; but, on a more minute examination the next morning, I found the following symptoms to be present :—A cough of a chronic nature, or rather what I term a "roaring" cough ; expiration a little accelerated; pulse small and quick ; tenderness evinced on pressure being applied over the region of the kidneys, with profuse discharge of urine, which sometimes had perfect blood mingled with it, and at other times it presented the appearance of blue clay and water, of a thick consistence. The animal was at once placed in a loose box, and had given to him the salts of copper, with vegetable tonics. In the course of four weeks he got quite fat, and looked healthy in his coat : he was then put to work as before, but it was not many days before the former symptoms returned; nevertheless, to this day he is at work, without any further curative treatment being resorted to.

Characters of the Urine.

General appearance :—A viscous fluid, of a dark brown colour, and opaque.

Smell :—Urinous and offensive.

Re-action :—Alkaline.

Spec. Grav. :—1·0035.

Nitric acid throws down numerous minute flocculi; heat does the same; and, the liquid being afterwards thrown on a filter, a transparent fluid, resembling ordinary urine, passes through, leaving the coagulated matter behind. This appears to consist of albumen, with the colouring principle of the blood.

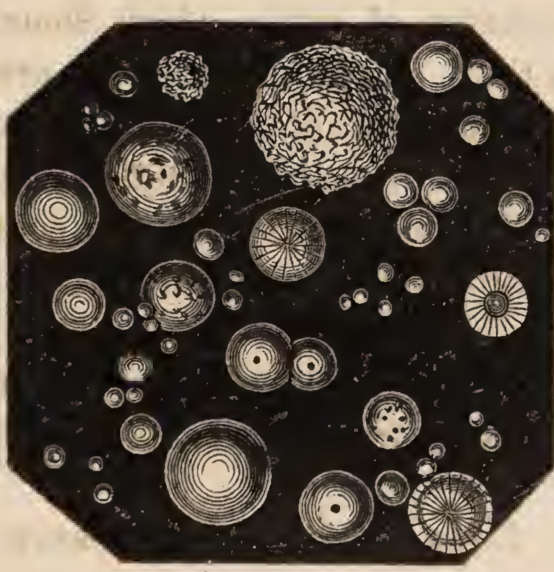
The quantity of urea and hippuric acid was found to be extremely small.

Trommer's test for sugar, and the yeast test, equally failed to demonstrate the existence of that principle.

The acids, and Pettinkoffer's test for bile, were alike ineffectual in shewing the presence of that secretion.

Under the microscope, Mr. Simonds found numerous crystals of carbonate of lime to exist, some of them being grouped together, constituting microscopic calculi; others isolated and beautifully developed [see *annexed woodcut*], with here and there a crystal of ammonia-magnesian phosphate, and myriads of blood discs, both altered in form and contracted in size. Mr. Simonds, therefore, thinks that it is more than probable a calculus is forming in the pelvis of the kidney; an opinion with which I am inclined to concur. We must, however, wait the result of time to confirm or negative this.

Fig. 4.



Spherical form of carbonate of lime.

On the Action of Iodine, and its Compounds.

By Mr. G. T. Brown, *M.R.C.V.S.*

On entering upon the consideration of the therapeutic Iodine, I deem it quite unnecessary to offer any comments on its physical or chemical nature, as all this may be derived elsewhere. My object is a simple review of the observable effects of the agent, so as to arrive at its *modus operandi* by a train of reasoning deducible from its action. In carrying out this, I propose adopting my usual mode of division; a proceeding which, although incompatible with elegance of expression, is nevertheless, to my mind, of much importance in a scientific thesis, as it tends to give a clear conception of the subject.

The divisions which suggest themselves to me are as follow:—

1st. The action of the agent iodine and its compounds in their relation to each other.

2dly. The action induced by them on glandular structures.

3dly. On diseased deposits.

4thly. On chronic congestions.

These several heads will be considered both with reference to the internal administration and external application of the agents.

Under the first head we take iodine itself, the iodide of potassium, the iodide of iron, the biniodide of mercury, and the diniodide of copper.

A careful reflection on the relative action of these compounds has led me to the conclusion that the principal effect is traceable to the iodine itself, independent of its combination with any other substance. Both when internally given and externally applied the results have been such as to warrant this conclusion. For example, an administration of iodine, iod. potass., ferri iodidi, or cupri diniod., produces definite results, all bearing a great similarity to each other; as does also the use of the ung. iodini and the ung. hyd. biniod. Resting upon this, we might at once come to the inference, that all the compounds of iodine are useless as therapeutics, and content ourselves with the employment of the element itself; but such a proceeding would be by no means warrantable, since not only do we not impair or alter the action of the agent by union with other bodies, but we also obtain the benefit of the compound action. From the great affinity which iodine has for hydrogen, it is fair to infer that it always combines with it in the system, becoming hydriodic acid, and then, uniting with an alkaline base, forms an hydriodate. This hypothesis becomes almost a demonstrated position by an analysis of the urinary excretion after the administration of the agent iodine; it being in it never discoverable in its elementary form, but invariably in combination with hydrogen and some alkali, or as an hydriodate. Could we then, from existing symptoms, infer a condition of the animal economy where the removal of hydrogen was desirable, the use of the element iodine would evidently be indicated; but as such a condition would be unavoidably associated with debility of the system, the propriety of combining some tonic agent is manifest; of course, chosing a compound that does not contain either hydrogen or an alkaline base. Thus the iodide of iron, or diniodide of copper, would be found very valuable compounds. If such debility be not present, the iodide of potassium is an elegant and efficacious form. The biniodide of mercury I have never given internally, and I consider we may advantageously restrict our compounds for internal use to the potass. iodid., the cupri diniod., and the ferri iodid. I have given iodine uncombined for some considerable time without any ill effects supervening, although I am informed it sometimes causes irritation of the mucous lining of the stomach. Since, therefore, I have not observed any advantage in the use of the element itself over its compounds, to be on the safe side, I would advise the employment of these in preference, for the reasons before stated.

With reference to the external use of the compounds of iodine, I have exclusively employed the hyd. biniod., and its action has been such as to warrant its recommendation. The ung. pot. iodid., and the ung. iodini, are also externally applied. The last of these is objectionable from the stain it leaves on the hands of the operator; while its effects are not more beneficial than those resulting from the use of either of the other two. The external use of these, in connection with the internal administration of some one of the compounds named, is a plan which I have found to be the most desirable.

Having thus considered the action of iodine in its relation to its compounds, marking by general rules the special condition of the system, or state of parts where each is indicated, we may proceed to a short notice of its effects on certain structures and definite forms of diseased action; premising that we now use the term *agent* as including all the compounds I have named, without particularising each individually.

2.—*The Action induced by Iodine on Glandular Structures.*

Without staying to examine the marvellous effects attributed to the agent, touching the removal of the testes and mammary glands by its long-continued administration, we have no hesitation in asserting its power over glandular structures when diseased. One marked peculiarity in the action of iodine is its stimulating effect on diseased parts; and, taking the lymphatic system as an instance, we point to farcy, the buds or ulcers of which disease are sensibly affected by the internal administration of the agent alone, and even at times the whole limb participates in the action induced. This apparent exacerbation of the symptoms, however, soon subsides, and then the benefit derived is observable.

Other instances also occur where this action is perceivable; a fact which has led some persons to reject the agent, as aggravating the disease it was meant to cure.

3.—*The Action of Iodine on Abnormal Depositions.*

To account for the *modus operandi* of medicinal agents in their removal of abnormal deposits, whether bony or fibrous in their nature, several theories have been advanced. Thus we hear of this or that therapeutic being a stimulant to the absorbents. Again, a more definite style of argument is used by those who maintain that the application of a counter-irritant to the surface of the skin covering a tumour has the effect of determining blood to that part in excess, thus causing a relative decrease in the amount sent to the tumour itself; and therefore the vessels depositing are arrested in their work, while the absorbents proceed to remove the diseased matters.

Another theory explains the difficulty by referring the absorption to an increase in the circulation through the part; attaching the highest importance to friction externally, rather than to any medicinal effect of the agent employed. Now, it appears to me that we may profitably spend a short time in the examination of these several arguments, or rather theories, with a view to ascertain how far they may be consistent with science and observation.

In the pursuing our analysis it is a matter of slight importance whether we allow the modern doctrine of venous absorption to be the correct one, or the older one of lymphatic absorption, or whether we allow both to play a part, since the same laws would influence both these sets of vessels.

We take the first position, that "certain therapeutics are stimulants to the absorbents."

Now, under no circumstances have we any right to infer that the absorbents, whether veins or lymphatics, are exclusively stimulated to a more rapid removal of any deposition : did such take place, we have no means of discovering the fact, because we do not yet know the rate at which the absorbents are acting in their normal condition ; and not having the standard, we are, of course, quite unable to appreciate any increase in velocity. We, however, distinctly know that, when absorption is suspended, an increase in the amount of deposition is the result ; and we also know that, consequent on a restoration of absorption, the deposition is removed ; but we cannot, therefore, assume that it is removed in a shorter space of time than an equivalent amount of matter would have been in a normal condition of the part. Besides, we have no grounds for asserting the existence of any agent that can stimulate the veins or lymphatics, and the arteries not participating in the increased action ; on the contrary, we have more reason to infer that the latter vessels, from the preponderance of contractile tissue in their composition, would be far more susceptible to the action of a stimulant than either of the former two. On these grounds, therefore, we reject the idea of stimulating the absorbents in the absolute sense, as implying an increase of velocity over and above the normal ratio ; while we are equally ready to admit the restoration of the function, where it is retarded or suspended, causing a relative increase in velocity over and above the ratio in disease.

To the second theory, viz., that by applying a counter-irritant to the skin covering a tumour we determine the blood to the surface, and thus lessen the amount sent to the structure required to be removed, we object both from scientific principles and practical observation. To apply a counter-irritant to the integument covering a tumour, is to set up inflammation not only in the integument, but also, from the inevitably close connection between the vessels, in the substance of the tumour itself; which action, certainly, is sometimes followed by a normal circulation and the removal of the diseased structure: but quite as commonly, or more so, the deposition is augmented; and more especially is this observable in the treatment of osseous depositions by counter-irritation.

The third explanation, of increasing absorption by increasing the circulation, is, I think, entitled to more respect than either of the former ones; inasmuch as experience proves the value of exciting the flow of blood through a part where congestion exists, as in windgalls, slight œdema of the extremities, &c., by means of friction. But we draw a wide distinction between increasing the circulation and setting up inflammation: in the latter case we commonly increase the evil, while in the former we as commonly remove it. While, therefore, we admit the value of friction in many instances, experience proves it to be utterly powerless in causing the removal of fibrous or osseous tumours.

As far as my observations have gone on the action of iodine, I do not call to remembrance an instance where an increase in the size of the tumour has been the result, but, on the contrary, either its partial or entire removal.

To specify the cases in which this has taken place, we will commence with osseous tumours. The agent has been confined by me hitherto under this head to splents, and with the most marked benefit. I have employed ung. hyd. biniod., made according to Morton's "Manual of Veterinary Pharmacy;" always using such small portions as not to have any perceptible effect on the cuticle for a week, and then ceasing for a time as soon as soreness is produced by it. By this plan I have succeeded in removing recent splents in a month or six weeks. Those of a long standing can seldom be entirely got rid of, although, by steady perseverance in use of the agent, they may be sensibly decreased in size whenever their appearance is an objection, and that without at all interfering with the animal's work. In cases of fibrous tumours on the elbows, points of the hocks, &c.—providing their magnitude be not extreme—the same treatment will commonly be attended with success, although the action may be so remarkably slow as to test the patience of both the owner and the practitioner. In one case of capped hock, where the use of the compound was persevered in for some time with no perceptible benefit, the animal was turned out for two months, at the end of which time I was surprised to find the tumour gone. Another case was related to me by Mr. Gowing, in which the ung. potass. iodid. was applied to a fibrous tumour on the hock of a cow without sensibly affecting its magnitude; but on his seeing the case after a period of two or three months, he did not at first again recognise the animal, so great was the alteration that had taken place, the enlargement having, in fact, disappeared.

To account for this peculiarity of action, I am compelled to go to chemical laws. From the reasoning I have advanced, we cannot fairly refer it to counter-irritation, because it need not be used to such an extent as to become a counter-irritant; in fact, experience proves the importance of avoiding this; and friction is confessedly insufficient to produce the like effects, therefore I hold that the hypothesis which refers it to chemical action is by no means untenable. It is not difficult to conceive that the agent enters into combination with the elements or constituents of the tumour, forming new and soluble compounds. At the same time, we are most ready to allow the value of friction in restoring the circulation through the part, thus promoting the desired end; but we most strenuously deny the propriety of setting up *inflammation* in a structure when our object is to effect its removal.

The use of iodine in certain forms of disease of the lungs, under the head of diseased deposits, constitutes an important point in its history as a therapeutic. After the subsidence of acute inflammatory action, it is no uncommon result to have certain fibrinous depositions in portions of the respiratory passages where such inflammation has existed, these causing an obstruction to the atmosphere in its transit, which is frequently attended with abnormal sounds. In such cases I have given the agent with the most decided benefit. I am again indebted to Mr. Gowing for an extreme case of this kind, namely, hepatization of one lung in pleuropneumonia. He relates that the cow had given to her half-drachm doses of the iodide of potassium twice a-day in her water for some time, without the use of any other medicine as an adjuvant, and she recovered. I have never had occasion to try the agent in such cases as consolidation of the lung; but where such a condition was only partial and recent, and not attended with immediate danger to the animal's life, we have good grounds to anticipate favourable results from its use.

In glandular enlargements the action of iodine seems most marked and decided, as in scirrhus or indurated mammary, parotid, or lymphatic glands, diseased testicles, &c. I have had many opportunities of testing its influence on the lymphatic system in glanders and farcy. In the latter disease its use has been attended with invariable success. In the former, though I regret I cannot record its curative action, still I have reduced the enlarged glands for a time by its external and internal use. In those diseases simulating glanders, and too commonly mistaken for such, I have also recorded successful cases.

We proceed, in the last place, to the fourth division of our subject, namely, *the consideration of the action of iodine on chronic congestions.* It is a demonstrated fact in human medicine that the effect of this agent in chronic congestions of the skin is most decided; and, so far as I have been enabled to test it in chronic congestions in the horse and dog, I have no reason to doubt but that an analogy exists.

The special disease in which I have most commonly employed it is congestion of the kidneys, giving rise to a profuse secretion from these organs, known as *diabetes insipidus.* A two-drachm dose of the iodide of potassium, given in the form of ball, will commonly effect a cure. Seldom is it required to give a third dose.

In congestion of the liver (chronic hepatitis), of the skin, in anasarca and œdematous swellings as a class, in purpura, &c., its influence is most decided. And, in that obstinate skin affection known as chronic urticaria, I have no doubt of an equally beneficial result; but I have never tried it in this disease. The compound which I should recommend (at the suggestion of Mr. Morton) would be the iodide of sulphur, this being externally applied, at the same time giving the iodide of potassium internally.

In the application of the agent for the abovementioned diseases I am by no means either original or singular; but in the last two

I shall now mention I believe I am, at least I am indebted to no one for any suggestion under this head : the affections I allude to are canker in the ear of the dog, and chronic coughs. Without entering into a consideration of the pathological nature of canker in the ear of the dog, I think I am justified in defining it as a diseased secretion consequent on chronic congestion of the glandular follicles in the membraneous lining of that organ. It was this view that led me to select the agent. To illustrate by a case, the only one, indeed, in which I have employed it :—A Newfoundland dog had been affected with this disease for three years. The compound employed by me was the iodide of potassium given internally in grain doses daily. With this a solution was applied externally, or rather it was syringed into the ear once a-day, in the proportion of six grains of the iodide to the ounce of water. This treatment was continued for the space of three months, and effected a perfect cure. I am quite ready to admit the justice of the proverb, that "one swallow does not make a summer ;" but I also think the nature of the case, and the length of its existence, with the exclusive use of the agent, are sufficient data for recommending its further employment.

In chronic coughs, ordinarily the result of membranous thickening or chronic congestion, I have found marked benefit result from the use of the agent. Two extreme cases must serve for illustration. One was of asthma in the dog of some time standing ; and the other of chronic cough in the horse, which had existed for nine months. In the former case single grain doses of the iodide of potassium given once a-day for two months effected a cure ; and in the latter, where the cough was almost incessant even when walking, being apparently the result of membranous thickening of the larynx and bronchi, as evidenced by auscultation, the iodide of potassium was used in drachm doses once a-day for five months, with intermissions of a few days at intervals. The improvement was very gradual until within the last six weeks, when the cough suddenly and altogether ceased. I have ridden the horse with the hounds several times this season, and he experiences no inconvenience whatever. On riding him last Friday, I found that he had quite lost a slight whistle in his respiration, which I noticed some months previous ; and though he coughed three or four times during the day, it was so altered in character as led me to consider it rather as the effect of a slight cold than connected with the former affection.

I have thus given the results of my observations, and, as far as I know, those of others also, adding the crude reasonings deducible from these data. The subject is still left in much mystery, and the only solution I have been enabled to offer for the *medicinal* effect of these agents has been chemical action. If it be asked, What is chemical action? I answer, *One* of those clouds which overshadow the boasted knowledge of the nineteenth century—*one* of those impenetrable barriers which must, while time shall last, check the speculative mind of man in its tendency to materialism—*one* of the spirits of the past, present, and future, that utters with unceasing voice, "Hitherto shalt thou come, but no further."

On Wounds, and their Treatment.

[An Essay read before the Veterinary Medical Association, Session 1848-9, and which obtained a certificate of merit.]

By Mr. John Yates.

Generically considered, a wound may be defined to be a breach of continuity in the soft textures of the body, the result of mechanical or chemical injury.

Various names are adopted to designate special peculiarities, according to the character of the injury and its situation in the body. On these particular circumstances I shall not, for the present, make any comment; but being thoroughly impressed with the conviction, that, before a structure can be built, its foundation must be laid, I first propose to examine the mode by which nature heals solutions of continuity in the animal organism. If I have rightly viewed the subject, it is indispensable to the success of my endeavours in the establishing of principles as to the mode in which organic textures are repaired, that, as a premise, I comment on the process by which the animal organism is first formed; and, for the attainment of this end, I purpose giving a brief outline of the functions of nutrition and development.

That change is constantly going on in the animal frame is a physiological fact obviously known to all. It is for the purpose of repairing and compensating for that deterioration of texture that a wonderful provision has been laid in the vascular system, which is destined to convey to all parts of the body BLOOD. the carrier of materials susceptible of organization.

The blood, as circulating through the vessels, consists principally of water, albumen, fibrin, pale and red corpuscules, fatty and extractive matter, and certain salts. It is, however, to the fibrinous and albuminous constituents that the vital fluid owes its reparative powers. The use of the red corpuscules is a question by no means solved by the best inquirers: their use in the organism is most probably connected with the function of respiration and calorification, and with them it is not my province now to engage: I shall, therefore, examine the blood minus the red particles, viz. the *liquor sanguinis*. It is this part of the blood which, by the process of exosmosis, is transuded from the coats of the capillary vessels. At first it is clear and transparent, but, in virtue of its power of self-coagulation, granules appear in it, and these cohere so as to form cells for the foundation of various textures, into which the liquor sanguinis becomes effused.

From this brief sketch of the nutritive process, it behoves us as veterinary surgeons to draw important conclusions: first, that, for the reparative process of tissues, the indispensable process being coagulation of fibrin, those circumstances upon which it is dependent must be maintained, or the process will be destroyed. Such conditions are, moderate temperature, rest, and contact of living tissue in a healthy state.

Secondly, if the process of fibrinous coagulation be indispensable, which no sceptic, I presume, will deny, it is imperative that the blood should contain its natural amount of fibrin, otherwise this solidification of the tissues cannot possibly take place.

Thirdly, insomuch as fibrin is acknowledged by chemists and physiologists to be formed by the albumen of the blood, it is evident that one important condition for the reparation of tissue is, that the blood should contain its proper proportion of albumen, in order that the fibrin may be elaborated from it for the production of the animal textures. The healing process by which nature restores the most simple wound, namely, a clean-cut incision, is by the exudation of liquor sanguinis, followed by solidification of its fibrin, and the production of new tissue. It is, in fact, an extension of the process of nutrition; consequently the inductions which we have established respecting the nutritive process are applicable to the reparation of wounds.

No one can doubt but that the process of adhesion above described, being the most simple and speedy by which a wound is healed, is the one which we, as surgeons, must invariably have in view to attain.

If, therefore, it is desirous to favour the adhesive process in our restorations of solutions of continuity, those circumstances must be attended to which have already been enumerated, viz., rest, contact, absence of all irritation, and, above all, blood highly charged with albuminous matter whence new tissue may be formed. And here we establish the fundamental principles generally to be followed in the treatment of wounds, viz., absence of all sources of irritation, either mechanical or chemical, and perfect rest to parts, so as to favour the solidification of the liquor sanguinis, but, above all, strictly abstaining from all measures which are likely to impoverish the blood, insomuch as we require the plastic elements of that fluid to heal the injury inflicted in the soft textures of the body: hence not only are we to abstain from withdrawing it from the system, so as to diminish its *quantity*, but also we are to guard against its being impaired in *quality* either by the inhalation of noxious vapours, or by the retention of excrementitious matters; whence we infer the important rules, that, for the proper and speedy healing of wounds, it is indispensable that free ventilation be maintained, and the natural excretory processes kept active.

Having thus elucidated the various incidental propositions required as introductory to my subject, I shall now revert to the primary definition of wounds, consider their special characters, effects on the organism, and mode of treatment.

A wound has been already defined to be a solution of continuity in the soft tissues of the body consequent upon the infliction of an injury, according to the instrument or agent which causes the breach of continuity, and various names are assigned to it. Thus an *incised wound* is inflicted by any clean cutting instrument. A *punctured wound* is so denominated when the depth is proportionably greater than the width. A *lacerated wound* is so termed because the parts are stretched before they are separated; and to constitute a *contused wound*, it is necessary that the tissue be subjected to pressure before the breach is completed.

INCISED WOUNDS rarely occur as the result of accident; most frequently they deserve our attention as being inflicted by the scalpel in the performance of surgical operations. It is obviously prudent, in all such cases, to promote the healing process by adhesion of fibrinous materials, this being the method by which parts are most speedily restored to their normal condition, and that, too, with the least suffering to the animal and detriment to the adjoining textures. For this purpose the divided surfaces must be brought in close approximation, and kept in a perfect state of rest by means of bandages and compresses, until the bond of union is firmly established. And, always bearing in mind that inflammation is diametrically opposed to the development of tissue, it is evident that all precautions must be taken in order to prevent its occurrence, or to abate it should it have commenced. Cold applications to the part are therefore indicated, and the antiphlogistic regimen generally adopted is found beneficial; not only as a direct remedial measure, but as a preventive to ulterior ill consequences.

Whenever excised wounds are of considerable magnitude, as when tumours are excised from some situation on the trunk, or when the incision is so situated as to preclude the possibility of maintaining the divided surfaces in contact by mere compression, as, for instance, in wounds of the head, neck, and superior part of the body, then it is requisite to have recourse to sutures as a method of bringing into approximation the edges of the wound. In order that the sutures may not frustrate our great end, union by adhesion, care is requisite in their insertion, whether wire or thread be employed:—

First. Not to draw the suture so tight as to cause irritation by unnatural distention.

2dly. Not to keep the suture in the living texture longer than forty-eight hours, unless imperatively demanded; else, by its action as a foreign agent, it will produce excitement and irritation in the part, and thus produce inflammation, with its results, suppuration, sloughing, &c.

In many cases, by the aid of sutures or compresses, we succeed in keeping the parts in continuity sufficiently long to favour the formation of a bond of union; frequently, however, in spite of all precautionary measures, local inflammation is set up, and we must then abandon all hopes of the adhesive process taking place or becoming perfected. The emollient treatment is then to be had recourse to; in fact, the same principles are to be followed as are applicable to lacerated wounds.

Punctured Wounds for the most part present a circular aspect, which is by no means favourable to the primary organization of lymph; but, nevertheless, is to be favoured to the utmost extent. With this object in view, the situation of the wound is to be ascertained with precision, as to whether or not it be in the vicinity of any important organs, extending into a joint, or any of the large cavities of the body; and, having carefully withdrawn all foreign bodies, the parts are to be brought into the closest possible contact; by this means it frequently occurs that the greater part of the wound heals by direct adhesion. If this be not the case, inflammation is set up, and its usual results take place, namely, suppuration and granulation, and which require at the commencement poultices and other adjuvants, but at a subsequent period the warm-water dressing deserves the preference.

The occurrence is not unfrequent, that, owing to the excessive depth of a punctured wound and the narrowness of its orifice, the pus formed in its interior burrows in the adjacent soft textures, presenting the character of a sinus or fistula. In such cases the scalpel is to be used for dividing the parietes of the orifice, so as to give to it an oblong figure; in which form the process of healing advances according to the plan of incised wounds already alluded to, or of lacerated wounds, now to be made the subject of consideration.

Lacerated Wounds we have already defined as being solutions of continuity in the soft textures, but which are stretched previous to their being separated. It is this kind of wound which most frequently demands the attention of the veterinary surgeon; and, owing to the extent of the injury and varied shape of the instrument by which these lesions are inflicted, they demand some consideration in this part of my Essay.

If the lacerated texture be limited in length and depth, in many cases, by the aid of sutures or compresses, so as to bring the torn edges into contact, union may be effected without the occurrence of much derangement of the system, or even of the part. But when the laceration is extensive, a correct diagnosis must be made as to the nature of the damaged parts; and, if any considerable artery be wounded, the arresting of hæmorrhage by ligature or other means is an imperative duty. Having carefully withdrawn from the wound all foreign agents, the several edges now require support, and which, in the majority of cases, can only be effected by sutures. Upon reflection, I cannot omit impressing on the minds of those whom I now have the honour of addressing, the necessity of abstaining from excising the lacerated edges of the wound. It is only with great expense that Nature can repair losses; and it behoves us to be economical in preserving tissue, not only as directly useful in healing wounds, but as a preventive against an excessive expenditure of Nature's powers. Having thus adapted to their normal position the injured parts, the emollient plan of treatment, viz., warm fomentations and cataplasms, are the only measures by which we can hope for ultimate success. The reason for which these soothing applications are applied is not, as many erroneously suppose, to set up inflammation, and thus to perfect the healing process, since inflammatory action requires nothing to promote it: it invariably occurs as the effect of the injury; and, indeed, as we have already pointed out, is detrimental to the healing process, and requires abatement; for which purpose fomentations are highly beneficial, because, during their evaporation, such a large amount of heat becomes latent as to lower the temperature of the inflamed part, and thus to promote the object we have in view. But another great point is gained by the use of warm applications when the acute inflammatory stage has once subsided. Tonicity, the power by which arteries retain their caliber, is diminished by the application of heat: thus, when an inflamed part is fomented with warm fluids, the tonic contraction of the vessels being diminished, they become comparatively lax tubes, and permit with greater facility the transudation of their contents by exosmosis; and by this discharge of the superfluous contents of the vessels two great objects are attained—1st. The vessels are relieved of their excessive distention, and, the nervous fibrilla being no longer pressed upon, two leading symptoms of inflammation, namely, swelling and pain, subside. 2dly. The materials which are exuded from the coats of the vessels are the elements of the liquor sanguinis, and precisely those by which torn parts are reunited, and new tissue produced. After the wound has been thus treated upon the antiphlogistic plan, SUPPURATION and GRANULATION, will commence.

These processes involve many interesting points elucidative of physiological facts, and instructive of surgical principles. The formation of pus is first preceded by a layer of lymph from the inflamed vessels; through that lymph transudes the liquor sanguinis, which contains fibrinous materials in the form of the deutoxide of proteine, partly in a solved state and partly in the form of the pale corpuscules. By exposure of these materials to the air, or to the influence of oxygen, the chemical union between the proteine compounds and an additional proportion of oxygen is promoted, so that a *trit*-oxide of proteine is produced; and the solubility of it is that which gives to pus its opaque character, and also its enlarged corpuscules with composite nuclei. Those corpuscules of the blood which are imperfectly oxygenated albumen, when exposed to the influence of oxygen, acquire on their exterior the more perfect character of a vesicular envelope; in which state, being more susceptible of endosmosis, the corpuscule necessarily enlarges by the imbibition of fluid; while the granules of the fat in the interior of the corpuscule acting as a centre, around which fibrine concretes, acquire a new and clear aspect.

When pus is produced according to the above-named process, part of the liquor sanguinis or coagulable lymph becomes consolidated, and in it bloodvessels are formed from the subjacent tissue so as to develope conical vascular papillæ or granulations. It is by this continued production that the chasm becomes filled up; and when the new material reaches the level surface, the cuticle extends concentrically from the margin of the wound, and as it advances, not only does the extent of surface become diminished, but the suppurative action likewise decreases.

While this process of granulation is progressing, the best treatment, in my opinion, is that which does the least harm, viz., the least active. The most splendid of Nature's works—the nutrition of textures—cannot be improved upon; and therefore I conceive that all stimulating applications are sources of injury so long as the healing process progresses normally. Upon this principle I give decided preference to the warm-water dressing, as it possesses the advantage of soothing and allaying any local irritation, and at the same time promotes the condition most propitious for the production of new tissue.

Occasionally the granulations are exuberant, that is, so much developed above the level of the adjoining parts as to prevent the cuticle from overspreading their surface. Under such circumstances mild caustics are indicated for repressing them; and here I beg to allude to the mode of application of these agents.

It is usual to apply the caustic indiscriminately to the whole surface of the wound, from which at least one great evil arises, namely, considerable irritation; and further than this, the healing process is necessarily disturbed by the adoption of such violent measures. When it is borne in mind that cuticle only advances from the margin of a wound, it is clear that the simple application of the caustic around the most exterior granulations sufficiently depresses them so as to allow them to be covered by epidermis. This treatment may be daily repeated, applying afterwards dry lint or tow, with pressure, until the whole surface is healed, which end will be speedily attained, since the processes of nutrition and nervous sensibility are not materially impaired.

In some cases, however careful the surgeon may be, the healing process is by no means speedy: the edges of the wound become everted and tumid; the secretion of pus is thin, yellow, and offensive; the granulations are flabby, and upon the application of pressure they readily bleed, and are highly sensitive. These appearances are evidently the result of a defect in the plasticity of the lymph; which must consequently be promoted by stimulant applications, such as the sulphate of zinc or of copper in solution, or of digestives and similar agents.

In the consideration of Contused Wounds, or those solutions of continuity which are the result of violent pressure or concussion before the soft parts are torn asunder, it is necessary to distinguish those cases in which the vitality of the textures is simply impaired from others in which it is definitely extinct. In the former the tissues are not dead, but injured, the capillary coats being torn and blood extravasated. In the treatment of such cases it is necessary to bear in mind that the adhesive process cannot occur; but such is the nature of the injury, that inflammatory action to a greater or less extent invariably supervenes; it is, therefore, obvious that warm emollient applications are to be resorted to, the effect of which is speedily to promote the healing process in the same way as in lacerated wounds.

The contusions which more particularly require notice are those in which the tissues are killed, as the result of extensive injury, when, circulation and nervous function being destroyed, the parts are cold and senseless. That dead textures cannot form part of the living organism is a well-known fact; and it is, therefore, clear that tissues killed by contusion require removal, and for the attainment of this end, Nature, in her wisdom, has amply provided.

The dead part soon becomes circumscribed by a ring of inflammation, and it has been a subject of speculation as to the manner in which inflammation is set up and the part removed; but, in reality, I conceive the phenomenon explicable without imagining any unknown exaltation of irritation and absorption, terms which are rather conventional than real.

The death of the part implies an arrest of blood, to which its vessels are no longer permeable; the vessels around must therefore be charged with that blood which formerly supplied the now dead part: the very fact of blood accumulating in the capillaries constitutes the foundation of inflammation, which is completed by the repeated impulse of blood from the heart, and consequent upon accumulation of blood we necessarily have its usual effects, effusion from the distended vessels; and the layer of lymph so deposited forms a barrier between the dead and living parts, and closes the vessels, so that when the dead tissue is removed the occurrence of hæmorrhage is prevented.

The increased flow of blood implies an augmentation of oxygen in the part which is the seat of inflammation; and, according to the views of Leibig, we can comprehend how, by the free supply of oxygen, eremacausis or death of the tissue occurs: that process implies dissolution of substance, which we well know occurs at the circumference of the part, and which must necessarily be removed as soon as it is wholly detached. Subsequent to the removal of the dead part, the remaining chasm is filled up by granulations, and ultimately healed by cicatrization, as already explained in cases of laceration; and the same treatment is, in fact, applicable in the one as the other. But we may additionally remark, that the value of poultices in extensive contusions is twofold; first, by evaporation relief is afforded to the nervous excitement; and, secondly, by warmth communicated the removal of the dead textures is facilitated.

Having completed this brief and therefore of necessity imperfect sketch of the peculiarities which wounds present, and their appropriate treatment, a few words more may not be misplaced as to the constitutional effects of wounds, and the measures to be adopted for averting them.

In case of slight injury little or no systematic disturbance is observed, but when the wound is extensive, symptoms of nervous and vascular excitement occasionally prevail; these are to be combated by strict antiphlogistic regimen, and attention to the state of the digestive organs. Sedative agents, also, are imperatively called for, and even bloodletting may be resorted to in extreme cases. On this head I would remark on the impropriety of withdrawing blood as a prophylactic, with the erroneous notion of preventing the ill effects of the injury. The nerves are the medium through which the general system becomes affected, and the vascular system is of secondary import; consequently, by bleeding soon after the injury is inflicted, we do not diminish the liability to systematic disturbance, but by debilitating the system we effectually prevent the possibility of counteracting the excitement with measures sufficiently energetic when it does occur.

I have already said, that in extreme cases alone is bloodletting to be resorted to; and for the obvious reason, blood is required to heal the wound, and, consequently, the more that is expended by artificial evacuation, the less is reserved for structural consolidation.

One awful effect of wounds, viz., tetanus, I purposely omit. Its importance, and the difficulties in accounting for its true pathology, are motives which preclude me from attempting its introduction, while its consideration may be safely left to other and abler hands than mine.

COMMUNICATIONS AND EXTRACTS.

Case of Fracture of the Tibia.

By Mr. T. W. Gowing, *M.R.C.V.S., Camden-town.*

The bone, in this case, was fractured in an oblique direction downwards and backwards, reaching to two-thirds of the shaft of the bone, and extending into its articulation with the femur. It occurred in a bay mare, fifteen hands and a half high, the property of a gentleman residing in Camden-road Villas, and she was used in double harness.

History of the Case.

On Sunday, the 17th of February, the mare was removed from her own stall, which was on the off side of the stable, and placed into the adjoining stall with her companion, standing on the off side of him. They had not been long thus placed together before she was kicked by the horse, the blow being inflicted on the inner and superior part of the tibia. The external injury was but slight and superficial, there being no wound, and the hair merely knocked off and displaced about the size of a sixpence. She was immediately taken out from the stall, and was observed to go rather limping. The coachman apprised his master that such an accident had occurred; but he, thinking the injury slight, and that a few days' rest would set all to rights again, thought little of the matter, and consequently I was not sent for at the time. The animal continued in her stall from the day of the accident up to the following Sunday, the 24th, lying down and taking her rest, as the coachman stated, as usual, but still continuing lame. On this morning she was removed from the stall and walked up the mews. There was no swelling that he could observe about the part, and she was brought back and again placed in the stable. She fed as usual, and occasionally a bran mash was given to her, and she took her rest as before. This continued up to Thursday the 28th, when I was sent for in haste; and on my arrival I found the following symptoms present:—A continuous spasmodic action of the muscles of the off hind leg, drawing the limb upwards; partial perspiration; breathing much increased; pulse from 50 to 56 in a minute, and feeble. I had no difficulty in pronouncing it at once to be a fracture of the bone, for crepitation could be plainly heard; also, when the limb was flexed, I could bring about distortion by means of the divided ends of the bone. The coachman stated that she was standing pretty well on her leg on Wednesday, and fed as well as ever; but just as he had got into bed, about eleven o'clock, he heard something like a struggle, of which he took no further notice, considering it to be one of the horses getting up in a hurry; therefore the fracture was not discovered until the following morning, as above stated.

I think this case may prove useful as a cautionary lesson to the young practitioner, that he should not treat slightly every blow or injury inflicted on the tibia or other bones that are not densely covered with muscle; for, in my opinion, this fracture took place when the injury first occurred, although it was thought to be but slight; but displacement of the divided ends of the bone was not brought about until Wednesday night, and this from some act of violence, or from the animal suddenly rising.

Case of Disease of the Trachea of a Horse.

By Mr. G. Austin, *M.R.C.V.S.*

13, *Grove-street West, Eaton-square, March 8th,* 1850.

Dear Sir,

On the 5th of January last I was requested to attend a case which had previously been under the care of a farrier, the history of which is as follows:—

The subject, a black mare, aged, had been worked by a cab-proprietor about the streets of the metropolis for upwards of two years, during the latter portion of which period she had become a roarer; but at this time it was difficult to detect any considerable noise, even when trotting with a load; she was, therefore, sent to grass for four or five months, her legs being previously blistered. On taking her up from grass she was sold to a carman for slow work, at which time there was some difficulty of breathing shewn, and she was worse than when first turned out; a whistling noise being heard when at work, and at times she almost fell in the streets.

She had worked only a few days when the farrier before mentioned undertook the case, and treated it as one of sore throat, by applying poultices, stimulants, &c.; and he said at this time there appeared to be much tumefaction observable externally (of this I have some doubt) about the larynx and glands of the throat.

I saw her two or three times after this, and, finding the treatment pursued was not attended with the least benefit, I desired she might be brought to my hospital; and when she arrived she was in imminent danger of suffocation. I resorted almost immediately to tracheotomy, which soon relieved her. The following day, on removing the tube and not allowing her to breathe through the orifice, she became as bad as when she first arrived. I again examined her by the mouth, and found but little sensibility to exist about the larynx; in fact, the finger could be passed over the epiglottis, and a thickened state of the covering membrane easily felt. By the nose the parts appeared normal, and the mucous lining membrane healthy. Externally, on the right side, at the inferior part of the larynx, I could detect a bony enlargement. She remained in the same state, breathing easily through the tube, and feeding well; in fact, getting quite fresh, but the disease itself was not in the least mitigated by the treatment; when, by some accident that occurred in the night, she rubbed the tube from out her trachea, and died of asphyxia. This was not the first time the tube had been rubbed out, for she would get it on the edge of the manger, and in this way pull it out; but, this happening in the daytime previously, it was soon replaced. The larynx, shewing the ossific deposition on the arytenoid cartilage, and the thickened state of the membrane closing the aperture for the admission of air, I have sent you. The only chance of the animal's being of the least service would have been by using her with a tube in the trachea.

I would venture to suggest the use of a vulcanised caoutchouc band to retain the tracheotomy tube, in lieu of tape. Had I taken out a portion of two of the cartilaginous rings and retained the skin back, it would only have been of temporary benefit, as the aperture so soon closes by new growths.

I am,

Your's, very truly.

To Mr. G. Varnell.

[The larynx, which Mr. Austin has sent to the College, with a description of the case from which it was taken, in one particular is like many other specimens in the College Museum; namely, there exists a diminished caliber of the tube at this part of the air-passage, but not one of them exhibits precisely the same morbid changes as this does, nor do we remember having recorded a similar case. The lesions are as follow:—A general thickening of the lining membrane of the larynx, but to a greater extent by fibrinous deposition in the submucous tissue on the right side than on the left, accompanied with a depressed and fixed condition of the right arytenoid cartilage. The supero-posterior and lateral parts are externally much thickened, and a degeneration of the right crico-arytenoideus posticus and arytenoid muscles has taken place. In a normal state, we find the arytenoid cartilage loosely attached to the cricoid cartilage, partly by a fibrous membrane extending from the posterior border of the arytenoid to the anterior border of the cricoid cartilage (the crico-arytenoid ligament), and by capsular ligament lined by a synovial membrane, thereby admitting of considerable motion when acted upon by the dilators and constrictor muscles connected with those cartilages, and thus varying the size of the glottal opening.

Upon further examination, we find ossification of the supero-posterior border of the arytenoid to exist, and also of the supero-anterior border of the cricoid cartilages, extending to each half of their width, involving the arytenoid ligament, and thus completely anchylosing and destroying all mobility of this part of the larynx. This rigidity was observed by Mr. Austin on passing his hand up the mouth to the glottal opening when he first received the horse into his infirmary.

The early history of the case affords no clue as to the primary cause of this morbid change. May it be that the larynx was assailed generally by an attack of inflammation; this, perhaps, only slightly affecting the mucous membrane, and having its seat more especially in the perichondrium clothing the above-named cartilages? In some cases, inflammation would induce suppuration, with destruction of parts; but in this instance, as demonstrated by a post-mortem examination, Nature had set up, possibly, a greater preservative process, namely, ossification. As Mr. Austin observes, the animal might have lived some time with a tube in his trachea, and thus have rendered his owner some service, had not the accident occurred by which he became suffocated.]

Case of Atrophy of the Muscles acting upon the Patella.

By Mr. C. Hunting, *Student.*

Gentlemen, *Queen-street, Camden-town, March* 11, 1850.

The following facts, relating to a remarkable case of lameness in a bay mare, the property of T. Christy, Esq., of Clapham, I have thought may not be uninstructive to your readers.

On Thursday, the 3d of January, my attendance was requested on the animal, it being suspected that her off hind leg was "out of joint." Finding on my arrival that some remedial measures had already been resorted to, my first act was to inquire into the history of the case and the treatment adopted. I was informed that on Saturday, the 8th December, the mare, apparently in perfect health, was put into a light gig for the purpose of being driven to town, and after trotting half a mile she evinced slight symptoms of lameness in the off hind leg, which gradually increased, until, on reaching town, the animal could scarcely raise the foot from the ground. The attendance of a practitioner was at once determined on; but as his treatment proved unsuccessful, the case was submitted to my notice. Upon a careful examination, it was evident that the bones of the limb were not displaced, but that the muscles extending from the hip-joint to the patella had lost their contractile power. No increase of temperature, nor any tumefaction, could be detected in the parts, and no symptoms of constitutional disturbance were apparent; but the prominent symptoms were—falling off of the quarter along the course of the rectus femoris, with no difficulty in extending the leg, but a total inability to support on it the weight of the body; and, when this was attempted, the stifle was much projected beneath the abdomen. The animal was likewise unable to place the heel upon the ground, going quite upon the point of the toe when made to walk, in which act she appeared to suffer little or no pain, yet the local sensation was not lost: the appetite was also good, and the evacuations healthy.

My prognosis was unfavourable, and I had recourse to very mild remedies, simply with the view to gain time, during which I watched the symptoms carefully. Three weeks having elapsed and no improvement manifested, I recommended that the animal should be destroyed. To this the owner consented; and this afforded me an opportunity of examining the parts by careful dissection. On exposing the rectus femoris, it was found of a pale colour, soft, and much diminished in bulk, weighing only two pounds four ounces, whereas that of the sound limb weighed four pounds. The vasti muscles were likewise pale and flabby, although natural in size: all the other muscles of the haunch were healthy, and so were the hip and stifle joints. The lumbar vertebræ were anchylosed. After passing between the psoas muscles the crural nerve became somewhat discoloured and atrophied; these changes becoming more marked as the nerve approached its ultimate distribution.

I removed the 2d, 3d, and 4th lumbar vertebræ, but could detect no abnormal appearance of the medulla spinalis in that situation.

Such are the facts; what explanation can be offered? To this query I am unable to give a satisfactory answer, and it is a wish that some one more experienced than myself may comment upon this extraordinary case which has induced me to publish these crude observations. On one point, however—the degree of participation of the nervous system in the disease—I shall subjoin a few remarks, for which I am greatly indebted to a friend. I am inclined to regard the atrophy of the muscle and nerve as effects of the same cause, and not as cause and effect; or, in other terms, it does not appear to me that the wasting and loss of power of the rectus and vasti muscles were the result of defective nervous energy, but were due to the same unknown cause to which the discolouration and atrophy of the nerve are referrible. Three facts support this opinion: 1st, The nervous centres, and the crural nerve in the first part of its course, were healthy. 2dly, The occurrence of lameness was sudden, and therefore not a probable result of such a slow process as atrophy from innervation. 3dly, Had derangement in the nervous functions been the original cause of the affection, the muscles of the limb would have participated more generally than they did, it being evident that, if the spinal cord in the lumbar regions had been injured, all the parts supplied with nerves below the stifle joint must have shared in the effects. These considerations influence me in the opinion, that the lameness was due to a sudden cause, to which the defective nutrition of the muscle and nerve, and the impairment of their functions, are related as effects.

I am, Gentlemen,

Your obedient servant.

To the Editors, &c.

Consultation respecting a Disease which has shewn itself among Horses in Java.

Report, &c.

The following are the symptoms of a disease prevalent amongst horses in Java, but more particularly about Batavia, by which hundreds are lost annually.

The malady always commences with a cough, which usually sounds very hollow, as if coming from the depths of the chest; after this has continued for two or three days a mucous discharge is seen from the nostrils; at times only from one nostril, but generally from both. This, at first, is white and clear, resembling the white of an egg; but it gradually acquires a darker colour, assuming a yellowish tinge, and at the same time it becomes gluey or sticky, adhering to the margins of the nostrils. After the disease has arrived at this stage there is often no swelling between the jaws, but at other times a swelling makes its appearance simultaneously with the discharge from the nostril or nostrils. Some horses retain their appetite during the greater part of the time the disease exists, only ceasing to eat three or four days before their death. Others lose their appetite at the commencement of the attack, and rapidly sink under it. Sometimes horses continue under its influence for months, and eventually recover; others quickly die from it. When it continues for any length of time—say three or four months—farcy-buds make their appearance, and the horse generally dies. I have at this moment a valuable pony with farcy-buds existing along the course of the large veins of the belly, and a large swelling on the hock, so painful that he cannot stand on that leg. This horse was attacked during my absence from home, and poultices of cows' dung were applied between the jaws for a month. On my return, I found a considerable discharge taking place from the nostrils, which were full of chancres. I immediately applied a blister between the jaws, and washed the nostrils three times a-day with a solution of blue vitriol, and in a week the sores had disappeared, the lining of the nostrils being healthy in appearance. The discharge had also entirely ceased from one nostril, and what came from the other was thin and white; the horse had also recovered his appetite, and was playful. I ordered him to be ridden gently for exercise, and was again absent for eight days, and when I returned I found him almost incapable of moving his hind legs, the discharge from his nose had likewise returned, and since this time he has been daily getting worse, and is now a mere skeleton.

I have hitherto treated this disease as strangles, and blistered between the jaws, washing the nostrils with a solution of blue vitriol by injecting it up both nostrils. The effect of this treatment generally diminishes the discharge, and prevents chancres forming; but there is evidently something more wanted to restore the animals to health, as they remain a long time stationary, and on cessation of the treatment suffer a relapse. Three or four months is no unusual time for their being under treatment, during which they cannot be used for any kind of work.

Horses here are fed almost entirely on fresh grass with a small quantity of paddy (rice) in the husk. Mine get about two pounds of paddy per day, with as much grass as they can eat. With this food they can do all the work required of them. They can go from ten to fourteen miles stages in a carriage or buggy without being distressed. The stables are open, adapted to the climate, and mostly well drained. In Batavia, where the disease is most prevalent and fatal, many stables are placed low, and the grass is bad, being for the most part under water. The disease there is at its greatest height during the rainy monsoon.

All the horses in use in Java are entire, and in the latter stages of this complaint the scrotum swells to a large size, which is accompanied, at times, with a swelling running from the sheath along the belly. The Dutch government here consider this disease incurable. I have the artillery and cavalry ponies destroyed when attacked; but it is not contagious, except by the matter coming in contact with some sore or wound, as I have seen a diseased horse driven with another for months without communicating the disorder to his companion.

An opinion is required as to the best mode of treating this pest.

Opinion.

Royal Veterinary College, London, Jan. 18th, 1850.

I have carefully considered all the circumstances described in a Report which has been placed in my hands, descriptive of a fatal disease prevalent amongst horses in Java; and the conclusion I have come to relative to the nature of the malady is, that it bears an analogous type to those diseases which in the veterinary nomenclature are termed glanders and farcy.

Without going minutely into the pathology of glanders and farcy, I feel it right to state that, although these are spoken of as separate maladies, they are really one and the same disease; and it has been satisfactorily shewn, both by inoculation and *infection*, and other atmospheric influences, acting as propagating causes, that the same poisoned condition of the blood (depending upon the susceptibility of the animal affected) may lead to the development of the symptoms of glanders or of farcy, or of both forms of the disease, in the same animal.

Although it is stated in the Report that a horse affected with the chronic form of the disease has for months been driven by the side of a healthy horse without communicating the malady to him, this fact, nevertheless, appears to me to be of but little weight, as tending to shew the non-infectious nature of the disease.

I am decidedly of opinion that it is communicable from diseased to healthy animals, both by inoculation and infection; and with this conviction, I feel that too much importance cannot be attached to separating the sick from the healthy on the first exhibition of the slightest symptom of the disease; and it must not be lost sight of, that in all such maladies there is what may be termed an incubative stage, that is, the system is affected, doubtless, for some days prior to any outward signs being shewn by the horse, beyond those of loss of appetite, a staring coat, and general dulness.

As it regards the treatment best to be adopted for the cure of this malady, but little of a satisfactory nature can be advanced; as I feel assured that in by far the majority of instances (as is found to be the case in this country) it is incurable.

Whenever, therefore, it exhibits itself in an acute form and rapidly preys upon the constitution, it is better to have the animal at once destroyed than to be at any expense in the adoption of medical treatment, thus incurring the risk of its spreading to other horses.

There may, however, be some cases wherein it may be successfully combated, such as when the horses affected are young and vigorous, and when the disease takes on a chronic form, or is more particularly confined to that stage of it termed farcy.

Should any such cases be submitted to treatment, there is the same necessity for caution against contagion which I have enjoined; for although the symptoms may be slight, *chronic*, and productive of no marked ravages on the constitution of the horse affected, yet such an animal might communicate the malady to others, and that too *in its most virulent form*.

It will be inferred from what I have above stated, that I attach considerable importance to the adoption of means to prevent the spreading of the disease in question when it has once broken out in an establishment of horses through infection and inoculation. I nevertheless wish it to be distinctly understood, that it is my decided conviction that the propagating causes of the malady are mainly referrible to atmospherical influences consequent on locality, inclement seasons, and imperfect ventilation, coupled, probably, with the debilitating effects of innutritious diet and severe work.

Instead, therefore, of seeking for a cure, the grand thing, in my opinion, is to look to the causes, and to adopt stringent measures of a prophylatic or preventive nature. By these means, and not by medicine, it is, that in this country we have, comparatively speaking, got rid of glanders and farcy.

The treatment should at all times be of a *re*pletive and not of a *de*pletive nature. Tonics combined with cordials or diffusible stimulants should be given, with generous and the most nutritive diet. The din-iodide of copper, in doses of from half to one drachm given daily with half an ounce of powdered gentian root, I have seen the best effects from.

Also the sulphate of copper and sulphate of iron, in two-drachm doses daily, I have found of advantage.

The nasal ulcers should be washed with a weak solution of the sulphate of copper, or of zinc; and the enlarged glands, together with the farcy buds, should be blistered, and cleanliness, above all things, should be strictly observed.

CHARLES SPOONER.

USES OF THE PANCREAS.

[From the "Monthly Journal of Medical Science," Feb. 1850.]

HALLER and (more recently) Majendie have confessed, that the function of the pancreatic juice is quite unknown. Tiedemann and Gmelin conjectured that, by means of the azotised principle which it contains, it may contribute to the assimilation of vegetable articles of food. Valentin, Bouchardat, Sandras, Strahl, and others, shewed, by experiment, that it possesses the property of converting starch into dextrin and grape-sugar.

Bernard promulgated an opinion, which has of late been almost universally accepted, that the chief or only use of the pancreatic fluid is, to effect the digestion of fat. Eberle had remarked, some years before, that the fluid had the property of retaining fat in a state of emulsive suspension (*Phys. der Verdauung*, p. 235). An abstract of Bernard's experiments and doctrine will be found in the "Retrospect" of the *Monthly Journal* for June 1849.

Frerichs has more recently investigated the subject, and his conclusions differ materially from those of Bernard. He remarks, that the pancreas of graminivorous animals is highly developed, yet that their food contains little or no neutral fat. It is tolerably clear that the function of the viscus must, in these animals, be unconnected with the assimilation of fatty matters. Frerichs' experiments have proved that starch-paste, digested at 86° Fahr. with pancreatic juice, is, within an hour-and-a-half, totally converted into dextrin and sugar; that the juice exerts no action upon coagulated albumen; that it forms an emulsion when shaken with olive oil, but that the oil again separates almost completely, when the mixture remains undisturbed; that serum, bile, and saliva, form similar emulsions with oil.

Artificially digested albumen, mixed for six hours with pancreatic juice, and then heated to the boiling point, becomes very turbid. This turbidity is far less conspicuous when a parallel experiment is made with bile, instead of pancreatic juice.

When chymified albumen is digested for twenty-four hours with a mixture of bile and pancreatic juice, the bile is found to subside in the form of a resinous precipitate; the fluid above remains clear, has a wine-yellow tinge, and, when heated, becomes flocculent. Similar effects were produced, but in a far feebler degree, by treating chymified albumen with bile alone.

When the pancreatic ducts of a cat are tied, and the animal afterwards fed upon milk, or fat meat, and killed from four to six hours after a meal, Frerichs states, that the lacteals are usually found full of white fluid. He varied this experiment in many ways; sometimes a ligature was passed round the intestine, below the point where the ducts from the liver and pancreas enter it, and the lower portion of the bowel was afterwards injected with milk or olive oil. In other experiments the small intestine was divided in the middle, and either portion filled with oil, and then carefully ligatured. It was uniformly found that, although the lacteals proceeding from all parts of the intestine contained white fluid, they were best filled in the vicinity of those parts of the intestinal canal in which bile and pancreatic juice had access to the injected fluid.

Frerichs' experiments seem to warrant the following conclusions:—

1. That *one* function of the pancreatic juice is, to convert amylaceous matter into sugar during the process of assimilation.

2. That the pancreatic juice converts the bile into an insoluble compound, and thus favours its expulsion from the system, while it prevents its resorption.

3. That a third use of the pancreatic secretion is, in conjunction with the bile, to effect the fine division of the neutral fatty matters, essential to their absorption into the lacteal system.

Report on the Epizootic Peripneumonia as affecting Cattle in the Cantons of Burzet, Montpezat, &c.

By M. Tisserant.

To the Prefect of the Department of Ardèche.

Sir,—Having been honoured by a request to investigate the disease which prevails among the cattle in the canton of Burzet and its vicinity, with a view to ascertain its nature and causes, and the means by which it may be arrested, I am anxious to render an account of the mission with which you have been pleased to favour me.

My observations, however, have not been confined to an investigation of the prevailing epizootic alone, but epizootics of the same nature, which have shewn themselves in the same places, have likewise been made the subject of inquiry; and I have received such information with respect to these outbreaks as enables me to establish their history. In my travels I have visited the stables which have been pointed out to me as containing diseased animals, and also many others which not long since were inhabited by them. I have likewise endeavoured to satisfy myself upon all points forming the subject of my investigation, by consulting the principal farmers and proprietors whose stock I have inspected.

Names of the disease.—The malady which prevails at this time in the cantons of Burzet and Montpezat is *epizootic peripneumonia,* as affecting cattle; called improperly by many veterinary surgeons *gangrenous peripneumonia,* and vulgarly, in the department of Ardèche, *lung disease* or *chest disease.* It is the *inflammation,* or *malignant inflammation of the pleura and lungs* of several French authors; *the peripneumonia* of the Belgians and Italians; *the pulmonary epizootic,* or putrefaction of the lungs, of the Germans; and the *pleuro-pneumonia* of the English.

History.—Contagious peripneumonia of the bovine race is probably of ancient date, but it has never been carefully studied until the last and present century.

It was especially observed in the canton of Zurich, in 1733, and it appears to have spread from thence to various other cantons of Switzerland. For a long period it seems to have been confined to the mountainous districts; but the migration of animals, commerce, and other causes, facilitated its extension. In 1765 Bourgelat studied it in Champagne. It prevailed at the same time in Piémont, Dauphiné, Jura, Vosges, Bourbonnais, and in the environs of Paris.

Its outbreak has sometimes been especially marked, often coinciding with the changes of cattle, resulting from commercial importations. It is in this manner that its presence may be accounted for in the North in 1822, in Holland in 1833, in Belgium in 1837, and in England in 1842. (?)

There are at the present time few of the departments in which it has not shewn itself, or in which it does not exist. The epizootic which I have studied in the department of Ardèche is not of recent date. Since 1847, it has prevailed very extensively in the cantons of Burzet, Montpezat, Coucouron, &c. I believe I am correct in stating, that it has destroyed upwards of five thousand cattle in the above cantons during the last three years; occasioning enormous losses to the farmers, as cattle constitute their chief wealth.

It seems at present to prevail principally on the right side of the mountain, where I fear it will remain, unless the causes which have produced it are removed.

At the period of my visit the disease existed in a severe form in eight stables, containing about 300 cattle. It had carried off more than a fourth, and would probably destroy many more of those remaining, as upwards of fifty were more or less affected.

The infected districts belong to two neighbouring communes, Usclades and St. Eulalie; but I have found stables in all the adjacent villages where the affection had prevailed within the last few weeks. Almost all the communes that I have passed through have suffered occasionally since 1847, and numbers of farmers have in a short space of time experienced severe losses. It is very difficult to arrive at the absolute or relative loss, on account of the sales and changes effected by the proprietors of cattle. I think that I may safely state, however, that the farmer in whose herd peripneumonia prevails will lose during its course the half or three-fourths of his stock.

I have not been able exactly to follow the course of the prevailing epizootic, which is so uncertain in its appearance that it frequently breaks out in the same place, whilst other villages, without any apparent cause, have been altogether exempt. I dare affirm, that it has had several *foci*, of which St. Eulalie, where there are several cattle-fairs held, seems to me to be the principal.

The records which I have consulted do not extend farther back than 1842, in which year the epizootic made its first appearance in the department of Ardèche; but I am informed, on the authority of several proprietors of cattle and farmers, that in 1839 it had already broken out on that elevated tract of land which is designated the Mountain.

I shall endeavour, in another part of my report, to shew, from information which I believe to be correct, that this disease had been observed in the same places at a former period, that is, 1826 or 1827. I have not, however, been able to ascertain that it has ever been in the arrondissement of Privas; but several communes of the arrondissement of Tournon are said, in the documents I have perused, to have been infected in 1842-44 and 1848.

Species attacked.—Animals of the bovine species are only susceptible of contracting contagious peripneumonia. It attacks them without distinction of age or sex. Those which are the most susceptible of being affected are generally such as are fat or highly fed. In these particular cases it is generally more serious, and its progress more rapid.

Symptoms.—Three periods or stages have been distinguished in peripneumonia, namely, the commencement, progress, and termination. I have adopted this method to render my description simple, and better understood; for, in reality, the several stages of the disease become mixed, and it is impossible to assign to them precise limits.

Commencement.—This is difficult, even for the veterinary surgeon, to detect and characterise. It almost always escapes the observation of the proprietor; for when he discovers a diseased animal in his shed, the affection may generally be considered as having existed from one to several weeks.

An experienced observer will notice the following signs, which are, however, only of value in so far as they lead to a suspicion of the existence of peripneumonia. The animals, without losing their appetite, eat less, and more irregularly; rumination however is not interrupted, but appears to be more slowly effected. When the animals are standing quietly in their places, they appear dull and hold their heads low. If they have been recently exposed to wet and cold, the back becomes arched and the coat staring. These two last symptoms are rendered more prominent by the influence of moisture and cold, and have been very useful in enabling me to establish my diagnosis. The respiration is accelerated and tremulous, so that I could not determine precisely which was the longest, the inspiratory or expiratory movement. The conjunctiva is red, or of a yellowish tint. The pulse is remarkably weak, small, and slightly accelerated. I have never found more than sixty pulsations per minute even among young animals.

Percussion and auscultation do not give, at the commencement of the disease, sufficient indications of structural derangement to enable us to arrive at a satisfactory conclusion.

The chest, on being struck on its sides with the closed hand or with the extremity of the fingers, sometimes denotes the existence of acute pain, at other times no effect is observable. It appears to me that we cannot attach much importance to this method, as simply applied to old animals, or to those which are ordinarily very quiet; for whenever I have made similar experiments upon the sick, and upon *young*, *lively*, and *healthy* animals, I have not been enabled to detect any perceptible difference.

Two symptoms of greater value than the above will serve to shew the commencement of peripneumonia, but, unfortunately, they are not purely pathological; these are, a cough and sensibility of the vertebral column. The cough is the symptom the most easy to detect, and is that which attracts the attention of the proprietor. It is weak, dry, and involuntary, and generally arrests rumination for one or two minutes.

As the cough belongs to the period which we describe as the commencement of the affection, the progress of the disease is not always noticed; and it is this which induces me to observe that the sounds afforded by auscultation and percussion are often of little value, as they are not so apparent, even to the most practised ear, as when the cough exists. I will describe them in speaking of the second period.

The sensibility of the vertebral column behind the withers appears to me, like that of the chest, to be more or less acute according to the temperament of the animal, independent of the state of health or disease. Almost all milking cows, especially those which have lately calved, likewise young calves, and heifers, all of which appear to be in health, shrink when the hand is pressed upon the dorsal region.

Diseased animals, indeed, have frequently been more insensible to a similar pressure, and large cattle especially constitute the exception. This obscure period of the commencement of the attack has a duration more or less extended according to the nature and activity of the causes of the disease, and depending on the physiological and hygienic condition of the subject. In the epizootic of the Mountain it varies from one to four weeks.

2. Progress.—The symptoms of the second period are easy to recognise. When the disease prevails among animals in the sheds, the farmers themselves are not deceived. The appetite is sensibly diminished, and is more irregular; as is also rumination. Animals which have eaten at all freely become hoven, but this generally disappears without treatment. It is not unfrequent to see diseased cattle in mountainous districts, especially towards the middle of the day, standing near walls or under the shade of trees, with the belly swollen, the neck drooping, and the mouth half open, allowing of the escape of frothy saliva. Those animals which are not objects of particular care, and as well as those which soon recommence eating, are more particularly liable to these attacks of indigestion, and their examination at once demonstrates the existence of peripneumonia.

The alvine dejections are slightly increased and very soft, and the urine rather scanty. Respiration is hurried, especially when the animals have been exposed to cold or wet, and have been recently brought into the stables.

Pressure of the pectoral region may produce pain, this being rendered evident by the movements of the animal, which shrinks from the hand that presses it, and manifests unequivocal signs of disease. Each movement of the body is accompanied with a moan, which may be heard at some distance.

By auscultation we are enabled to hear on one side, but rarely on both, and always towards the anterior part of the chest, a dull grating sound, in which a kind of humid crepitation is distinguishable. This sound, which is very evident during inspiration, is short and hardly perceptible during expiration. There may be heard at the same time a blowing sound, which is sometimes very marked, indicating hepatization. In other respects respiration is performed as usual.

In epizootics, especially in those whose progress is slow, the sounds detected by auscultation are generally difficult to characterize: I will describe the cause of this when I speak of the lesions of the lungs. I have never perceived bronchophony so marked as when the *bruit de souffle* and the other sounds beforementioned, which were so easy to observe as would not be overlooked by the most ordinary observer, were present.

Percussion, employed with the intention of ascertaining the permeability of the lung, has been of slight utility to me. In health the sound is nearly inaudible on the right side; and I confess that the difference has not appeared marked enough to warrant me making it the basis of my diagnosis.

The pulse is small and thready to the feel, and sometimes more or less accelerated. I have never found it more than 67 beats in the minute, even in young and vigorous animals. The mouth is hot; the muzzle dry, or occasionally moist; and the mucous membranes are rather paler than natural.

The observations which I have made respecting the sensibility of the vertebral column to the pressure of the hand in the first stage are applicable, but to a less extent, in this second stage. Thus I have found animals decidedly ill which did not present any difference in this respect from the healthy animals in the same stable. The ears and base of the horns are alternately hot and cold. The coat is staring and the skin inelastic. It is in this stage that cows in calf generally miscarry. Those which do so bring forth their calves dead, and sink themselves very shortly afterwards. I have seen but a very small number of cows survive abortion or premature parturition.

The milk diminishes in quantity and loses its qualities: it is more serous, and contains less proportion of the elements of butter and cream. This circumstance will alone suffice to explain the care which the inhabitants of the Mountain take to conceal the existence of peripneumonia among their stock.

After having observed all the ordinary symptoms of the disease, I wished to examine the characters of the blood; but in the remote districts in which I was placed, and being far from any medical man, I had not any special instruments at my disposal; it was therefore necessary to use the most ready means which offered themselves for this purpose. The blood of diseased animals poured upon white paper, and folded in the corner of the paper, or thrown upon a white polished substance, has at all times shewn a more viscid state than healthy blood when rubbed slightly between the fingers. It coagulates with extreme rapidity, forming in about five minutes a clot, in which fibro-albumen is abundant.

In a calf about six months old, which was killed and immediately opened in my presence, I found at the anterior part of the chest a large clot of blood already enveloped in a fibro-albuminous sac, which was more than a centimetre in thickness. The blood, which resulted from the incision made in the animal, had scarcely flown more than five or six minutes before I examined it. In another subject, in which the right lung was hepatized, I found, surrounding the trunk of the aorta at the base of the heart, a clot about the size of a man's fist, which was likewise surrounded by a false elastic membrane. This extravasation resulted from a rupture situated at the superior and middle part of the right lung.

The second stage of the malady extends from ten to twenty days: it is associated with the stage which precedes and also that which follows it. I cannot, therefore, determine the precise moment it commences or terminates, it being impossible to observe any thing else than a slow and gradual progression of the symptoms.

Anatomically, the commencement of peripneumonia is characterized by congestion of the lung and serous infiltration of the interlobular cellular tissue. To these pathological phenomena succeeds the organization of the effused products.

That which renders distinction of the periods difficult is, that congestion and hepatization do not invade the lung at one and the same time: their existence in one point does not prevent new deposits gradually taking place in the neighbouring parts, accompanied with the same characters and symptoms, and also with the same slowness as in the first instance.

3. Terminations.—I have never observed in the epizootic of the Mountain but two terminations, namely, recovery and hepatization with hydrothorax. Recovery may occur naturally, in consequence of the sudden abatement of congestion, but then the

disease has not arrived at its second stage. It may take place after effusion, and when one part of the lung is hepatized; but this is extremely rare, and I believe never radical. I have seen many animals which have been ill for two or three months, in whom the principal symptoms of the disease had disappeared either by Nature's influence or by treatment; and I have never known one of them completely cured. The state of the respiration and the pulse, the paleness of the mucous membranes, persistent cough, general emaciation, staring coat, and heavy breathing, all indicate in these animals the existence of pneumonia partially passed on to the chronic state. I have not unfrequently detected, among those which were considered as cured by their proprietors, hydrothorax with adhesions, connecting the *pleuræ pulmonalis et costalis.*

Young animals in this condition appear dull and dispirited; oxen breathe hurriedly on undergoing very slight extra exertion; cows gradually lose their milk and generally become barren, and are therefore of little use as milking animals. The bull, whose generative aptitude is not changed, produces stock of weak constitution, and certainly predisposed to affections of the lungs. Those animals, the treatment of which becomes tedious and unsatisfactory, ultimately sink from the diseased state of their respiratory organs, if they are not disposed of to the butcher, and there are very few which recover.

[To be continued.]

A Circular,
Addressed to the Members of the Veterinary Profession.

> " Science belongs to no country; and, when misfortune has overtaken men distinguished in the veterinary profession by the services which they have rendered to science generally, all the members of the profession, to whatever country they may belong, may be appealed to to assist in the reparation of such an intense calamity."

Such is the sentiment expressed in a communication that accompanied a Memorial addressed by the National and Central Society of Veterinary Medicine of France to the Veterinary Medical Association of England, on behalf of the widows and families of two Professors lately deceased,—M. Alexis Dupuy, senior Professor at the Alfort School, and Director of the Veterinary School at Toulouse; and Professor Jean Baptiste Rodet*. The former, we are informed, besides being editor of a veterinary periodical—*Journal Pratique de Médécine Vétérinaire, consacré à l'Etude des Maladies Sporadiques*—was author of a work on "The Existence of Intermittent Fevers in Animals," &c. &c.: and the latter, in addition to being co-editor of a veterinary journal, was author of "The Doctrine of Physiology as applied to Veterinary Medicine;" "An Analytical Treatise on Veterinary Legal Medicine;" "A Treatise on Cattle Medicine;" "Researches on the Nature and Causes of Glanders;" "The Elements of Military Veterinary Medicine," &c.

Concurring with the above sentiment, the Veterinary Medical Association determined to comply with the requisition of the Memorial, that an appeal should be made to the members of the veterinary profession in England to assist, in a pecuniary way, the families of those Professors who have been left in very straitened cirumstances, since we are told "to do good and to communicate forget not." Acting in accordance therewith, a Committee, whose names are subjoined, has been appointed to receive subscriptions, and it is confidently hoped that a ready response will be made by our professional brethren.

Well have the Memorialists said, "The magnitude of the most majestic river is effected by the number of streams which bring their tribute to its waters." It is such a result as this they wish to accomplish; and on that account they do not ask for large contributions, but would rather that the many should engage in so good a cause: it has, therefore, been determined by the Committee that no subscription shall be received exceeding the sum of ten shillings, which may be forwarded by a Post-office Order to any of its Members; and it is further suggested, that, for the sake of convenience, smaller sums be transmitted in postage stamps.

Only one other point would they urge upon you, and that is promptness of reply; inasmuch as a considerable, although necessary, delay has already taken place. Besides, true charity is not cold; and relief timely afforded cheers the desponding mind, and, by seasonably alleviating suffering, awakens feelings of sin-

* See THE VETERINARY RECORD for January, p. 48.

cere gratitude in the receiver's breast; while to the giver the consciousness of having performed so good an act is always of itself a sufficient recompense, nevertheless we have the promise of a still higher reward.

COMMITTEE.

Chairman . . . Mr. Charles Spooner.

Treasurer, Mr. J. B. Simonds.

Mr. S. Robinson, Tamworth
,, J. Turner, 311, Regent Street
,, W. Percivall, 1st Life Guards
,, J. Kent, Bristol
,, W. Baker, Sudbury
,, J. Wilkinson, 2d Life Guards
,, F. King, Stanmore
,, J. Nice, Earl Street, Blackfriars
,, W. C. Spooner, Southampton
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,, J. Dunsford, North Row, Grosvenor Square
,, T. W. Gowing, Camden Town
,, G. T. Brown, Park Mews, New Road
,, F. Blakeway
,, R. Wilson
,, T. W. Talbott
,, G. Westropp
,, C. Hunting
,, J. Paradise

Students at the College.

W. J. T. MORTON,
Hon. Secretary.

ROYAL VETERINARY COLLEGE,
February 1850.

*** The reason why the postage of the Circular is not paid is simply this:—the sum charged to each individual is only a small one, while the aggregated sums would constitute a large amount to be deducted from the contributions we hope to receive.

The above Circular has been addresed to all the members of the profession *whose addresses we have been able to obtain;* we, therefore trust that, should any one not have received a copy, it will be attributed to the cause just named.

We have been gratified at the ready response made to the appeal, and we hope the list of contributors will yet be considerably increased, as but few of the members of the Committee, especially those residing in the country, have yet sent in their receipts. Up to the present time, contributions have been received from the following friends to the cause:—

Mr. W. Allan
— J. R. Atcherley
— J. Arnold
— J. Austin
— W. Burley
— W. C. Bland
— C. Baker
— A. Bottle
Messrs. Barrow
Mr. E. A. Burke
— E. T. Bass
— S. Baker
— J. Batchelder
— E. Bailey
— T. Bark
— W. M. Boag
— G. T. Brown
— F. Blakeway
— R. Bowles
— L. Brockhurst
— W. Barker
— E. Braby
— T. D. Barford
Messrs. Compton and Ritchie
Mr. T. Cox
— B. Cartledge
— W. Cheesman
— R. Cooke
— J. Child
— G. Chalmers
— W. Cox
— "Caritas"
— H. Chamberlain
— H. J. Cartwright
— W. Dyer
— G. Draper
Messrs. Darby
Mr. P. Davies
— R. H. Dyer
Mr. C. Dickens
— E. Dyer
— F. Delany
— W. Ernes
— W. Field
— A. Fowler
— J. Fenner
— G. Freer
— W. Faulder
— W. J. Godwin
— J. W. Gloag
— D. Gresswell
— E. Grey
— J. Harvey
— J. Hazell
— E. Hutchinson
— C. W. Harvey
— J. Howell
— A. Heriot
— H. Hallen
— G. Harvey
— E. Higgs
— H. M. Hancock
— G. Holmes
— J. Jekyll
— J. Kent
— W. McKenna
— J. Lawson
— J. Lucas
— A. Lawson
— C. Marshall
— W. Mavor
— J. Meekes
— C. Morgan
— J. Morris
— Evers Musgrave
— J. Nice
— R. Nicholson
— W. Percivall
— W. Plomley
Mr. S. Peech
— J. Phillips
— J. Paradise
— R. B. Paterson
— E. Price
— — Pakeman
— T. Plews
— P. O. Polding
— J. Rose
— W. Robinson
— S. Robinson
— A. Robinson
— J. Rushton
— J. Rose
— W. Stanley
— H. Sparrow
— S. Sparrow
— C. Snewing
— E. Stanley
— W. Simonds
— J. Swaine
— A. J. Shorten
— — Shorten
— J. Stoddard
— P. Strutt
— T. Stanley
Messrs. Surmon
Mr. T. W. Talbot
— W. P. Toll
— C. Taylor
— S. Withers
— R. Wilson
— W. S. Wallis
— J. Worthington
— S. Wheatley
— J. S. Worm
— Professor Wilson
— G. Westropp
— J. Yates
— G. Yeomans.

A very general feeling has been expressed that it would have been a disgrace to us, as a professional body, if we had not taken the subject up on behalf of the widows and orphans of our late continental brethren, who have so just a claim on our sympathies, from the distressed state in which they have been unexpectedly left. At the same time, it has been a matter of great regret with many that we have not an available fund for benevolent purposes connected with our profession. This has been long felt by us; and in 1839 a proposition was made through the pages of *The Veterinarian* * to form a Veterinary Benevolent Society, which met with very little notice until the "Club of United Veterinary Surgeons" took the subject up in February 1841, and chose from among their body a provisional committee, who issued a circular so as to ascertain the feelings of the profession respecting it. To this sixty-one members gave in their adherence, and many valuable suggestions were made by those who felt interested in the accomplishment of so praiseworthy an object; but it having been resolved that unless one hundred names were received no further steps should be taken in the matter, its formation was consequently not entered upon. In 1846† Mr. G. Baker, V.S., proposed the formation of a "General Annuity Fund," without making the slightest reference to the first-named proposal; and he calculated that quickly five hundred members would enrol their names as members of this "provident and self-supporting fund." Alas, that these sanguine expectations should not have been realized! It was well, perhaps, to have set the standard so high, although we had placed it much lower, and nevertheless failed. But have we just grounds to hope that even now we should succeed? Is there a oneness of sentiment and a greater cordiality of feeling among us? Are we more united than we were then? Are there no petty jealousies remaining? no unkindly feelings indulged in? And can we—will we—sacrifice them all the shrine of forgiving and unresenting charity? 'We pause for a reply.'

At present we purposely refrain from offering any suggestions of our own in reference to the plan to be adopted, but shall content ourselves with making one selection from among the many proposals we have received, withholding the party's name, because we do not know if its being given publicity to would be approved of by him.

* *Veterinarian*, vol. xii, p. 530. † *Ibid.*, vol. xix, p. 8.

"To do away in part with the necessity of such contributions, may I suggest the propriety of the establishment of an institution which members of our profession may join for the benefit of their widows and families, similar to those of the medical profession? Such institutions, I am told, are connected with the Edinburgh and Glasgow Medical Colleges. Licentiates in these, I am informed, on the payment of a small annual sum, secure to their families, in the event of death, an annual income; the scale of payment, of course, to vary with age. I would also suggest a *graduated payment*, that is, a person paying in five pounds per annum to secure to his family at his death a yearly income of thirty pounds; one paying ten pounds to secure sixty; one paying fifteen to secure ninety; and so on. Of course, these sums are only stated as illustrations of my suggestion, and not as matters of detail into which it is not my purpose to enter, but merely to submit the propriety of the formation of such an institution to the consideration of your Committee. The respective Professors at our several institutions, who are alive to the importance and benefit of such societies, would impress upon the minds of their students the desirableness and expediency of availing themselves of the advantages accruing therefrom."

Improvements in the Forms of Veterinary Instruments.

Improved Tracheotomy Tube.

By Mr. T. W. Gowing, *M.R.C.V.S.*

Mr. Gowing has made some important alterations in his tracheotomy tube (of which notice was taken in a previous number of this Journal), and which are decided improvements. The stilette is rendered flexible by being made of a series of hinge-like joints. The shield is likewise made moveable, so as to accommodate itself both to the size of the neck of the animal, and to allow of any swelling that may take place after the operation has been performed.

An Improved Form of a Balling Iron.

By Mr. W. P. Toll, *M.R.C.V.S.*

The above instrument has been forwarded to us, accompanied with the following note:—

Dear Sirs, *Harlow, Essex.*

Having succeeded, after many fruitless attempts, in making a balling iron upon an improved principle, and one less complicated than that presented by Mr. Joseph Sewell [see Veterinary Record, page 329, for 1842-3], I beg to submit it to your inspection; not because I think it has much, if any, advantage over two others you already have in your institution, but from its being varied in the action of the screw. The advantages this instrument possesses over the common balling iron needs no comment; it must be obvious to every veterinarian at first sight.

Mr. M. Titchmarsh, Bishop Stortford, and myself have both used one upon this principle for the last two months. Several other veterinary surgeons have seen it, and approved of it. The one before you is made stronger than either of our own, which is a decided improvement; as Mr. Titchmarsh had his bent in the mouth of a powerful horse whilst operating upon the teeth. The lower arm, you will perceive, is raised or lowered by means of a small nut working in it. We use no permanent protection to the mouth over the arms, but prefer wrapping some tow or cloth around them when about to use the instrument, and remove this when the operation is over, so that the instrument may be cleaned and thus the formation of rust prevented.

If you approve of the instrument, it is quite at your service.

I remain,

Your's respectfully.

To the Editors, &c.

[There can be no doubt of the advantages possessed by this instrument over the old form of the balling iron. The movement of the arms, so as to approximate them or otherwise, is a most valuable improvement; but it has struck us that the plan resorted to for this purpose by Mr. Toll is too slow in its movement; nor with the present form of the lower bar, acted upon as it is by means of a nut, can it be obviated: could it, and the movement be thus rendered quicker, we should then obtain all that can by possibility be desired. We thank Mr. Toll for his ingenious instrument.]

OBITUARIES.

We had not received the information in time to record in our last number the decease of another veteran of the profession, Mr. Robert Thompson, late V.S. to the 14th Light Dragoons.

Mr. Thompson entered as a student at the Royal Veterinary College in the year 1800, previous to which he was assistant surgeon to the regiment, and had served with the army in Flanders from the commencement to the termination of the campaigns which ended in the withdrawal of the forces*. He passed his examination in 1801, and was at once appointed V.S. to the regiment. At that period this was considered the more speedy and advantageous plan to adopt so as to obtain skilful veterinary surgeons for the service, without which the horses of regiments ordered on foreign service would have been left to the unscientific practice of the ordinary shoeing-farriers, until regularly qualified veterinary surgeons had completed their education, and were ready to fill the appointments.

Mr. T. was again engaged on foreign service in the Peninsula, and retired from the army above thirty years since. He afterwards resided in London, and at his decease was in the eightieth year of his age.

Another once member of the profession, Captain T. D. Burrowes, died previous to Mr. Thompson; but having in early life relinquished the profession, his decease, as recorded in the military

* He kept a daily journal of events, which he lent to our informant, who states it to have been a very interesting and stirring narrative of hair-breadth escapes from accidents and death.

obituary in the *Army List*, escaped our notice. He entered as a student in 1797, and, having passed his examination in 1799, he was appointed veterinary surgeon to a regiment of Light Dragoons then stationed at the Cape of Good Hope, and shortly afterwards proceeded to India, where he received a cornetcy, and continued to progress until he attained the rank of captain. He had on several occasions highly distinguished himself. Twice he returned to Europe on account of impaired health, and on his recovery the last time he was appointed Barrack Master in the Island of Dominica, in the West Indies, and subsequently at Preston, in Lancashire. He died in the sixty-fourth year of his age.

To the foregoing may be added the demise of John Cumming, Esq., M.D., which distinction he possessed previous to his entering the College as a student. On his obtaining a veterinary diploma, he was appointed veterinary surgeon to a regiment of Light Dragoons, and subsequently to the R. H. Artillery. He served in some of the early campaigns on the continent, and was at the siege and capture of Copenhagen. He had retired from the service several years, and died at an advanced age.

To these we regret being enabled to add the names of many more late members of the profession, whose deaths we have been made acquainted with through the appeal we have been recently called upon to make to the profession. We had thought them still engaged in the conflict with "things of time and sense;" but the battle has been fought, and, we trust, the victory won. 'Tis indeed true

> "Our life's a dream,
> An empty tale; a morning flower,
> Cut down and wither'd in an hour."

TRANSACTIONS OF THE VETERINARY MEDICAL ASSOCIATION.

November 9, 1847.

[We are sadly in arrears under this head, and will do our best to bring them up. This can only be effected by curtailing the more lengthened essays, and omitting others altogether.]

On Organic Chemistry.

By Mr. W. B. Lord.

[Continued from page 298 of the last volume.]

Matter is placed under the dominion of chemical affinity, whose constant tendency is to produce new arrangements, and to effect the destruction of the organic kingdom of nature, by making it pass into the inorganic: as a sentinel, to stand in antagonism to this power, is placed that principle known as vitality. It is the duty of vitality to sustain and increase the mass of the body in which it resides, and the object of the chemical forces is to tear down and destroy that which vitality has built up. In a word, the chemical force is the element oxygen, one of the principal constituents of the air, so that the chemical force may be said to be encamped on every part of the fortress which vitality has to defend.

The whole life of an animal (says Playfair) consists in a conflict of these rival forces; in the endeavour of vitality to sustain and increase, and in that of chemical affinity to waste and destroy. In health, vitality possesses the ascendancy and modifies the destructive effects of the chemical powers. Disease, on the other hand, is a temporary conquest of the chemical over the vital forces, whilst death is the victory of the former and the annihilation of the latter.

When a waste of body is effected by the chemical powers, as oxygen, it is converted into the elements from which it sprung, that is, into carbonic acid, water and ammonia. There are certainly a few intermediate compounds formed; but these are the final products of the decomposition or decay of the body, or its parts, and, as I told you at the beginning of this thesis, these are the very substances on which plants live.

All know that the vital forces decrease when the body is subject to a certain degree of cold, and, when sufficiently intense, they are either suspended or completely annihilated. But the chemical force, on the other hand, has its power condensed and increased by such agencies. Vitality being removed or weakened, chemical affinity acts upon those tissues freed from its dominion, and effects their destruction. I may possibly convey to you a clearer conception of my meaning, by considering briefly the process of starvation, that is, when a living being is placed in a situation to breathe freely the atmosphere, but not having the power to obtain those materials for its support we call food. You will bear in mind that the oxygen or chemical force never leaves the body, save in combination. First, the fat disappears, its elements being held together by the weakest attraction; then the muscles and softer tissues yield to its destructive influence. It then attacks the brain and nerves, when delirium and madness rapidly come on, and death, or the triumph of the chemical forces, closes the scene. Such a being, however he may be inclined to cavil with the term *burn*, is as truly and essentially burnt to death as if he were consumed in a blazing fire.

Every movement, however slight, nay, every thought, is accompanied by a waste of matter. For instance, the arm, when at rest, has all the power of vital force exerted on it, both to maintain its structure and add to its mass; but let volition call upon it to raise that arm to the head, its force would then be expended in the production of motion; and the moment that it leaves a point in the fortress unprotected, does the chemical force begin the work of demolition. Hence the more bodily labour a man takes, the greater is the amount of food he requires to supply the waste of his tissues.

A good example of the validity of these theorems may be cited, taken from the daily press. When speaking of the late famine in Ireland, namely, that warmth is an equivalent for food, and that motion is always accompanied with waste of matter, we are informed that whole families, unable to obtain a morsel to eat, remained in bed for days together, covered by as many clothes as their scanty stock could furnish. In this state animal heat was artificially retained, and, little or nothing being expended in motion, a small amount of food only was required to maintain the vital force.

Take, as a contrast to the above, another example of the same fact. You will find it remarked with surprise by most travellers, that Englishmen in hot countries are more fond of violent games than they are wont to take in England. The reason is obvious :—in India the air is expanded, and little oxygen enters the system ; but the natives living on food containing but a small amount of carbon, find this quite enough for its combustion, the temperature being nearly that of the body,—so he enjoys his siesta in indolence. But the Englishman abroad thinks not of this ; he eats his heavy dinners as he did at home, consisting of food with a large amount of carbon : the expanded air is insufficient to combine with this, and consequently he is obliged to resort to such games as golf, racket, or dancing, to increase the number of his respirations, and thus restore the balance. I might adduce numerous other instances, but these will suffice.

Now, if you bear in mind that all matters serving as food to living organisms are composed of two or more elements, held together by certain chemical forces ; if you farther reflect that, in the act of manifestation of force in a living tissue, these elements are made to combine in a new order, it is quite clear that the momentum of force, or of motion, in the vital principle was more powerful than the attraction of chemical force holding together the elements of the food. Had both forces been equal, no kind of sensible effect would have ensued. Had the chemical force been the stronger, the living part would have undergone a change. But just let us suppose that a certain amount of vital force must have been expended in bringing to an equilibrium the chemical force, there must still remain an excess of force by which the decomposition was effected. This excess constitutes the momentum of force in the living part, by means of which the change was produced. It is this excess which gives the part the power of causing farther decompositions, and of retaining its condition, form, and structure, in opposition to external agencies. If this excess were to be removed and employed for some other purpose, the existence of the tissue would not be endangered, because the opposing forces would remain in equilibrio ; but by such a removal the part would lose its capacity of growth, its power to cause farther decompositions, and ability to resist external causes of change. If, in this state of equilibrio, oxygen gas should be brought in contact with it, it would combine with some element of the living tissue, because you have taken away its power of resistance in the excess of vital force.

I could dwell with pleasure considerably longer on a subject possessing so much novel and interesting matter for consideration ; but I have, I fear, already drawn too largely on your time and patience. I am fully conscious of the many imperfections in my paper, and my inability to do justice to the subject ; yet, in the erection of an edifice, it is essential there should be many labourers, and also that they should be of many grades ; some to build up and beautify, and others to supply these more skilful workmen with the materials to prosecute their labours. So it is, analogically, in erecting the Temple of Science ; there also must be many labourers, and those, too, of many grades ; and if I, as one of them, can but furnish the materials from which more skilful artizans may be able to add only a buttress to the building, I shall feel that I am amply repaid. Blindfolded ignorance gropes with hesitating steps through ways untrodden; but knowledge steps boldly forth, guided by the lamp of science, which she has kindled to light her on her way.

Mr. G. T. Brown thought that, when considering the causes in operation to produce animal heat, the nutritive function must not be lost sight of. This fact is proved by the warmth of the body corresponding with the age of the animal. Thus, in early life, when the deposit of new matter is greater than the absorption of the old, constituting the growth of the animal, more heat is evolved than in middle age, when the forces may be said to be *in equilibrio;* or in old age, when absorption is greater than the deposit, for at that time a chilliness pervades the body.

Friction of the tissues over each other is another cause in operation, and likewise of the blood passing through its conduits ; and from both of these heat is eliminated, as well as during the reproductive process. Thus, to generate that which is essential to the maintenance of life, namely, heat, both mechanical and vital laws are in operation, as well as chemical.

Mr. Lord, in answer to the question put by Mr. Brown, stated, that if two animals, equal in their physical powers, age, &c., were placed, the one on liberal diet and subjected to hard work, and the other on restricted diet and no work given, the former would, in all probability, live the longest, and be the most healthy; because the various organs of the body would be called upon to perform their natural functions: while in the other, disease would be engendered, through Nature's laws being deviated from, and fat would become deposited in the various tissues.

The existence of fat in excess, he considered, amounted to disease, and that even in hybernating animals, as all are by it rendered unfit for any exertion; yet, if this last-named be considered an exception, it must be referred to the conservative powers of nature to meet an emergency.

In the feeding of animals, therefore, due attention should be paid to the nature of the provender; nitrogenized matters being chosen when we wish to develope muscular fibre, and non-nitrogenized, or amylaceous substances, when we are desirous of laying on fat.

Mr. Brown believed that the conformation of the animal had very much to do with the deposition of fat, as well as nervous irritability; and hence the reason why wild animals are rarely met with in a fat condition. Here, too, we perceive a provision on the part of Nature, since, were animals in this state to become plethoric, they would be unable to defend themselves when attacked, or to obtain their prey for sustenance.

In reference to the quantity of oxygen that is withdrawn from the atmosphere during respiration, amounting to about one-third of the amount there existing, this, he stated, is required for the wants of the system; the remaining two-thirds, with the unchanged nitrogen, although not capable of supporting the combustion of a taper, would do so were the carbonic acid which is excreted by the blood in its transit through the lungs removed by a solution of potash or of lime. It is the presence of this last named gaseous compound which renders expired air so prejudicial.

Mr. Lord was of opinion, that oxygen is removed from the atmosphere by the skin, as well as by the blood in its passage through the lungs; this being effected by endosmose, or is an act of displacement, carbonic acid and watery vapour being substituted for it.

NOVEMBER 23, 1847.

Mr. G. VARNELL, V.P., in the Chair.

THE following communication was read, as received from Mr. W. Wright, V.S., Burnham, on the Action of the *Extract of Henbane.*

Dear Sir, *Burnham Overy,* 17*th Oct.* 1847.

There is one thing I have to return my kind thanks to you for. When the question respecting the action of opium was first mooted, I obtained your opinion on the extract of henbane, which I have now made use of for the last two years with the greatest success. I do positively say, as an antispasmodic, opium has no chance with it. A form I employ is, one pound of the extract to one gallon of nitrous æther; and this given in two-ounce doses, with or without the decoction of aloes, is the best draught that can be administered. In spasmodic colic, the extract is equally as efficacious when given in two-drachm doses, made up with flour and palm oil into a ball. I have not used two ounces of opium for the last two years. I should like to hear the subject discussed in the Association. But I am satisfied with its action, and to you, and no one else, do I stand indebted for making so general a use of it.

Allow me to add a case illustrative of the good effects of this extract of henbane.

A short time since, I was called on to attend a heifer that had received a wound in the vagina. The parts had suppurated, but the animal was constantly straining. The excretions were natural. I gave her ʒij of the extract, to see what effect it would have. After the first dose, the cow-man told me she had not strained so much; I therefore gave her another, when she became decidedly better; and a third dose effected a perfect cure. By this means I allayed the irritation, and that without producing constipation; whereas, had I given her the same quantity of opium, I should have produced fresh inflammation in the parts from constipation being induced.

I remain,

To W. J. T. Morton, Esq. Your's truly.

An Essay was then introduced, by Mr. C. N. Carter, On Spasm of the Intestines, the leading points of which are embodied in the following condensed report of the debate that followed.

Mr. Gowing had beneficially employed the water of ammonia as a counter-irritant to the horse, and his manner of applying it is as follows :—A cloth is to be saturated with the solution, and placed over the part where he wishes to induce action, another dry cloth being laid over it, to prevent evaporation. By this means a large amount of external irritation is immediately set up.

In the formation of a sinapism, he remarked that sufficient care was rarely taken, since the water employed should never exceed 200° Fahr.; otherwise the essential oil is dissipated, on which the activity of this therapeutic depends.

Mr. Clements, in cases of inflammation of the bowels, advocated the detraction of blood from both jugulars, so as to make a sudden impression on the nervous system, and stay the progress of inflammatory action.

Mr. Gowing thought he had lost sight of the difficulty attendant on pinning up both the orifices again.

Mr. Clements replied that he was indifferent about pinning up at all, never having seen any ill consequences result from allowing the blood to flow as long as it would.

Mr. Brown deprecated the sudden withdrawal of large quantities of blood when our object is to produce merely a sedative effect on the organism: he would then prefer its slow abstraction, by which, he contended, a greater impression would be made on the nervous system, and the vital force be thereby lessened. When, however, we are desirous of overcoming spasm, then certainly blood should be quickly withdrawn; but reaction is sure to follow the loss of a large quantity of blood, and this in certain states of the system would prove prejudicial rather than beneficial.

In bleeding during the existence of spasm, it was not so much with a view to prevent the accession of inflammation, as to overcome the morbidly contracted state of the muscular fibre, and this was effected by its lessening the nervous excitement of the part.

Strangulation, rupture, and other accidental occurrences, the result of spasm, he referred to the paroxysms that take place; and he advocated the combination of sedative agents with purgatives, believing each to produce its own peculiar action, and which, in this conditional state of the system, is most desirable. He doubted if the diagnosis of each tunic being separately involved could be laid down as clearly as stated, yet he did not question the existence of diarrhœa as a symptom of the mucous coat being involved.

Mr. Weston would rely on the use of opium in enteritis, guarding against its constipative influence by the interposition of a dose of oil after the subsidence of inflammatory action. In long continued spasms he had successfully employed tobacco enemata.

Mr. Clements would not hesitate to administer a purgative, even during the existence of spontaneous diarrhœa, before he had recourse to opium; believing this increased action of the bowels to be very frequently nothing more than an effort on the part of Nature to get rid of something that was offensive.

Mr. Cartledge feared the evil of delay. Before a purgative would act, several hours must elapse: other agents therefore would be preferred by him, and he should at once throw in sedatives, such as opium or henbane; believing that, if the pain were relieved and the inflammation checked, the bowels would quickly resume their natural action.

Mr. Gowing, in the employment of tobacco enemata, had often observed their depressing influence to be so great, that the bowels had ceased to act altogether. He recommended the combination of large doses of calomel with opium in enteritis, following these up by repeated smaller doses, until relief was afforded; not, however, withholding the lancet at the commencement of the attack, nor forgetting counter-irritants.

The use of medicated fomentations was mooted, but they were considered as possessing no advantages over the rug dipped in boiling water and quickly wrung out, another dry rug being placed over this; the only objection to their employment was the difficulty of confining them on the abdomen.

Mr. Brown had observed animals to be comparatively quiet during the application of fomentations, relief from pain being afforded.

The actual cautery, applied over the surface of the abdomen, was recommended by Mr. Clements, and objected to by Messrs. Brown and Cartledge.

Young horses were considered by some of the members as more liable to attacks of enteritis than old ones, from the varying diet to which they were often subjected and irregularity in their work; while old horses were more commonly the subjects of spasms.

Mr. Gowing, however, thought that old horses rather than young ones would be found most liable to inflammation of the bowels, from the diseased state of their molares, and a loss of tone in the intestinal tube; hence the alimentary matters often became heaped up or impacted, and then all the consequences attendant on derangement in function of the organs of digestion will take place.

Mr. Carter condemned the giving of cut straw to horses, having frequently witnessed indigestion follow its use. And repeated attacks of spasms he had traced to the existence of a calculus, which during life had become temporarily dislodged from its sacculus.

Mr. Varnell believed that bowel affections often consisted in inflammation of the white fibrous tissue entering into the muscular coat of the intestine. In peritonitis we have no spasm; and when the mucous lining is alone affected, then the term enteritis ceases to be at all applicable. If, however, the muscular fibre and this together be implicated, then that form of disease exists to which the name of muco-enteritis may be correctly given.

NOVEMBER 30, 1847.

Mr. C. N. CARTER, V.P., in the Chair.

Mr. Gowing laid on the table the fractured ischium of a pony, with rupture of the ligamentum teres. The history of the case is brief, and as follows:—He had been requested to examine the pony on account of a reported lameness of the foot, for which the shoe had been removed, &c. Finding the symptoms urgent, and the position in which the animal placed himself peculiar, the foot being extended forwards, he doubted the correctness of the information he had received, and proceeded to examine the limb.

which he found much swollen, and considerable effusion had taken place into the cellular tissue opposite the upper head of the femur. Moving the leg, and placing his ear near the part, he distinctly heard crepitus: he at once pronounced a fracture to exist, and, the case being altogether hopeless, a few days after the animal was destroyed. He then was informed the pony had fallen while in harness, and an examination of the parts post-mortem shewed the ischium to be broken off near the pubis, and the ligamentum teres torn from its attachment within the acetabulum, the capsular ligament of the joint not being ruptured.

Mr. Varnell related an analogous case, in which, by a horse's falling on his side, he ruptured the ligamentum teres; yet he worked for two years afterwards, the head of the femur slipping in and out of the acetabulum, a false joint being formed.

Mr. Cartledge then introduced a very lengthened Thesis, entitled, "*On the Comparative Value of the different Agents employed as Counter-irritants by the Veterinary Surgeon.*" Its extreme length precludes its insertion, which we regret. The discussion this evening was confined to firing as a counter-irritant.

Spiritus Argumenti.

Mr. Gamgee, while he complimented the author of the Essay for the ingenuity and talent he had evinced, questioned the truthfulness of many of the positions laid down by him, and contended that his deductions were not correct. If Nature, in her restoration of parts, does not make them as perfect as at first, nevertheless they are such as will carry on the ordinary functions. If we have partial inelasticity of the skin produced by its contraction, the newly-developed areolar tissue underneath compensates for the loss thus sustained. He repudiated the idea of "firing" acting in any sense as a bandage; since, if the cautery causes an effusion of lymph, this is an elastic material, and the parts soon accommodate themselves to the augmented quantity of it.

Mr. Brown assented to the position, that by the use of the firing iron the elasticity of those portions of the skin with which it comes in contact was very considerably destroyed; yet he could not believe that on this account any thing approaching to compression was communicated to the parts beneath. It seemed to him opposed to all correct views. What would result from the application of a bandage to a joint? Yet it is most commonly for diseases involving joints that the firing-iron is resorted to. By the throwing out of more cellular tissue he considered elasticity to be increased rather than lessened, and thus motion was facilitated. Immediately after the iron has been applied, it is quite possible a slight degree of compression might follow; but to this supervenes the throwing out of much cellular tissue, as proved by dissection, and then, of course, every thing approaching to the semblance of a bandage immediately ceases.

Mr. Cartledge stated in confirmation of his opinions, which he reiterated, that, after the introduction of a seton only, so large an amount of lymph becomes effused, that should it be the case that, at some future time, another seton is required, the resistance offered to the passage of the needle is considerable. Now, if this takes place when only one furrow or channel is made, what may we not anticipate when fifteen, sixteen, or more furrows are caused by the red hot iron? The ridges thus produced, he believed, communicated a large amount of pressure to the contiguous parts, each ridge throwing out matter which pressed upon the subjacent tissues.

Mr. Clements could not see how the firing-iron could produce a result that allied it to a bandage, except it was in the very earliest stages after its application; nor did he think the amount of contraction induced in the skin of any moment whatever. He also questioned the truth of the position that the cellular tissue becomes more dense after the introduction of a seton under the skin.

Mr. Reeve said, if the edges of wounds made in the skin by means of the firing-iron approximate, as stated by the author of the Essay, the consequence would be expansion rather than contraction. In the case of an incised wound, for instance, it opens, and lymph becomes effused; the edges then are seen to approach towards each other, and the skin surrounding the wound appears to be tightened, but it is more seeming than real.

Mr. Gamgee.—All expansion may, perhaps, be considered as relative contraction.

Mr. Cartledge considered it a matter of little moment as to the direction in which the lines may be drawn; when, however, he wished to obtain the bandaging or compressing effects he would fire through the skin; but when inflammation is to be followed by suppuration, then the iron should be more lightly or superficially used.

Mr. Lord believed that newly formed tissues are not tougher or more resisting than the original ones, and they would be therefore the first to be removed by the use of certain therapeutics.

Mr. Gowing referred the beneficial effects of the actual cautery to the irritation which is set up, and not to any compression that follows. Hence results an alteration in the appropriating power of the capillaries; blood is determined to the skin, and from the inflammation induced we have the formation of pus; the deeper seated and diseased parts now become relieved, and a restoration to health, either partial or complete, takes place.

Mr. Dickson concluded that the firing-iron, by destroying the vitality of the skin, at the same time destroyed its elasticity, and hence it acted as a compress round the limb.

Mr. Gamgee stated, that the more highly organized a part is, the more perfect it is, hence the more resistant; therefore, the matter which becomes effused after the application of the firing-iron wanting this, it is less capable of offering resistance, and consequently is less able to act as a compress.

This was combatted by *Mr. Clements,* who contended that tendon is less highly organized than muscle, yet its power of resistance is greater.

Mr. Brown explained the *modus operandi* of the cautery to be dependent, in the first instance, upon the powerful action induced by it in the skin, whence results the secretion of pus; for which purpose blood is necessarily determined to the surface; the circulation subsequently becoming equalized, the absorbents regain their normal function. In the second instance, ulceration having been set up in the interior of the joint by the powerful stimulus imparted by means of the red hot iron, the ulcerative cell is destroyed, and the arteries are then able to carry those materials which are necessary to bring about anchylosis of the joint.

Mr. Lord agreed with the former part of Mr. Brown's theory, but the latter he demurred at, being of opinion that destruction of the ulcerative cell could only be effected by the contact of some powerful excitant.

Mr. Brown replied, that the application of an external irritant had often proved most effectual, and he referred its action to an augmentation of nervous energy.

MISCELLANEA.

A Diseased Kidney from a Cat.

The following was the history of the case:—The animal had for some days been inactive and drowsy; she was then seized with convulsions, followed by coma and death. There was no opportunity of examining the urine. The kidneys were about twice the normal size, much congested, and presented to the naked eye an abundant yellowish-white deposit in the cortical substance. Under the microscope, the urinary tubes were seen to be uniformly and greatly distended with red globules. Microscopical examination of fatty degeneration of the kidneys from this class of animals was very easy and satisfactory, on account of the delicacy and transparency of the tissue.

The bloodvessels of the kidney, probably, were much congested, in consequence of the compression to which they were subjected by the dilated urinary tubes: from the same cause some of the Malpighian vessels had given way, and the tubes had become filled with blood. The healthy cat's kidney contained a minute quantity of oil, but infinitely less than in the disease in question.

Dr. George Johnson, from Proceedings of the Pathological Society of London.

The Horse.

An article, in the sale of which you may cheat your own father without any imputation upon your honesty or your sense of filial duty.

TO CORRESPONDENTS,

AND SHORT NOTICES OF COMMUNICATIONS, &c., RECEIVED.

We have again to thank Mr. S. W. Jeffery, V.S., 9th Light Cavalry, Hon. East India Company's service, for his friendly communication, and also for the promise, "In my next I will give you a description of the treatment of other diseases in India."

From the communication bearing date Mhow. December 11, we extract the following:—

"If at any time the remarks on veterinary science I may make be considered by you worthy of a place in your Journal, I am sure I shall feel proud to be a humble contributor. Since I have been with my regiment I have had 173 cases under my care, out of which number there were 12 foot cases, 4 with bruised and cut soles, the remainder were severe thrush cases, or I may call them cankered frogs. My first object was to reduce inflammation, in the last cases, by applying cold poultices for two days, which effected the desired end, and also cleansed the feet; after which I had them well pared out. I then applied daily an astringent powder, composed of pulv. lign. carb. ℥j, sulph. zinc ʒij, sulph. cupri ʒij, misce. This I have found very effective even in the most inveterate cases. I likewise invariably order the horse or horses to have walking exercise twice a-day, so as to give the foot or feet pressure. As it regards the treatment of inveterate thrushes, or cankered frogs with maggots in them (you must know that the natives are very, very careless, and never report a horse until he is downright lame), I first order a poultice to be applied, made of bran and oil of turpentine instead of water, and kept on or renewed until all the maggots are destroyed. My after-treatment consists of the astringent caustic powder, and exercise, which I find answers very well. In slight cases, when the horses are not brought to the hospital, I use eight parts tar, and one part sulph. cupri, mixed together, and give the farrier of each troop a pot of it.

"Since I have been here I have castrated four old horses, and one young horse for an infantry officer. I find the old plan of castration answers very well. The ages were as follows:—one 17 years old, one 16 years, one 12 years, the others 8 years and 5 years. I remove the testicles with the hot iron, and then apply the same to stop the bleeding, interposing a little resin. In the 16-year-old horse I was obliged to take up the artery of one testicle after the operation, on account of hæmorrhage supervening. I need hardly describe the subsequent treatment. Of course, the horses are prepared before castration by having given to them a dose of physic, and I generally administer diuretics, after the operation, every other day until suppuration takes place, and the swelling begins to decrease: after six or seven days, the animal has one hour's walking exercise the first thing in the morning. There is always in the daytime a man with a fan to keep the flies from annoying the part; this precaution being necessary in a hot country. In my next I will give you a description of the treatment of other diseases.

"I should think, with you, that the iodide of arsenic would be found an excellent remedy for bursauttee, but I cannot get it at the Government Medical Depôts. The aloes we use here are very bad.

"P.S.—It came out in General Orders three months since, that all veterinarians in the Hon. East India Company's service are to pass an examination in Hindoostanee, the same as the other officers, in consequence of which I am studying it.

"*To W. J. T. Morton, Esq.*"

The following communications have been received from Mr. E. Lewis, the receipt of one of which was acknowledged in our last Number:—

"Case of Fracture of the Zygoma and Orbital Arch (Horse.)

"Monmouth, Dec. 16, 1849.

"Dear Sir,—On the 29th ult. I was called to attend a horse which had met with the following accident while winding up coals out of a pit in the Forest of Dean:—The large iron pin which connects the apparatus in which the horse draws to the beam above, broke in two. The large beam, from the weight of coal at the extremity of the rope, took, of course, a backward motion, the velocity increasing every time it came round. The first time it came round it struck the poor animal a blow commencing on the frontal bone, and terminating on the occipital, exposing the sagittal suture and the parietals an inch on either side as though it had been done with a scalpel. As soon as the animal could get up he did so, holding his head high in the air; when he was struck a second time, the blow completely smashing in the orbitary and zygomatic arches, and nearly forcing the eye out of the socket. I at once took away all the smaller pieces of partially detached bone, and, replacing the two larger ones, brought the edges of the wound together by sutures. I next administered a purgative draught, and ordered the horse to be kept on a mash diet.

"*Dec.* 1.—The wounds are rapidly healing. Took some blood from the angular vein, on account of there being some febrile excitement. Ordered mashes to be continued.

"10*th.*—The animal is much improved; the wounds over the eye are nearly healed. Took away the sutures. Directed him to be allowed a little hay.

"14*th.*—The horse has nearly recovered the sight of his eye; continues to feed better, and is improving in every respect. Passed a seton on each side of the occipital bone, to allow some pus to pass off which had collected there.

"I am, your's truly.

"*To Professor Spooner.*"

"Case of Effusion of Blood on the Medulla Oblongata (Cow).

"Monmouth, Jan. 20, 1850.

"Dear Sir,—The 2d instant I was desired to attend a cow, the property of a farmer in the country. Upon my arrival I was informed that within the last few hours she had had several fits. He had not observed her to lie down for several days but once, and then she rose instantly as if frightened. One look satisfied me as to the nature of the disease. The eyes were glaring and bloodshot, and sometimes appeared as though they were being forced out of their orbits. Then, again, the retractor muscles would act so that nothing but the fatty matter, &c. could be seen; after which the whole frame would become suddenly convulsed. She would then turn round for about a dozen times; the neck become distended; and the mouth covered with foam. Violent twitchings of the muscles of the fore extremities were also present; the back bent until the abdomen nearly touched the ground; a gulping in the throat was heard; the greatest aversion to light was evinced; she would erect herself upon her hind legs, and paw violently at a small aperture in the door through which light was admitted, and would then make a sudden rush at an opening in the side of the shed. These "fits" at first were intermittent; but in a short time the symptoms became aggravated, the agony more intense, and the irritability so extreme that the sound of the human voice caused an instant relapse. I at once informed the owner that it was a hopeless case; however, he wished something to be done for her. We failed in extracting much blood, and while the blister was being applied the animal dropped down, and expired.

"*Autopsy.*—Upon cutting into the sheath containing the medulla oblongata, about ℥ij of sanguineous fluid escaped. I never saw any thing more beautifully injected than were the pia mater and the plexus choroides; in the latter of which a vessel had become ruptured. The left ventricle contained more than its usual quantity of fluid. And here I beg to observe what I before omitted, that the animal continued to hold its head to that side. I should have continued my examination of the parts, but night had 'set in,' and I was prevented.

"*To Professor Spooner.*" "I remain, your's truly."

We thank Mr. Bowles and Mr. Hazell for their communications. Also, Mr. Cleveland, of Wangford, Suffolk, for a case of "Malignant Scarlatina succeeding Catarrh." It, however, so closely resembles other cases that have recently appeared in the Journal, that its insertion is withheld.

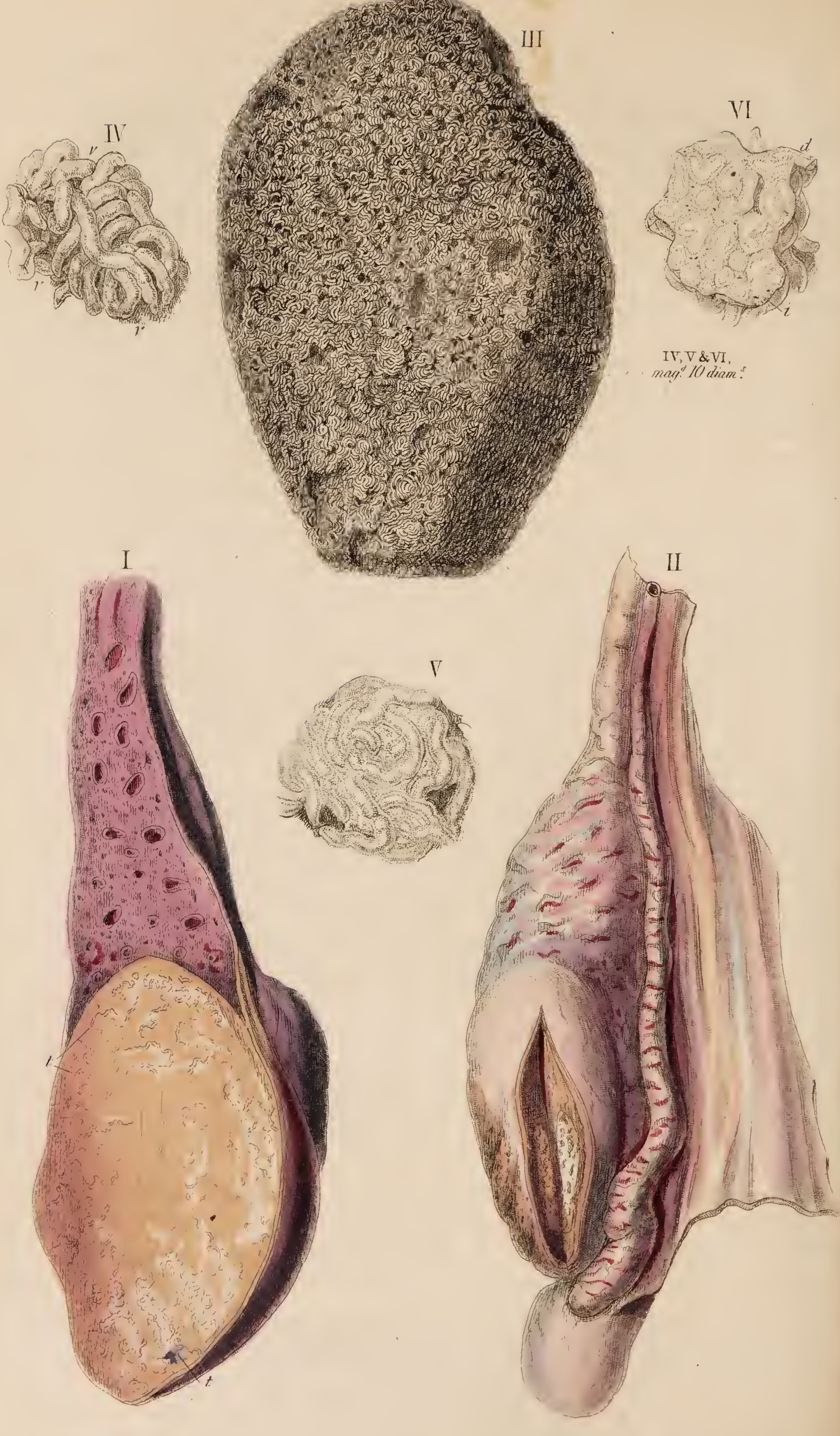
We are obliged to Mr. Scruby, Royston, for forwarding a *lusus naturæ*—a lamb having eight legs.

We have also to acknowledge the receipt of the "Spirit of the Times" from some friend in America. And likewise the French and other Journals in exchange.

Errata in last Number.

For Gentlemen, p. 17, read Gentleman.

For Alex. Ward, p. 67, read Alex. Mavor.



J. D. C. Sowerby sculp.t

THE

VETERINARY RECORD, &c.

Vol. VI.] JULY 1850. [No. 24.

A Lecture on the Anatomy, Physiology, and Pathology of the Organs of Respiration and Circulation; with especial Reference to the Nature and Treatment of Pleuro-Pneumonia in the Ox.

By James Beart Simonds.

[Concluded from p. 139.]

THE name given to the affection to which I am about to allude, by almost universal consent, is pleuro-pneumonia. I object, however, to the malady being thus designated; and if my view of its nature be correct, a less appropriate name could scarcely have been selected. The term *pleuro-pneumonia,* or *pneumo-pleuritis,* which has been proposed by some who consider the pleura more especially implicated, would immediately convey to the mind of the medical man that the disease was an inflammatory one, involving the substance of the lungs, with their investing membranes. Although there may not be much in a name, nevertheleless it were to be wished that a better one had been adopted for this disease; as inflammation is not its essential feature, especially at its commencement. An incorrect nomenclature is sure to lead to false conclusions with regard to treatment, and thus the life of the patient will be greatly endangered.

Prior to discussing the question of the true nature of this malady, I shall take a rapid view of the epizootics which have visited Europe from the earliest history to the present time. Mention is frequently made in the pages of Holy Writ of these diseases, and we read that among the plagues of Egypt a grievous murrain swept off the cattle. Homer frequently alludes to their ravages in Greece; and Virgil, Ovid, and other Roman authors, speak of their destructive effects among the cattle of Italy, &c. Of late years these maladies appear to have been on the increase, and within a short period England has been visited by *eczema epizootica, pleuro-pneumonia,* and *variola ovina.* The prevalence in this country of these particular diseases may be said to be new to the present generation; but whether they have existed here at a remote period is somewhat doubtful. Believing this matter to be of some importance, we are induced to look into the history of these outbreaks; and should it appear that there is a reasonable ground for the supposition that pleuro-pneumonia is not altogether new, but that it has long since both visited and quitted our shores, we have thereby a strong reason to hope that it may again disappear from among us.

About the commencement of the Christian era diseases of this class are mentioned by Columella, who considered that they spread by means of their contagious properties. In the fourth century they are again noticed by Vegetius, who described some of their symptoms, and entertained similar views to Columella with regard to their extension.

In 810, it is recorded that all the cattle in that part of the Emperor Charlemagne's dominions, now called Germany, were destroyed by one of these pests, the nature of which can only be conjectured, for the term "murrain" seems to have been of general application, and consequently its adoption throws but little light on the inquiry. From this period to the revival of the arts and sciences, nothing satisfactory can be learned respecting these epizootics; but in the sixteenth century we have detailed accounts of their progress and devastating effects. According to Ramazini, in 1514, and again in 1599, the Council of Venice forbade the use of beef and veal, and even milk, on account of the diseased condition of the cattle. The same author likewise states, that in 1691 sheep were swept off by thousands—pustular eruptions covering their bodies, which he unhesitatingly affirms were of the nature of small-pox. In 1693, the cattle in Hesse fell victims to "pulmonary phthisis:" it may, however, be reasonably doubted whether the disease was properly named; and it is probable that it was identical with the modern pleuro-pneumonia. Both cattle and sheep in Lower Hungary suffered severely at the commencement of the eighteenth century, the former from an epizootic, which is undefined, and the latter from small-pox : these maladies made their appearance early in 1712, and continued with great virulence throughout the year. About the same period the cattle in England were likewise attacked with a disease which bore a great resemblance to eczema epizootica.

During nine months in the year 1713, no less than 30,000 cattle are said to have died in Rome and its environs, of malignant dysentery, accompanied with tumours and ulcers on various parts of their bodies. And in 1730-31, Bohemia, Saxony, France, &c. experienced a heavy loss from the outbreak of a similar disease. In 1745, thousands of the cattle of Italy, France, Germany, and England, again fell victims to one of these pests. The malady seems to have been accompanied with many symptoms akin to those of pleuro-pneumonia, and to have been equally destructive. The lungs are described as its seat, and the *post-mortem* appearances, as recorded by Dr. Barker, bear a strong resemblance to those observed at the present day. Whether this disease extended hither through the medium of a vitiated condition of the atmosphere, or owed its origin to a more direct introduction, has not been satisfactorily proved.

" Some authors assert that it was brought from Holland by certain calves, imported into the neighbourhood of London by a farmer for the purpose of crossing the breed; while others state that the lucrative views of an English tanner, who bought a parcel of distempered hides in Zealand which were forbidden to be sold, was the origin of the affection*."

In a pamphlet written in 1745 by Dr. Barker, it is stated that the malady was centred in the lungs; and its acute symptoms were preceded by a dry and husky cough, lasting from " a fortnight to three weeks." In the second stage, he says—

" They begin to forsake their food, and if they be milch-cows their milk dries up—the fever, which was before obscure, begins now to be very perceptible; the cough increases, they breathe with great difficulty, and the eyes and nostrils in many of them begin to run with a thick and sometimes fetid rheum; the body grows hot, and the pulse is very full and hard. In three or four days after their milk is gone off, and they have ceased to eat and chew the cud, a purging most commonly comes on. The stools are at

* Simonds on Variola Ovina.

first thin and watery, soon afterwards they grow slimy and fetid, and sometimes they are mixed with blood. The purging continues for a week or more, if the cattle live so long; but if at the end of six or seven days it begins to abate, and the excrements grow more solid, it is a token of their recovery. The difficulty of breathing does not seem to be relieved by this discharge. When the disease has been of long continuance, the body has sometimes swelled extremely, either before or immediately after death, and even to such a degree as to burst the paunch; but in those which have died early in the disease, the body has seldom or never been known to swell. If the cattle begin to swell, and their flesh grow cold towards the end of the disease, it is a certain sign of approaching death. The continuance of the disease is very uncertain and precarious, for many have died in two or three days after the fever has appeared, others have lived six or seven, and some even twelve or fourteen days."

This graphic account of the symptoms of the epizootic observed by Dr. Barker agrees in many essential particulars with those of pleuro-pneumonia; as is likewise the case with the *post-mortem* appearances, which he describes as follows:—

"Upon opening the bodies of several which have died of this disease, I have constantly found the bloodvessels of the lungs stuffed up and distended with grumous or coagulated blood, and the bronchia or air-vessels so much inflated as to make the bulk of the lungs appear much larger than usual. And though some of these cattle were opened before the body was cold or the blood congealed in the other vessels, yet in those of the lungs it was constantly found to be coagulated to such a degree as not to flow out of the vessels upon cutting them*."

The lesions here spoken of, as well as the symptoms, bear so striking an analogy to those of the present malady, that I am strongly inclined to believe it to have been pleuro-pneumonia which thinned the herds of the British agriculturist rather more than 100 years since; and it follows that it had so long disappeared from among us, as not to be recognised in its recent outbreak. If, therefore, I am right in the conjecture that the disease is not in reality new, it is evident that certain causes, of

* An Account of the present Epidemical Distemper amongst Black Cattle. London, 1745.

which we are now ignorant, came into operation and produced its withdrawal; and we are thereby encouraged to hope that ere long it will assume a milder type, and ultimately cease altogether.

It has already been stated that pleuro-pneumonia was preceded by the affection commonly called "the old epidemic," in which vesicles arise on the tongue, lips, feet, &c.: by some this malady is regarded as its cause. In my opinion they are perfectly distinct diseases, and neither of them can be viewed as a necessary sequela of the other. It is true that animals which have been affected with eczema are occasionally the victims of pleuro-pneumonia; but it is equally true that many of those which have died of pleuro-pneumonia have not been attacked with eczema. The two maladies are often seen on the same farm at the same time, and run their course perfectly independent of each other; besides which, *eczema,* unlike pleuro-pneumonia, shews no preference for the ox tribe; but extends to sheep, pigs, and even poultry. These facts are sufficient to prove their separate independence, without looking to the special characters of either affection.

The origin of pleuro-pneumonia, like all other epizootics and epidemics, cannot be traced to any positive cause :—

"Exposure to the changeable state of the weather, the partaking of bad provender or stagnant water, are viewed by many as the chief causes of epizootics, while others trace them to a vitiated condition of the atmosphere: but whether such state consists of a mingling of mephitic vapours, or deleterious gases arising from either animal or vegetable decomposition, or from an excess of humidity or dryness, affecting the electrical condition of the air, they scarcely venture to conjecture*."

Pleuro-pneumonia undoubtedly existed on the Continent for several years before shewing itself in England. Its extension here did not however depend, like *variola ovina,* on the direct importation of infected cattle, but the destructive poison was wafted hither through the medium of the air, as has been the case with that of Asiatic cholera and similar pests. The atmosphere is, consequently, to be looked to as the source of the disease; but in the present state of science we are compelled to admit that the precise nature of the poison is as little understood as it was centuries since. Experience proves that a vitiated condition of the

* Simonds on Variola Ovina.

air gives rise to diseases which speedily destroy both animal and vegetable life; but we fail by analyzation to detect the deleterious matter. The true cause of the potato disease has engaged the attention of many of our scientific investigators, but both it and the laws which govern the extension of the affection have hitherto remained undiscovered. Nor is this a matter of surprise; for chemistry equally fails in demonstrating such substances as our senses quickly recognise. The perfume of a bouquet, and the most offensive odour, are alike undetectible by chemical means. We often judge, therefore, by the effects which we observe to follow the inhalation of an atmosphere which is thus charged, and of this we have a striking illustration in the deleterious results of the *malaria* engendered by the rays of the sun on stagnant water in marshy districts.

The mingling of noxious matters will occasionally produce a physical change in the air; a remarkable instance of which is thus described by Dr. Prout in his Bridgewater Treatise*. He says that

"He had for some years been occupied in investigations regarding the atmosphere; and for more than six weeks previously to the appearance of cholera in London had almost every day been engaged in endeavouring to determine, with the utmost accuracy, the weight of a given quantity of air under precisely the same circumstances of temperature and pressure. On a particular day, the 9th of February, 1832, the weight of the air suddenly appeared to rise above the usual standard. As the rise was at the time supposed to be the result of some accidental error, or of some derangement in the apparatus employed, in order to discover the cause the succeeding observations were made with the most rigid scrutiny; but no error or derangement whatever could be detected. On the days immediately following, the weight of the air still continued above the standard, though not quite so high as on the 9th of February, when the change was first noticed. The air retained its augmented weight during the whole time these experiments were carried on; namely, about six weeks longer. The increase of the weight of the air observed in these experiments

* Chemistry, Meteorology, and the Functions of Digestion, considered with reference to Natural Theology, by William Prout, M.D. F.R.S., &c. p. 353 *et seq.*

was small, but still decided and real. The method of conducting the experiments was such as not to allow of an error, at least to an amount so great as the additional weight, without the cause of that error having become apparent. There seems, therefore, to be only one mode of rationally explaining this increased weight of the air at London, February 1832; which is, by admitting the diffusion of some gaseous body through the lower regions of the atmosphere of this city considerably heavier than the air it displaced. About the 9th of February, the wind, which had previously been west, veered round to the east, and remained chiefly in that quarter to the end of the month. Now, precisely on the change of the wind the first cases of cholera were reported in London; and from that time the disease continued to spread. That the epidemic cholera was the effect of the peculiar condition of the atmosphere is more, perhaps, than can be safely maintained; but reasons, which have been advanced elsewhere, lead the writer of this treatise to believe that the virulent disease termed cholera was owing to the same matter which produced the additional weight of the air."

I am not aware if any physical alterations of the atmosphere have accompanied the present outbreak of Asiatic cholera; but the foregoing statements, together with the quotation I have just made, are sufficient to establish the point that the air may be vitiated by an admixture of various matters.

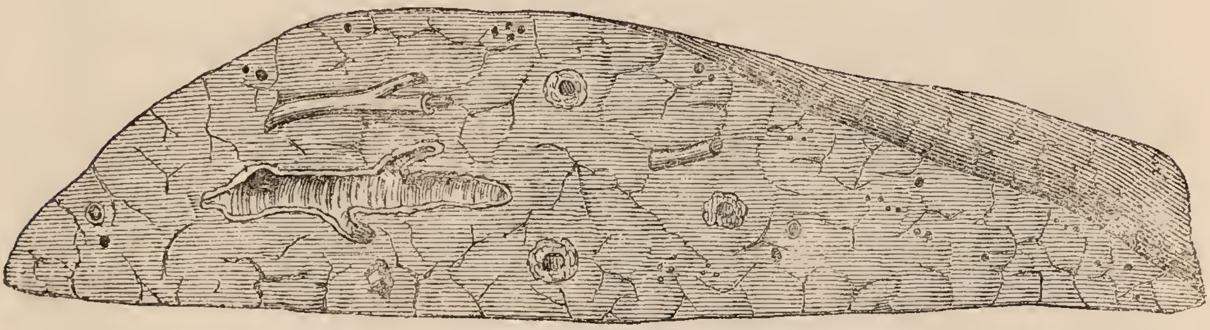
By a careful investigation of epizootic diseases we become acquainted with certain laws which govern their spread, as well as with the secondary causes which predispose animals to their attack. Some of these maladies are contagious or infectious, as is the case with the small-pox of sheep, and may be also with pleuro-pneumonia. Many an outbreak can be clearly traced to diseased animals being brought upon the farm; nevertheless this is not a necessary consequence of such a procedure, and very often the malady breaks out independent of any such cause. The very existence of a doubt on the contagious nature of pleuro-pneumonia should put the purchaser of cattle on the alert, and prevent his obtaining them from an infected district. Having been led to make the following remarks in my work on Variola Ovina, with reference to infection, and they having a practical bearing on this subject, I trust I shall be excused for introducing them here:—

" Whatever the combination of causes may be which produces these maladies, certain it is that very many of them assume an infectious nature, otherwise we could not account for animals separated and kept apart from those which are diseased frequently and sometimes altogether escaping; while those are sure to become early victims that are allowed to pasture or live with the affected: besides, we can often succeed in producing the malady by inoculating healthy cattle; thus shewing how closely the spread of the disorder depends upon contagion or infection. The fact, however, of animals when in health, if placed with affected ones, contracting a disease of the same kind as that which the latter are suffering from, is the best proof of the infectious or contagious nature of a complaint. An animal escaping an attack, when such affections are raging in the locality in which it is placed, may arise from a variety of causes, as non-susceptibility, and also the possibility of the exciting agents never having been brought within its sphere of inhalation."

Whether an epizootic be or be not a contagious disease, its victims are rendered susceptible of receiving the malady by the operation of secondary causes. This predisposition, as it is called, may be induced from a variety of circumstances, and a mere alteration in the food will occasionally be sufficient to produce it. A want, however, of nutritious diet—exposure to the changes of the weather—pasturing on wet and cold soils—neglect of a proper ventilation of the buildings the animals occupy—inhalation of offensive gases from accumulated manure—the fatigue of being removed from one locality to another—are the general predisposing causes of pleuro-pneumonia and similar diseases. Care should, therefore, be always taken by a better system of management, feeding, &c., to avoid every thing which tends to bring the system into a condition favourable for the reception of the special cause of an epizootic, and more especially when such is raging in the neighbourhood. All these means will, however, fail when the disease is purely an infectious one, from a neglect of isolation or the removal of the healthy from the diseased. It is a well established fact that infection has its limits; and although these may ever remain undefined as to their extent, still daily experience proves that the removal of animals but a short distance from each other, and the prevention also of indirect communication between them, will at once put a stop to the spread of the malady.

From the preceding remarks, it is evident that I look chiefly to a vitiated state of the atmosphere as being the cause of pleuro-pneumonia, and hence the greater necessity for the avoidance of all predisposing causes. If this be the case, it may be asked how the empoisoned air produces its morbid results ? I answer, not by its direct irritation on the membrane lining the air-passages, but by its specific action on the blood, which fluid, thus acted on, does virtually, although not immediately, by its changed condition affect the pulmonary tissues. I have before stated my conviction, that pleuro-pneumonia is not an inflammatory disease in the strict and legitimate meaning of the term. In order more distinctly to explain my view of the manner in which the abnormal condition of the lungs is produced, I beg to direct attention to the annexed sketches, which exhibit sections of the lung of the horse and ox. Fig. 18 represents the lung of the horse, which on being com-

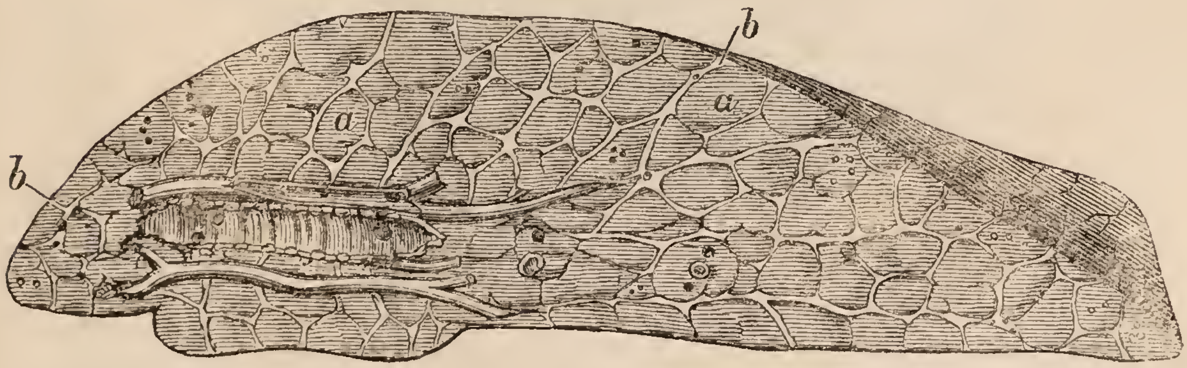
Fig. 18.



A section of the lung of the horse, shewing its condensed structure and relative deficiency of the interlobular areolar tissue, which is represented by the irregular dark lines scattered on its cut surface.

pared with Fig. 19 (a similar portion of the lung of the ox) shews its structure to be more condensed, and a less amount of areolar tissue to enter into its composition. In the anatomical portion of this lecture mention has been made of the *lobules* of the lungs

Fig. 19.



A section of the healthy lung of the ox, with its lobules and interlobular or connecting areolar tissue. *a, a.* The lobules. *b, b.* The interlobular areolar tissue.

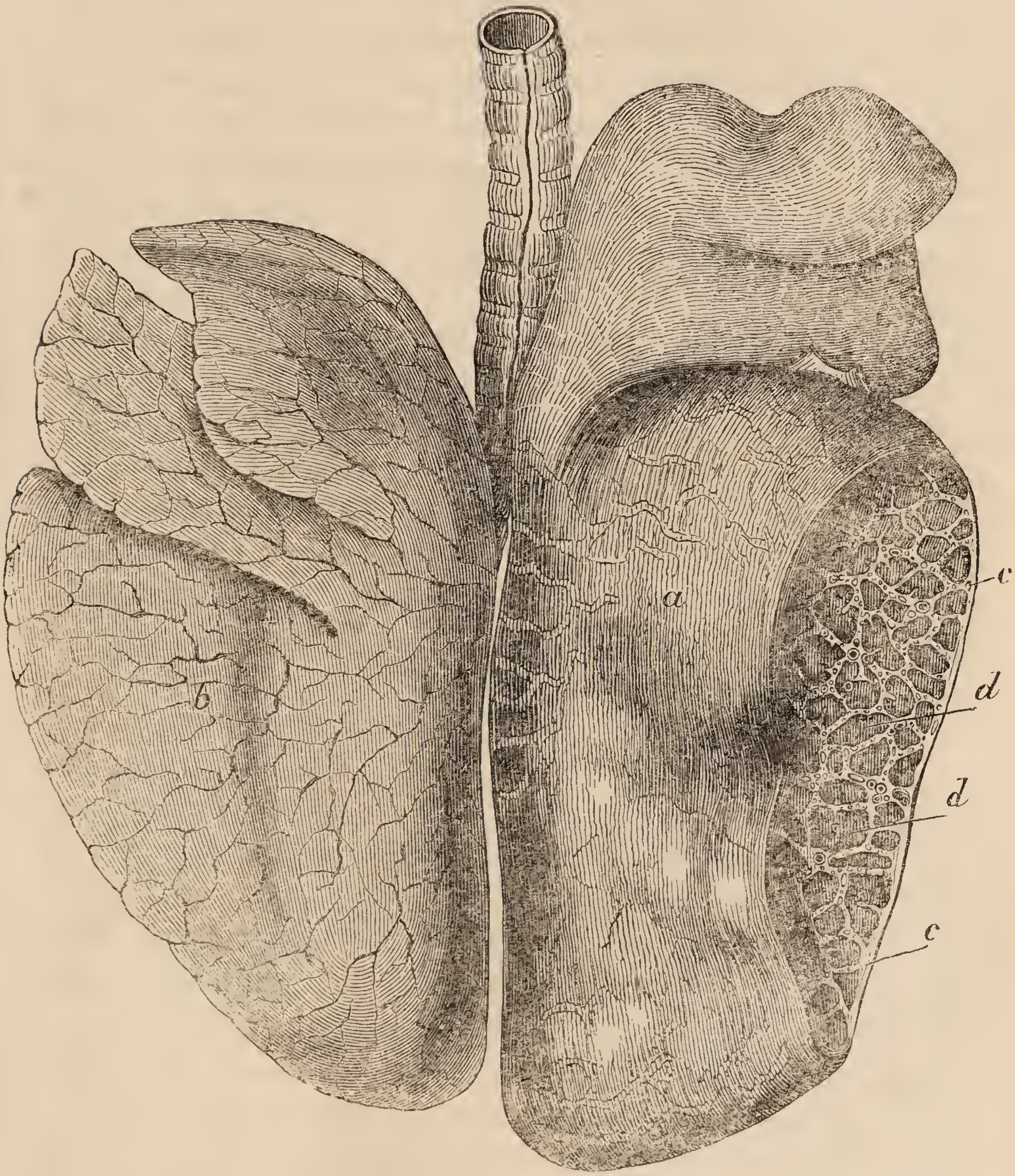
Fig. 20.

Section of a diseased lung, shewing the nature of the changes its structure has undergone.

a, *a*. The dark patches produced by the retained red corpuscules of the blood in the meshes of the interstitial tissue, and also in the capillaries of the air-cells. *b*. The interlobular areolar tissue distended with the fibrino-albuminous portions of the blood. *c*. The sub-pleural tissue similarly distended. *d*. A section of the interlobular tissue, exhibiting its great increase in thickness.

and their connexion to each other by areolar tissue, designated the *interlobular* tissue. The lobules in the ox are much more distinct, and they are also very loosely joined together, consequently a much larger proportion of the interlobular tissue exists here than in the horse. This excess of the connecting medium, when infiltrated with the colourless portions of the blood,

Fig. 21.



a. The right lung of the ox, considerably increased in size, and covered here and there with effusions of fibrin. *b*. The left lung still retaining its healthy condition. *c*, *c*. The yellowish bands which intersect the diseased lung in various directions, being produced by the interlobular tissues surcharged with the fibrino albuminous portions of the blood. *d*, *d*. The dark-coloured patches, arising from a retention of the red corpuscules, &c.

gives rise to those light-coloured or yellowish bands which intersect the lungs in all directions in pleuro-pneumonia (see Figs. 20 and 21). These appearances, therefore, are to be referred to original structure, as well as to the character of the disease; and the reason the lungs of the horse, when loaded with the serous parts of the blood, do not shew a similar condition, is their deficiency of the interlobular tissue. Besides the union of the lobules here spoken of, I have also stated that the various component parts of the lungs are held together by *interstitial* areolar tissue. The network of this tissue is very minute; and when in this disease the red corpuscules of the blood escape from the capillaries by a rupture of their coats, it retains these bodies in its meshes, and assists in producing the dark colour of the isolated patches. This colour likewise depends, in part, on many of the capillaries being distended almost to bursting by the red corpuscules. The united pressure of the overloaded vessels, and of the infiltrated interlobular and interstitial tissues, compresses the air-cells of the lungs, and prevents the entrance of the atmospheric air into them; hence the absence, in the advanced stages of pleuro-pneumonia, of the respiratory sound in the affected parts. The great depth in the colour of some of the patches is also produced by the same cause; for the pigment of the accumulated corpuscules cannot be decarbonized, from the non-entrance of the oxygen of the air into the cells.

I have already remarked that the vitiated atmosphere does not act as a direct irritant to the pulmonary tissues or mucous membrane of the air-passages; a fact which is proved by the absence of all the usual symptoms of catarrh, laryngitis, or bronchitis, as precursors of pleuro-pneumonia. Besides, if such were the case, both lungs would be equally affected; whereas it is well known that the disease is very partial, and that the right lung is principally involved (see Fig. 21). The aërial poison, whatever may be its nature, being carried by the ordinary process of respiration into the air-cells of the lungs, exerts its baneful influence upon the blood in its circulation through the capillaries. The blood, thus impregnated with something detrimental to its healthy condition, undergoes changes similar to the solids when diseased, and these changes are figured forth in the pulmonary tissues.

Each organ of the body seems susceptible of being acted upon in a special manner by deleterious matters entering the circulation: thus the poison of small-pox re-acts on the skin; that of glanders on the mucous membranes of the nasal cavities,—of rabies on the nerves,—of eczema on the lips, tongue, and feet,—and of pleuro-pneumonia on the lungs.

The amount of the deleterious matter received at each inspiration appears to be insufficient to interrupt at once the functions of the lungs; for, were this the case, death would speedily occur from asphyxia; whereas we have constant proofs that the disease we are considering is partial in its attack and insidious in its nature, making its way stealthily; being very often unobserved, until it has made great inroads on the constitution. This character of the affection is alone sufficient to create a doubt of its being inflammatory, for inflammation of the lungs, even at its commencement, is marked by unmistakeable indications of ill-health. The absence of the ordinary symptoms of *pneumonia,* together with the peculiar changes observed in the lungs, have satisfied me that pleuro-pneumonia is not of an inflammatory nature at its outset, and that inflammation is rather the result than a cause of the disease. It is difficult to explain the precise change which takes place in the blood from the operation of the aërial poison; but it appears to me that the vitality of the fibrin is interfered with, and that it, with the albuminous constituents of the fluid, also altered in quantity, is transuded from the capillary vessels, and finds its way into the areolar tissue of the lungs, accumulating where this tissue exists in greater abundance, namely, in the interlobular spaces. This inordinate transudation seems to depend on a tendency in the blood to separate into its several constituents, arising most likely from the diminished vital force of the fibrin, and an arrestation to the conversion of the albumen of the serum into fibrin. The fibrino-albuminous portions of the fluid are thus changed, and probably also augmented, and their exudation is a natural consequence of such condition. The red corpuscules, being in part deprived of the liquor sanguinis in which they float, are retained in the capillaries, where they accumulate in unlimited numbers, obliterate their passage, and compress the air-cells they surround, so as to stay the entrance of the air, and produce, as elsewhere stated, the dark-coloured spots which stud the lungs. It is these effusions and the obliterated condition of the vessels which give bulk, increased weight and solidity to the lungs, and destroy their function as aërifying organs.

From this explanation it is evident that I regard pleuro-pneumonia to approach nearer to a *dropsical* than to an *inflammatory* disease. The lungs, if examined at the commencement of the affection, will shew that the morbid action commences here and there in their substance, and that these patches quickly increase in size so as to run into each other. We have also frequent opportunities of verifying these remarks in animals which have died in the advanced stages of the malady, from the circumstance that one lung is principally affected, the other exhibiting the beginning of the disease. Fig. 22 is inserted for the purpose of rendering this description more evident. The spots, marked *a a*, represent the tumefied portions of the lung, which the cut, *b*, discloses to be referrible to effusion into its substance.

Fig. 22.

Lung, shewing the commencement of pleuro-pneumonia.
a. Elevated spots produced by effusion. *b*. A cut carried through one of the spots, to demonstrate the nature of the change producing it.

The exudation of the altered liquor sanguinis is not limited to the lungs themselves, but extends to their investing membrane, the pleura, thus accounting for the depositions of semi-solid fibrin on their exterior, and the existence of serous effusions in the cavity of the thorax. That these results are not produced by inflammation, is clear from the circumstance that, in innumerable cases, no redness of either the pleura covering the lungs or lining the chest can be detected; both the fibrin and the serum being likewise perfectly colourless. Dropsy of the chest may be said to be now associated with dropsy of the lungs. Although inflammation takes no part in the original production of these morbid lesions, still, as previously remarked, it may arise as a consequence; and this I believe is generally the case with those animals which recover. The blocking up of the air-cells, vessels, &c., produces death of these structures; and when this is partial and of little extent, portions of the lung will ultimately become detached, and be enclosed in sacs formed by the adhesive stage of the subsequent inflammation. This will also explain how it is that collections of pus and other morbid products are occasionally met with in our *post-mortem* examinations of long-existing cases of pleuro-pneumonia. It ought, therefore, to be no matter of surprise, nor to be viewed as an opprobrium of the veterinary art, that an affection which depends on an empoisoned atmosphere, and is associated with such extensive lesions of organs so essential to health, and which stealthily but securely wends its way and saps the very vitals, should prove so destructive to life, and likewise resist the most vigorous and scientific treatment.

Having given my view of the nature of the malady, I proceed to narrate the symptoms which accompany it. The disturbance of the animal's health is rarely observed until the disease is fully established, and effusion into the lungs has made some progress. Proprietors of cattle should, therefore, be early and late with their stock, narrowly watching the slightest indication of ill-health. It will often be observed that oxen at pasture, when the disease is commencing, will early in the morning be separated from the herd, standing under the hedge with their backs arched, coats staring, and refusing to eat; while as the day advances they will join the rest, and appear in their usual health. A slight but husky cough will be occasionally recognised, and now and then the breathing will be increased, as if the animal had undergone some extra exertion; while in milch-cows there will be a diminished amount of milk in addition to the above symptoms. As the disease progresses, the cough becomes more frequent and husky, the respiration is hurried, the pulse increased and somewhat oppressed, the appetite diminished, rumination suspended, bowels constipated, surface of the body chilly, &c. In the more advanced stages the respiration is difficult, laboured, and painful; the patient is frequently lying, or, if standing, the head is protruded; the mouth is covered with a frothy saliva; the muzzle is cold; rigors occasionally come on; and the pulse is rapid and often indistinct. An enlargement of the right side of the chest can generally be detected in this stage of the malady; percussion gives a dull sound, and ascultation detects an increased bronchial respiration, with a crepitating *râle* in some parts, while in others there is a total absence of sound. Approaching death is shewn by moaning, grinding of teeth, loathing of food, cold extremities, wavering pulse, distressed breathing, liquid stools, and distention of the rumen by the disengagement of gaseous compounds from the ingesta. This deranged condition of the digestive organs is probably owing to the high carbonization of the blood, as the elimination of the carbonic acid is prevented by the obliteration of the air-cells of the lungs.

The length of this lecture forbids a more minute detail as well as a separate analyzation of the symptoms, and therefore I pass on to speak of the principles which should govern our treatment of the disease. The first remedy to which I shall allude is blood-letting. The propriety of abstracting blood will depend on the stage of the malady and the amount of symptomatic fever which is present. It must be done early, or not at all; for in proportion to the extent of the effusion, so will be the debility of the patient. To bleed late is to hasten a fatal termination; but if we attend to the animal at the very commencement of the disease, much good will be done by a bold blood-letting. No rule, however, can be laid down as to the quantity to be abstracted; but the pulse must be carefully watched, and as soon as its character is altered, the bleeding must be suspended. I do not recommend an early blood-letting for the single purpose of allaying the febrile condition of the system, but to withdraw a portion of the vitiated fluid which has laid the foundation for, and is quickly building up, the disease.

Another remedy of frequent adoption is the exhibition of purgative medicine. In most disorders it is of the first importance to clear out the *primæ viæ,* as thereby we not only remove offensive and offending matters from the system, but subdue the excitation which is present by the nauseating effects of the medicine, assisted by the agent increasing the intestinal and other secretions. If constipation is present, even in the advanced stages of pleuro-pneumonia, a gentle aperient may be given, but cathartics should be avoided. I have already stated that diarrhœa often comes on as the case approaches its end; and it should be remembered that this morbid condition of the bowels is very easily excited by purgative medicine. Cathartics, like blood-letting, must be used cautiously: they are admissible at the beginning of the affection, but rarely afterwards. The ordinary saline mixtures are as good as any, but they ought to be given without the large doses of ginger, &c., with which they are too generally blended.

Diuretic agents stand next in the list. Medicines of this class stimulate the kidneys to increased action, and their employment is found to be associated with far less weakening effects on most animals than is the case with purgatives; they may, therefore, be frequently and quickly repeated. Diuretics carry off a considerable portion of the watery parts of the blood, and hence their great use in affections of a dropsical nature. The nitrate of potash is one of the safest and best of our diuretic agents, and I especially recommend it in the treatment of pleuro-pneumonia. I do this for several reasons; among which is the established fact, that the alkaline carbonates and nitrates are of the greatest benefit when the blood itself is in an abnormal condition. One of the best ways of using the nitrate of potash is to add it to the water which is given to the animal to drink.

Sedative medicines have been extensively employed by some persons in treating this disease; but in my experience they have rarely proved of service; nevertheless, their occasional administration will be needed, especially when the circulation is much excited: Pulvis Doveri, opium, and ext. belladonna, are the most valuable agents of this class. Calomel in combination with opium has also its advocates, and in certain cases I have given it with advantage.

Diaphoretics, or medicines which promote the secretions of the skin, are beneficial, but their action should always be assisted by warm clothing, without which they are nearly useless. Antim. tart. is one of our chief diaphoretics; I have found it, however, to act too freely on the mucous membrane of the intestinal canal, and to produce thereby considerable mischief: as a rule, I do not employ it, and more especially in protracted cases of the malady. The other preparations of antimony are not open to the same objection, and these, with the Pulvis Jacobi, should be selected. To effect a copious secretion of perspiration, the skin of a recently killed sheep, applied while yet warm to the back and sides, surpasses every thing we have as yet tried.

Diffusible stimulants and tonics are, in my opinion, the most valuable of all remedies, and invariably I have recourse to them as early as circumstances will permit. Of late we have heard much of the beneficial effects of brandy as a diffusible stimulant, and doubtless in the second stage of the malady it has proved of service: I prefer, however, the spt. æther. nitr. and the liq. ammon. acet. in combination, the ammonia being in excess. But, in the advanced stages, even these agents fail to support the system against the debilitating effects of the disease, and we must now employ both vegetable and mineral tonics; the sulphates of iron, and quinine, gentian, ginger, columba, and the barks, are the best. Before concluding these remarks on the treatment, which are of necessity very much condensed, I shall allude to another remedy which has many advocates, and properly so, in my opinion, namely counter-irritation, or the application of stimulating ointments and liniments to the sides of the chest. This class of remedies is generally adopted when active inflammation pervades some internal organ, and with the happiest results; and although I do not view pleuro-pneumonia as essentially an inflammatory affection, still we can easily understand that benefit will follow the use of a counter-irritant. By the long-continued action of an agent of this kind, the inflammation which it excites in the skin will be attended with effusion of the albuminous parts of the blood into the subcutaneous tissue; thus artificially producing a disease here analogous to that of the lungs, and thereby giving relief to those organs.

Many observations might be added to the foregoing on the nature and treatment of this disease; but I hope sufficient has been said in explanation of the principles which should govern our proceedings with a view both to its prevention and cure. It is evident that no specific can exist for such a malady; and it is likewise equally so, that he who undertakes its treatment without a knowledge of its nature, and of the structure and functions of the organs it affects, is acting like an ordinary artisan who sets about the repair of a machine the wheels and levers of which he has never investigated.

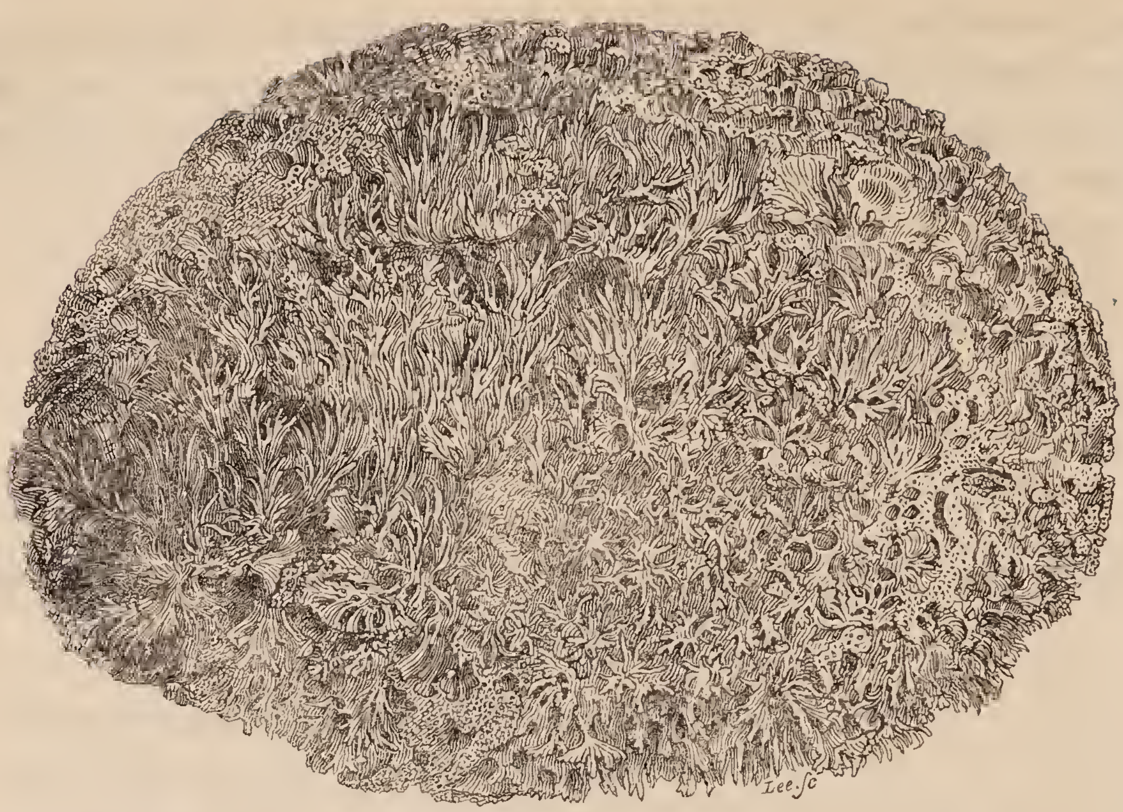
On Accidental Osseous Formations.

By Mr. G. Varnell, *M.R.C.V.S., Demonstrator of Anatomy in the Royal Veterinary College.*

In the early part of the Session 1849-50, a large and comparatively solid tumour was brought to the College by a slaughterman, who said "he took it out of the hind limb of a cow." From his statement, it must have been situated at the postero-inferior part of the thigh, or between the long head of the triceps adductor femoris and biceps rotator tibialis muscles, at the upper part of their inferior third. In form, it was ovoid. Its long diameter measured ten inches, its short seven inches, and it was quite unconnected with any normal bone. Its feel indicated ossific matter within its structure, and adhering to its outer surface were portions of muscle of a pale aspect and very firm, and which, when cut with a knife, produced a harsh sound, as if cartilaginous: this material, perhaps, always precedes the formation of bone.

I made a section of the tumour by sawing through its long diameter, when its true character was more fully developed. The centre was comparatively solid, from which irregular plates and spiculæ radiated towards the outside of the tumour, forming, as it were, spaces or cells, in which other elements making up the substance were contained; such as fibrous tissue, cartilage, and vessels. The two halves were now put into the macerating tub, and, after having been left there a sufficiently long time, they were carefully cleaned.

The annexed woodcut represents the form and characteristics of one-half of the tumour:—



According to an idea advanced by Mr. C. de Sowerby, in form it resembles the fungus called *theliphora cristato*, and in colour and general appearance a mass of *madripora angulosa lactuca*. At one portion of the surface the ends of the spiculæ seemed to be flattened into various forms, which were very porous; at other parts they terminated in sharp points, some of which were slightly curved. Since it has become thoroughly dry both the centre and its radiating plates are very light and porous.

It first struck me as being a transformation of the muscle into bony substance; but, upon more mature reflection, I have thought otherwise, and have been induced to ask the question, Whether this bony formation did not commence in the cellular tissue interposed between the muscles?

In *Andral's Pathological Anatomy*, by Townsand and West, vol. ii, page 361, I find an article "On Ossification of the Cellular Tissue," from which I shall make a few extracts. A faithful transcription of the whole article would be highly interesting, in explanation not only of the abnormal formation now under consideration, but of specimens in our possession, and also of similar lesions of nutrition which I have met with in the dissecting-room. The paragraph more particularly relating to this case is as follows: "The intermuscular cellular tissue has occasionally been found ossified in several points. Those cases in which it has been stated that muscles themselves have been seen transformed into a horny substance, belong, in all probability, to this class; the ossification of the intermuscular tissue being accompanied with the atrophy and absorption of true muscular texture. I have seen a remarkable instance of ossification of the cellular tissue interposed between the layers of muscle in a limb affected with elephantiasis. The muscles were perfectly colourless, and could with difficulty be discovered amidst the masses of indurated cellular tissue, to which the increased bulk of the limb was principally owing. Spiculæ of osseous matter were seen dispersed in rows through the whole mass."

Meckel considers occidental formation of bone in muscle as very rare.

Teidemann mentions a case of accidental formation of bony concretions which were very abundant in the muscles of a man affected with gout. These concretions were attended with ossification of several arteries.

Some beautiful specimens of ossification of the right auricle of the heart, of a very spongy character, are in the College Museum, and also several others of dilatation of arteries, particularly the posterior aorta, which are encircled with ossiform plates beneath the serous membrane. It is the opinion of Andral, that this ossific process is usually confined to the sub-serous cellular tissue. It has yet to be explained why the *right* auricle of the heart of the horse is most often affected with this kind of degeneration, which, as far as my investigations have gone, is the case; while in the human subject, according to authors which I have referred to, it seems to occur most commonly in the *left* side.

It is also the opinion of the same author (vol. ii, page 360) that the true ossiform degeneration of the heart may be divided into three species, according as it is situated in the cellular, fibrous, or muscular tissue. The first and most common species of ossiform degeneration has its seat in the cellular tissue which unites the several anatomical elements of the heart together. They occur most frequently in the neighbourhood of those parts where fibrous tissue exists; such as around the orifices of the auricles and ventricles, along the chordæ tendineæ of the mitral valves.

In the Museum of this Institution are some very good specimens of such deposits in the semilunar valves at the origin of the aorta, and I have occasionally met with them in the heart of the ass in the dissecting-room. The second kind is seated in the fibrous tissue, in the tendinous zone that encircles the left auriculo-ventricular orifice, which is thus converted into a bony ring. The third species, which is by far the rarest, is seated in the muscular tissue. In some cases it is confined to the carneæ calumnæ; in others it involves to a considerable extent the muscular parietes of the left ventricle.

During the present Session, while dissecting the pleura of a horse for demonstration, I found in the sub-serous cellular tissue (I have said the sub-serous cellular tissue, because the deposit I am about to describe was covered by a smooth glistening surface), at that part of the pleura which is reflected over the fibrous portion of the pericardiac sac on the right side, extending downward from the roots of the large vessels for the space of six or seven inches, numerous layers of calcareous deposit, some of which assumed the form of osseous plates as much as one inch in length, but they were not so wide, of an irregular form; others were mere granular deposits, varying in size from a pin's head to a pea, and flattened.

In the Museum of the College there are also two rare, and perhaps unique, specimens—as far as extent of lesion is concerned—of what are usually described as ossified *lung* and ossified *liver*. Both of these were taken from one horse belonging to the royal family. The animal was above twenty years of age, very fat, and had, up to the time he was slaughtered, done his ordinary work. The so-called ossified lung is nearly as hard as true bone. Its appearance is that of a mass of calcareous granules, some of them being as large as peas; but mostly they are about half that size, and are deposited around the bronchi to the distance of six or seven inches from the division of the trachea. The liver presents the same morbid changes, nearly the whole gland being involved. We very often meet with calcareous deposits on the surface of the liver, sometimes in the form of thin osseous plates; at other times granular tubercles exist, some of these being nearly as large as a walnut, and others much smaller.

An excellent specimen of ossified spleen was sent to the College by Mr. E. Taylor, V.S., of Bury St. Edmunds, an account of which is inserted in The Veterinary Record for July 1849, p. 279. This has more the character of true bone, being smooth and dense on its external surface, with irregular thin plates and spiculæ, extending into the structure of that organ. Andral mentions having once found a spleen transformed into a mere osseous shell: the compartments into which its interior was divided were likewise converted into bone, and contained only a small quantity of reddish fluid like muddy wine.

Most of the readers of The Veterinary Record, doubtless, have seen in its pages descriptions of supposed ossification of the brain of the cow; they are to be found as follow:—

In "The Proceedings of the Veterinary Medical Association," March 30, 1841, is an account of an ossified brain of a cow, forwarded to the Association by Mr. Gloag, of the 11th Hussars. Another in "The Veterinary Record," vol. i, page 106, April 1845, of a supposed ossified brain of an ox, in the Veterinary Museum of Milan, read at the scientific assembly in Turin by Dr. Luis Patillani, and translated from the Italian by Mr. J. S. Gamgee; a third instance of an ossified brain of a cow, killed at Fettercairn, a village near Montrose, in the county of Angus, Scotland, is given by Thomas Simson, M.D., in a work published by him in the year 1742; "An Inquiry how far the Vital and Animal Actions of the more perfect Animals can be accounted for independent of the Brain." This account will be found faithfully transcribed in the pages of "The Proceedings of the Veterinary Medical Association" for March 30, 1841, page 267.

The production of osseous tumours may occasionally depend, at least as far as we know, upon the following causes:—External violence, such as kicks, blows, bites, falls, &c.; also, upon unequal pressure keeping up a continued irritation of the part. It may be assumed that the new osseous structure is a fibrinous fluid exuded from the blood; this occurring sometimes slowly, but continuing for a long time. At other times it exudes more quickly; and again, at others, it creeps on insidiously from constitutional or local internal causes, as deranged action existing, and is only discovered by the effects produced.

No doubt, many of the so-called osseous formations are nothing more than concretions; and even those bony plates and tumours of accidental production are not true bone.

In the second volume of the Cyclopædia of Anatomy and Physiology, page 857, the writer of the article on osseous tissue says, "I have examined many of these formations, and find them to be composed of true osseous tissue, but not true bone, for they have not the definite Haversian system, which, formed of true osseous tissue, constitutes bone; but they have cavities scattered through them: these, however, have no definite shape, but assume all kinds of irregular forms; and though they are, no doubt, necessary to the vitality of the mass, yet their action cannot be very perfect. Spiculæ of osseous matter are sometimes met with in cancerous tumours, but here it is very rare to find an Haversian system." Similar appearances were presented by a small portion of the tumour first spoken of, being examined under the microscope with a power of 200. A provision appeared to be made for the circulation of the blood, analogous to the Haversian system, but not identical with it, and there were numerous lacunæ or bone-cells irregularly scattered throughout the mass.

Our knowledge of the causes and origin of osseous tumours being very limited, I think we ought at all times simply to record facts. With this view I have endeavoured briefly to describe the very beautiful osseous tumour depicted in the woodcut, alluding at the same time to a few other similar morbid productions existing in the College Museum, and some others that have presented themselves to my notice during my dissections.

Cases of Poisoning of Horses with Savine.

By Mr. J. Rose, *M.R.C.V.S.*

My dear Sir, *Worcester, March* 31, 1850.

It affords me much pleasure to reply to your letter; but I must beg to express my regret at not having been able to do so ere this, and also being unable to render you that assistance, as it regards poison, I could wish. The horses you allude to were not poisoned by colchicum (nor did I ever see any injured by it, although I have seen many cattle), but by savine, a plant wagoners are often using. Five horses were ill from the use of it: one died immediately, and two others on the fifth day. The others, after much suffering, recovered. A member of the profession was called in to the horses when first attacked, who, I understood, considered them labouring under the prevailing epidemic, and treated them accordingly by bleeding, blistering the throat and chest, and administering laxative and fever medicine, with clysters. I was requested to attend them on the fifth day, and I at once gave it as my opinion they were labouring under the effects of some vegetable poison; and as so long a time had elapsed since it was given or taken, I considered nothing more could be done than to support the animal's strength by stimulants and tonics, and endeavour to allay the irritation of the rectum and urethra by frequent injections: nevertheless, two of the four cases I saw sunk shortly afterwards.

The symptoms, when I first saw them, were great prostration of strength; pulse very frequent and small; breathing quick and hurried; mouth and tongue much swollen and blistered, and secretion therefrom very offensive; strangury; the fæces liquid, and frequently voided, but whether this was from the effect of medicine administered or not I could not say; extremities cold; complete loss of appetite; extreme thirst; frequently lying down, and much anxiety of countenance expressed.

I saw the stomach of one horse only after death, which bore marks of inflammation of the mucous membrane. The contents were analyzed by an eminent chemist here, but he could detect no poison. The man at last confessed to have given savine, with the intention of improving the condition of the horses.

I beg further to add, that I saw four other cases a short time previously to these, all very old horses, and very poor, that were suffering from the effects of some deleterious herb given to them, two of which died. The principal symptoms present were, great prostration of strength; quick and small pulse; mouth and tongue swollen and blistered; and the saliva very offensive. All that I could ascertain was that the wagoner had given them some of the wild or wood-laurel in their food, supposing that it would increase their appetite. I believe its proper name is *daphne laureola*, or spurge laurel. No post-mortem examination of these cases was made.

Allow me, in conclusion, to observe, that I shall feel great pleasure in giving you any further information upon the subject in my power; and am

To W. J. T. Morton, Esq. Your's truly.

[It will be inferred from this communication that we had written to Mr. Rose. We did so on being informed that some cases of poisoning with colchicum had fallen under his notice. His kind reply sets that question at rest. Since we received his letter, however, another case of poisoning by savine has come to our knowledge. We were told that a horse had died, as it would seem, suddenly and unexpectedly; at any rate, it was under suspicious circumstances, for the carcass was buried very soon after death. On searching the stable, some papers containing certain drugs were discovered; and, these having been submitted to us for examination, we found them to consist of savine, mixed with nitrate of potash and fœnugric seed in powder.]

In a note some time since received from Mr. Wright, of Burnham, he says,—

"There are more horses poisoned by the daphne laurel in our neighbourhood, given by farmers' servants, than any poison I am acquainted with: it is administered by them as a vermifuge, and also to improve the condition of the horse. I destroyed a horse with it myself, as an experiment, with only one ounce. The leaves are dried, powdered, and given in warm water. In two and four drachm doses it is decidedly the best vermifuge I ever gave. I hope you will obtain some of it, and observe its effects. I have attended several horses destroyed by it, many years before I was aware that carters and grooms made such general use of it."

The practice of allowing carters to "doctor" their masters' horses unquestionably deserves the severest reprobation. Many cases of suspected poisoning by this means are constantly being brought before us; and, as veterinary surgeons are so frequently called upon to give their opinion as to the cause of death, and sometimes to test the contents of the stomach to decide the question, whenever the lesions warrant the inference that a corrosive poisonous agent has been administered; and as arsenic is so frequently resorted to for the destruction of life, and sometimes it is also given as a tonic and vermifuge, from which, occasionally—doubtless from its having been injudiciously exhibited—serious consequences have resulted; we may be permitted to append a very ingenious method adopted by Dr. A. Taylor to demonstrate the existence of this substance, with which he has favoured us, and which, although only a modification of Riensch's plan, from its simplicity and certainty recommends itself to the notice of the profession.

" *Chemical Laboratory, Guy's, April* 26, 1850.

" Dear Sir,—

" The plan which I now adopt as the most safe and satisfactory is, first to make a strong aqueous decoction, then to add one-eighth of pure muriatic acid (prepared by myself), and to boil again until all is dissolved. Copper gauze, *presenting an enormous surface*, is then introduced, and, if arsenic be present, it becomes coated with the metal in from half an hour to an hour. I enclose you a piece of the pure copper gauze, which is expressly manufactured for me. It contains 16,000 apertures in the square inch, and costs a guinea a square foot.

" The coated gauze can be cut and rolled up in any form; and being thus treated, and then gently heated in a tube, very beautiful octoedral and quadrupedral crystals are procured. The glass containing the crystals is now to be filed off, powdered, digested in pure nitro-muriatic acid, evaporated to dryness, and touched with nitrate of silver; when arseniate of silver, of a brick-red colour, is formed, leaving it conclusive that the coating on the copper was *metallic arsenic* and the crystals obtained *arsenious acid.* This process differs from most others in being liable to no fallacy, provided the muriatic acid be quite pure.

" *W. J. T. Morton, Esq.*" Your's, &c.

Case of Amputation of the Penis of a Horse.

By Mr. E. T. Barker, *M.R.C.V.S.*

Gentlemen, *Pershore, Jan.* 23, 1850.

Although instances of amputation of the penis are not so rare as to be made matters of wonderment, nevertheless they are not of every-day occurrence: I have therefore thought the following case, with the consultation, might not prove uninteresting to your readers.

From hearing so much of the dreadful state in which the horse was, I went from mere curiosity to see him; and on as careful an examination as I could make in the field, just behind the glans penis, I perceived several ugly-looking ulcers to exist, extending about two inches up the penis, from which the urine passed out, as well as blood at times, accompanied with a very fœtid discharge. From the attendant I learnt that the disease, on its first appearance, was just like scabs, which on being removed disclosed very small ulcers, and these, from being kept clean, disappeared. Several months after, the organ appeared again affected, and ulceration began gradually to destroy the parts, until the urine passed out of twenty holes, almost similar to water flowing out of the rose of a watering-pot.

The horse was now put under treatment, and the ulcers were dressed with a caustic; and from that time the penis became inflamed, fungous granulations were thrown out, and the smell from the discharge became intolerable. The oftener the parts were dressed with caustic, the larger the fungoidal mass became, until, from the weight, it hung down below the point of the hocks; so that when I next saw him he presented a most loathsome spectacle. I then recommended amputation as the only chance of life being preserved, and that but a wretched poor one; but as the horse was to be destroyed, it was worth a trial. To attempt to convey to you by words the appearance of the parts would be imimpossible. The horse had been suffering for eight months from the attack to the operation, which was performed according to our worthy Professor's instructions (which I enclose), with one exception, which was, tying the pudic arteries, instead of using the cautery to them.

On the horse being cast and an examination made, the penis was found to be diseased to within an inch or so of the curve of the organ; the whole of the penis was therefore dissected away to the curve, and then amputated: it weighed eight pounds. The reason I preferred the ligature was in case hæmorrhage should come on after the parts had retracted, when it would have been impossible to have stopped it. The tape ligature being removed, when perfectly satisfied that the bleeding was stayed, the parts were allowed to retract themselves. After the operation the horse went on well, and when now he stales it runs from him in a quiet stream: he is improving in condition, and appears as lively as ever; and has been driven twice in harness, and went as well as usual.

On cutting open the removed parts, the structure of the penis was found to be completely destroyed. It was a beautiful specimen, since, about an inch of the healthy portion having been cut off, the glans penis had dropped away, and several other pieces were ready to follow.

I cannot close, then, without thanking our worthy Professor Sewell for his kindness in so promptly giving me his advice.

I remain,

Respectfully your's.

To the Editors, &c.

P.S.—I met with three cases of rather a novel character lately on post-mortem examinations. In the first case there was a tumour which weighed ten pounds entangling the anterior mesenteric artery. All the small glands of the mesentery were greatly enlarged, and a large abscess existed on the spleen. The other two cases were precisely the same as this, differing only in the size of the tumours. They were three young horses, the pride of the stable, and months elapsed between their deaths. What could have been the cause? They were not the same breed, and were bought at different times. The symptoms and immediate cause of death were the same in all.

Consultation on the above Case of Amputation.

Dear Sir, *Royal Veterinary College, Jan.* 25, 1850.

The disease you describe is a cancerous state of the glans penis. It is not very common, but I have amputated a few, and there is no other remedy. It is to be regretted that this has been so long delayed, as probably the prepuce has become involved; or, if it be merely inflamed and swollen, it will again become healthy when the penis is removed. I have seen one case exactly like your's, the urine passing out in all directions. My plan has been, after the parts are well cleaned, and washed with a weak solution of chloride of lime, so as to render them less offensive, to draw out the penis; then tie on a tape ligature, to prevent hæmorrhage, and cut the urethra through with a knife: let the organ retract as much as it can; then slit it on the inferior part about half an inch, to prevent it healing over and obstructing the passage of the urine. Next amputate the penis, and sear or cauterize it as you would the spermatic cord in castration, or any other bleeding surface; then slacken the ligature as you would the clams, so as to ascertain if the bleeding is arrested. If the orifice of the urethra should in a few days contract and become closed with the granulating process, withdraw the penis, and, if requisite, open it again, and reduce the edges by touching freely with the sulphate copper.

Take care and do not apply the actual cautery to the urethra, as that would inflame and soon close it.

I remain,

Faithfully your's,

WM. SEWELL, Professor.

Mr. Barker, V. S., Pershore.

ON CASTRATION OF HORSES IN INDIA.

By T. HURFORD, *Esq., M.R.C.V.S.,* 15*th Hussars.*

My dear Morton, *Bangalore,* 8*th March,* 1850.

As I was reading, or rather looking through, some old volumes of THE VETERINARIAN, a month or two ago, I saw some discussions as to the modes of castration; and, having performed the operation many hundreds of times, I thought I would tell you how I do it in India.

A very few years ago the whole of the horses in the service were entire, but they will soon be all geldings. Government has been trying how the geldings will stand work, and in a long forced march they are found to bear it quite as well as the entire horses. This was first done in the native cavalry. Since that an order was received to castrate a squadron of the 15th Hussars, and this I have completed; having castrated 144 horses, of all ages, viz. seventeen, 3; sixteen, 5; fifteen, 17; fourteen, 10; thirteen, 9; twelve, 2; eleven, 2; ten, 7 years old; the rest are under ten, and all but one are over five years old. Of this number there have died five: one ruptured himself by struggling violently during the operation, and was shot. Two died from rupture also; one fourteen hours after the operation, and the other one hour. The other two were each fifteen years old, and died three months after the operation, their constitutions never having recovered the shock.

The mode of operating is this :—Grasp the cord within the scrotum so as to make the scrotum tight; make a free incision, so that the testicle may escape, and then divide the seminal part of the cord. You now take a rough-edged knife, and scrape the cord up and down till you scrape through it, and then let the horse up. Of course, the testicle is always in the left hand, which keeps the cord tight. I can operate in twenty-four seconds on a horse; that is, from the first incision till he is ready to be let up. There is very little bleeding, though I should not care for a few quarts of blood being lost. I never allow a horse to go to work for a month afterwards, and was rather surprised at one gentleman saying five or six days were sufficient. The knife for scraping is about nine inches in the blade. I hope you will understand this. I can do fourteen horses within the hour: I mean casting, &c. &c., and that with one set of hobbles. I do not know if you have ever tried this in England; if not, pray do, it is very simple. I have never lost a horse from excessive bleeding, and I have operated on more than a thousand. I should have told you that I do not touch the wound until the third morning, when it is washed clean, and the coagulated blood removed. It is washed every morning after.

Believe me, very truly your's.

Cases of Cholera in the Horse.

By Mr. W. Miles, *M.R.C.V.S.*

Sir, *Nile-street, Cork, Ireland, April* 27, 1850.

As the head of the veterinary profession, I think it my duty to transmit, for your consideration, a description of three cases of disease in the horse that I have met with in this neighbourhood, and which, from its rapidly fatal termination in two cases without premonitory symptoms, have led me to assume it to be a new and specific disease.

I had heard of several cases in which horses had been seized and died in a few hours of "gripes" (or the doctor); but on the 9th of this month I was sent for by Mr. Thomas Forrest, an extensive dairy-farmer at Faggot Hill, near Blarney. My patient was a fine draught gelding, five years old, and in good condition. He had brought that morning a puncheon of distillery wash from Cork, about three miles, with his usual animation; on being unharnessed, about eleven o'clock, A.M., he pawed slightly, laid down and rolled, &c., displaying the ordinary signs of an attack of colic. He was bled by the owner to the amount of two or three quarts, and had several injections: not getting better, I was sent for.

On my arrival, about one o'clock, I found him lying down; pulse very soft, weak, and fast (70); extremities warm; mouth cool; nasal membrane dark-coloured; respiration tranquil; eye bright and healthy; dung soft; urine copious and pungent. There was nothing about the case, except the peculiar character of the pulse, to lead me to suspect it any thing but an ordinary case of colic. I re-opened the vein, the blood trickled very slowly, of a very black colour, and, as afterwards appeared, with an undue proportion of serum. As I did not like the feel of the pulse, I stopped after taking two quarts, administered an aperient anodyne draught, and a laxative injection; about ten minutes afterwards the animal suddenly plunged violently, reeled across the stable, and fell dead without a struggle. Suspecting internal rupture, I opened him immediately, and most minutely searched for it in vain. The stomach and intestines contained a considerable quantity of fluid matter having the odour of malic acid. On opening the colon, about the sigmoid flexure I found appearances of most intense inflammation for the extent of three feet; it was *perfectly black*. Of course, I assumed it to be a case of enteritis, and told the owner it must have been of earlier origin than I had been apprised of; but all the men asserted he was in perfect good health and spirits up to the moment of the attack.

No. 2, *April 12th.*—A very fine and powerful draught gelding, seven years old, in high condition, and in constant work, belonging to Denny Lane, Esq., Distiller, of Cork. He was attacked at the distillery at Riverstown, six miles from the city, from whence he had just returned, at about eight o'clock in the evening. He was attended by the local farrier. At five next morning I was sent for; but he had died about twenty minutes before my arrival, in the same manner as the preceding one. All the men concurred, that he had been in perfect health up to the moment of the attack. The symptoms were not violent: he appeared restless and uneasy, but up to the moment he fell down dead no danger was anticipated.

On opening the abdomen an extraordinary sight presented itself; the whole peritoneal surface of the intestines appeared of the most beautiful variegated colours, red, green, blue, and orange, and of the most vivid tints: the only thing I can compare it to is the internal surface of the shell of the kaliotus. On laying hold of them they tore easily, like wet brown paper. On opening the colon the same appearances presented themselves as in the previous case, and in precisely the same situation, about the sigmoid flexure. The whole of the intestines were filled with fluid fæcal matter, having the same apple-like odour. The other viscera were healthy.

No. 3, *April 24th.*—Bay gelding, six years old, belonging to the same gentleman, at the farm of Killalough, a high farm situated two miles from the distillery, and eight miles N. by E. from Cork; a very fine animal, in good working condition. He was attacked at about seven in the evening: had been at work carting dung. I arrived at the farm about half-past ten P.M. I had advised the superintendent of the distillery, should any other horses be attacked, to rub spirits into the abdomen and set fire to it, or use any means that could suggest themselves at the moment to produce counter-irritation, until I arrived. This had been done, but ineffectually, and the animal had been bled to the extent of three quarts.

Symptoms.—Very restless; stamping violently; kicking at the belly; lying down; turning on his side, and looking back: he would force his nose against his side, and keep it rigidly there; a spasmodic incurvation of his neck; eye bright; mouth cool; extremities warm; nasal membrane dark-purplish red. *Pulsation none! The artery felt as if inflated with air,* being full and soft: on applying the finger to it, it divided on each side, and gave no indication of life. The heart beat faintly, almost indistinctly.

I commenced by rubbing in a powerful vesicating liniment to the abdomen, and then heating it with hot flat-irons, over which I applied cloths to keep in the heat: I then administered a draught, aloes ℥j, opii ʒj, ether. sulph. ʒj, aqua bull. Ojss. In an hour I repeated the ether and half the quantity of opium, with tinct. of cinnamon ʒij. About two A.M. he not only became more composed, but I fancied there was an improvement of the pulse: I could detect some flutterings. His favourite position was lying, his belly on the ground, with his fore legs stretched out straight before him. At three o'clock I poured two large kettlefuls of boiling water over the abdomen, and covered him up again with hay and sacks. Shortly after he got up, staled freely, and after some time laid down on his side and stretched himself out, in which condition he remained quietly, under the influence of the narcotic, till eight o'clock, when I returned to town for more medicine.

On my return at two, I found a manifest improvement in him; yet I repeated the stimulant to the abdomen by means of the blistering ointment, and exhibited ether. sulph. ʒj, opium ʒss, ol. juniperi ♏xx, ol. cajeput ♏xx, in thin gruel. The amendment now was rapid, the pulse rose in power and diminished in frequency; and by seven o'clock I had the pleasure of seeing him free from pain, and disposed to eat. He is now convalescent. The weather has been cold, with prevailing easterly winds, for the last month. The autumn and winter were unusually wet for even this wet locality.

From the absence of premonitory symptoms and likewise of fever, the rapidly fatal result, and the appearance of the intestines and contents, I think I am justified in assuming these to be cases of pure cholera in the horse; but I shall be most happy to hear your opinion on the subject.

I am, Sir,

Your most obedient servant.

To Professor Sewell.

Successful Treatment of Pleuro-Pneumonia in Cattle with Creasote.

By Mr. H. King, *M.R.C.V.S.*

Gentlemen, *Morpeth, April* 10, 1850.

Holding it to be the duty of every member of a liberal profession to advance its interests by all the means in his power, I feel anxious to contribute to this end, by putting my brethren in possession of a successful mode, which I have lately resorted to, of treating pleuro-pneumonia in cattle. The agent employed by me is CREASOTE; and the benefits resulting from its use in this disease arise from its having, in my opinion, a specific action on the respiratory organs. It was almost by chance that I found out its value. Having been applied to by a person who had a mare, which, as he said, was going broken-winded, I gave her creasote in doses varying from half a drachm to a drachm; and before a week she was nearly recovered, and now she is so, and has been for ten months past. With regard to the nature of the lung disease in cattle, it seems to me, in nine cases out of ten, to arise from debility existing in the most vascular part of the lungs; and we get serum effused almost on the very first appearance of disease, *at least we always have effusion in the lungs* before the disease is detected by a casual observer. However, there are some cases which occur, in cattle in high condition, that partake more of an inflammatory nature; but even in these it is not like a common attack of pneumonia, nor does it bear the treatment of pneumonia, more especially bleeding. And here I would observe, that, in the last nine cases I have had under my care, only one has been bled; and this was a cow, in good condition, and so suddenly and acutely attacked from the first, that she was both bled and purged; at least, her bowels were opened freely for twenty-four hours, and after that time she gradually sunk, and died in eight days from the period of the attack. On examination after death, a large quantity of serum was found in the thorax. Of the other cases not one was bled: they were all treated with creasote, and seven of them recovered. Two of these were killed here within the last fortnight: both were fat, but one side of the lungs of each was in a bad state, being much diminished in size, and containing a good many of what had been abscesses, but which were filled with a yellow substance of the consistence of paste. There are two more up feeding in this neighbourhood at the present time.

The case which terminated fatally is a proof that the disease is not inflammatory in the first stage. She was a cow within ten days of her calving, and in high condition. On the first appearance of the disease she was treated with laxative medicine, and the creasote was continued for eight days, when she cast her calf, after which she became much reduced; but with the aid of tonics and creasote she improved and rallied for a time, but eventually died of water in the chest, as already stated.

Now, had this animal been bled, I am certain she would have died within seven or eight days of the first attack; at least this has been the result of *all* the cases that I have adopted active treatment for. It affords me some gratification to be able to add that I can now go to a case of lung disease without any fear,—a thing I could not say during the past four years before; in fact, the owners, as soon as I pronounced it to be *the disease*, cried out, "Oh! off to the market directly with it; or if you can get me a few pounds for it, do so; but it is of no use your attempting to treat it." And I could not say it was, because time would soon shew, that, had the owner killed the animal at first, he would have been four or five pounds in pocket; and unfortunately this is the great secret in practice—*money:* you must save your employer's cash, or he will soon have done with doctoring cattle.

The method as to treatment which I pursue is sufficiently simple. First, I have the animal placed in a cool, quiet situation, and well clothe the body. Should the diet have been dry, such as straw or meal, and the bowels constipated, I always commence with giving a dose of laxative medicine, consisting of the sulphate of magnesia, varying in quantity from ℥x to ℥xvi, according to the size and condition of the animal. This is followed by ammon. carb. et potass. nit. ā ā ℥ss, given in thick gruel or linseed tea eight hours afterwards. I then begin with the creasote, giving it twice a-day. Four drachms are put into an eight-ounce bottle, and filled up with linseed oil: of this I give from one to two table spoonfuls, in thick linseed tea, according to the age, size, and condition of the patient, always keeping the bowels in a relaxed state with linseed oil given in combination with the creasote, and occasionally adding spt. ether. nit. The trachea and front of the chest are well rubbed night and morning with ol. canth., and the patient kept perfectly quiet. The diet is soft, cool, and nutritious, such as oil cake, turnips, or grass, if to be had.

After pursuing this plan for about eight days there will generally be perceived at the end of this time an abatement of the *hoose:* it is loose and not so frequent, nor so distressing to the animal, and the action at the flanks is also much abated: the nose, too, becomes moist, and the eye not so dull nor so indicative of pain as it had been. This last change, together with the character of the *hoose*, are never-failing symptoms of the approaching recovery of the patient, although in most cases she is in a sadly reduced state: however, she soon regains flesh, and if kept under cover she will feed very rapidly, requiring no subsequent treatment, except good nursing.

I remain,

Very truly your's.

To the Editors, &c.

Second Communication.

Dear Sirs, *Morpeth, May* 15, 1850.

Since writing to you, I have had two fresh cases of pleuro-pneumonia, for both of which I have used the creasote successfully. The proprietor had lost twelve out of thirteen up to last week, having previously employed a quack, on the terms of no cure no pay.

Your's respectfully,

H. King.

To the Editors, &c.

Case of Necrosis.

By Mr. G. T. Brown, *M.R.C.V.S.*

Royal Agricultural College,

Dear Sirs, *Cirencester, May* 29, 1850.

The following is a sketch of a case of necrosis of an extensive character, occurring in a yearling filly belonging to this College. I know not if the case be *unique*, but I have never met with any thing approaching to it in the archives of veterinary medicine.

On the 23d March last, I observed the animal to be lame, apparently from a kick received from one of the colts running with her. On examination, a tumour of considerable size was perceived to exist on the outer side of the off hind limb immediately above the fetlock joint; the skin of both hind heels was tense, and several transverse cracks existed in it.

As the application of local remedial measures could scarcely be resorted to, in consequence of the wildness of the animal, she was merely removed from the wet strawyard to a dry shed, and fed on mash diet for a few days, when the swelling subsided, and soundness was apparently restored. The cracked heels, however, were not much altered in appearance, and on her being returned to the yard they became worse ; it was therefore found necessary to apply a mild solution of zinci. sulph. by means of a syringe, which seemed to have the desired effect.

On the morning of April 9th, the animal was found by the attendant lying in the shed with her hind legs under the manger, and, on being made to rise, her off hind limb was carried by her pendulous. It being evident that now there was something of importance to attend to, she was brought to the hospital, but only with great difficulty, refusing to place the off foot to the ground. Immediately on being placed in a loose box she fell down, and did not rise for more than an hour. While in this position I had a good opportunity of making a careful examination of the parts, when I found that both hind heels were slightly ulcerated, the off one more so than the other: no enlargement of any portion of the limb was perceptible, nor any tenderness on pressure evinced. I was consequently thrown back to the inference that the lameness must result from the ulcerated condition of the skin, although I confess I was by no means satisfied with my diagnosis. The affected parts were fomented and poultices applied, sol. aloes ℥iv also administered, and a mash diet enjoined.

The following day considerable tumefaction of the limb, from the foot upwards, was present, with constitutional symptoms indicating pain. Around the coronet, and immediately above the sesamoids on the outside, the enlargement had become more defined, indicating the formation of an abscess. On shaking the extremity by grasping the hock, the pastern bones could be distinctly heard to rattle in their situation, as though they were disconnected with any other structures ; but this I attributed to the impaired tonicity of the muscular tissues from the œdematous condition of the limb.

The next morning fluctuation was apparent round the coronet ; the tumour above the sesamoid had burst, and discharged a thin fœtid pus ; the œdema had greatly increased, and much pain was present, accompanied with general prostration of the vital powers.

The coronal abscess was freely opened, and nearly half a pint of sanious purulent fluid escaped. The probe was passed to the bone without any opposition, communicating a peculiar dead feeling to the hand.

Up to this time the treatment has consisted of fomentations unremittingly continued. Slight punctures in the upper part of the extremity where the skin was most tense were made; with the occasional administration of sedatives for the purpose of allaying nervous irritability.

The time elapsing between the admission of the case and the opening of the abscess was three days. The peculiar fœtor of the discharged matter indicating disease of bone, I ordered the injection of mild stimulants and disinfectants, as zinci sulph. and acid. hydrochlor. dil.; continuing the use of sedatives and conjoining tonic agents, which were now decidedly called for.

April 16th.—In spite of all treatment, the animal has become worse: the discharge continues plentiful and fœtid; the enlargement of the limb has increased; and considerable portions of the integument in front of the coronet have sloughed daily. She is at present lying suffering from complete exhaustion; the pulse scarcely perceptible, extremities cold, and countenance peculiarly haggard. These symptoms led me to prognosticate unfavourably, but by no means was I prepared for the result of my further examination. I found the entire front of the coronal bone, and part of the suffraginis, perfectly denuded of all covering, the finger being easily passed between their articulations; the edges were extremely sharp, and the surface of the bones rough. The foot was connected only by the posterior flexor tendons, and the slightest force would have sufficed to remove it. With such lesions no consideration was called for. The animal was immediately destroyed.

Post-mortem examination.—The removal of the integument disclosed fibrinous deposition over the whole surface of the leg from the stifle downwards; the theca of the flexor tendon much thickened, and its synovial secretion almost replaced by a quantity of pus, which was discharged externally through the opening above the sesamoid bones. The flexor perforatus also thickened, and there was pus between it and the perforans. The latter tendon was not so much enlarged, but small quantities of inspissated matter, about the size of hazel-nuts, existed in several places, particularly on each side of the tendon, where it emerged from the sheath formed by the perforatus. A quantity of fibrinous matter was effused below the fetlock, covering the vessels with a thick coat, as also the ragged portions of the ligaments and extensor tendons.

The inferior portion of the os suffraginis and the whole of the os corona were deprived of all connecting tissue: tendon, ligament, periosteum, and cartilage, were as completely removed as though they had been subjected to boiling for some time. The surface of the bones was very rough, and the edges sharp; the colour a clear puce or light plum. A pointed scalpel could be passed into the shell of the bone for a small distance, perhaps a quarter of its thickness. A section of the corona, the most implicated, shewed a quantity of sanious fluid in the cancellated structure, which was in an advanced state of decomposition. The upper part of the os pedis and the entire navicular bone presented the same colour, but the disease had not progressed sufficiently in them to cause any sloughing of investing structure.

Remarks.—I think we may safely exclude the cracked heels from any share of importance in the cause of this disease: I refer them to the wet situation in which the filly was placed, as other colts were similarly affected at the time; and although the absence of an apparent cause led me to look on them as mainly producing the lameness, a few hours sufficed to dispel that delusion. There are only two periods from which we may date the origin of the disease:—from the latter end of March, when the animal was kicked; or from April 9, when she was found with her hind feet under the manger. I have no hesitation myself in recurring to the prior date, looking to the blow as the exciting cause. The enlargement existed above the fetlock, but the injury might have implicated parts below; and, from a slight abrasion on the outer and lower part of the os suffraginis, I am inclined to fix on that as the spot at which death of the bone first took place, as the direct result of external force. From the known effect of contact of the dead with living tissue, we can readily understand the extension of the disease; the removal of the various structures subsequently being the natural result of the attempted expulsion of the dead bone from the system: of course, the reparation we should fairly expect to take place in vascular tissue was quite out of the question here, provided the portion of bone first destroyed had also been fractured—and in the majority of cases it would—the part would have been removed, and no material injury perhaps have followed; but its connexion with the vital parts was necessarily attended with the worse results.

In the event of diagnosing the disease in the early stage, the only available treatment would be removal of the dead parts, which in this case would have necessitated amputation below the hock. Were a case to occur in a cow, I should not hesitate a moment to do this; but in the horse there would, of course, be nothing gained by preserving life at the expense of utility.

I remain, dear Sirs,

Your's very truly.

To the Editors of the Veterinary Record.

A Calcified Testicle of a Ram.

By Mr. Joseph S. Gamgee, *M.R.C.V.S.*

(Illustrated with a coloured Engraving.)

This morbid production was laid before the members of the Veterinary Medical Association during the past session. It was obtained about the year 1843, from an aged ram, the property of Mr. Folliott, farmer, of Tilsted, Wiltshire. During life the animal served in the flock with other rams, and had never been recognized as a bad stock-getter. Hydrothorax was the cause of death, after which the testicles were thrown as food to a fox kept in Mr. Folliott's yard. The one testicle was eaten; but a considerable mass being left, it was picked up, and found to be the hard, heavy, stone-like substance before us. It is said to have been covered by membranes. In this condition it was seen by Mr. Hussey, who, being an eye-witness to the fact, kindly communicated to me the preceding history while a student at the Royal Veterinary College. None of Mr. Folliott's rams ever furnished a similar morbid specimen, nor had they been subject to any peculiar disease of the osseous system.

The outline of the testicle is irregularly oval. [see *Plate* 2, *Fig*. 3]. It is flattened on its two surfaces; conical and pointed at one extremity, quadrilateral and truncated at the other. Its maximum measurements are, four inches and a-half in the longitudinal direction, three inches from side to side, two inches and three-eighths thick, and nine inches in circumference; weight, fourteen ounces and a-half avoirdupois.

Mr. Tufnell, of the Birkbeck Laboratory, subjected a portion of the earthy substance to qualitative analysis, and he has kindly favoured me with the following result:—"The principal constituents are, phosphate of lime combined with a small quantity of phosphate of magnesia; a little sulphate, and probably carbonate, of lime; also some nitrogenized organic matter."

The surface of the testicle is of a dirty white colour, and imparts a slight sensation of roughness to the hand when passed over it. It is marked by several shallow and indistinct grooves; one, in particular, deeper than the others, and all taking a longitudinal course. It is likewise studded with numerous shallow foramina, some of which are so small as only to admit the point of a pin, while others are an eighth of an inch across: between these two extremes all gradations of size are met with. Moreover, upon careful examination, the surface presents to the naked eye a multitude of small, yellowish white, crescent-shaped objects, closely packed, and more distinctly visible in some parts than others [see *Plate* 2, *Fig*. 3]. When examined with an inch lens, these shining crescent-shaped objects appear to be the bendings of little hard cylindrical rods, emerging from the interior of the mass, and there returning [see *Fig*. 4]. At several points they appear agglutinated together by a calcareous amorphous deposit, and this is especially the case at the broad and blunt end of the testicle. [see *Fig*. 6]. The supposition that the little rods are the calcified tubes of the testicle is confirmed by examination of a portion of the surface, where pieces have been at various times accidentally broken off: here the little rods are seen to be very much twisted; many of them are broken across, while the bendings of others remain perfect; and so closely does the appearance resemble the characteristic structure of the testicle, that, when the specimen was shewn to a distinguished anatomist (without any intimation as to its history), he at once suspected its true nature.

Both in a transverse and longitudinal fracture the interior of the calcified tubes is found filled with a hard material, of a whiter colour and less shining than the outer surface. The fragility of the substance having prevented the preparation of a section sufficiently thin to be seen by transmitted light, we have examined under the microscope, with reflected light and an inch power, magnifying 100 diameters, the surface of a small piece sawn off from the testicle in a transverse direction. The tubules [see *t*, *Fig.* 5] are seen to be completely filled by uniform earthy deposit of a dead white colour; many of them are studded with a few small holes. The circumferential border of the tubes is darker than their interior. Their shape varies; some of them are perfectly circular, others oval or elliptical, and others are much elongated, and bent in the form of a crescent. This difference in shape, doubtless, depends upon the relative direction in which the tubes were divided; some being sawn directly across, others more obliquely, and a few lengthways, i. e., along their long axis. The diameter of the spherical tubes averages from $\frac{1}{660}$ to $\frac{1}{333}$ of an inch; a few, however, only measure $\frac{1}{1000}$ of an inch across. Many of the tubes are in close apposition, while others are separated by a considerable quantity of intermediate substance, of a yellowish colour, and apparently granular texture, interspersed with numerous small holes. In some parts this material is wanting, and the tubes are separated by irregular chinks.

In systematic works on pathological anatomy, I find no mention made of diseases affecting the testicle similar to this now recorded; but it is with pleasure that I acknowledge my gratitude to Dr. Sharpey for having called my attention to, and allowed me to have a copy taken of, a drawing in the late Dr. Carswell's extensive and valuable collection, now in University College. The figures represent the process of calcification in the testicle of a goat, at a much earlier stage than the case just recorded: and although that eminent pathological anatomist has not described the *hard wiry* vessels as the tubes of the testicle calcified, yet connecting his case with our's, we hesitate not to regard them as specimens of the same disease in different stages. The following is the description appended to Dr. Carswell's figures [see *Plate*]:—

"*Fig.* 1 represents the right testicle laid open longitudinally. The bulk of the testicle appeared to be natural, as well as its colour and consistence. Scattered through it, however, were seen a great number of vessels of considerable size, filled with a straw-coloured substance, which made them so hard and stiff, that, when the finger was passed over them, they felt like wires.

They were most numerous at the inferior part of the organ, where they were coiled up into branches, resembling the spermatic organs of the worm. There was also a considerable number at the top of the testicle, and several could be seen scattered here and there in its body.

"*Fig.* 2.—The left testicle was greatly wasted; it was not more than the fourth of the bulk of the right, while the *vas deferens* and its branches appeared to have preserved their original size. The inferior half of the testicle was wrinkled, and felt hard, and when cut was found to be converted into a hard earthy substance, of a straw colour and granular structure. It adhered firmly to the substance of the testicle, which was firm and somewhat dry, and did not contain any of the vessels found in the other.

"The poor animal in whom this diseased state of the testicle was found was confined, in a state of solitude, in sight of his former female associates, with whom he had formerly been actively engaged in propagating his species."

8, *Euston-grove, Euston-square.*

Explanation of the Plate.

Fig. I and II, represent the process of calcification, in an early stage, in the testicle of a goat, after Dr. Carswell. At fig. I, *t*, the tubes are converted into hard wiry vessels. The testicle, represented at Fig. II is greatly wasted. At its inferior half is a hard earthy substance, of a straw colour, and granular structure.

Fig. III. The calcified testicle of a ram.

Fig. IV. A small portion of the surface of the testicle viewed with an inch lens; at *v*, are seen the bendings of the calcified tubes.

Fig. V. Another portion of the surface, examined with the same glass as the above; the tubes are rendered indistinct by an intermediate calcareous deposit.

Fig. VI. A transverse section of the testicle examined with the microscope by reflected light. The cut tubes *d*, magnified 100 diameters, are seen filled with a white calcareous deposit. They are of various shape, and their boundaries are darker in colour than the interior. At *i* is the intermediate substance, of a dirty yellow colour, studded with small holes.

On Digestion in the Horse.

By Mr. J. D. Barford.

[An Essay read before the Veterinary Medical Association during the Session 1848-9, and for which a Certificate of Merit was awarded.]

True it is, that, on whatever object a man may employ his intellectual powers, whether on the sand-grain which, in countless numbers, covers the surface of the desert, or on a drop of water, myriads of which compose the mighty ocean; whether he looks on the glow-worm which, with its lambent flame, appears like a gem set in the earth-car of night; or on the fierce volcanic fire, which, while it dazzles vision, depresses his courage and inspires fear; in all these must man feel the limit of his powers, arising from the splendour of all the created objects by which he is surrounded, and which are proofs of the infinite wisdom of Him by whom all things were made.

But amid the numerous subjects for admiration with which the universe abounds, none, it appears to me, can surpass the provision by which the organic kingdoms of nature, both vegetable and animal, persist, grow, and multiply; thus becoming subservient to each others wants and to the final end of their existence—the well-being of man.

By the laws which govern organic nature, its principal features are seen to be action, change, and decay. These phenomena would necessarily involve destruction or annihilation, were it not that plants are endowed with a property whereby, under the influence of solar light, they decompose carbonic acid, assimilating the carbon and liberating the oxygen, the pabulum in which animals can alone exist. At the same time, in virtue of physical properties, under the control of vital laws, nutrient matter is imbibed by the roots of vegetables from the earth in which they are lodged, to circulate in the stem and leaves of the plant, where the appropriate matters are retained, while the useless and noxious ones are discharged as excrementitious.

For a similar purpose, but by different means, the numerous individuals constituting the animal kingdom partake of food, which is retained in a cavity in their interior, and there changed so as to be fitted to the requirements of the organic textures. The existence of a digestive organ is a universal fact among animals, and constitutes one of the characteristic features by which this kingdom is distinguished. But another great difference requires notice, which is, that animals alone can subsist on nitrogenised elements; and these, either directly as in the carnivora, or indirectly as in the herbivora, are derived from plants, which, with the most stupendous economy, are the elaborators of what animals require from that which they produce.

Having thus briefly sketched the purport of my thesis, and given the general features of the process for consideration, I shall now allude more in detail to the function of DIGESTION. This term is employed by anatomists for a twofold purpose: the one designates the change which the food undergoes in the stomach, and the other comprehends the whole series of chemical and mechanical action to which the food is subjected, from the moment it is taken into the mouth to its conversion into blood. Under this more generic signification it is that I intend discussing the function of digestion; and for the facility of description, as well as perspicuity of delineation, I shall divide it into six stages; 1st, the act of mastication, or that by which the alimentary matters are comminuted; 2d, salivation, or admixture with the food of a peculiar fluid called saliva; and this for a twofold purpose, namely, chemical and mechanical; 3d, when thus prepared, the aliment is passed from the mouth through the pharyngeal passage into the œsophagus, constituting deglutition; 4th, the nutritive material having entered the stomach is chymified, that is, it is converted into a pulpy mass by the reciprocal action of the gastric juice and pepsine on it; 5th, the chymous mass issuing from the pylorus is mingled with the biliary and pancreatic secretions, whereby chylification is effected; 6th, the nutritious elements are absorbed from the intestinal surface, and then conveyed by a system of vessels into the large veins of the body, and there mingled with the circulating vital fluid, into which, by the additional changes occurring in the lungs, they are converted.

Having thus subdivided my thesis, and first taking *in routine* the process of mastication, or that act by which the food is comminuted so as to be with greater facility acted on by the animal fluids, I may remark that this is effected by the action of teeth implanted in the jaws, which are moved in various ways, and present diversities of character according to the class of animals to which they belong.

I have before alluded to the fact that all animals require nitrogenised food for their subsistence, and this they derive from animals or vegetables. The proximate elements are fibrin, albumen, &c.; but it is evident that flesh, when ingested, requires a much less change to be effected in it ere it is converted into blood, than do vegetable tissues to be converted into animal; and, accordingly, we find that the preparatory apparatus of mastication is far more simple in the carnivora than in the herbivora. Such, indeed, is the economical provision of nature, that the relation between the quality of food and the anatomical structure of the teeth and jaws is rigorously observed; so that, from an examination of those organs, we are enabled to prognosticate the place held in the zoological scale by the animal whence they were obtained. Thus, in the tiger and carnivora generally, the coronoid process of the inferior maxilla is cylindrical and placed transversely across the glenoid cavity, so as only to allow of an opening and shutting movement, precluding the possibility of a lateral one. In the rodents, such as the rabbit, hare, rat, &c., the condyle of the lower jaw is fitted in a cylindrical cavity, but longitudinally placed so as to permit with ease an antero-posterior movement, essential to the manner with which those animals gnaw their food, and altogether preventing any other kind of action.

In the horse, but more especially in the ruminantia, the condyle of the jaw articulates in a shallow cavity in the temporal bone, thus favouring lateral movement; and, in fact, a greater freedom of action altogether is given for the purpose of comminuting the vegetable aliment. In consonance with these peculiarities, we observe the teeth of the carnivora are completely covered with enamel, and so formed as to render them most efficient in cutting and dividing; whereas, in herbivorous animals, the peculiar arrangement of the three substances, enamel, crusta-petrosa, and dentine, which, owing to their different hardness, have an unequal wear, give an irregular surface to the tooth, admirably adapting it as a grinding instrument. But even in the compound teeth some interesting peculiarities present themselves: in rodents, the face of the tooth is marked by ridges, transversely placed, so that by the antero-posterior movement of the jaws the food is made to cross the sharp edges, and thus effectually to divide it: in herbivora, the unequal prominences on the grinders are longitudinal, viz., from before backwards, and so arranged as to cut the alimentary matters when they are passed across them by the lateral movement of the inferior maxilla. By this arrangement, suited to the wants of the several classes of animals, the food, while being comminuted, is subjected to the process of insalivation, which we now purpose to consider.

Saliva is a viscid and somewhat opalescent fluid, secreted by a special apparatus which, in the majority of domesticated animals, is constituted of the parotid, submaxillary, and sublingual glands; but, besides these, the buccal and intralingual, with numerous compound follicles in the lips, are considered by some anatomists to be salivary secreting organs: this is, however, by no means a settled point, because, though the anatomical structure of those parts is similar, it is not a rule that their function is necessarily identical, for the structure of the tracheal glands is similar to the parotid, yet the former secretes mucus and the latter saliva; and until the secretion of the buccal and other small glands has been particularly examined, I concur with those physiologists who doubt if it be saliva. Saliva, when obtained from the mouth, has an acid re-action, which is referrible to the mucus mingled with it. Dr. Garrod found that the secretion from the parotid duct had a distinct alkaline reaction, and that, when saliva was secreted in large quantities during mastication, its alkaline properties overcame the acidity of the mucous secretion, and even the fluid from the mouth restored the blue of litmus, and rendered turmeric paper brown. The alkaline re-action of saliva is usually referred to soda, either free or in the form of carbonate, but Enderlin alleges that it is due to the tribasic phosphate of soda. Having evaporated the water which forms a large part of the saliva, solid matter is obtained in the proportion of 1.5. The solid constituents of saliva admit of a distinction into animal and saline. The animal matters are unequivocally three, viz., mucus, a peculiar principle named salivine or ptyaline, possessing all the properties of a watery extract; and the spirit extractive, ozmazome.

Brande and Gmelin maintain that healthy saliva contains albumen, but this point requires confirmation: certain it is that, during ptyalism, albumen is one of the salivary constituents. The salts of saliva, as a general rule, in ruminants, have soda for their base, whereas in the human subject the salts of potass are in excess: they are the chloride of potassium, lactates of potass and soda, carbonate of soda, phosphate of lime, carbonate and phosphate of magnesia; besides sulphates and acetates of potass, with sulpho-cyanide of potassium, which strikes a rich port wine colour by the addition of sulphate of iron to saliva.

The uses of saliva are threefold; first, by moistening the food it facilitates its deglutition; secondly, it enables man and animals to taste the aliment; for, if even sugar be placed on the tongue when perfectly dry, it is tasteless: lastly, saliva exerts a chemical action on the alimentary matters, converting amylaceous principles into dextrine, a gummy substance, and probably into grape sugar. That this is the case may be proved by the fact, that, on adding a solution of iodine to cooked starch mingled with saliva, it no longer strikes a blue colour. This change is analogous to that which occurs in the process of malting, wherein the starch of the barley is converted into dextrine and grape sugar, by catalysis inducing the formation of a peculiar substance called diastaste. Mons. Mialhe has been thought to have discovered the active principle of saliva, and he has named it *animal diastaste.* This, in all probability, is the ptyaline, to which we have already alluded. In conclusion, I may revert to the theory once advanced by Liebig, that the action of saliva is much extended by its conveying oxygen into the stomach, for the purpose of uniting with the epithelium to form pepsic mucus. This theory, though pretty and ingenious, has from its birth been destitute of sufficient evidence to render it a general doctrine; and we feel warranted in abandoning it, in concurrence with the majority of physiologists; and even the distinguished chemist of the Giessen school himself appears now to have dropped it, since he does not mention it in his able treatise "On the Chemistry of Food."

The food, when thus acted upon by the salivary secretion, is conveyed in its onward course by the act of deglutition, which, in reality is continuous, but, for convenience of description, it is divided into three stages; first, the passage from the mouth into the fauces, which is purely a volitional act; secondly, it traverses through the pharynx by the contraction of its various muscles, this being slightly referrible to the influence of the will, but principally dependent on reflex action; thirdly, its transit from the pharynx through the œsophagus into the stomach, this being purely an involuntary movement, and effected by the contraction of that muscular tube.

It now behoves us to consider the changes which the food undergoes in the stomach, and, in anticipation, a few remarks on the state of that viscus during digestion may prove an acceptable premise. At the commencement of the digestive process the pylorus is quite closed, and gradually relaxes itself to give exit to the solved aliment, and finally to the undigested matters; at the same time, the inner surface of the stomach is accurately applied to its contents. By virtue of the contractility of its muscular coat, certain movements constantly occur in the stomach, which are of a twofold character, the one of rotation round the long axis of the viscus; the other of expulsion, which is effected by the circular order of fibres at the pyloric end of the stomach, thus propelling the alimentary matters into the duodenum so soon as they are sufficiently softened. The correctness of these statements is proved by the circular arrangement round a central axis of the hairs which constitute the balls occasionally found in the stomachs of ruminating animals.

The Gastric Juice is an acid fluid capable of coagulating milk, and dissolving food even out of the body; moreover, it possesses remarkable anti-putrescent properties. It contains water, acid matter, and a peculiar animal principle denominated *pepsine*. The real nature of the acid contained in the gastric juice is a *questio vexata*. Dr. Prout alleges that it is hydrochloric, whereas Liebig more than insinuates that it is lactic acid, and I believe the latter is the theory accepted at the present day.

The salts of the gastric juice are chloride of sodium, phosphate and hydrochlorate of potass, soda, and magnesia; and, according to the authority of Berzelius, iron is likewise a constituent. *Pepsine*, the animal principle of the gastric juice, is an azotised substance, and so far resembles albumen that it is soluble in cold water, and coagulated by hot. It is interesting to observe, that an acid solution of pepsine, which may be prepared by steeping the mucous membrane of an animal's stomach in dilute hydrochloric acid, is capable of dissolving nutritious substances, if kept in a warm situation. It has been observed by Dr. Beaumont that digestion is influenced by certain circumstances: 1st, The amount of food must be proportionate to the secretion of gastric juice, because nature does not supply gastric juice in unlimited proportions, but only just sufficient to fulfil the wants of the animal economy. This is a most important point in Hygienics, because it teaches us that not only is it extravagant, but detrimental to health, to supply animals with food *ad libitum*, since that alone, and no more, can be digested which is required for the animal's sustenance. Secondly, for the performance of digestion, an elevated temperature is indispensable; thirdly, motion is required to thoroughly expose the digestible matters.

The changes which the food undergoes in the stomach are of two kinds, mechanical and chemical. The former consists in the disintegration of the food, and its conversion into a soft pulpy mass. By virtue of the latter, viz., the chemical agency of the gastric juice, the nitrogenized principles of the food are dissolved preparatory to absorption, and their properties are thus somewhat modified; and although it is found by chemical analysis, that they are essentially the same, yet the fibrin dissolved in the stomach is no longer spontaneously coagulable under similar circumstances; the albumen is not coagulated by heat, nor is gelatine precipitated by acids. Fatty matters undergo no change in the stomach, but they are merely minutely subdivided, being destined to be acted upon in another portion of the intestinal track.

According to Sandras, the solved azotised matters are principally absorbed by the veins of the stomach. Explanatory of these changes which the food undergoes in the stomach, several theories have been advanced. That some are erroneous, is evident from the fact that they are numerous; and we shall give in brief words a detail of those in accordance with chemical principles which are least objectionable.

The action of the gastric juice and pepsine on the food resembles catalysis in two great points; first, a very small quantity of the agent effects great changes; secondly, it does not enter into combination with the products of decomposition. So far the action of the gastric juice may be compared to fermentation; and this analogy derives support from the fact that yeast and other ferments contain nitrogen. If the statement of Liebig be true, that just as ferments, which induce changes in large masses by action of presence, are in a state of incipient decomposition, so is pepsine in a decomposing state.

By these processes the ingesta are converted in the stomach into chyme, which escapes by gradual relaxation of the pylorus into the duodenum, where the final change of chylification is performed by the biliary and pancreatic secretions, the physical and chemical properties of which we shall now consider.

Bile is a green fluid, possessing a bitter taste and nauseous odour. In those animals which possess a gall-bladder, the cystic bile has a greater spissitude than that from the hepatic duct; owing to one of two causes—either to the absorption of the watery constituents, or to the addition of mucus. Bile contains mucus, fat, salts, and proper biliary matter. The fatty matters are of three kinds, viz., saponifiable fats, constituting the adipose acids in combination with soda; a small quantity of free fat, and a peculiar fatty matter called cholesterine, of a crystallizable character, and saponifiable by the addition of an acid.

The colouring biliary matter is cholepyrrhine. The salts of bile are the phosphates of magnesia, lime, and iron, chlorides of sodium and potassium, sulphates of soda and potassa, with the tribasic phosphate of soda. According to the analysis of Berzelius, the peculiary biliary matter is biline, while Demarcet alleges, and Liebig admits, that it is choleic acid in combination with soda. These apparently conflicting testimonies are reconcileable from the acknowledgment of Berzelius, that biline is speedily acidified, and is in combination with soda, so that biline and choleic acid are, most probably, one and the same substance.

The Pancreatic Secretion M. Bernard has proved to be, in health, a highly concentrated fluid of alkaline re-action, containing very little extractive, but yielding eight per cent. of solid residue, which, in part, consists of salts, and of a substance very similar to, though not quite identical with, albumen.

What is the action of the bile and pancreatic juice on the chyme when expelled from the stomach into the duodenum? The simple, though beautiful and highly conclusive, experiments of M. Bernard have demonstrated that the pancreatic juice is the active agent in emulsionating the fat, i. e. in dissolving the oily particles so as to render them fit for absorption. Frerich has attempted to invalidate the conclusions of the French physiologist, but we must regard them as established facts; for not only were Bernard's experiments conducted with the utmost care, but they have been repeated by an eminent man with whom we are well acquainted, and the results have been corroborated. At the utmost, Frerich's observations would induce the belief that the pancreatic fluid, though the principal agent in emulsionating the fat, may not perform that office exclusively.

That the bile is a stimulus to the peristaltic action and secreting function of the intestinal tube is proved by the fact, that when, in jaundice, the biliary secretion is arrested, the bowels are constipated, and the fæces, when expelled, are light in colour and extremely dry. In some degree, it appears that the bile and pancreatic fluid may effect the transformation into gum of any amylaceous matters not acted on by the saliva or the gastric juice; but what is the real office in the animal economy of that complex fluid, *bile*, cannot be asserted. The theory propounded by Liebig, that the bile is absorbed from the intestinal surface, and its hydro-carbon consumed in the process of respiration, is ingenious and plausible; but some recent facts, determined by eminent inquirers, induce us to regard the doctrine of the Giessen school as possible, though by no means as demonstrated; and we rest with the statement, that the function of the bile is yet to be determined.

Finally, as to the changes which the food undergoes in the intestinal canal previous to its being absorbed as chyle, I may remark, first, that the absorption of the protein compounds, which commences in the stomach, continues in the intestines; secondly, that the pancreatic juice dissolves fat so as to render it available to the wants of the animal economy; thirdly, that the conversion of amylaceous matters, which originates in the mouth with the salivary secretion, probably continues in the duodenum by the addition of the pancreatic and biliary fluids. Thus it is that the process of chylification is completed, and the greater part, if not all, of the nutritive ingesta rendered available for absorption.

It is a point of much interest to be borne in mind, that nutriment is absorbed in the alimentary canal by two classes of vessels, viz., by veins and lacteals; the former are the agents mostly concerned, and, having already alluded to them, we shall now examine the lacteals as carriers of fluid Chyle.

By a process of endosmose and cell-development, and not imbibition by open mouths, as was at one time erroneously supposed, the chyle is taken up from the intestinal surface. This fluid, on first entering the lacteal vessels, has a white colour, and a neutral or slightly alkaline re-action. It is composed of two main constituents—the plasma, or liquor chyli, and the solid corpuscules, of which several varieties are distinguished: first, proper chyle corpuscules, analogous in microscopic appearances and chemical character to the pale ones of the blood; secondly, very small molecules, which, according to Gulliver, constitute the molecular base of the chyle, the fatty nature of which is proved by their partial solubility in ether; thirdly, we recognize oil globules, much larger than the former, though identical in composition; and, lastly, the chyle contains spherules totally distinct from the preceding, insomuch as they give no evidence of a fatty, but rather of a proteinaceous constitution.

The liquor chyli is distinctly separable into clot and serum by spontaneous coagulation. The serum of the chyle contains 33 per cent. of fat, in addition to albumen, extractive matter, and salts, the most remarkable of which are those of iron and the alkaline carbonates.

The chyle, thus constituted, is conveyed by the lacteals through the mesenteric glands into the receptaculum chyli and thoracic duct, which is in direct communication with the left axillary or jugular veins, and occasionally with the posterior vena cava.

After having traversed the mesenteric glands, the fibrin and chyle corpuscules are undoubtedly more abundant than when first the chyle is absorbed.

Inquiring into the origin of these two important elements, it is conformable with reason to suppose that the fibrin is produced from the albuminous materials, and that such a conversion may occur is shewn to us by analogy. A fresh egg contains no fibrin, but much albumen; when, however, it is exposed to the heat of incubation tissues are formed, which must necessarily have been produced by the fibrin derived from the albumen. As to the origin of the chyle corpuscules, the doctrine of Heule seems to me the most reasonable,—that they are cells containing a nucleus, and that this is formed by the agglomeration of nucleoli, which are fat molecules, and around which a cell wall is developed by the heterogeneous attraction of the chyliferous elements.

The chyle having then entered the systemic veins from the thoracic duct, it is propelled with the whole mass of venous blood into the lungs: here the oxygen from the inspired air is absorbed and rendered available to the elaboration of the chyle by oxidating the albumen so as to convert it into fibrin.

One point still remains to be considered in order to complete the dissertation on the conversion of the nutritious materials into the elements of blood by the process of digestion; I allude to the origin of the colouring matter of the vital fluid. This is a question to which I can offer no satisfactory solution. We know that the red blood particles appear in the embryo of the chick ; but to say whence they are derived defies ingenious inquiry. The varied colours which adorn the flowers of the field, and still more so hot-house plants, constitute as great a difficulty to the talents of the inquiring and scientific botanist as the origin of the colouring matter of the blood has invariably proved an obstacle to physiological research : I shall, therefore, not attempt speculation, but rather be satisfied with acknowledging that, such is the marvel of most of nature's works, that it is beyond the grasp of man to scan their depth or to imitate their beauty.

[Since Mr. Barford's essay was read before the Association, M. Bernard's researches have subverted several of the principles there laid down ; we have, therefore, deemed it but right to allow a friend of Mr. Barford's to substitute M. Bernard's observations on the action of the pancreatic juice for those which the Essay originally contained, as the professional avocations of the first-named gentleman prevent him from performing this duty.—Editors.]

ROYAL VETERINARY COLLEGE.

At an examination for honours, held at this Institution at the close of the session 1849-50,

Division, The anatomy, physiology, and pathology of the horse,

Professor, Mr. Charles Spooner,

A silver medal was awarded, with a certificate of merit of the first degree, to Mr. W. H. W. Toby.

A certificate of merit of the first degree was also awarded to Mr. A. Hampson ; and certificates of merit of the second degree, to Messrs. T. W. Talbott, T. P. Gudgin, C. M. Baker, and J. C. Paradise.

The following is the list of questions propounded, to which written answers were given by the competitors; and it was gratifying to observe, that the number of students who contended for the prizes was large.

Examination for Honors, Session 1849-50.

I.—Describe the circulation of the blood, and the nature of the changes to which it is subjected in its transit through the body. 20

II.—Point out the peculiarities of the fœtal circulation, as to the course of the blood, and state if any differences exist in that respect in the horse, from other domesticated animals . . 15

III.—Describe the structural anatomy and physiology of arteries, and point out their peculiarities as compared with veins 15

IV.—State what is understood by 'bursæ mucosæ,' describe their general structure and uses, and name the parts of the body where they most abound 10

V.—Describe the origin of the flexor pedis perforans and perforatus muscles of the fore leg; their connexion with other muscles, with the main arteries and nerves of the limb, and the relative connexion and course of their tendons, with their precise attachment to and connexion with the bones 18

VI.—Describe the conjunctiva, its reflections, the nature of its vascularity, adherency, and the parts with which it is connected by continuity 10

VII.—Describe the superficial origin of the fifth nerve, its peculiarities within the cranium, its course out of that cavity, and briefly state its distribution 15

VIII.—Describe the symptoms whereby you could assert that a horse is affected with acute glanders, and state the differences in the symptoms, indicating the chronic form of this disease 10

IX.—State the most frequent causes of pneumonia in the horse, and describe the symptoms 10

X.—Give the definition of an ulcer, state by what process it is healed, and the treatment best to be pursued. 8

XI.—Give the definition of hernia, and describe the varieties most frequently met with in the horse, as affecting the viscera of the abdomen; also state the causes, both predisposing and proximate. 18

XII.—Describe the causes, symptoms and treatment of laminitis 10

It affords us very great pleasure to announce that Mr. Joseph Gamgee, M.R.C.V.S., obtained the gold medal, and first certificate of merit, from the University College, London.

Division. Anatomy and physiology.

Professor. William Sharpey, M.D. F.R.S.

Presentation of a Testimonial to Professor Simonds.

The students of the Royal Veterinary College met on Thursday, April 18, 1850, at the Freemasons' Tavern, for the purpose of presenting to Professor Simonds a handsome silver epergne, accompanied with the following expression of their feelings written on vellum :—

To J. B. Simonds, Esq.,

Professor of Anatomy, Physiology, and Pathology of Cattle in the Royal Veterinary College.

Sir,

We, the pupils of the Royal Veterinary College, actuated by sentiments of gratitude for the many benefits received from your unwearied efforts in the prosecution of that department of veterinary science committed to your care, do earnestly solicit your acceptance of the accompanying Epergne, in testimony of our esteem.

That you may be favoured with that share of health and mental energy which will enable you to pursue these researches, which have been and are of such inestimable value to the profession generally; and that your name may be handed down to posterity with that honour which a life well spent in benefitting your fellow-men justly merits, is the sincere wish of

Your grateful and obliged pupils.

Committee.

Francis Blakeway *(Chairman.)*

William G. Hazard George Westropp Edward Mellett

Charles Page W. H. W. Toby J. V. D. Brennan.

Chas. M. Baker *(Treasurer.)* T. W. Talbott *(Secretary.)*

Here followed the signatures of the other students.

The other Professors were present by invitation of the Class, and the honour of presentation devolved on Mr. F. Blakeway, one of the senior students, who admirably acquitted himself, with earnestness and feeling conveying his grateful thanks and those of his fellow-students to their preceptor. To this Mr. Simonds having suitably replied, the remainder of the evening was passed in the utmost cordiality; sentiments of the highest esteem being freely interchanged between the teachers and the taught.

DIPLOMAS.

NAMES OF THOSE WHO HAVE OBTAINED THEIR DIPLOMAS FROM THE ROYAL COLLEGE OF VETERINARY SURGEONS, LATE STUDENTS OF THE ROYAL VETERINARY COLLEGE, LONDON, SESSION 1849-50.

To those before whose names a single asterisk appears *Certificates of Membership* of the VETERINARY MEDICAL ASSOCIATION have been granted: to those having two asterisks, *Certificates of Fellowship* have been also awarded for Essays introduced by them at the weekly meetings of the Association.

May 15, 1850,

*Mr. Herbert Sewell, London
**Mr. J. C. Paradise, Bowcott
**Mr. Robert Wilson, Louth
*Mr. T. W. Talbott, Whatton
**Mr. F. Blakeway, Kidderminster
*Mr. George Westropp, Long Melford
*Mr. Charles Page, Banbury
Mr. Edw. Mellett, Henley-on-Thames
*Mr. W. H. W. Toby, Exeter
**Mr. Charles Hunting, Bermondsey
**Mr. T. P. Gudgin, Hawnes.

May 22, 1850.

**Mr. Chas. M. Baker, Sudbury
*Mr. Richard Ricketts, Highworth
*Mr. Francis Midgley, Sheriff Hutton
Mr. H. W. Allison, Willington
Mr. C. S. Hussey, Tilshead
Mr. R. H. W, Holloway, London
**Mr. H. T. Batt, Backwell
**Mr. J. V. D. Brennan, Kildare
*Mr. William Ferris, Torquay
*Mr. I. J. Channon, Taunton
*Mr. Richard Rothwell, Hyde.

May 23, 1850.

*Mr. G. J. Browne, London
Mr. Vincent Nelson, London
*Mr. Peter Rackham, Lowestoff
Mr. Adam Hampson, Bolton-le-Moor
Mr. Henry Alcock, Chester
Mr. T. G. Webb, Epping.

The Charitable Fund

on behalf of the Widows and Orphans of the late Professors Dupuy and Rodet.

Since our last-published list of contributions to the above fund (see The Veterinary Record for April, p. 180), we have received subscriptions from

Mr. W. Baker	Mr. G. Lepper	Mr. W. C. Spooner
— J. Broad	— R. M'Robie	— C. Spooner
— J. Cooper	— T. W. Mayer	— J. Stevenson
— J. Dunsford	— W. J. T. Morton	— W. S. Surmon
— E. Dycer	— J. Osborne	— J. Turner
— W. Goodwin	— H. Pyatt	— T. Turner
— T. W. Gowing	— J. W. Riches	— T. Turner, jun.
— C. Hunting	— D. Sayer	— G. Varnell
— J. Hutton	— W. Sewell	— L. E. T. Vicary
— R. R. Hutton	— J. B. Simonds	— T. Wells
— F. King	— W. Smith	— J. Wilkinson
— H. Lepper	— J. Snow	— J. Woodger.

A sufficient length of time having been allowed to elapse, and no further contributions having been received, it was inferred that all desirous of forwarding their donations had done so. The Committee therefore met, and, acting on the principle that "hope deferred maketh the heart sick,"—

Resolved,—"That the subscription be considered as closed." And they further directed that the sums placed in the hands of the Treasurer, and now amounting to £57, be transmitted to Mons. Bouley, Secretary to the Central and National Society of Veterinary Medicine of France, for the benefit of the widows and orphans of the late Professors Dupuy and Rodet—a contribution to the general fund from the Members of the Veterinary Profession in Great Britain.

The following communication has been since received:—

My dear Sir, *Alfort, June* 10, 1850.

I have received the sum of £57, which you addressed to me for the families of Professors Dupuy and Rodet, in the name of our veterinary brethren of England, who have so kindly responded to your generous appeal. I am sorry that my remissness in not replying sooner should have caused you any uneasiness, and I trust you will excuse me, as I was not aware that so long a period had elapsed since the arrival of your letter of advice. I am so much engaged at this period of the year, that I do not observe the rapid progress of time.

I shall shortly have the pleasure of addressing to you a letter of thanks in the name of the Veterinary Society of Paris.

Be pleased to receive, my dear Sir,

the assurance of my devoted sentiments,

To Professor Morton. H. Bouley.

EXTRACTS FROM JOURNALS.

[As urinary deposits have lately awakened some investigation, and are, without doubt, of importance in relation to Pathology, the following extract may prove acceptable to many of our readers.]

Mode of Examining the Urine.

By Dr. Bence Jones.

The urine cannot be well seen unless in a transparent vessel. A six-ounce phial, filled with the urine, and sediment if there be any, will be sufficient for every purpose. If possible, the urine as soon as it is passed should be put into the bottle.

The first test to be used is litmus-paper. The question you ask is—What is the state as regards acidity—not as to the quality only, but as to the quantity? Is it too much, or too little acid? Litmus paper cannot fully answer this question. It can tell whether the urine is ammoniacal, or alkaline from fixed alkali, or contains little or much acid, but it cannot tell whether the acidity is more than it should be. Simple inspection of the urine is able to solve this question, and that better than any other mode whatever. There cannot be an excess of free acid in the urine without the uric acid being set free, though this often requires many hours to crystallize out. If, then, you wish to know if the urine is too acid, you must leave the phial at rest for twenty-four, and sometimes ninety-six, hours; and if there be too much acid, red crystals of uric acid will be very distinctly seen adhering to its sides, or deposited. The microscope may tell you quicker, but it will not tell you more surely, than the naked eye. Whatever the degree of reddening of the litmus, or the amount of urate-of-ammonia sediment, you cannot with truth speak positively of excess of acid being present, unless you see uric acid crystals; and it is only when free acid is present in the urine that alkaline remedies are absolutely necessary.

Litmus-paper, then, tells if the urine is acid or alkaline. Uric-acid crystals tell if it is too acid; their absence indicates that alkaline remedies are not absolutely necessary.

If the urine is alkaline, heat applied to the litmus-paper will generally tell whether it be from fixed alkali or ammonia. If the former, mineral acids and tonics have the best possible effect; if the latter, inflammation of the mucous membrane is the most probable cause of the change of the urea into carbonate of ammonia.

The microscopic examination of the sediment serves to confirm all these deductions. In the last case, pus-globules and prisms of phosphate of ammonia and magnesia are seen; in the former case, granules of phosphate of lime, and frequently oxalate-of lime octahedra.

Here, then, a short examination of the urine tells whether there is local inflammatory disease of the mucous membrane of the urinary organs, or whether the general disorder of the system is to be remedied by giving alkalies or acids.

After examining the acidity of the urine, if clear, the specific gravity is next to be taken, either by a urinometer, or by a bottle and balance. If the urine is of low specific gravity, the probability of albumen existing in the urine should be tested. If the urine is of high specific gravity, the existence of sugar should be suspected, and the more so the paler the urine is.

Having determined the specific gravity, a drop of the urine, with the sediment, should then be examined by the microscope. Pus, mucus, blood, fibrinous casts, urate of ammonia, uric acid, oxalate of lime, phosphate of ammonia and magnesia, may or may not be seen to be present. The drop of urine should then be left to dry on the glass for twelve or more hours, and then again examined, and sugar or urea may be then seen; and by the ease or difficulty with which the glass can be cleaned, albumen may be proved to be absent or present. The bottle, also, containing the urine, should, after twelve hours' standing, be again examined. Uric acid, blood, and pus, may then sometimes be more clearly seen by the naked eye. If, from this examination, pus is suspected to be present, the action of liquor potassæ on the sediment should produce ropiness. If fibrinous casts are seen, or adhesive matter forms on the slip of glass, the urine should be filtered and examined for albumen. If sugar is suspected, the sulphate-of-copper test, and the test by boiling liquor potassæ, should be also tried.

Let me again repeat another example of the knowledge which may be derived from examination of the urine.

Let me ask this question. Is there blood or is there no blood in the urine? If there is, does it proceed from the most frequent disease of the kidney—Bright's disease—or from calculus? The first question, simple inspection of the urine after it has stood in the phial for twelve hours will generally decide. Usually the blood-globules are insoluble in the saline urine; they subside in twelve hours; and though the eye cannot judge with certainty whilst the blood-globules are suspended, it can judge most accurately when they have fallen and form a layer at the bottom of the glass. For this no microscope is necessary, though it will more quickly decide this question; and without the microscope, the second question, as to the cause of the blood, cannot be solved except by the general symptoms. If fibrinous moulds of the ducts are found by the microscope with blood, there can be no doubt that the blood is caused by congestion of the cortical structure of the kidney; and if this constantly exists, Bright's disease is present, and the low specific gravity and excess of albumen in the urine will generally help to confirm this deduction; the history of the case always being well considered. If with the blood uric-acid or oxalate-of-lime crystals are found, and the specific gravity is high, and fibrinous moulds are wanting, then most probably a calculus is present in one kidney. Perfect rest will help to confirm or contradict this diagnosis. These instances I might multiply; but these are sufficient to shew you the value of examination of the urine for diagnosis and treatment. By such examination, both in serious diseases and in slight disorders, I believe that as much or even more useful evidence will be obtained regarding complaints of the stomach, the kidneys, and the system than has been acquired respecting diseases of the lungs and heart by the stethoscope. *The Lancet.*

Dr. Bernard on the Pancreatic Juice.

[Allusion was made in our last number to Dr. Bernard's experiments on the pancreatic juice. We extract the following account thereof from *The Medical Times*, deeming the subject one of considerable interest.]

It is easy to obtain the pancreatic juice of living animals. Those on which M. Bernard experimented were large dogs. Having exposed, by incision, the duodenum, and a portion of the pancreas, he made a small opening into one of the pancreatic ducts, and introduced a silver tube, destined to give issue to the secretion. The parts were then returned into the cavity of the abdomen, and the external wound closed by suture. A small Indian-rubber bag was now attached to the extremity of the tube, to receive the fluid. As the operation does not much affect the animal's health, the secretion goes on almost normally. In seven hours more than half an ounce of pure pancreatic juice was collected; but the quantity and quality of the fluid will vary according as the animal's stomach may be empty or in the act of digestion. The greatest quantity is obtained at the commencement of the digestive process. About two drachms per hour are secreted by a large dog. Should inflammation of the pancreas supervene, the fluid secreted is greatly increased in quantity, but so altered as to be unfit for experiment.

Characters of the Pancreatic Juice.—Healthy pancreatic juice is a colourless, viscid fluid, which issues slowly from the duct in syrupy drops, and soon foams on being agitated. It has no odour; its taste is slightly saline, like that of the serum of the blood. It has always an alkaline re-action. When exposed to heat, it coagulates into a concrete mass of remarkable whiteness. This solid principle is precipitated by nitric and sulphuric acids, the metallic salts, alcohol, &c.; and the precipitate is redissolved by the alkalies.

The pancreatic juice, then, has many of the chemical properties of albumen, but its physiological properties are quite different. Besides, it may be distinguished chemically from albumen by the fact that the dried precipitate is soluble in water, whereas albumen, treated in the same manner, is nearly insoluble.

The pancreatic juice is, of all the secretions, the one which becomes altered most rapidly. When exposed for a few hours to a heat of from 104° to 140° Fahr., it emits a nauseous odour, and loses its property of coagulating. Summer heat or thunder-storms will alter it in a few minutes; hence it should always be kept cool.

Function of the Pancreas.—The function of the pancreatic gland is to furnish a juice which dissolves, or, in other words, prepares for digestion, the neutral fatty matters of the food.

This is easily demonstrated by experiment. It is unnecessary to describe the long series employed and recorded by M. Bernard. They prove, "that healthy pancreatic juice enjoys the property of instantly changing all the neutral fatty matters into a kind of emulsion, and subsequently converting them into glycerine and fatty acid." It is, besides, the only animal secretion which possesses this property. Bile, saliva, gastric juice, serum, and other fluids, when mixed with the fatty matters, exercised no influence on them.

The experiments were repeated in the presence of MM. Majendie, Rayer, Bouillaud, Andral, and Berard.

Action of the Juice during Digestion.—From the preceding experiments with the pancreatic juice out of the living body, it seems admissible to conclude, that this fluid, by changing the fatty matters into an emulsion, renders them capable of being absorbed, and thus becomes the principal agent in the formation of chyle. This latter fluid, when perfect, always contains a certain proportion of fatty matter intimately mixed with it. In the stomach the fatty substances are merely liquefied, and not changed. Now, when the two pancreatic ducts of the dog are tied, the fat passes through the intestinal canal without the slightest change, and the lacteals contain a limpid chyle, which affords no trace of fat.

The rabbit, however, affords an opportunity of testing the fact in an elegant and convincing manner. In this animal the pancreatic duct joins the intestine very low down, nearly fourteen inches below the opening of the gall-duct; and it is easy to demonstrate the existence of two kinds of chyle in the lacteals. High up they contain a transparent chyle; but immediately below the opening of the pancreatic duct they hold an homogeneous and milky chyle, which contains the usual fatty principles.

The above conclusions, are, it will be seen, diametrically opposed to those of Sir Benjamin Brodie, who maintains that chylification is effected through means of the bile. Having tied the ductus choledocus in cats, and found that the lacteals no longer contained any thing but a limpid chyle, without fatty matter, Brodie came to the conclusion just mentioned. But when Majendie repeated the same experiment on dogs, he did not obtain the same results, perfect chyle being formed, notwithstanding the ligature. The error of Sir B. Brodie may, perhaps, be explained in the following manner:—In cats the pancreatic duct joins the biliary duct before the latter opens into the intestine. Hence, it is very possible that Brodie tied the common duct, and thus cut off the supply of pancreatic as well as hepatic secretion. In dogs the two ducts are separate, and the experiments of M. Majendie are therefore more conclusive.

It would, therefore, appear to be demonstrated that *bile* is not the grand agent of digestion, as British practitioners have been so long taught to believe; and, if this be the case, what becomes of our blue-pill?

The Medical Times.

On the Production of Sugar in the Living Body by the Liver.

By M. Bernard.

In the vegetable kingdom, sugar is evidently formed by the organs of the plant. Does the same occur in the animal kingdom? or is the sugar found in the living body derived from the amylaceous and saccharine matters contained in their food? Such is the interesting question which M. Bernard, the discoverer of the function of the pancreas, endeavours to solve in a memoir, an analysis of which we now present to our readers.

As the food which animals take often contains more or less saccharine matter, it was natural to consider, that the sugar found in their blood or fluids was solely derived from this source, and such is the prevailing opinion at the present day. This idea was, moreover, confirmed by the theory, that animals are incapable of creating any immediate principle, but merely destroy those which are furnished to them by the vegetable kingdom. Hence the power of generating sugar has been said not to exist in animals, who are supposed to be capable of destroying that principle, and nothing more. Experiment and physiology overthrow this doctrine.

The first series of experiments performed by M. Bernard relate to the conditions necessary for the formation of sugar. Animals were fed on substances containing the sugar, or a substance capable of being transformed into sugar; and this latter principle was accordingly found in the blood soon after the meal. But it was necessary to push the inquiry further. Other animals were, therefore, fed on flesh, or left fasting for a long time: they were then killed, and their blood equally contained sugar. This important fact once determined, it became necessary to ascertain whence was derived the sugar found in animals which had not taken a particle of saccharine or amylaceous food. The sugar, though found in the blood of the heart, was not, probably, fabricated in that organ. Where, then, was it made? A glandular apparatus of the abdomen was the most probable source, and, after various unsuccessful attempts which need not be noticed here, M. Bernard adopted the following method:—

A dog was fed on flesh, and then stunned seven hours afterwards. Some blood was collected from the vena porta, some chyle from the thoracic duct, some blood from the heart, and, finally, some of the matters contained in the stomach and intestines; all these were carefully tested for sugar. It was found in some quantity in the blood of the heart; in much greater quantity in the blood of the vena porta. Not a trace could be discovered in the matters taken from the stomach and bowels.

These experiments, frequently repeated, always gave the same results, and the author was evidently on the track of his discovery.

Whence comes the sugar in the vena porta ? was the next point to be ascertained. A dog fed on flesh was rapidly killed, and all the veins coming from the principal organs of the abdomen were quickly tied. No sugar could be found in the blood of the intestinal, gastric, pancreatic, or splenic veins ; while the hepatic veins, on the contrary, contained large quantities. The tissue of the liver was now analysed, and sugar found in it : the tissues of the other organs contained none.

The question was thus solved. The liver manufactures sugar. But it may be asked, How came it that sugar was found in the hepatic veins, since, if made by the liver, it should have been carried forward towards the heart by the supra-hepatic veins ? The answer is simple. When the abdominal cavity is opened, all pressure is removed. The blood returns by reflux into the porta and hepatic veins. On placing a ligature over the porta, at the point where it enters the liver, no sugar is found in its blood, for no reflux then takes place.

It thus follows, from the experiments now noticed, that the liver contains a considerable quantity of sugar ; that this sugar is dissolved in the blood which traverses the liver, and that it is thence carried by the veins to the heart.

Having clearly established this important proposition, M. Bernard proceeds to describe at great length the various processes which he employed for the purpose of determining the presence of sugar in the liver and blood ; but it is unnecessary to enter into these details, which are purely chemical. When a portion of the liver is triturated, then boiled for a few minutes in a small quantity of water, and filtered, we obtain an opaline fluid, having all the characters of a saccharine solution. This latter turns brown when boiled with potass ; reduces the tartrate of potass and copper, and ferments on the addition of a leaven, giving off carbonic acid, and the residue, when distilled, furnishes alcohol. M. Bernard has never been able to obtain the sugar in a crystallized state, on account of the great quantity of salts contained in the tissue of the liver. He thinks himself justified, however, in affirming that it is not cane sugar, nor the sugar of milk, nor glucose, but the same principle as the sugar of diabetes.

Lastly, it may be asked, whence is derived the sugar contained in the liver ? Here two suppositions are admissible,—either the sugar is formed by transformation of certain elements of the liver, or it arises from antecedent alimentation. The latter hypothesis is not adopted by M. Bernard. Sugar was found in the blood of dogs which had been fed on flesh for nineteen days. Again, section of the pneumogastric nerves suspends the formation of sugar in the liver, even in animals fed on carrots, &c. Its presence in that organ has been demonstrated at the fourth and fifth month of intra-uterine life.

Conclusions.

These may be given in M. Bernard's words :—

" Diabetic sugar exists normally and constantly in the blood of the heart, and in the liver of man and animals.

" This sugar is formed in the liver, and is not derived from saccharine or amylaceous nutriment.

" Its formation commences during intra-uterine life, and, consequently, before the ingestion of any food.

" The secretion of this saccharine matter appears to be connected with the pneumogastric nerves."

The preceding facts overthrow, in the clearest manner, the generally admitted law, that animals are incapable of producing any immediate principle. We here see that animals, like vegetables, can both create and destroy sugar. But the question is far from being exhausted. From what has been said, we are not to conclude that sugar will be found in the liver of the first subject taken from a dissecting-room. Many diseases eliminate it from that organ before death. It is well known that sugar disappears from the urine of diabetic patients some time previous to death ; it also disappears from the liver. M. Bernard examined the livers of nineteen subjects, and in several there was no sugar ; but his observations are not numerous enough to decide under what circumstances the sugar thus disappears. It is already certain that lingering disease either diminishes the quantity in a remarkable manner, or removes it altogether.

The different classes of animals may also present differences in a normal state. There is a good deal in the livers of birds and mammalia, while fishes do not contain any sugar. Whence this difference ? Perhaps, from the peculiar respiratory phenomena of these animals ; for M. Bernard proposes demonstrating, in another memoir, that the energy of these phenomena is intimately connected with the formation of sugar in the liver.

The Medical Times.

Diabetes in a Bitch.

M. Leblanc (veterinary surgeon) has addressed a note to the French Academy of Medicine relative to the occurrence of saccharine diabetes in a bitch, who had fed all her life on raw meat. (*L'Un. Med.*, Feb. 21.)

Case of Retention of Urine in a Horse—Puncture of the Urethra.

Report of the Case, by Pupil Hurney—Observations by M. Luton.

On the 6th of February 1849 a cabriolet-horse, belonging to M. Chambaud, farmer at Lyons, was admitted into the infirmary for treatment. The animal was in poor condition, of the German breed, fifteen hands high, and eight years old.

Remarks.—We were informed by the servant who brought him that the horse was subject to slight colicky pains, seemingly of little moment, as they disappeared as soon as the animal had satisfied his desire to urinate. To-day, contrary to his usual habit, these colicky pains had shewn themselves more violent, and had continued already about two hours.

State of the Animal when admitted into the Infirmary.—He staggered as he walked ; the head was depressed ; the countenance indicated pain ; the nostrils were dilated ; the eyes fixed and brilliant ; the artery at the jaw full, and the pulse accelerated ; the conjunctival membrane much injected ; general perspiration covered the body, but more especially over the loins, flanks, and internal surface of the thighs. The animal looks at his sides, strikes his belly with his foot, paws the ground, lies down, rolls over, and then rises, appearing to be in the greatest pain. These attacks are very acute, and do not allow him an instant of repose.

Diagnosis.—Intestinal congestion.

Treatment.—Ordered blood to be abstracted, and ol. terebinth. to be well rubbed in under the belly and on the inside of the thighs. Twenty minutes elapsed without any advantageous change taking place. During the progress of the disease the animal places himself in a position to urinate, and endeavours to do so, but without success.

These new symptoms, unobserved until the present moment, induced me to suspect that the disease might have its seat in the urinary organs. The bladder was explored, and the error of our diagnosis made manifest, as the cause of the sufferings of the animal was from a retention of urine. Nothing in the course of the urethra or in the bladder led us to suppose the existence of a calculus.

Treatment.—It was deemed advisable, in as short a time as possible, to let the urine escape, which filled the urinary vesicle to distention.

With this view, we endeavoured to compress the bladder by introducing the arm up the rectum; but, although we tried several times to effect this, it was without success. The power of the hand was not sufficient to overcome the obstacle which opposed the escape of the urine; and we feared, and it was expected, that pressure more energetically applied would burst the bladder, so much was this organ distended.

An India-rubber catheter, about fifty inches in length, was introduced into the canal of the urethra, but without any success; and, after the most persevering efforts, we were compelled to abandon the use of it, not being able to pass the sound beyond or through the neck of the bladder, so much was it contracted. We then again had recourse to pressure with the hand on the bladder, but still without avail. Thirty grains of nitrate of potash were then administered. Half an hour having been allowed to elapse after the administration of this medicine, the sufferings of the animal became more acute, the pulse weak, and the extremities cold.

The only resource which presented itself was that of trying urethraotomy, so that the catheter might be introduced into the bladder; and it was at once decided to hazard this operation.

The horse being conveniently fixed by a side line, by means of the ordinary syringe tepid water was injected into the urethral canal, in order to render it more prominent on the exterior, and while an assistant elevated the animal's tail, the operator, having the bistoury in his right hand, passed the blade of the instrument on a line with the ischiatic tuberosities to the depth of four or five centimetres, and, withdrawing it, enlarged the orifice by a slight incision. The water which filled the urethral canal escaped by the aperture thus made. The injection of tepid water being repeated, it was found to flow through the same opening into which the catheter was passed, and directed upwards. The blade of the straight bistoury, following the groove in the sound with the cutting-edge turned backwards, was now introduced into the interior of the urethral canal until the point of the instrument had reached superiorly the line of the incision which we were desirous of making; and, in order to obviate any lateral or upward direction, the operator, by a flexile movement of the hand, divided the tissues by directing the instrument horizontally. Profuse capillary hæmorrhage ensued, but it was not productive of any serious consequences. The aperture resulting from this operation permitted the introduction of the forceps, and, after a careful examination, no indication of the existence of a calculus either in the neck or interior of the bladder itself was perceptible. After this, efforts to urinate were made, when the bladder was immediately compressed, but without any result. The elastic catheter before used was now introduced by the artificial opening made, and plunged into the bladder, at the same time, by the aid of the hand, the superior part of the organ was compressed; these two means, by their simultaneous action, caused the escape of some urine of a yellow colour, sedimentous, and viscid. It flowed through the catheter, and the quantity may be estimated as being about three pints and a half. The bladder, which before had extended far into the abdominal cavity, now advanced forwards; it still remained, however, of a large size. Thinking that it would be easy to draw off an amount of fluid at least equal to that which was injected, by the assistance of the catheter which remained in the same position, about a quart of warm water was injected into the bladder, when there flowed out the same quantity of fluid, consisting of the mixture of the water just injected and the urine contained in the bladder. This was repeated several times; hoping by this means to replace the urine, which had become irritating, by the water which was warm and emollient, and the absorption of which is quick and easy. We did not, however, entirely succeed; nevertheless the bladder was not so much distended, and it returned into its normal position.

The sufferings of the animal after this were less, and the colicky pains disappeared. Conducted into his stall, he endeavoured to eat some of his litter, and received with pleasure the warm farinaceous drinks presented to him. He was then rubbed dry, comfortably clothed, and left quiet.

In the evening he again experienced, at two different intervals, a return of the colicky pains, which however soon disappeared. The animal also has been enabled to urinate without the aid of the catheter.

Feb. 7th.—The patient is slightly feverish, the flanks evince pain on pressure, and the urine flows freely by the artificial opening made during the operation. Total abstinence from solid food enjoined.

8*th.*—No change. A small quantity of hay only given.

9*th.*—General state of the animal satisfactory. The urine flows partly by the urethral canal, and partly by the artificial opening.

10*th and* 11*th.*—Patient lively. The wound in the canal of the urethra is much diminished, and proceeding rapidly towards cicatrization. Placed on full diet.

12*th.*—The inferior extremity of the penis is tumefied and painful. The urethra at this part is also swollen, and does not allow an easy escape of the urine, which, on this account, flows chiefly by the artificial opening. Scarifications were made over the swelling, and the parts directed to be bathed with a decoction of poppy-heads. Subsequently the penis became pendulous, and required to be suspended by a bandage. Administered a dose of the sulphate of soda, and diminished the diet.

13*th.*—The patient more lively; fever less intense, and the swelling of the extremity of the penis much diminished. The urine flows more freely by the ordinary channel. Repeat the medicine as on the previous day.

14*th.*—Animal in the same state: pursue the same treatment, allowing a moderate quantity of hay.

15*th.*—The wound continues to cicatrize, but the reactionary fever is very intense. The animal is also much debilitated: this was attributed to the blood-letting at the commencement of the attack. Aromatic wine to be given, and place on full diet.

16*th*.—The wound in the urethra has entirely closed, and the patient is lively. On the following day he was removed from the hospital, being in a state of perfect convalescence.

On the second of March following, this horse was again admitted into the hospital of the school, to be treated for a large œdematous swelling, having its seat on the sheath. It was thought that acute inflammation had been set up in the interior of the canal of the urethra, occasioned by the manipulations necessary for the introduction of the catheter into the bladder. Scarifications of the swelling were resorted to and the animal placed on low diet. During the following days the swelling increased in size, and the application of some ung. lyttæ was therefore ordered.

March 14*th*.—An enormous abscess was opened at the superior part of the sheath, from which escaped a considerable quantity of thick sanguineous pus. From this time the swelling gradually diminished.

March 17*th*.—The animal was removed from the hospital completely cured.

We have since seen him, and were informed that he had continued to do his ordinary work well.

Remarks on the case, by M. Luton.—It is true that, by the aid of an elastic catheter introduced into the bladder through the urethra, it is sometimes possible to effect the evacuation of a certain amount of urine, but it should be had recourse to with reserve, for it must be borne in mind that the length of the urethral canal, and the marked curve which it describes in passing over the ischial arch, render it necessary that the operator; for an instant at least, should introduce into the interior of the probe a piece of whalebone of a certain degree of rigidity, and by this means the mucous membrane is inevitably irritated, and that sometimes to a considerable extent; while a still greater difficulty remains, namely, to pass the catheter through the neck of the bladder, which, excited by the pressure of a foreign body, contracts with an energy proportionate to the force employed in surmounting the resistance offered to the pressure of the instrument; and, finally, even when the bladder has been reached, we cannot flatter ourseves with the hope of obtaining the escape of a large quantity of urine, because the probe has a tendency to be forced against the superior wall of the bladder instead of being plunged into the middle of the fluid, the evacuation of which it is destined to facilitate.

The operation of *urethraotomy*, indispensable in cases analogous to that which we have just reported, does not enable us to escape, however, from all the difficulties that present themselves in practice. I am guided by these reflections, founded on the observation of facts, to the idea of bringing to the catheter a modification which will permit it to fulfil more surely the part of a syphon, which it is called upon to play. This identity with the syphon has frequently struck us, and at the first glance we have concluded that the catheter thus modified would offer an early and certain mode of extracting the whole of the urine which the bladder contained, provided that *urethraotomy* had always previously been performed. Nevertheless, in the hope of verifying the exactitude of our views, the following experiments have been made:—

1*st Experiment, February* 24*th*, 1849.—At ten o'clock in the morning we tied with a piece of thread the inferior extremity of the penis of a horse, in order to obtain a large amount of urine in the bladder. This, however, was not completely attained, as a certain quantity still flowed out, in spite of the enormous swelling which extended all round the ligature.

The next day, at the same hour, after having performed the operation of urethraotomy according to the ordinary mode, we introduced by the artificial opening an elastic catheter, modified as we have just advised, and as soon as the animal made any effort, the urine flowed in a continued stream, which lasted during forty-five minutes, and did not stop until the bladder was entirely empty. The quantity obtained by these means was estimated as being about two litres. We injected afterwards into the bladder, by the aid of the same instrument, three litres of water. The probe was then withdrawn and introduced an instant after, when we obtained the same result as before. We remarked that this liquid was only mixed with a small quantity of urine. The first time, nearly all the urine contained in the bladder had been withdrawn. Another injection of warm water was made, and precisely the same results took place.

2*d* *Experiment.* — This second experiment was made upon another horse, in condition similar to the first, and the results were the same. The experiment finished, the animal which had been the subject of it was killed and opened, when the bladder was found completely empty, presenting only a slight inflammatory blush towards its fundus.

Journal de Médicine Vétérinaire à l'Ecole de Lyon.

Extraction of a Calculus from the Neck of the Bladder—Urethraotomy—Cure.

By M. Bonneford, *V. S., Vienne.*

Sept. 17*th,* 1847.—I was called to attend a horse in low condition, small in stature, and about twelve years old, affected with violent colicky pains.

Remarks.—For three days past this animal had not been observed to pass the slightest quantity of urine, only voiding from time to time small quantities of blood. He refused all food, and had an unextinguishable thirst.

Symptoms.—Languor ; head depressed ; visible mucous membranes much injected ; mouth very hot ; pulse hard, and making during the minute 65 pulsations ; the body covered with a cold perspiration, especially towards the hind extremities ; violent colicky pains, during which the animal strove to place himself continually on his back.

The escape of blood induced me to examine the urinary passage. I had informed myself at the first of the state of the bladder, which organ appeared ready to burst from distention.

In order to discover the cause of this retention of urine, I slid my hand from the neck of the bladder, and followed the canal of the urethra towards its bend. There I felt a hard body of an oval form, which I concluded was a calculus. After making vain efforts from above and below to dislodge it, assisted by oily injections so as to make the body glide, the animal appeared to me to be menaced with immediate death ; I, therefore, decided at once to take the chance of an operation. Profiting by the time when the animal was lying down, we had him carefully secured ; then, while an assistant kept the tail in an elevated position, I made a longitudinal incision upon the right side of the urethral canal, in order to avoid the artery of the bulb. Shortly afterwards I withdrew with my fingers, without the aid of the forceps, a calculus the size of a small pigeon's egg. It was of a yellow colour, the surface rough and irregular. Immediately a large quantity of urine, mixed with blood, flowed through the opening. It was likewise of a dark colour, and highly offensive. I afterwards placed in the interior of the wound a pledget of tow dipped in tincture of aloes, and drew together by a suture the separated parts, in order to facilitate the dressing. The animal, when unbound, arose immediately: he was directed to be kept on low diet. An hour after, I removed some clots of blood, and I left the dressing in the wound until the next evening. The animal urinated as soon as it was removed, and the greater part of the urine escaped by the artificial opening made in the urethra. I then replaced the dressing. During several days I proceeded in the same manner, when gradually the orifice closed, and eight days after the operation the urine passed by its ordinary channel. A stimulating lotion was now applied to the surface of the wound, and the cicatrization soon became complete.

Ibid.

Note on the Physiological Action of Ether, Chloroform, and analogous Anæsthetic Agents.

By M. E. Robin.

The author admits, with several physiologists who have studied this question, that the anæsthetic action of these substances is the result of a more or less complete state of asphyxia. Now, this asphyxia is produced, according to him, because the vapours of ether or chloroform, which penetrate into the lungs, prevent the oxygen of the air which enters into the lungs with them from exerting on the lungs the action—which is the principal result, the object of the action—of respiration; because these vapours shield the blood contained in the capillary vessels against the action of oxygen, as fluid, ether, and chloroform, protect from the same agent a piece of muscular flesh, or any other pulpy animal substance steeped in them.

TRANSACTIONS OF THE VETERINARY MEDICAL ASSOCIATION.

Resumed debate on Mr. *Cartledge*'s paper "*On Counter-irritants.*"

A communication from Mr. J. Mellows, V.S., *Half-pay*, late of the 1st Dragoon Guards, was read:—

Dear Sir. *Prebend-street, Camden Town, Dec.* 23*d*, 1847.

When I had the honour to be present as your visitor at the discussion of the Veterinary Association a short time since, I conceived that it would be indecorous for me then to offer any remarks elicited by the debate. I however paid great attention to the question included in the term "counter-irritation;" and if you consider the following observations at all useful, when the subject is renewed, I respectfully submit them to the Society. In the first place, I solicit your separate perusal of them, that you may interpose your veto should they appear superfluous, or their admission inconsistent with some rule in the constitution of your meetings. I have not many years been familiar with the words "counter-irritation," "counter-irritants," and the like. To my ear these sounds are rather new; and though I, in common with other practitioners, have used these terms when explaining the action they produce, yet I admit I should have found a difficulty in defining the essential meaning of the terms, had I been closely and critically interrogated. Two gentlemen, whose studies must have been more recent than mine, and, of course, better acquainted with the technical language of the present day, appeared to differ in the definition of "counter-excitement." Each, no doubt, had in his own mind a meaning essentially correct, yet the word was used by each according to a different acceptation. The legitimate use of technical language is, not to display the learning of the speaker by a difference from the uninformed; nor, as some have supposed, to conceal the minutiæ of science from the vulgar; but rather to render the minds of the studious familiar with a more recondite science than can be symbolized by common terms. I therefore conceive that it is of importance not only that the general meaning should be known, but that the essential definition should be specifically understood. This, in my opinion, appears more especially requisite for gentlemen being initiated in an art now placed among the liberal professions; so that when they go out in the world, they may be able to shew that the veterinary art is on the "march of intellect," and that its followers have a clear and definite knowledge of the terms they use. When I was a student in this Institution, in the year 1801, we were taught, as a matter of course, that inflammations deeply seated were relieved frequently by superficial determinations. If the word "counter" had been used, the description implied "counter-determination," and the applications "counter-determinants." Is this the manner in which counter-irritants are said to operate? Do they apply to the hitherto more latent causes of determination? I have asked this question of several medical men. Some have given the above-mentioned acceptation to the terms; others have considered that they implied *a newly-excited irritation in a part already under the excitement or irritation of disease.* This is somewhat analogous to the doctrine of homœopathy, whose specifics are said to act similarly to the diseases they are proposed to overcome. At any rate, the two acceptations are specifically different, and I think this was the difference between the gentlemen to whom I have alluded at the beginning of this letter. The pathological law of counter-determination is embodied in the practice of medicine; but when I was a student, I do not know that any term was used to define the essence of its operation. With respect to irritation artificially excited in a part already under the irritation of disease, I do not think its efficacy rests on a sufficient induction of facts to warrant the general use of the word "counter-irritants;" and, when the language is used, I think the sense intended by the speaker should be stated.

I beg, Sir, in pursuing this theme, to presume a case of exostosis; say, for example, a spavin, which has been for some time, and is still, in a course of progressive growth, and that it is manifestly productive of pain, rendering the animal decidedly lame, and nearly useless. Let us next presume that, subsequently, the cautery has been deeply applied; that a period has elapsed commensurate to the subsidence of the artificially-excited inflammation; that the pain has diminished, and the consequent lameness become less considerable; and that the exostosis not only has ceased to grow, but now occupies a smaller space on the surface of the bone. These effects, in this presumed case, we propose when we "fire" for a spavin; and, taking for granted they have fully answered our expectations, let me now suppose that I am required to account for these changes under the head "counter-irritation." I am free to admit that the task would be a tax on my ingenuity, and I should find a difficulty to meet it. The iron, no doubt, would have caused a commensurate inflammation in the adjacent parts, and, associated with increased pain, be, perhaps, considered as a counter-action to the periosteal sensation on which the lameness primarily depended, But, even though I made no distinction between a sensitive and an irritative effect, I should rather fall into the opinion suggested in the debate, that the pain and lameness were removed by the iron *in the nature of neurotomy;* for the nervous fibrils must have been destroyed by the heated instrument; and this, I presume, was the chief purpose proposed by the deep firing recommended in spavin. The case may be, in some measure, explained by the pain we feel in consequence of a hollow tooth; for, as far as regards the sensation, it is the same whether produced by a morbid loss or growth of substance. Use as many counter-excitants or irritants as you please, you will effect but a transient relief as long as the dental nerve is in a living state. But, probe effectually the hollow tooth with a heated wire, or apply sulphuric acid within the part (this last is a very simple and easy cure for the tooth-ach), and the destruction of the nerve will effectually remove the tooth-ach. I have seen some instances in which caustics had, with similar results been applied to spavins. Incisions had been made through the integument, and bi-chloride of mercury introduced. In two instances, it opened the joint and destroyed the horse; but one animal, totally useless, it restored to temporary utility; and this, I think, can be explained only on the principle of neurotomy. Let us, however, suppose that the iron has produced counter-irritation, or has excited a sensation of pain counter to that arising from the spavin, transferring a deeply-seated to a more superficial sensation, and that thus it has relieved the lameness of the spavin, by favouring the motion of the joint—does it account for the discontinuance of ossific deposition, and the subsequent diminution of its volume? The action of the depositing arteries must have been lessened, and that of the absorbents preternaturally excited. In all respects there has been counter-excitement (excitement being used as a general term, applicable to all organic action); but I cannot see how all these separate effects are reducible to the law of irritation. Besides, the action of the iron being considered as a counter-irritant, the cautery was recommended to produce an alteration in the texture of the skin; and as this statement did not appear to be unanimously received, I shall take the liberty to view it as an abstract position. Are such alterations effected in the integuments as give them a deeper or firmer texture? First, then, is the integument thickened in its substance? We know that a coagulum is deposited between the cutis and the subjacent tissues. Such a coagulum follows not only the application of the iron but that of active blisters, particularly when those excitants have been repeated more than once. The deposit afterwards is partially removed by the absorbents, yet, in my opinion, a portion of it remains, enters into a new cutaneous organization, and renders the skin thicker than before. This brings me to a slight difference of opinion on the word "contraction;" not, however, used under a particular acceptation, but left indefinite, whether to be considered as a vital or a physical effect—a retraction merely of the cutaneous fibres closer within the texture of the integuments. The effects mentioned by one gentleman as contraction were considered by another as expansion. The one regarding only the immediate effect on the skin, the other the subsequent effect on the tissues. The difference was accordingly reconciled by the affirmation that absolute contraction under the one view was relative expansion in the other.

This, then, was the state of the proposition; but the *modus operandi* was not explained, which explanation I shall therefore take the liberty of attempting. When an incision is made into the cutis, particularly with the iron, and the vitality of the surface has yielded to the sharp edge of the heated instrument, the integument recedes from the line of section; and when two lines approaching to a parallel are described it recedes from each, and covers a smaller surface than before the lines were drawn. This loss is ultimately restored; but the restoration is not made by a physical expansion or elongation of the cutaneous fibres, but by a new growth, that is, by a deposition and organization of new matter, forming a living structure, whose texture becomes interwoven into the divided portion of the skin. This process produces a thickening of the cutaneous substance. It becomes more indurated, and its surface loses somewhat of its sensibility. This statement receives a corroboration from an observation mentioned in the debate, namely, the difficulty experienced by operators in passing setons through parts of the skin that had been fired. Nor is this answered by alleging that at some future period the normal state of the cutis is partly restored. In this place I think I can state, as the result of experience, that a similar thickening of the skin is sometimes induced by repeated blisters; but in these latter instances it sooner recovers its original state, if there has been no destruction of substance; and then the sensibility becomes as acute as in other parts. But whether the effects I have mentioned be admitted or denied, our chief consideration is the utility of the measure in the prevention or cure of injury and lameness. The change in the structure of the skin was the earliest reason for the operation. It was proposed to give a firmer texture, and to render the integuments securer bandages on the subjacent tissues, and on the tendons. This opinion was carried so far that, even in my time, sound horses were often fired as a preventive practice, when the owner fancied the skin was too fine for the purposes of nature.

In the 23d Dragoons, some forty years ago, more than two-thirds of their horses had, at some time or another, undergone this operation. It was favoured by the commanding officer, and, the veterinary surgeon entertaining the same opinion, fortunately for himself, met the expectations of his superior by a correct eye and steady hand. The lines were finely and accurately marked, and beautifully feathered on the surface of the cutis, and thus nature was said to be improved by artistical embellishment. I do not say that the operation was performed in that regiment merely as a preventive measure (as I have often known it in private practice). Some disease or accident was always said to indicate the application; but the slightest hurt, if called a strain, was deemed sufficient; and yet I never heard that fewer horses were cast from that than from other regiments, on account of the injuries the operation was said to cure. For my own part, notwithstanding my observations on the thickening of the cutis, which at the first view seems agreeable to the principle on which, in former times, firing was recommended; yet I am very sceptical concerning its superior advantages to those of other applications. For instance, in cases ordinarily denominated strains in the back sinews, and similar accidents, I admit that, in the first instance, it creates more external and adjacent inflammation, but I question if this is not counterbalanced by a subsequently diminished excitability, leading, at some future period, to a second operation, as unsuccessful as the first. Nor can I think the thickening and induration of the skin, though the effects should remain, preferable to artificial bandages, adapted and regulated "*pro re nata,*" according to the skill and judgment of an intelligent practitioner. I am not, however, equally sceptical in painful cases of exostosis, particularly in spavins of long duration, that have rendered the animal nearly useless to his owner; for since the lameness does not admit of a radical cure, it would be better, if inconsiderable, to leave the case to nature. In the first place, as already stated, the iron removes, as by neurotomy, the morbid sensibility of the part, and thus relieves it of the pain and consequent lameness attendant on the motion of the joint. In the next, it gives a counter-action to the depositing arteries by the opposite excitement of the absorbents.

I do not pretend to offer the above remarks as original. As, however, such questions are often resolvable as well by experience as theory, I respectfully submit them to you, should you deem them worthy to be read at any time to the society.

I have the honour to be, dear sir,

Your most obedient and very humble servant.

To W. J. T. Morton, Esq., Secretary, &c.

Mr. Gamgee, after having adverted to the advantages derivable from an application of scientific principles to medicine, and stating how baseless the superstructure would be if not resting on these as foundations, asked the author of the thesis, what he implied in the employment of the term CHRONIC in reference to inflammation? Was it the long continuance of inflammatory action, or had all indications of this action ceased and altogether disappeared?

Mr. Cartledge replied by adducing a disease as explanatory of his meaning: a cough which has existed for some time, as a month or two, he would say had become CHRONIC. So when the acuteness of an inflammatory attack had passed off, and health had not returned, the stage designated sub-acute might be said to exist. In both of these forms of disease he advocated the employment of counter-irritants; but in the truly acute stages of disease he should abstain from their use, for he believed that two active inflammations might exist in the organism at one and the same time, and hence these agents could not become curative. Other means would therefore be preferred by him, so as to lessen the increased action set up in a part; and when this had been obtained, then counter-irritative agents may be advantageously had recourse to. Thus, in enteritis, he would resort to blood-letting and the administration of sedative agents before he should think of employing counter-irritants of any kind; but should a relapse occur, or the acute stage become protracted, then he certainly would not hesitate to use them conjointly with his other remedies.

Mr. Clements would not object to their employment in the first or acute stage, that is, immediately after the use of the lancet, the urgency of the symptoms demanding the withdrawal of blood, since time was required before the full operation of this class of agents was brought about. Moreover, their action depends upon the determination of blood to a part, and thus the part originally affected or labouring under the effects of increased vascular action becomes relieved: they are, in fact, depletives of a mild form, and lessen inflammatory action by diminishing the amount of blood in the system.

Mr. Gamgee deprecated the use of counter-irritants in the acute stage of any disease. Doing too much, he said, was as bad as doing too little. Their influence at no time could be so powerful as to overcome diseased action of any internal viscus in its primary or active stage; but when this had been subdued, when the therapeutics employed had made an impression on the system, then they might, perhaps, be beneficially had recourse to. Were they not in their operation essentially irritants? and was it desirable to create more excitement in the system when already some portion of it, some organ or viscus, was affected? He certainly viewed them as antagonistic in their action, setting up another disease in a less vital organ than that affected, yet their *immediate* operation being that of an irritant, until antiphlogistic measures had been tried he would not advocate their use. But when the disease had assumed a chronic form—and by chronic he understood long standing—or was even sub-acute, then he would not hesitate to employ them.

Mr. Clements by no means meant to imply that he would resort to counter-irritants to the exclusion of the lancet in acute attacks, or even before it; but he thought it desirable, as hours might elapse before the desired action would be induced by them, to apply them immediately afterwards. They certainly were revulsives; and we should endeavour by all means in our power to dislodge the enemy from his strong hold, and a combination of means often proved more effective for this purpose than any one employed alone.

Mr. Cartledge, in reply to the inquiry from Mr. Lord, stated that he should apply these agents as near as possible to the part affected. The older practice had been to apply them at remote distances, on the principle that they drew away the humours; a view altogether erroneous and absurd.

Mr. Brown in part agreed with those who would not employ counter-irritants in the acute form of any disease; not, however, altogether on the grounds advanced by some, that they would induce greater excitement, since it was well known that oftentimes no action whatever was created by them, and this became a prognostic sign. Again, judgment on the part of the practitioner is called for in the agents to be thus employed, lest by its absorption a gland or viscus implicated should become even more powerfully excited, and thus evil rather than good would follow their use. He also did not concur with the statement made by physiologists, that two active inflammations could not exist in the organism at one and the same time.

Mr. Clements saw no reason why, because action did not follow on the application of a counter-irritant, that it should not be resorted to. He considered that this became merely a proof that more disease existed in a part than we were able to produce by artificial means in another. It was an unfavourable sign it must be allowed, and yet it enabled us, by external indications, to ascertain the comparative amount of inflammation existing internally.

As it respects the action of blisters, it will be borne in mind that hours must elapse before their full effects are brought about, and often they call for repetition. *When* and *where* they are to be applied require the judgment of the practitioner, and oftentimes doubtlessly these, in common with every other therapeutic, are abused ; still this is no argument against their usefulness. The reason why they do not act is, of course, referrible to the blood, on which their operation depends, being determined elsewhere.

Mr. Varnell, as a general law, would advocate the use of these remedies only after the subsidence of active inflammation in an organ or a viscus. When the usual antiphlogistic measures had been resorted to, and that with some degree of benefit, then may we hope that their employment would prove of service. In themselves they were not, strictly speaking, curative, but aids or adjuvants to other measures. This being a general law, there were exceptions to it which rendered it so ; therefore in some individual cases, as, for instance, inflammation of the bowels, hot rugs and agents of the class under notice may be used simultaneously with medicinal agents and blood-letting. On the other hand, in acute attacks of the lungs, he should abstain from their employment, but in chronic and sub-acute affections he was favourable to them.

Mr. Lord did not think it sufficient that the immediate influence of these agents on disease should be taken notice of; their remote or secondary action should be considered. There were some the use of which would be highly objectionable, for instance, terebinthinate and cantharidine compounds in affections of the kidneys; for these the sheep-skin may be substituted, the effects of which may be referred to a threefold action : 1st, Being applied, generally speaking, as soon as removed from the animal, it becomes the source of considerable irritation, by which blood is determined in increased quantities to the part, whence an augmentation of the perspiratory secretion is brought about. 2dly, Being a bad conductor of heat, its action is from this cause increased; and, 3dly, it operates as a depletive to the vascular system.

In the use of setons in cases of ulceration of the inter-articular cartilage, he was inclined to question their being sufficiently active so as to destroy the cell formation on which the existence of ulcers depended; and if they were not, then would ulceration continue to carry on its devastations.

Mr. Cartledge considered they acted as derivatives : thus blood being sent to a part diseased, it was, by the intervention of these agents, withdrawn from it, and a healthy condition induced. It is true that a reproduction of cartilaginous matter never takes place, yet may the healing process be set up in it, and the normal action of the joint restored.

DECEMBER 14, 1847.

Mr. G. VARNELL, *V.P., in the Chair.*

ON the table was laid the spleen of a horse, obtained from the knacker's yard, studded with large melanotic tumours. It excited only a few incidental observations.

Mr. H. J. Fitter presented for discussion an Essay on "DENTITION IN THE HORSE, OX, SHEEP, GOAT, DOG, AND PIG." Although it embraced a considerable amount of matter, the argument that supervened did not become animated, nor were any points of particular interest dwelt upon.

The meetings were then adjourned to over the Christmas holidays.

JANUARY 4, 1848.

Mr. W. B. LORD, *V.P., in the Chair.*

Mr. Woodger forwarded to the Association a fractured os suffraginis of the hind leg of a horse, which had taken place while the animal was trotting in harness over some macadamized road.

The remainder of the evening was occupied by the reading of the prize thesis "ON THE ANATOMY AND PHYSIOLOGY OF THE FOOT OF THE OX AND SHEEP," by Mr. G. T. BROWN, which has already appeared in the pages of this journal. (*See* vol. iv, p. 177.)

JANUARY 11, 1848.

Mr. W. B. LORD, *V.P., in the Chair.*

An elaborate Essay "ON THE ANATOMY, PHYSIOLOGY, AND PATHOLOGY OF THE LIVER OF THE HORSE," was read by Mr. W. CLEMENTS.

[We make the following extract from the pathological division of the thesis, being obliged, through want of room, to omit both the anatomical and physiological portions.]

Having endeavoured throughout this essay to follow the motto with which you are all familiar, that "Order is Gain," I shall not lose sight of it now that I have arrived at this last division of my thesis, and therefore shall treat of the diseases of the liver in the following order:—

ACUTE and CHRONIC HEPATITIS; STRUCTURAL DISEASES, as follow,—Fatty degeneration of the Liver, Encephaloid Disease, Unnatural Enlargement, Jaundice, Biliary Calculi, Softening of the Liver, Rupture, Abscesses, Scirrhus, General Derangement and Unhealthy Secretions.

Each disease I shall subdivide into *Causes, Symptoms, Diagnosis, Prognosis, Treatment, Results,* and *Termination.*

The post-mortem appearances I shall reserve till the last part, when I shall endeavour to arrange them in the order in which I have reviewed the diseases.

ACUTE HEPATITIS,

This is a disease which writers upon the veterinary art have stated seldom attacks the liver of the horse. Here I must disagree with them, and perhaps in so doing many will meet me with the question, How is it, then, that we do not observe the symptoms of it more frequently in the horse? This, in my humble opinion, does not prove that it but seldom exists, for on the other hand, we have ample proofs that it has existed at some past period, from the various morbid appearances which are observable in that viscus on post-mortem examinations; and yet the animal, during life, has seldom shewn any signs of indisposition, and never any which would warrant us in forming the opinion that he was labouring under an attack of acute hepatitis. This immunity has been ascribed to the simplicity of the biliary apparatus in the horse. Hurtrel d'Arboval refers it to the small quantity of cellular tissue entering into the composition of the horse's liver; but I am inclined to coincide with the opinion held by Mr. Percivall, and consider that the reason why the horse is so seldom attacked with disease of the liver of such a nature that we cannot take cognizance of by the symptoms presented, and yet man be most subject to it, is on account of the great difference which exists between the habits and mode of living in the one animal as compared with the other.

Causes.—The causes are, exposure to cold and to wet, highly stimulating food, want of regular work, injuries; and, in fact, any of the causes which will produce inflammation in other structures will excite it in this viscus.

Symptoms.—Pain upon pressure on the right side, languor, and inactivity; a peculiar drooping and dulness of the eyes; the animal hangs his head, and is off his appetite; he has not lain down, perhaps, during the past night, but if he has, it will be observed that he has lain upon the right side: the fæces are of a yellow greenish colour, being largely mixed with bile of a vitiated character; the urine is found to be thick, and of a bilious-looking colour; and when the disease has existed for a few days, we observe the conjunctiva, the mucous membrane of the mouth, and the Schneiderian membrane, become of a yellow colour; and as the disease still further progresses, we notice that the patient evinces pain, yet not of an acute kind, but rather a sort of dull gnawing pain, to judge from the appearance of the animal. He will often look round at his sides, and, in his dumb language (if I may be allowed the expression), tell the practitioner where the seat of the pain is. Sometimes we observe a slight alteration in the respiration of the animal.

Diagnosis.—This disease is easily distinguished from inflammation of the lungs by the absence of all auscultatory signs, and by the situation of the pain. We can also easily distinguish it from gastritis, by the pain being entirely situated in the right hypochondrium, also in the difference of the character of the pain. In gastritis it is of an acute nature, while in the disease of which I am treating it is (as I have before stated), of a dull character; and from peritonitis, by its local position, there being in the latter disease general pain throughout the abdomen.

Prognosis.—If the disease does not assume a very violent character and diarrhœa has not set in, we may occasionally hope, with care and attention, to render the horse again fit for service; yet this will be at the loss of the normal state of his liver.

Treatment.—The disease being an inflammatory one, demands from us that mode of treatment which we should practise in inflammation of any other organ. Bleeding from four to eight quarts, depending upon the size of the animal, should be resorted to. Purgatives are most essential, and as an agent I should prefer the Barbadoes aloes, given in solution, from ʒv to ʒvij, and this frequently repeated, so as to keep up a relaxed state of the bowels; but after the first dose it should be given in smaller doses. It has been very wisely remarked by Mr. Elliotson, in his "*Practice of Medicine,*" that this last mode of treatment acts as a local means of subduing the inflammation going on in the liver, by preventing a great quantity of blood going into the vena portæ, and therefore less gets into the liver. Mercurial compounds have been condemned by many as most injudicious to administer in this disease, and amongst those who object to them stands Mr. Percivall. He states in his Hippopathology, that "calomel, and indeed every other preparation of mercury, being a stimulant to the liver, should be scrupulously avoided." Nevertheless, I should recommend calomel in scruple doses, combined with opium, to be administered twice, or even three times a-day. The effect I should wish to produce would be ptyalism, and we know that this agent, when pushed to such an extent, has a most beneficial effect in subduing inflammation. Clysters should also be frequently administered, and if the symptoms are very urgent, I would stimulate the sides of the animal with the liquor ammoniæ.

The *Diet* should consist of bran mashes, &c., scrupulously preventing the animal from partaking of any food of a stimulating character.

Results.—Often acute inflammation subsides into the chronic form. In fact, any of the diseases to which the liver is subject, with the exception of one or two, may be the result of active inflammation of that viscus; yet *most generally* we have chronic supervene upon active inflammation. Sometimes we have it ending in resolution, yet this but seldom.

Remarks.—I have not alluded to the state of the pulse; and I have refrained from so doing from being unable to lay down any decided statements respecting its frequency, for it varies so materially in this disease, that to pretend to give the exact number of the pulsations in a minute would be little less than empiricism. I will, however, mention, that it puts on the same character that we find it does in almost all other diseases of an inflammatory nature, being quick, strong, and bounding. Many writers have stated that in this disease we often have as a characteristic symptom lameness of the right leg.

Mr. Cupiss, in his prize essay on the diseases of the liver, says that "as the symptoms progress, the appearance which they put on may lead the unobservant, and also the careful, practitioner to be deceived into the opinion that inflammation of the bowels exists." I think I have shewn that any person having the least pretensions to a knowledge of veterinary science would easily be able to draw a distinction between the two, and that a very marked one.

In all diseases the improvement of the animal greatly depends upon the care which we take of him; I should, therefore, recommend, that the animal labouring under this disease should be placed in an airy and well-ventilated loose box, at the same time taking especial care that we keep his body warm by means of good clothing.

Chronic Hepatitis.

This is a disease which very frequently exists in the horse, and writers also upon this—and among the number is Mr. Percivall—state that its presence during life is apt to be passed over altogether unobserved. I attribute this to the want of a proper knowledge of its pathology. I am satisfied that there are many affections which the horse labours under, and which we in our ignorance cloak by stating, that the horse is labouring under an "attack of fever," or is "a little out of order," &c., which, were we advanced enough in knowledge, we should attribute to some derangement of the liver, and that, most probably, chronic hepatitis.

Causes.—The only one which I can state is from acute hepatitis.

Symptoms.—The horse will be observed to be out of condition; his coat does not present that healthy aspect which it ought to do; he is dull, and does not perform his work with that alacrity which we have a right to expect from him in a healthy state; his dung is of a peculiar clay colour, and often enveloped in a bilious-looking fluid; his appetite is much impaired; the pulse gives us indication of much functional derangement; and the conjunctiva, the membrane of the mouth, and the Schneiderian membrane, are often observed to have a yellow aspect.

Diagnosis.—We cannot expect ever to return to the animal his former health, yet we can much ameliorate this disease by paying attention to his diet, &c.

Prognosis.—I have before hinted that this disease, in my humble opinion, is often confounded with general fever, &c.; and to lay down any rules by which you may distinguish it from these diseases would, perhaps, be attempting more than I can reasonably be expected to perform. I would, however, state, that when you have a horse brought to you presenting the symptoms which I have just described, and from his previous history learn that he has not looked well or eaten well for some time antecedent to that at which you have seen him, I think you may with correctness attribute it to chronic hepatitis.

Treatment.—This must be somewhat similar to that which we should adopt in acute hepatitis, only in a milder form. Calomel should be administered, so as to produce an effect upon the mouth; not, however, to produce severe ptyalism; and this should be kept up for some time. Laxatives should also be given, and these I would also recommend to be carried on for some time. Much benefit may also be derived from repeatedly rubbing the sides.

Results.—Chronic inflammation often produces suppuration: it may also produce a scirrhous state of the liver.

The *Diet* should be the same as that enjoined in acute hepatitis, and the same attention should be paid to clothing, &c.

Structural Diseases.

Fatty Degeneration of Liver.

This disease is one which is often present in the horse, and consists in the viscus becoming exceedingly fatty.

Causes.—I am at a loss to account for the peculiar appearance observable in this organ. I am fully aware that the liver contains, in its natural state, fat and cholesterine, and these matters predominate in this disease; yet, to put you in possession of the *modus operandi* by which this altered state is brought about, I freely confess myself unequal to the task.

Symptoms.—Here again I must acknowledge that I cannot give you any symptoms which shall enable you to form a correct diagnosis. The animal will be languid, and will not feed in his usual manner; his coat will look dull, and there will be evident symptoms of general derangement, with yellowness of the conjunctiva, the Schneiderian, and the mucous membrane of the mouth: the fæces will be of a clay colour, and rather dry; the pulse will indicate constitutional disturbance; and, in fine, the whole of the symptoms will lead us to the inference that we have disease of the liver present; and yet they will not be characteristic enough to warrant us in giving it as our opinion, that we have fatty degeneration of this organ existing.

Diagnosis.—I have before said that it is difficult to distinguish this from other diseases of the liver.

Prognosis.—In order to form a correct prognosis, we must have a distinct knowledge of the disease existing, otherwise, the one which we form will be hypothetical.

Treatment.—If, from the symptoms present, we were led to suppose that this disease existed, the treatment I should recommend would be as follows:—Keep the animal's bowels in a constant state of relaxation by the exhibition of laxatives, and put him on a very spare diet. I should also recommend frequent bloodletting, but at each time only abstracting a small quantity of blood. If we are unable to distinguish it as this disease, we must, of course, treat it as derangement of the liver merely.

Terminations.—I cannot say whether this disease does ever terminate otherwise than in death, yet, I should think, if the liver is but partially attacked by it, we may have a termiaation of it, if we pursue the proper course of treatment.

Remarks.—The reason why I have recommended the above treatment is simply this,—that the depletive measures which I should pursue would tend much to debilitate the animal, and, by so doing, the fat would be taken up into the system for its nourishment. We know that fat is but, as it were, a store of nutriment laid by to serve, at some future period, the wants of the animal; and there are certain conditional circumstances requisite to be present before this laying on of fat can take place, and they are, I am quite certain, familiar to you. You are, I am sure, as equally familiar with the fact, that starvation is diametrically opposed to the storing up of fat; and may we not, therefore, reasonably expect, that when the liver is in this state, a restricted diet will be the means of restoring it to its normal condition?

Encephaloid Disease of the Liver.

This is a disease which is seldom observed to attack the horse, and is sometimes called fungus hæmatoides. These tumours are white, and sometimes cause an elevation on the external surface of the liver. They differ in size, and are found in different portions of the liver, some being situated upon its surface, others towards its centre. When cut into they are found to contain a brain-like substance.

Unnatural Enlargement.

The liver often becomes very much enlarged, and Mr. Field mentions a case where the liver attained the enormous weight of forty-three pounds; and this may often exist without causing any inconvenience whatever, if we judge from the appearance of the animal.

Causes will be the same as in acute hepatitis.

Symptoms.—Mr. Cupiss, of Diss, mentions that the symptoms are, generally enlarged and tense abdomen; the bowels sometimes constipated, at other times relaxed; there is considerable thirst; pulse accelerated to 100 or more, loud and thumping, and easily mistaken for a primary affection of the heart. Here I would disagree with this gentleman, and state it as my belief, that the symptoms present would be those which, in some respects, would resemble disease of the respiratory organs; there would be accelerated respiration, owing to the enlargement of the liver interfering with the action of the diaphragm; and the pulse will be quickened, but in character would partake more of one of irritation than inflammation. That part of the abdomen which the liver occupies becomes much increased in size, as also other portions of the abdomen; and by a careful manipulation of the abdomen we may sometimes be enabled to feel the edges of the enlarged viscus.

Diagnosis.—The means by which we are enabled to distinguish this from other diseases of the liver, is in the enlarged and tense state of the abdomen, and sometimes being enabled to feel the viscus.

Prognosis.—This disease generally ends fatally.

Treatment.—Give the iodide of potassium combined with mercury, also laxatives, and apply counter-irritants to the sides.

Termination.—This disease very often ends in death.

Jaundice.

This disease, which is often called by the unscientific, "the yellows," but by the scientific, "icterus," consists in the secretion of bile being absorbed and carried into the circulation, instead of passing in its normal way into the intestines.

Causes.—This disease may owe its existence to any stoppage of the biliary duct, which, by preventing the escape of the bile, causes derangement of the digestive functions. However, pathologists disagree amongst themselves in describing the right cause, and cases occur in which we are totally unable to assign any definite origin to its production. For my part, I consider that it often attends acute hepatitis, and this opinion is strengthened by the appearances which we observe in this latter disease, namely, the yellowness of the membranes.

Symptoms.—Yellowness of the mucous lining of the mouth, Schneiderian and conjunctival membranes; fæces pale-coloured; pulse accelerated; and if the disease is very acute in its nature, the animal will be observed often to turn his head towards his right side, expressive of pain; appetite much impaired; the urine will be observed to be thick, and of a very yellow colour; his coat will have a very unhealthy appearance, and sometimes pain will be evinced on pressure being applied to the right side. If this disease is produced by a stoppage of the biliary duct, we shall observe the fæces to be devoid of bile.

The *Treatment* which I should recommend would be precisely that which I have stated for acute hepatitis. I should also advocate the use of laxatives. Blood-letting will be found most beneficial in this disease; for by this means we shall discharge much of the bile from the system.

Diagnosis.—This may generally be distinguished from other diseases of the liver by the intense yellowness of the membranes; but as I have before stated my opinion to be that it often accompanies acute hepatitis, we cannot reasonably expect to draw distinctions between these two last-named diseases.

Prognosis.—With care and attention, I think, we may expect in a short time to return the animal to his former state of health. It does, however, sometimes assume a chronic form, and the animal during his life is subject to exacerbations of the disease.

Results.—The same as those which generally follow acute hepatitis.

Biliary Calculi.

These are very seldom found in the horse. When they do exist, they produce the same symptoms as acute hepatitis, and, during their passage through the biliary ducts cause considerable pain.

Treatment.—The only treatment that we can pursue in these cases is that which will alleviate the pain.

Softening of the Liver

Is a disease which often is found to attack the horse, and consists in a softening of the structure of this viscus. It is found paler in colour, being of a clayey aspect, and easily torn asunder when force is applied to it; in fine, it appears in that condition which some people have been pleased to term "rotten."

Causes.—Acute or chronic inflammation.

Symptoms.—This disease often exists without our being able to take cognizance of it; but when we are, we shall observe the following symptoms:—The animal is off his feed; the respiration is increased; the coat unhealthy; the fæces of a pale colour, and quite devoid of bile, and the urine will be observed to be very dark in colour.

Diagnosis and Prognosis.—This disease generally terminates the life of the animal; and this it does by bringing the liver into such a state that rupture is inevitable.

Treatment.—We cannot expect to render the animal any great service. We may ameliorate the disease, but to cure it is, I think, beyond our power, for when the animal is brought to us he is generally in the last stage.

Result.—Death by rupture.

Rupture of the Liver.

This generally follows as a sequela to the preceding disease, and accompanying it, or, as an effect of it, we have hæmorrhage.

Causes.—We may have two causes in operation to produce rupture of this viscus. The one may be produced by the structure of the liver having been rendered, by previous disease, softened in structure, or it may proceed from an engorgement of it with blood, or, to speak more properly, a congested state.

Symptoms will be those of internal hæmorrhage; the respiration will be short, and this will be accompanied with sighs; appetite entirely gone; pulse feeble and increased in frequency; conjunctiva, Schneiderian membrane, and mucous membrane of the mouth pallid; fæces scanty and dry. As the hæmorrhage proceeds these symptoms will increase; the pulse will become more feeble, almost imperceptible; the respiration more deranged; the mucous membranes much paler; he will also be found to be restless, shifting from one side of his box to the other; and to these symptoms will succeed amaurosis of the eyes; and on elevating the head partial syncope will be produced, the horse staggering from the effects of it. The countenance now becomes distressful; tremors come on, the animal suddenly falls, and expires without a struggle.

Treatment.—Some recommend bleeding, others condemn it, and advocate the employment of sedative and styptic agents instead. I should conjoin them, and as it regards bleeding, this operation should be performed on both sides of the neck, our object being to avert the current of blood suddenly; cold water should then be applied to the sides, and clysters of the same fluid administered. Mr. Percivall recommends the oil of turpentine to be given: the greatest quietude should be observed.

Prognosis.—The disease generally ends fatally.

Remarks.—We sometimes have rupture of the liver without any lesion in its peritoneal coat; and when this takes place we have the blood effused between this covering and the organ, forming a large sort of vesicle or bladder. When this is the case we may expect a cure, although generally, I believe, the peritoneal coat gives way from the distention to which it is put by the escape of blood.

Abscesses in the Liver.

These often proceed from acute inflammation, and we are unable to take cognizance of their existence during life. Mr. John Field mentions a case of a horse in which he found an abscess in the liver, containing twenty-nine pounds of thin brown pus. He further states, that the animal had been ailing and wasting for a considerable time before, and was occasionally unfit for work. The first acute inflammatory symptoms shewed themselves about three weeks previous to his death. The pulse was not frequent; the symptoms, however, were all those of subacute inflammation of the pleura. Sometimes the abscesses point externally, and if this be the case, they may be opened.

Treatment.—I should recommend iodine in the form of iodide of potassium, combined with the treatment which we should pursue in chronic hepatitis.

Terminations.—We have very seldom a termination, death generally being the result.

[To be continued.]

MISCELLANEA.

Effect of Colour on Diseases of the Skin.

A veterinary surgeon named Stenier relates in a German periodical devoted to the diseases of animals, that in the summer of 1841 the leguminous plants, especially the vetches, became subject to honey-dew, and that all white horses, and even such as had only white marks, which partook of them suffered from disease of the skin. The white portions in party-coloured horses became gangrenous, and separated from the dark portions, which continued sound. The dark-coloured horses which did, and the white ones which did not partake of this food, continued healthy. In the same journal a Pomeranian veterinary surgeon mentions a circumstance of exactly the same kind occurring from the same cause. Similar observations were made by Burmeister, at Anklam, in 1842.

Mr. Youatt relates a case bearing upon the subject. A cow, for the most part white but having some black spots, fell sick, and became bald on every part of the white surface. On these parts the epidermis detached itself from the subjacent true skin, while the dark parts continued perfectly healthy. A veterinary surgeon named Erdt relates a similar case. A black and white cow became very ill. The two colours, perhaps, were nearly alike in quantity, but were commingled in numerons patches of very various sizes. As the cow recovered, the portions of skin covered with white hair were observed to be swollen and unduly sensible, while the portions covered with black hair remained in their normal state. At the lines of junction between the two colours, the epidermis of the white portions separated, became warped, and acquired a parchment consistency. These portions gradually retracted, and rolled themselves up, falling off in a week or two; so that, at the end of a fortnight, not a trace of the white hairs and subjacent skin was observed; and so slowly were these reproduced, that three months after the animal was still denuded of half its hair. Not the slightest injury befell even the smallest portions of the parts covered with black hair. After the detachment of the skin, not a white hair could be detected upon the entire animal; nor could careful examination discover a single black one on the portions of skin that were thrown off.

[These effects may, as we believe, be referred to the difference in radiation from different portions of the skin; this, of course, depending on their colour. We have satisfied ourselves that horses having black legs are far less frequently the subjects of "Grease" than white legged ones are; and the same thing has been found to obtain in other animals].

TO CORRESPONDENTS,

AND SHORT NOTICES OF COMMUNICATIONS, &c., RECEIVED.

We are obliged to Mr. Walker, M.R.C.V.S., Rugby, for the very interestiing specimen of twin fœtuses in the uterus of a cow, with one extern to that viscus in the same animal. Also, to Mr. Cooke, M.R.C.V.S., Erith, for a singularly diseased testicle taken from a horse. Of these detailed accounts shall appear in the next number.

We are likewise indebted to Mr. R. Sanders, M.R.C.V.S., Beverley, for a splendid specimen of a renal calculus, taken from a horse, and a large hair ball from the stomach of a calf. From the note which accompanied these accumulations we extract the following:—

"Leven, near Beverley, April 2, 1850.

"Dear Mr. Morton,—The horse this calculus was taken from was bought for a hunter; but being considered of little value as a hunter, he was sent to farm work at five years old, where he worked till his death. The only history of the case I have been able to obtain is, that he was frequently attacked with, as it was thought, colic, and although only a mile from me, he was always well when I got there, or rather appeared to be so. He never went wider behind than other horses; ate his corn well, but never looked well; in fact, his appearance was more like a dog horse than one belonging to a merchant. I believe he had a fall some short time before he died, which brought on the attacks more frequently, and they were of longer duration.

"The hair ball is, perhaps, not a very interesting one, except that although of a white colour, it was taken from a red calf, twelve days old, and the mother was red; nor was the calf ever known to be near a white animal. I should have sent these specimens before, but I have been waiting for a favourable conveyance. I saw a calculus taken from the bladder a short time since, but, unfortunately, the knacker's curiosity led him to break it into small pieces, to see what it was like in the inside. It filled the whole of the bladder, and the horse has gone wide behind for several years, so that I should say it had been that time forming.

"[The *weight* of the renal calculus is 26½ ounces troy; its *form* very irregular, and its *composition*, carbonate of lime and animal matter]."

Case of misplaced Ear of a Calf. By Mr. J. Stevenson, M.R.C.V.S.

"Whitby, April 4, 1850.

"Dear Sir,—I have forwarded per rail, what I consider a very interesting "lusus naturæ," viz., part of the head of a calf, having an ear which appears to have been attached to the fauces, and filling up the cavity of the right nostril. The animal was killed by a butcher last week for the market, who, in splitting open the head, had separated the ear from its attachment before he perceived what it was. A peculiarity was observed in the animal's breathing, otherwise it was perfectly healthy and naturally formed. Had the animal been reared, it might have puzzled some veterinary surgeon to know the cause of this impeded respiration.

"I have attached the ear by a few pieces of wire, as nearly as possible in the position in which it was at first.

"I am, dear Sir, your's truly."

Rupture of the Liver and of the Rectum, with Diseased Heart and Brain of a Horse. By Mr. George Lewis.

"Monmouth, April 27, 1850.

"Dear Sir,—On the 17th instant I was called to attend an entire horse, thorough-bred, aged, the property of H. G. the Duke of Beaufort. I was in the country when the messenger came, and prior to my attending there had been two quarts of blood extracted. I was informed that he had had a 'fit,' and tumbled headlong against a projecting portion of the box, laying bare the frontal bones.

"*Symptoms.*—Pulse languid and slow; Schneiderian membrane ashy pale; extremities alternately hot and cold; stiff straddling gait of the hind quarters; repeated efforts to urinate, which induced the groom to imagine that his bladder was affected; cold perspirations bedewed the body; head held down; and respiration much quickened at times. Sometimes the animal would sigh, utter a low moan, and then look back at the flanks. But what was more remarkable, in the morning there was amaurosis of the off eye, while in the evening there was amaurosis of the near eye, and the off had perfectly recovered; and the eyes continued in this state until the death of the animal.

"My prognosis was unfavourable, the disease being hæmorrhage from the liver. The parties, however, were anxious that relief should be afforded if possible, and I was desired to do 'something' for him. I administered some medicine, but, as I expected, without any beneficial effect.

"*April* 18.—The animal is gradually sinking, and continues to make efforts to expel both urine and fæces. Upon making an examination per rectum, I discovered that that intestine had become ruptured, and on my desiring that the horse might be destroyed, my request was acceded to.

"*Autopsy.*—Upon exposing the contents of the chest, which I did by removing a portion of the ribs, together with the sternum; the lungs were found perfectly healthy, but their vessels were nearly free from blood, so that they had a blanched or white appearance.

"*The Heart.*—In the right ventricle there was considerable dilatation, with atrophy. Both auricles and ventricles contained scarcely any blood. In other respects the organ was healthy.

"*Abdominal Cavity.*—Upon dividing the symphysis pubis, and removing the bladder, &c., a section was made into the peritoneal covering of the intestines, when about twelve or fourteen gallons of venous blood escaped. The meso-rectum was torn into fragments for about a third of its length; the rectum was also ruptured for about three inches in extent. The other intestines were free from disease.

"*The Stomach* was remarkably small for the size of the horse.

"*The Spleen* was much enlarged, and scirrhous in patches.

"*The Liver.*—There was only one small lobe which had any appearance of health; the remaining portion was one mass of disease, and appeared to be composed entirely of coagulated blood; indeed, it was with the greatest difficulty that a piece of any size could be lifted out at once. The weight of this diseased mass, as near as could be guessed, was above fifty pounds.

"*The Brain.*—The left ventricle was much enlarged, and contained considerably more than its ordinary quantity of fluid. The brain was much softened throughout.

"And now to account for the metastasis of amaurosis, the rupture of the meso-rectum and rectum, the ineffectual efforts to void the fæces, and the acute hæmorrhage from the liver.

"The first I am unable to account for, unless it be from the brain participating in the disease of the right ventricle. When the hæmorrhage from the liver took place, the brain, already diseased, was then more easily acted on, and thus the influence of the optic nerves was lost. I suppose the rupture of the rectum and meso-rectum to have been caused by the efforts made by the animal to expel the fæces, the peristaltic motion of the intestines being stopped by the weight of blood effused into the abdominal cavity. The acute hæmorrhage from the liver I conjecture to have been caused by the sudden fall the animal sustained, the latter being probably occasioned by the diseased state of the brain.

"I have thus made an effort to account for the above mentioned appearances, and remain,

"Dear Sir, your's very truly."

"*To Professor Spooner.*"

STRANGE IF TRUE.

"Gentlemen,—A case is reported, upon credible information, of a cow having died a few days ago, about ten miles from this place, which, upon examination after death, contained in the womb two calves, and between the two calves were found two snakes, each twenty inches in length. If this be an extraordinary case (as I take it to be), I should be happy, if you deem it worthy, to proceed thither and institute strict inquiry into the matter, and to lay before you the result of my investigation.

"I am, Gentlemen, your obedient servant,

"William Thomas,

"Chemist, &c., Bala, North Wales, April 15, 1850."

"*To the Professors, Veterinary College, London.*"

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OBSERVATIONS ON SOME OF THE DEFORMITIES OF THE LIMBS OF HORSES, PARTICULARLY THOSE WHICH ARE CONGENITAL; WITH OTHERS DEPENDING UPON INJURY OF TENDON OR LIGAMENT.

By Mr. G. W. Varnell, *M.R.C.V.S., Demonstrator of Anatomy in the Royal Veterinary College.*

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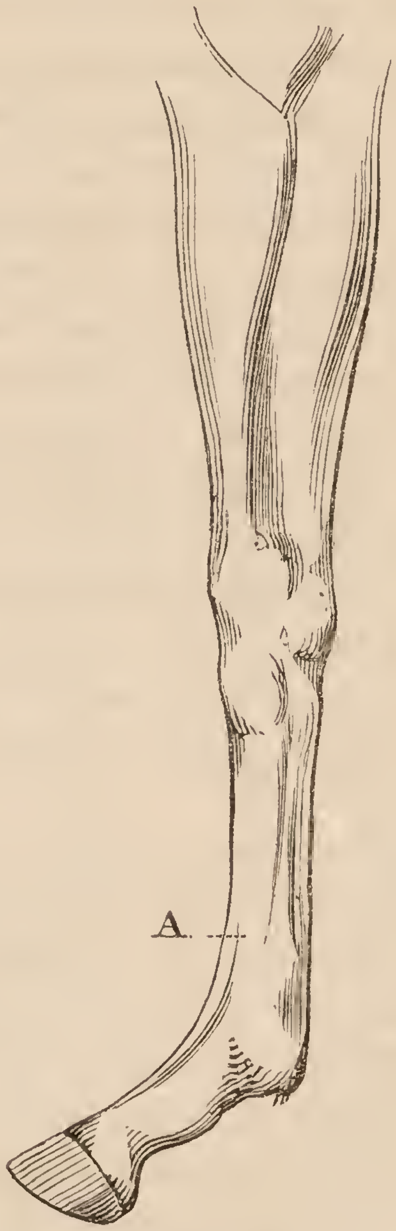
THE following paper was suggested by reading, in The Veterinary Record for July 1848, an artitle entitled, "On the Division of Tendons in the Extremities of Solidungulated Animals, by M. Tirart," extracted from the *Journal l'Ecole de Lyons.* I was much pleased with the perspicuity and talent evinced by the author in discussing the subject; and while I agree with him in opinion that tendiotomy is one of the most brilliant operations in veterinary surgery,—when it is scientifically performed, and the after treatment carried out according to principles, that the veterinary surgeon is called upon to resort to for the relief of our noble patient,—it is not with a view of criticising that able article that I am induced to lay before the public my thoughts on the subject, but with a desire to bring about a more general application of the operation than M. Tirart has advocated. In *The Veterinarian* for May, 1850, also appeared an article by Mr. Percivall, of the 1st Life Guards, to which I would refer the reader for the history of the operation, together with some excellent observations as to the success or non-success of "*tenotomy*," depending upon various circumstances; most of which, as that gentleman observes, will, on due reflection, prove to be within the control of the veterinary surgeon. In the same Journal, for June 1850, appears a letter from Mr. Cooper, V.S., Berkhampstead, giving the result of his experience in such deformities, and reminding Mr. Percivall of an omission of a cause which distorts the fore limb of the horse; with his mode of operating as a remedy. Truth being our object, I am compelled to make some remarks on his letter. I shall, however, only allude to this and other cases which are recorded, as convenience may suit, confining my observations chiefly to those cases which have come under my own notice.

At the period of birth we occasionally meet with congenital malformed limbs, depending either on the flexors or the extensors being too short. It is by far most commonly the flexors which are implicated, thus causing the animal to go on his toes, thereby distorting the limb or limbs. This may be so slight, that in the process of development, if due attention be paid to the shape and position of the feet, no operation, either mechanical or surgical, is required. But should the limb be to a greater extent malformed, it will be necessary to pay even more than usual attention to the feet, and, as soon as time will admit of shoes being placed on them, let it be done. These shoes should have a piece of iron projecting from the toe, from two to three inches in length, and slightly curved upwards. At the same time the heels must be kept low. I well recollect two foals of my father's in which these defects existed: their sire was a thorough-bred horse, namen *Sparrow-hawk*. He had one *congenital* malformed fore leg, and went on his toe; but, being a remarkably fine horse, many people in that part of the county of Norfolk put their mares to him: the result was, that, to my knowledge, he got a great number of foals with deformed limbs. The two colts of my father's were both in this state; one affected only in a slight degree, the other much worse.

Neither of them had that attention paid to them which veterinary skill might have devised; nevertheless, the one but slightly affected recovered by using the kind of shoe I have alluded to; and the other was so much improved as to be useful. I have no doubt, from what I remember of the case, that had an operation been performed, and proper treatment otherwise had recourse to, deformity might have been obviated. *Fig.* 1, A, represents the deformity alluded to. I also recollect that a mare, the property of a

Fig. 1.

Fig. 2.

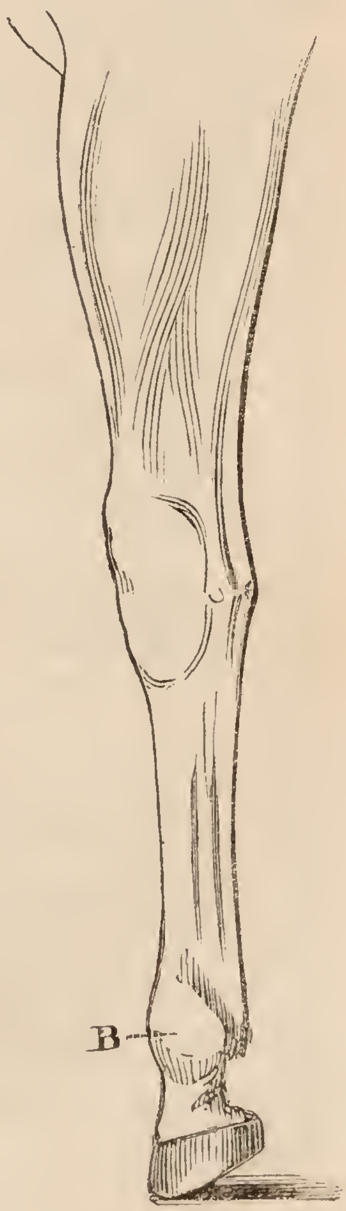


neighbour, has dropped a foal that was nearly thorough-bred, with malformed fore legs, which malformation depended on the tendons of the extensors, particularly the extensor pedis, being too short (see A, *Fig.* 2). The poor little animal in walking went upon the posterior part of the fetlock-joints and the heels, the toe not coming to the ground. I suggested to the veterinary surgeon who attended him that an operation might be performed with advantage; but neither he nor the proprietor seemed to fall in with my views on the subject; the foal was therefore allowed to take its chance. Not being particularly engaged at that time, I asked to be allowed to do something by way of experiment, which was assented to, provided I did not operate. I had some boots made of leather, with iron stays, and well padded: they reached as high as the knees, and were so arranged, that with laces and straps they could be easily adapted to the position of the limbs. In the course of a month the animal was much improved; indeed, so much so, that while he had his boots on he walked round the box with the limbs in a very fair position. However, the parts which received the greatest amount of pressure, namely, those at the posterior part of the fetlocks and immediately below the knees, in front of the legs, became so much injured, that sloughing of the common integument was the result, in spite of all we could do to prevent it; therefore the continuance of this plan was abandoned. The mare and foal were now turned into a paddock, the foal to take its chance as before: for a time he walked much better, and without the fetlocks coming to the ground. After this I saw no more of him, but was told that after some time he became as bad as ever; and I believe he was, at last, shot. In this instance I think a division of the tendon of the extensor pedis would have been worth a trial; and the way in which I propose performing the operation will be stated hereafter.

In the VETERINARY RECORD for 1845, page 417, is an account of a case of Congenital Malformation of the Fore Feet of a Colt, sent to the College by Mr. Smith, V.S., Epsom. It is recorded by Professor Spooner, under whose care the animal was placed. I well recollect the case, and how it terminated: the manner in which the operation was performed was purely experimental; therefore it was resorted to only on one leg. Professor Sewell having asserted that the French veterinarians were constantly in the habit of dividing the tendons below the fetlocks, it was determined it should be tried in this case. The synovial sheath was first cut into, by making an incision through the common integument, about an inch in length, along the lateral border of the perforans, which being divided, the position of the foot was easily altered by traction applied to the toe in a direction forwards and upwards. For further details of the case, see No. and page referred to. Suffice it to say, that the colt was destroyed in consequence of the formation of abscesses above and below the fetlock joint, and the great degree of constitutional disturbance set up. The leg not operated upon is now in the College Museum, the inspection of which plainly indicates, by the flexure of the pedal bone upon the os corona (*Fig.* 1 A exactly represents it), that the perforans alone would require to be divided so as to straighten the limb. The anatomy of the fore leg shews that the same effect, as to the position of the foot, would have been produced by dividing the tendon above the fetlock, without the danger resulting from opening a synovial sheath.

The kinds of deformities met with in the growing horse, are, firstly, congenital and extreme flexure of the pedal bone upon the os corona, depending upon the perforans being too short. Secondly, permanent flexure of the pastern bones upon the large metacarpal (see B, *Fig.* 3). In this instance the perforatus being too short will be found productive of this distortion, connected with disease of the dense membranous sheath which invests it posteriorly. Depending upon the degree or angle at which the bones are placed, must be our remedial measures. If the distortion be but slight, mechanical means only need be resorted to; if greater, a surgical operation conjoined with some mechanical contrivance will be found to be absolutely necessary.

Fig. 3.



In the second instance the toe will be turned up, the animal going on the posterior part of the fetlock and heels. This depends upon the tendon of the extensor pedis being too short. The ligament also which extends from the outer and inferior part of the knee to the upper and anterior part of the first phalange takes its share in producing this effect. Here also, as in the first instance, must our remedies be regulated by the amount or degree of distortion.

Thirdly;—Occasionally we meet with instances of a bowing outwards of the fetlock joints. In such cases the external lateral ligaments are too long, and the internal ones too short. Or in others, and which are less rare, the reverse of this exists; when the fetlock joints will approach each other too near, the feet turning outwards. Of course, under such circumstances, the lateral ligaments would be the reverse of the former case, as to their comparative length to each other. In either instance we should not be justified in resorting to any surgical operation. In some slight cases, if proper attention be paid to the shape of the feet during the period of development, much good may be done towards improving the position of the bones we are now considering.

Another kind of deformity often exists below the parts we have been describing; namely, at the joints formed by the pedal bone and os corona, and to a slight extent between the os corona and os suffraginis. This, although there may be a natural tendency to it, often takes place during the growth of the animal, from a neglect of those who superintend the rearing of colts, especially as to the wearing away of the hoofs; allowing the inner and anterior part to become elongated, thereby throwing the weight and the wear upon the outside of the foot, and thus producing what is commonly called *pigeon-toed*. Or, on the other hand, the outer and anterior part of the hoof may become similarly elongated, and the weight is then thrown upon the inner side, the effect of which is obvious.

In a horse with congenital malformed limbs, the bones, in the process of growth, become fashioned to the form of the limb; so that, if the animal be neglected until he has arrived at adultism, no procedure, either surgical or mechanical, will produce the effect we are desirous of obtaining. But during growth, the parts being then pliable, by altering their position when it is practicable, and by some contrivance so as to place the limb in a state favourable to cause a proper development, our object may be gained.

In young horses it is common to meet with a knuckling forwards of the hind fetlocks (see A, *Fig.* 4); so much so, that at times the front of the joint is on a perpendicular line with the toe. This condition is seen in most cases only at times, and that, generally, when the animal is standing: or, he may walk in this manner, except at intervals; but when either standing or going, the bones will resume their natural position. The veterinary surgeon is often called upon to give an opinion respecting these cases. He examines the joints by careful manipulation; and he minutely traces the tendons, but finds no lesion of any kind present. There may be, however, more or less fulness of the bursæ above the fetlock. I have very lately examined a bay mare, five years old, affected in this way. She is not in the slightest degree lame; her legs are as fine and free from disease, as far as the eye and hand can detect, as can be conceived; and yet she more frequently stands "knuckling" than in any other way. Nor is this observed in her paces, except at times, and that when walking slowly. The question has been often asked, What is the pathology of this affection, and what parts are implicated which cause the animal thus to place himself? It seems to be a commonly received opinion, that putting horses to hard work too early is

Fig. 4.

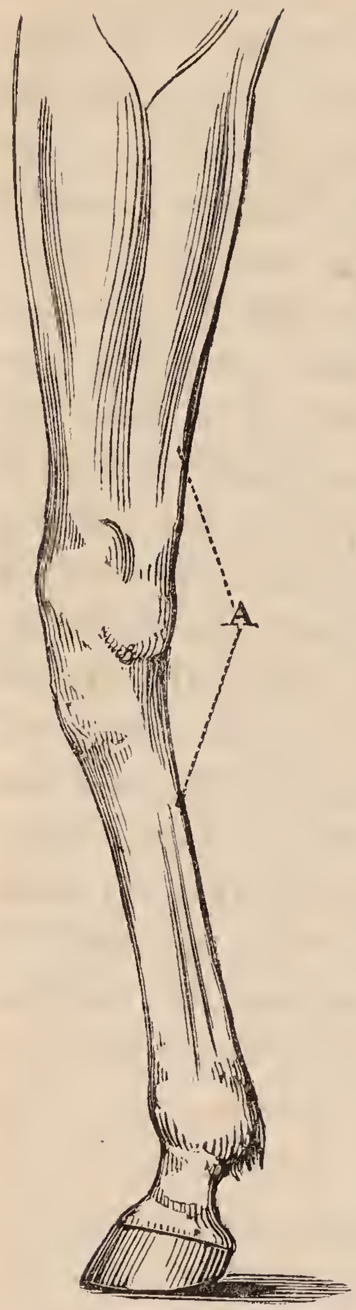
the principal exciting cause; and the result of my own observations leads me to think that this is correct. It is likewise asserted by some persons, that bad constitutions, independent of early and hard work, are a very common cause. This probably may be the case; still we see the affection in horses having the best constitutions. Colts with naturally formed upright pasterns are, if worked too early, particularly predisposed to become thus affected. I have before asked, if we can detect no disease, what can produce this anterior convexity of the joints? Is it that the tendons of either the perforatus or perforans muscle are slightly strained at the point opposite the sessamoid bones? and does the synovial membrane participate in the injury? If so, the result of this would be slight, but continuous pain, when weight is thrown upon the limbs, not sufficient, however, to be felt when the animal is excited; therefore, when at rest, he so places himself, that the bones are in a more upright position, and the weight is carried from one bone to another, and not thrown upon the tendons at the place above described. The next question is, What can be done to restore the parts to their normal condition? At this stage of the affection no operation is indicated, because we can detect no shortening of the tendons or ligaments. As far as my experience goes, I would advise that the animal be thrown altogether out of work; that mild blisters be applied to the fetlock joints, and repeated a second or a third time; after which the horse should be allowed as long rest as may be considered necessary. But even after this, the proprietor must not be too sanguine as to the benefit to be derived from such treatment. If due time is allowed, the horse may return to his work, and shew no signs of his former affection; and in some instances he will continue sound; but it is more likely, after having been again worked hard for a time, we shall find that the parts will return to the same condition as at first. This may continue for an indefinite period, depending upon the severity of the work the animal is put to before the affection merges into permanent flexure of the fetlock joint. If we now examine the limb, from a little above the fetlock posteriorly downwards to the insertion of the perforatus tendon, we shall detect a rigidity of structure which in most cases is attended with thickening. Nothing now will restore the limb to its former position but an operation, and the propriety of its being performed we will now consider.

The incapability to extend the foot depends, no doubt, as in all other deformities of the kind, upon the length of the tendons or ligaments, between their two fixed points, being from some cause or other diminished. We shall here find that this abnormal condition of the tissue exists at such a part as either forbids or allows of relief by operation, and which is the only means by which the obstacle to either flexion or extension can be remedied. As far as my investigations have gone, the cases referred to, in most instances, depend on the perforatus and its outer dense fibrous membrane, extending from the superior part of the sessamoid bones to where the tendon becomes inserted into the supero-posterior part of the os corona, and that which is continuous with the fibrous frog, becoming more or less thickened, and sometimes semi-cartilaginous; consequently they are shortened at this particular part. Taking a view of the anatomical relationships of these structures, forming, as they do, a synovial sheath for the perforans, and also their pathological condition, we should not be justified in using the scalpel, especially as the only chance of effecting our object would be by operating below the fetlock-joint, and this we should not be warranted in doing.

Bowed Knees.

There are but few veterinary surgeons who have been long in practice that have not been consulted with respect to a deformity of the fore legs of horses, called "Bowed Knees;" that is, a curving forwards of those joints, generally designated as shaky in the fore legs (see A, *Fig.* 5). This affection is very common in foals at the time of birth; and to such an extent does it occasionally exist, that the breeder is doubtful as to whether the young animal will ever become upright upon his legs. However, it often is the case that young foals, more or less thus malformed at one year old, become quite straight upon their limbs; indeed, such a formation is generally more pleasing to the breeder, if not present in too great a degree, than that called calf-kneed; a position the reverse of the one we have just described. In the latter case the anterior

Fig. 5.



part of the fore leg, in a line from above downwards, is concave, and posteriorly it is convex; and while in the first named affection the owner looks for daily improvement in the form of his foal's legs, in the latter he is assured from experience that no improvement can be anticipated. In the adult horse we occasionally observe "bowed knees" in legs that were originally upright, or perhaps had only a slight tendency to be bowed; but the animal having been put to hard work on the road, or hunted for three or four years, by the time he has become eight years old, his legs are so deformed, so much over at the knees, that while standing they appear incapable of supporting the weight of the fore parts of his body. There are many persons who consider such horses unsafe both to ride and drive; but experience teaches us that these fears are, to a great extent, unfounded. It is not to be understood, however, that we consider such a form of the fore legs as safe as those we term perfect. But let us endeavour to ascertain what gives rise to this affection in the working horse, since to account for congenital deformity in the foal would be altogether futile. Perhaps a few words, as to whether an operation is advisable or not, are here admissible. Even in those cases in which the deformity is extreme, or in whatever degree it may exist, I am inclined to think the veterinary surgeon ought not to risk his reputation by interfering with the parts with his knife; if, by some mechanical contrivance, which would tend gradually to restore the knee to a normal position, good can be effected, the practicability of which, considering the habits of our patients, I am doubtful of.

But, returning to the working horse, various hypotheses have been advanced as to what parts are implicated which would cause this alteration in the form of the carpus. Some persons consider it to depend on a relaxed and lengthened state of the extensors; others on that of the ligamentous tissue at the anterior part of the knee; and, again, there are others who assert that it consists in an inordinate contraction of the flexors, and to such an extent that the equilibrium of the two sets of muscles (namely, the flexors and extensors) is destroyed. Now, although the last hypothesis seems the most feasible, still the result of my dissections of the fore legs of horses thus affected—and which were purposely selected—certainly does not confirm any of those opinions. In the first place, the white fibrous tissue in front of the knee, from a little above to the inferior part of that joint, is so arranged as to admit of free flexion, and offers no restraint to that action: the capsular ligaments also—particularly the one between the radius and upper row—are very loose; the fibres of the anterior annular ligament, which serves to bind down and assists in forming thecas for the extensor tendons, likewise runs transversely across the carpus, and thus by no means can it impede motion: consequently, we cannot suppose that any undue laxity of these parts would be productive of this affection. In the next place, the extensor pedis performs its function; namely, that of extending the bones below the large metacarpal, and more particularly the os pedis, in the act of progression. The extensor metacarpi magnus, like the last named muscle, also acts normally, which is, that of extending or straightening the large metacarpal bone in a line with the radius, or, at any rate, to as great an extent as what I consider to be the obstacle to further extension will admit of.

Having thus briefly considered the two extensors, and being unable to attribute any loss of power to them, the other two small ones, the extensor os suffraginis and the obliquus, we shall take no notice of in this affection; but proceed to make a few remarks upon the flexors, and ascertain what share they may be supposed to take in the production of this deformity of the limb. Those only worthy of consideration are the three flexor metacarpi, with the perforatus and perforans, the two accessory muscles being of minor importance. The only muscles, then, likely to produce a curving forwards of the knee, are the three flexor metacarpi;

their fixed points being superiorly to the condyles of the humerus, inferiorly to the trapezius, and two small metacarpal bones. In these the scalpel develops nothing abnormal either of their muscular tissue or the tendinous structure by which they are inserted and intersected; nor should we expect to find any thing, seeing their function is not interfered with. The perforatus and the perforans both arise superiorly from the inner condyle of the humerus; the latter is inserted into the plantar surface of the os pedis, the former into the supero-posterior part of the os corona. The position of these bones is not at all altered; which would be the case did any permanent shortening of these ropes (if I may so call them) exist. If, therefore, it does not depend upon derangement of any of the parts I have reviewed, where are we to look for the cause of this deformity? We have here a portion of the limb which by common consent is called the knee, although quite unlike the knee of man: comparatively it is analogous to the human wrist; having eight small bones entering into its composition, six of which are arranged in two rows. Of the remaining two, one is of considerable magnitude and importance; the other very small, and comparatively unimportant. The larger one is situated at the postero-external part of the joint, and superiorly it gives insertion to two of the flexor metacarpi muscles, and is also characterised by the number of ligaments which connect it with the radius and the outer small bones of the knee, as well as to the outer small metacarpal bone: it likewise gives insertion to the posterior annular ligament.

The inferior extremity of the radius rests upon the upper row, and the lower row upon the large and small metacarpal bones; while the motion takes place only in one direction, namely, from before backwards. This movement is hingelike *(ginglamoid)*; the greater part being between the inferior extremity of the radius and the upper row. Motion exists to a less extent between the upper row and the lower, from there being no ligaments anteriorly to restrain this action other than the capsular, which is very loose, and but slightly obtains between the lower row and the three metacarpal bones. At this articulation, independent of the capsular ligament, there are small ones, running from above downwards, rather in an oblique direction; and thus we find provision made for the limb to be bent, to an extent which will allow of the foot coming in contact with the ulna when it is extremely flexed. At the posterior part of the carpus numerous ligaments are found, which are so arranged as to admit of extension only in a forward direction; while the bones present tuberous projections for the attachment of other ligaments, the direction of which is from above downwards, obliquely crossing each other *(crucial)*. They extend from the postero-external border of the inferior fourth of the radius to the trapezius, being blended with the posterior annular ligament. They also proceed from the trapezius to the outer small bones of the knee, and the outer small metacarpal bone, and are continuous with the inferior part of the posterior annular ligament. They likewise pass from the postero-inferior part of the radius to the tuberous projections of the small bones of the knee and the summits of the small metacarpal bones, and likewise the supero-posterior part of the large metacarpals, blending here with the suspensory ligament. Thus, by this brief description of some of the ligaments of this important part, we observe that by no possibility can motion take place forwards further than in a straight line with the radius and metacarpal bones. And may it not be that these ligaments at the posterior part of the knee become so deranged as to cause this affection? I am inclined to think such is the case. I know of nothing else that would so effectually prevent the full extension of the limb. It may be asked, What is the primary cause? Does the scalpel develope any lesion of this ligamentous tissue? In the specimens I have examined, all have shewn the same peculiarities. I have carefully removed the muscles, both the flexors and extensors, taking care not to divide the annular ligaments, or, in fact, any of those proper to the carpus; after which I have endeavoured to straighten the leg, but invariably have failed. The abnormal position was persistent, and that to the same extent as before the muscles were removed. Further to test the share the ligaments took in the flexure, I have made as many as four transverse sections through them, each of which was followed by an altered position of the bones; thus allowing the limb to be easily placed in a straight line, and of necessity leaving a considerable space between the divided ends of each ligament. The question that now arises is, Can any thing be done to remedy this defect, either by the employment of the knife, mechanical contrivances, or any other means?

Believing that the ligaments at the posterior part of the carpus are in the first instance slightly sprained, but being so only in a slight degree, it would give rise to no other symptom than a disposition on the part of the animal to refrain from putting them on the stretch, as this, no doubt, would produce a certain amount of pain. To avoid this, when standing, the extensors are a little relaxed, thus allowing the knee to come somewhat forwards, thereby removing the tension of the ligaments posteriorly. This state of parts we observe only occasionally, for when the animal is excited, or at work, the limbs resume their natural position. This goes on for a time; but the cause alluded to being still in operation, the abnormal position becomes permanent; and the bursæ which are situated at the lateral, inclining to the posterior part of the limb, a little above the knee, are now more than usually filled, which, if the animal be a valuable one, induces the owner to seek advice. This being determined on, it is usually recommended that the horse be placed on a mash diet, and have a dose of purgative medicine administered to him; after which that he be blistered once or twice, and have a long rest, —not less than two months. The general result of such a course of procedure is, that the animal comes up much improved. He is put to work, which if hard, in the course of two or three months his legs again become as bad as ever. Still he is worked on, until finally he is permanently bowed at the knees, not being able, as when at first affected, to stand at times upright.

I consider that the impediment now consists in a slight thickening, and consequent shortening, of the ligamentous tissue we have before referred to.

No treatment in this advanced stage would, in my opinion, be of any avail, whether medicinal, surgical, or mechanical. Such a horse must be considered as unsound, if the affection exist in more than a slight degree; for although we daily observe horses thus deformed performing their work well, still, on the other hand, many of them shew blemished knees, the result of falls.

We now pass on to lesions of the flexors of the fore legs, together with the superior sessamoid or suspensory ligaments, their connecting tissue, and thecas; which, if neglected, often give rise to distortion of the limbs. These may simply consist either in permanent thickening of the parts at the seat of injury, or of thickening accompanied with a diminution of the length of the structures we have described. In the latter case, of necessity, the position of the limb would be altered; and, as veterinary surgeons, it is not only our duty to restore, if practicable, such deformities, but to treat those accidents which give rise to them in their incipient stages.

We shall do well, perhaps, to consider, first, their cause; secondly, the precise seat of the injury; thirdly, the pathological condition of the parts; and, lastly, the treatment to be pursued which is best calculated to restore the animal to a healthy state, or to that of usefulness.

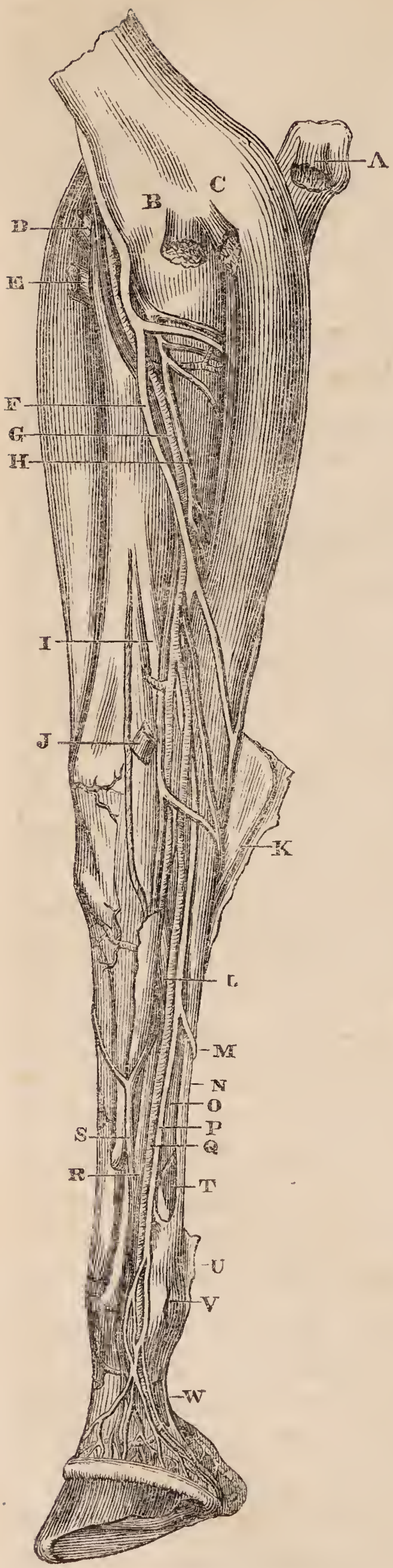
The predisposing causes are, badly-formed limbs; too long and oblique pasterns; low heels; congenital deficiency of magnitude, and a laxity of structure connected with a heavy carcass. The exciting causes may be, severe exertion; the carrying of great weights; the drawing of heavy loads (affecting the hind limbs more particularly); taking descending leaps; going over uneven surfaces, such as rabbit holes, water furrows, &c.; and the wearing of thin-heeled shoes. Lesions of either tendon or ligament, caused by external violence, are also calculated to produce that change in structure by which the limb becomes distorted.

Clearly to understand our subject, we must keep in view the anatomy of the parts. A reference to the subjoined woodcut will, I think, assist in the explanation.

Those who are at all acquainted with the habits of the horse know that he can and does rest in the standing position, and many horses have been known not to lie down for years, and yet to suffer no apparent ill consequences. Knowing this to be a fact, it is clear that some provision is made to obviate that inconvenience which *we* should experience if compelled to stand long in one position; namely, pain in the muscles employed in preserving that posture. This provision the anatomist demonstrates by dissection, and physiology explains why it is so.

We will confine our remarks to the two muscles above-named, together with the suspensory ligaments. We see that the perforatus and perforans arise as one muscle from the inner condyle of the humerus, being at a short distance from their origin divisible into two; the posterior of which is much the largest. They are

Fig. 6.



EXPLANATION OF FIG. 6.

Fig. 6 represents the fore extremity, cut off a little above the condyles of the humerus, with the flexor metacarpi internus, medius, and the ulnarus accessorius mnscles removed.

A, The origin of the ulnaris accessorius muscle.

B, The flexor metacarpi internus.

C. The flexor metacarpi medius.

F, The radial nerve.

G, The radial artery.

H, The radial vein.

I, The superior suspensory ligament, or band.

J, The tendon of the flexor metacarpi internus muscle.

K, The cut edge of the posterior annular ligament turned back.

L, The inferior suspensory band.

M, Oblique branch of nerve crossing the perforatus tendon.

N, The perforatus tendon.

O, The perforans tendon.

P, The inner metacarpal nerve.

Q, Metacarpal artery.

R, Suspensory ligament.

S, The metacarpal vein.

T, One of the lumbrici muscles (this is drawn too wide at the upper part).

U, Cut edge of the thin dense membrane which invests the perforatus from a little above the front of the fetlock downwards.

V, The perforatus tendon.

W, A portion of tendon lined internally with synovial membrane, removed, to expose the perforans as it passes through the bifurcation of the perforatus.

again connected by the tendinous structure which intersects them, at that point where the muscular tissue ceases, namely, at the infero-posterior part of the radius. Immediately below this the two tendons become quite distinct; the perforatus or posterior tendon having the superior ligamentous band which arises from the infero-posterior and inner border of the radius (see I, *Fig.* 6), blended with its structure. The perforans has also united with the tendons of the two accessory muscles, the ulnaris accessorius, and the radialis accessorius. The perforatus and perforans then continue their course downwards, bounded anteriorly by the carpus, posteriorly by the posterior annular ligament (see K, *Fig.* 6, the ligament being cut and turned back to expose the tendons). The perforans is the broadest of the two, and forms, by its being concave posteriorly, a portion of the sheath of the perforatus. The posterior annular ligament, which extends as far down as the lower part of the upper third of the large metacarpal bone, forms, however, the posterior boundary of this sheath. A little below this point, the anterior tendon (the perforans) has mingled with its fibres those of a powerful ligament, which arises from the posterior part of the lower row of the carpal bones, and the supero-posterior of the large metacarpal bone (see L, *Fig.* 6). But as we shall have to allude to this again, I shall only state that at its posterior surface it is clothed with synovial membrane, which also is reflected over the tendons; and the anterior and inner portions of the superior suspensory band, and the ligamentous structure at the back of the knee, thus forming a long and large vaginal bursæ, admitting of free motion to the tendons when the knee is flexed or extended. Such being the case, it appears strange that Mr. Cooper, to whom I have alluded in the first part of my paper, should have ventured to open (which he must have done in both the operations he has recorded) so large a synovial sac; and, doubtless, Mr. Percivall has reference to this in his remarks upon Mr. Cooper's letter, when he says, "Confining our section to the metacarpal ligament, in the operation of tenotomy, is to us new, and, in our opinion, is one well deserving attention." Of course, he means, that our attention should be particularly directed to the fact that we should be careful to avoid, in the performance of this operation, wounding those structures which would be attended with serious consequences; and especially, he would say, when our object can be obtained by a section being made at another and safer part.

Following the direction of the tendons, we observe that they are only slightly connected to each other by coarse cellular tissue, which is continuous with that which surrounds them, and forms a loose cellular investment; their opposing surfaces not being lubricated by synovia, from that point where the inferior suspensory band is inserted into the perforans, to a little above the sessamoid bones, a distance of about two inches. Here the perforatus becomes wider, and at the upper part of the fetlock completely forms a theca for the perforans, but at the point of the joint the sessamoids constitute its anterior boundary. Below this the tendon partially bifurcates, and is inserted into the supero-lateral and posterior parts of the os corona. In dissecting these parts we observe that the perforatus, from the fetlock downwards, is covered posteriorly with a dense fibrous membrane (see U, P, *Fig.* 6), which is firmly adherent to the tendons, and to the lateral and outer portions of the sessamoid bones, and also to the os suffraginis and os corona; thus binding down and supporting, as it were, the tendons laterally.

This structure is connected with the synovial membrane which encircles the perforans, and inferiorly it joins with the fibrous frog. The perforans, from about two inches above the fetlock, is entirely covered by synovial membrane. The tendon now gradually widens as it proceeds over the sessamoid bones, below which it becomes a little narrower, and passes through the bifurcation of the perforatus; after which it gradually increases in width, as it continues its course over the infero-posterior surface of the navicular bone to be inserted into the plantar surface of the os pedis. The anterior surface of this tendon, about opposite to the middle of the os corona, has attached to it a thin broad ligament, composed partly of white fibrous tissue and partly of yellow elastic tissue. We trace this ligament to the upper border of the navicular bone, and observe it to be clothed posteriorly by synovial membrane, which continues down over the anterior surface of the tendon to the broad inferior ligament of the navicular bone, whence it passes to the infero-posterior surface of the point we started from.

Thus we see that, from about two inches above the fetlock to the insertion of the flexor pedis, we have two synovial sheaths; the upper one entirely enclosing the perforans, while the inferior one only covers the anterior surface of it. The posterior surface, from about the middle of the os corona, is firmly adherent to that dense fibrous membrane which I have before spoken of as clothing the perforatus posteriorly, from the fetlock downwards, being continuous with the fibrous frog.

My object in thus briefly describing the anatomy of these parts, is to shew that we may not with impunity divide the flexor tendons at any point between the carpus and the foot.

Although the muscles we have been reviewing are largely intersected with tendinous structure, which enables them to a great extent to bear tension, still, were it long continued, they would become exhausted. To obviate this, when the weight of the body is thrown upon the foot, the tendon of the perforans is first put upon the stretch. This tension is communicated to the inferior suspensory band (see L, *Fig.* 6), but no higher than its origin. The perforatus next becomes tense, and that as high up as the origin of the superior suspensory band above the knee (see I, *Fig.* 6); and, thirdly, the weight is communicated to the suspensory ligament, and the articular ligaments. By this beautiful provision, the fibres of the flexor muscles, when the horse is standing, are in a state of quietude, as far as their active contraction is concerned, as much so as if the animal were recumbent.

Taking a retrospective view of the anatomical peculiarities we have noticed, we are enabled to determine the part of the tendon or ligament most likely to be injured when force is applied by the weight of the animal being thrown unexpectedly upon his fore feet or on the hind limbs by sudden and severe draught, or leaping. The opportunities I have had of investigating such cases, at the College and elsewhere, enable me to arrive at the following conclusions; namely, that in the fore limbs the lesion occurs most frequently to the inferior suspensory band at its connexion with the perforans, or to the tendon immediately where that ligament is inserted into it (at M, *Fig.* 6), and occasionally a little above the fetlock. (In the hind legs of draught horses this ligamentous band I have found most often to be the seat of the injury.) If the perforatus alone be implicated, I think its seat will generally be a little above the joint, and where it forms a complete theca for the perforans. In such cases we observe the bursæ distended, and very painful. If in the hind limbs—more especially of draught horses—I have observed the investing dense fibrous membrane to be involved in common with the perforatus. Or, should the suspensory ligament be the seat of the injury, it will be found to be where that ligament becomes inserted into the sessamoid bones, extending a little upwards. This last-named lesion seldom occurs in the hind limbs.

It would be difficult to predict, under all circumstances, precisely, which of the above-named structures is most likely to be injured; but, the lesion having occurred, there will be no difficulty in the practitioner's diagnosing his case correctly. The symptoms by which we are guided will presently be alluded to. Those cases which do not depend upon congenital deformity are, in the majority of instances, the result of strain, arising from external violence, contusions, &c.

We may now ask, What constitutes a strain? For our purpose, we may define it to be a sudden and violent extension of a ligament or a tendon, to such a degree that its component fibres are over-stretched; in some instances, many of these are ruptured, and accompanied with laceration also of their connecting cellular tissue. This is attended with severe pain if the animal be moved, or if the parts are at all put on the stretch by manipulation, even before any other symptoms of inflammation are manifested. This circumstance seems rather strange, and difficult to account for, as no nerves have been traced into the structure of tendon or ligament, although they have been demonstrated to exist in the contiguous cellular investment. Soon, however, other symptoms are observed; such as tumefaction; increased vascularity (which is seen in the common integument if it should happen to be white); abnormal heat; throbbing of the arteries in the neighbourhood of the injury; as well as a greater amount of pain and lameness.

As the injury will present itself in different degrees of intensity, so will its results be fonnd to differ. If, for example, the lesion is slight, and the integrity of the tendon or ligament but little interfered with, the swelling will not be great, as here it will depend simply upon a *serous* effusion taking place into the interstices of the investing cellular sheath. If, on the other hand, the tension has been so great as to cause a rupture of the connecting cellular tissue, and probably even of the fibres themselves, the effused elements will differ. In the first named case, we may have only the colourless part of the blood occupying the inter-cellular spaces; while in the latter we shall have, not only such material interposed between the fibres of the tendon, thereby altering their normal arrangement, but, in addition to it, some small blood-vessels being ruptured, will give rise to ecchymosed spots; or even larger clots of blood may be effused, which, if in the interior of the tendon, may result in the formation of abscess and ulceration of structure. Should, however, the extravasated blood be confined to the external surface of the tendon or ligament, the chance of its being absorbed is much more favourable. If we examine tendons or ligaments that have been recently subjected to severe and sudden extension, we shall find their structure loose, resembling a piece of rope whose strands have been untwisted and separated from each other. Infiltration having taken place, the process of organization commences, which goes on, till, finally, the separated fibres are united again into one solid and somewhat gristly mass; and, as I have before stated, of necessity they become shortened. Not so, however, if the cellular infiltration is confined to the exterior of the organ; as this, if not absorbed, would leave only a thickening of the part. But should extravasated blood to any extent exist in its structure, or a large amount of inflammatory effusion take place, thereby interfering with organization and consolidation, abscess in all probability will be the result.

Our diagnosis, therefore, will depend upon, first, the length of time the accident has occurred before our attention is directed to it; and, secondly, upon the extent of the injury the structures have sustained. Suppose our opinion is required in a very recent case, and one of simple character, we should state that, with judicious treatment, the issue would be in a quick restoration of the parts to a normal condition. Or if consulted at a later period, when the effused material had become consolidated, producing but a slight enlargement, even then we may consider that, by proper management, the limb will become again as fine as before. In the first instance, absorption will take place rapidly, the effused material being suitable to be removed by the vessels with which it is in contact. In the second, a longer time will be required, as disintegration of the consolidated effused matter, and its conversion into a fluid state, must occur before it can be carried into the circulation by either bloodvessels or absorbents.

In more severe cases, where the integrity of the tendon or ligament is interfered with, by a separation of its fibres, from the interposition of infiltrated matter, as well as that of the investing cellular tissue, all of which may be suspected by the severity of the symptoms present; in all such cases, although we may restore the animal to usefulness, a distortion of the limb will, most likely, be the result, and this only can be remedied by a surgical operation.

Again; if the force applied has been sufficient to partially rupture the tendon or ligament, separating its fibres, lacerating the small bloodvessels, and thereby causing interstitial hæmorrhage, followed by inflammatory effusion, our prognosis must be unfavourable; and the result we have already pointed out.

Repeated strains of ligamentous tissue, in old horses, lead to the deposition of ossific matter in their structure. This I have often met with in the suspensory ligament, near its insertion into the sessamoid bones, and more particularly on the inner side. This ligament, which is capable of elongating a little when weight is thrown upon the limb, by virtue of a very small amount of elastic tissue in its composition, is rendered by this organic change inelastic, and becomes somewhat shortened, causing a more upright position of the bones than normal. We have many specimens of this morbid change in the College Museum. Invariably, in coarse-bred horses, we find muscular fibre mingled with the structure of this ligament. The proprietors of horses require of us, as veterinary surgeons, a definite opinion, whether or not money and food shall be expended in the treatment of such cases. In this respect we labour under a disadvantage which the human surgeon does not; for if he can patch up his patient, or relieve him from pain, thus prolonging life even at the expense of a stiff joint or the loss of a limb, he is extolled for his judgment, thanked by those immediately concerned, and paid into the bargain; and all this he richly deserves. Whilst the veterinary surgeon is expected to restore the injured structures to their normal state, or, at any rate, to that condition which will enable the animal to perform the duties required of him; otherwise all the labours of the attendant are thought to be of no use, and his endeavours therefore are not valued. With domestic animals, then, it is merely an affair of pound, shillings, and pence.

We may now say a word about the treatment best calculated to remedy the several injuries we have spoken of; in some instances restoring the subjects of them to their pristine state; in others not so, but perhaps to one equally useful, although with a distorted limb. In the more severe cases, that allow only of being patched up, the animal may probably be rendered capable of doing light work, or, if a mare, may be kept to breed from. On this subject the breeder would do well to ponder awhile, and ask himself a few questions, which time and space will not allow my entering upon. I may, however, state it as my opinion, that he who is desirous of breeding good and sound horses should be very particular in the choice of those he intends to breed from, selecting only such as are exempt from congenital deformities, or affections of parts arising out of congenital deficiency of organism. The importance of this I am well convinced of, from what I have observed during many years, and more especially of late, among thorough-bred stock.

The treatment to be adopted may be described as follows:—*first*, when we are called upon to treat recent injuries of tendon or ligamentous tissue, so as to aid nature in bringing about a return to their pristine state; *secondly*, those deformities of limb depending upon either entire negligence or improper management. In the first instance, our therapeutics will be partly medicinal and partly mechanical; while in the second, in all probability, we shall have to perform a surgical operation; after which our assistance will be required to bring about the reparation of the divided tissues. (Congenital deformities we shall allude to again, when speaking of the operations.) We must also take into account the influence that age and general habit of body may have upon our patient. There are many circumstances which will induce the practitioner to deviate in his treatment from any rule that can be laid down; still it must be based upon certain principles. Our remedial means being both general and local, as circumstances may indicate, judgment is required in modifying their application: for example, our patient may be in a debilitated state, in which depletents are not admissible, but rather a generous diet and tonic medicines. Or we may have, in another case, the reverse of this: the animal is in the prime of life, and has been living high, so as to induce a decided inflammatory diathesis. Here our antiphlogistic treatment must be rigidly carried out. (Of course, I refer to inflammation only as being inimical to the well-doing of our case.) On the other hand, in old horses whose ligaments and tendons have become hard, unyielding, and brittle, we had better desist from performing an operation to remedy any existing deformity, as the reparatory process would be very tardy and imperfect: under such circumstances, we should deem it advisable at once to advise the owner to have the animal destroyed.

To illustrate our views as to the treatment to be pursued in strained tendon or ligament, we will suppose the following cases:—

Case the First.—A horse, who had the day before slightly strained his flexor tendons, of either the fore or the hind leg, is lame, and unable to bring the heel to the ground without pain being evinced; tumefaction at the seat of injury, and for some little distance below it, is perceptible (since we may expect the swelling to extend below the seat of injury, as the effused fluid gravitates); indentations are, perhaps, left on pressure; there is increased temperature of the part; and pain evinced when the tendons are manipulated: the horse we suppose to be in good condition, inclining to plethora. Here local bleeding should be resorted to, by opening either the vena saphena or the radial vein, having first carefully taken the shoe off, and replaced it by one with a moveable high heel; for which a lower one can be substituted, when required, without removing the shoe. Cathartic agents must be given, and the leg kept continually and carefully fomented with warm water. His diet should be light, such as bran mashes, with little or no hay; in fact, our treatment must be antiphlogistic. The limbs should be placed as much as possible in a state of quietude, although to accomplish this we labour under a great disadvantage. The fomentations having been assiduously employed, the physic operating, tension also having been relieved for some time by the use of the high-heeled shoe, and some twenty-four hours having elapsed since we were called in, we may expect to find the animal able to bear more weight upon the injured limb: less pain too is evinced on pressure, and the heat is diminished. Should this not be the case, and the medicine have failed to operate, give an enema, and continue the fomentations; but do not allow exercise of any kind. If, however, the general symptoms be abated, as we have supposed, still continue to keep the limb wet with tepid water; and although the purging may have ceased, nevertheless the fæces must be kept in a soft state. The kidneys also may now be excited by the occasional exhibition of a diuretic. Probably there will be for some little time a degree of morbid heat remaining, and the leg being now prepared for a change of temperature, I would suggest the use of either dilute acetic acid or spirits of wine and water; or we may employ a solution of the diacetate of lead. With either of these let the limb be kept constantly wet. The high heel of the shoe should be removed, and the lower one put on in its place. Continue this treatment until all increased heat and tenderness have left the leg. A wedge-heeled shoe may now be resorted to, and a little walking exercise allowed; and as in all probability some thickening will remain, we may, with a view to facilitate absorption, apply friction to the limb, and moderately tight bandages, from which I have seen much benefit result, when properly applied.

Although the case we have selected is one not very intense in character, still we must insist upon the horse having at least one month's rest after his apparent recovery. But the length of time will, of course, depend upon the kind of work required of him.

Case the Second.—This is one in which the organs shall have received a greater injury. The connecting areolar tissue of the tendonous fibres is lacerated, causing their separation, and perhaps some of them are ruptured; the horse is in the same plethoric condition as in the last supposed case, and the symptoms generally are more aggravated, conjoined with some constitutional disturbance. Here our antiphlogistic treatment will require to be more fully carried out, and general and local bleeding may be resorted to with advantage; by these means endeavouring to control the inflammatory action. The bowels also must be kept open by laxative medicine, and occasionally a diuretic administered. Should the effused material become organized, and formed into structure, thickening, and consequently shortening must be the result. Taking this view of the changes likely to occur, I should, even though it would cause pain, lower the heels earlier than in the former case. My reason for adopting such a course of procedure is to preserve, if possible, the full length of the tendon or ligament; which, if accomplished at all, must be done while the abnormal deposition is in a state capable of being elongated. Evaporating lotions are to be constantly used as long as any increased heat is detected. Bandages I consider of the greatest importance when applied at a proper period, and skilfully adjusted. But, despite all our efforts, in many cases of this kind, shortening of the injured tendon or ligament will be the result; producing an altered position of the bones.

In cases in which the lesions are even more serious, and accompanied with hæmorrhage into the connecting and surrounding tissue, combined with other effused elements, we must do all we can to control inflammation, and to facilitate absorption. But this state of parts is not always easy of detection. Should our case take an unfavourable turn, abscesses may form in the structure of the tendon, and be followed by ulceration; the treatment of which, as well as wounds and injuries from external violence, I shall not allude to in this paper, but proceed to describe my mode of operating for some of the deformities of the limbs.

The animal, under all circumstances, requires some preparation. He had better be rested from work for at least a week. The leg to be operated on should be thoroughly cleaned, and repeatedly wetted with cold water, so as to render it, if possible, free from all abnormal heat at the time of operating. His bowels should be attended to, the fæces being brought into a relaxed state—perhaps, in the majority of cases, he ought to be purged, and even lose some blood. The shoe must be taken off; the hoof pared and rasped to the desired form, and a shoe employed of such a shape as may be thought best to assist us in restoring the foot to its natural conformation. In some cases the heels will require to be lowered, and those of the shoe made thin, and a piece of iron also projecting from the toe. Or we may apply a shoe with moveable high heels, and which can be replaced by lower ones, or taken away altogether; thus allowing the heel of the shoe to come in contact with the ground. All this must be well considered before we proceed to operate.

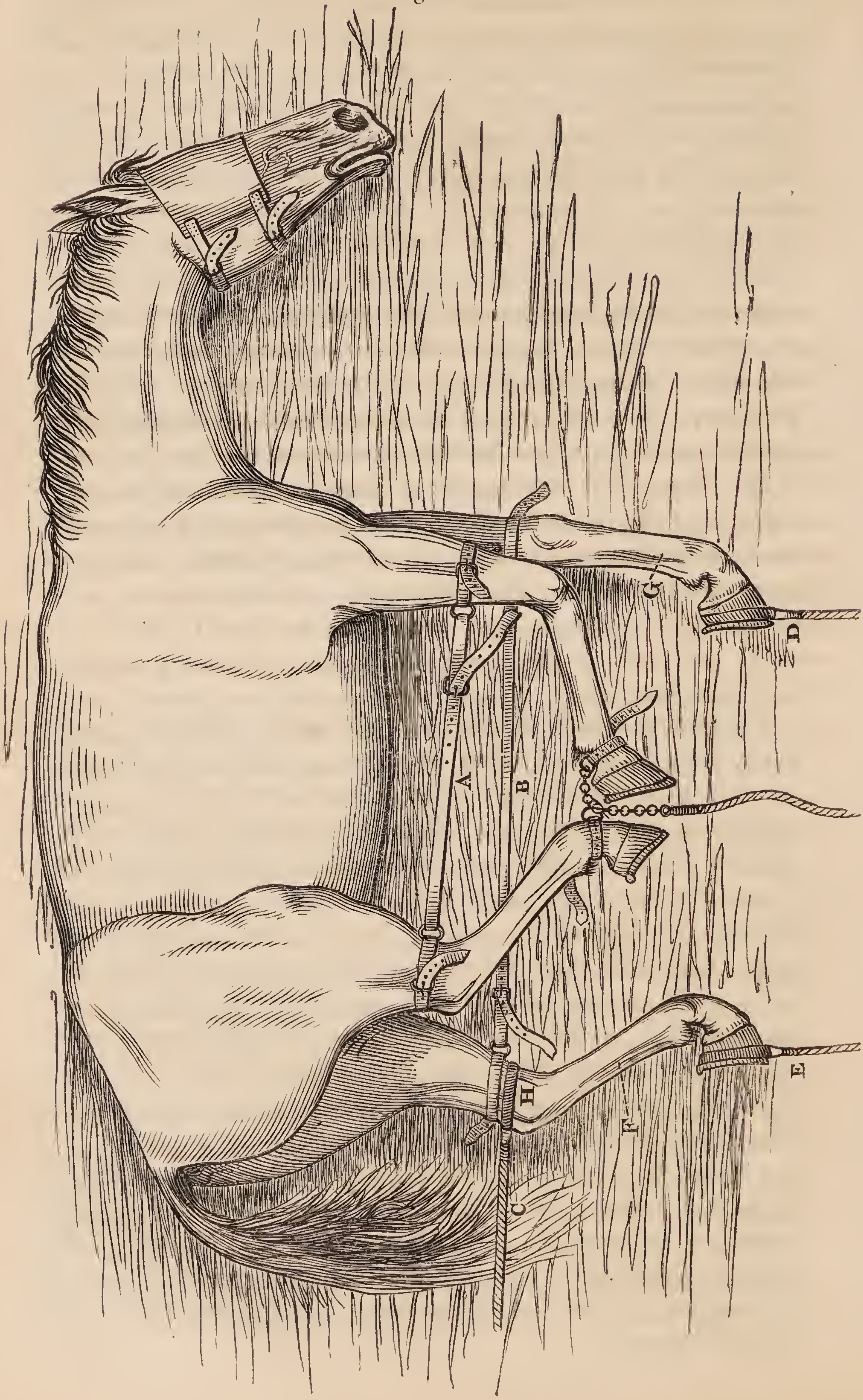
The instrument I prefer for dividing the tendon is a bistoury, having a strong handle, suitable in size to the hand of the operator. This is important, as it will enable him to hold it firmly while making the section. The blade should be narrow, about three-sixteenths of an inch in width, the back comparatively thick, with its angles rounded off; the cutting edge about one and a quarter inch in length, and a little bellying; the space between it and the handle is about half an inch long, and somewhat rounded. I choose this form of instrument, because, when it is introduced, the cutting edge only is applied to the tendon to be divided, and it does not interfere with the small puncture made in the skin. We also require a linen bandage, and a small quantity of lint, with the means necessary to secure a wounded bloodvessel should such an accident occur; although with proper care this is not likely to take place.

Mode of Operating.

The method I have adopted, and proposed to others for several years past, and which many who were pupils at the time but are now in a lucrative practice, I hope, can testify to, is as follows. I may state here, without discussing the merits of the different plans advocated for the operation of tendiotomy, that I fully concur in the opinion of M. Tirart (see Veterinary Record for July 1848, p. 231), that all those which are not based on the subcutaneous method are in opposition to sound principles of surgery, and ought to be abandoned by practitioners of the new school. It will be seen, from what I have before advanced, that only at certain parts can a section of the flexor tendons be made with safety; whether in the young animal, arising from congenital deformity, or in the adult, from various injuries.

Tendiotomy, in the majority of cases, will be required for the perforans, occasionally both for the perforatus and perforans; seldom or never for the perforatus singly; and division of the extensor pedis will only be justifiable in cases of congenital deformities, and also, in my opinion, when the suspensory ligament is diseased.

Fig. 7.



EXPLANATION OF FIG. 7.

Fig. 7 represents the horse cast, with the legs removed from the hobbles, preparatory to the operation.

A, The upper cross strap.
B, The under cross strap.
H, A web-halter around and above the hock.
C, Its free end directed backwards.
D, A similar piece of webbing around the fore foot.
E, The same.
F, The part where section of the tendon is to be made in the hind leg.
G, The same in the fore leg.

Sufficient hands being assembled to assist us, and every thing ready, we first proceed to operate upon the extensor pedis of the young animal. Our patient is cast in the usual way.

The limb to be operated upon is removed from the hobble, the cross hobbles having been put on to restrain the legs (see B, *Fig.* 7). A piece of webbing being placed immediately around the fetlock, with its free end held by an assistant, who must draw it steadily forwards against the cross hobbles, and in this way the leg will be somewhat fixed. Another piece of the same material is to be placed around the foot (see D, *Fig.* 7), with its free end in the hands of another assistant you can depend upon, and who is to pull in a direction in a line with the leg, or a little backward of that direction. The operator is now to make a very small puncture through the skin, at the inner border (O, *Fig.* 6) of the tendon, but only sufficiently large to admit a small probe-pointed bistoury, which is slightly curved. This instrument is to be forced between the common integument and the tendon, as far as its outer margin. The edge is now to be directed against the tendon, and at the same time the assistant must draw the rope which is attached to the foot steadily and firmly, when a slight sawing motion being made with the knife, the tendon will be severed. This will be indicated by a sudden jerk, the upper part receding by the contraction of the muscle. It will be immediately seen whether there is any other obstacle to prevent the phalanges being straightened upon the large metacarpal bone; if there should, carry your knife a little further outwards, and divide the tendon of the extensoris suffraginis and the extensor ligament. No antagonistic power or obstacle will now exist to prevent the flexors straightening the inferior bones of the limb. Scarcely a drop of blood need be lost in this operation; and the only dressing required will be a little moistened lint laid over the puncture, and confined with a light bandage. In a short time, should there be a want of power in the limb to assume the upright position, the practitioner must contrive some mechanical support to it.

We will now describe the operation of dividing the perforans. The horse having been prepared, and every thing in readiness, he is cast in the usual way: and the cross straps are placed upon his legs, above the hocks and knees (see *Fig.* 7), the horse lying upon that side on which the limb rests we intend to operate upon: a position which will enable us to operate on the inner side of the limb. My reasons for preferring the inner side are, that the cicatrix is less in view than it would be if it existed on the outer side, and we are not likely to wound the oblique branch of nerve (see M, *Fig.* 6), which leaves the inner metacarpal at the upper third of the space between the knee, or hock, and fetlock, to join the outer at the lower third. If we are about to operate on the hind leg, the upper cross strap (see A, *Fig.* 7) is buckled up tight, thus drawing the uppermost hind leg as far forwards as possible. The foot of the leg to be operated upon is now removed from the hobble; a web halter is placed around the leg above the hock (H), but below the cross strap, its free end (C) being held by two assistants, who are to pull, when desired to do so, in a backward direction. It will be seen that this traction will be directly against the cross-straps (B), which will fix the leg. A similar piece of rope is to be placed around the hoof (E), the heels of the shoe will prevent its slipping off; and the free end is to be held by an efficient assistant, who also is to draw steadily when directed. To raise the leg a little, it may be placed upon a cushion. The operator is now to place himself so as to be out of personal danger. The two men at the posterior rope are to draw firmly and steadily. The assistant at the foot rope is to flex the foot as the operator directs, who is now to grasp the tendons, which are quite lax, about midway between the hock and fetlock, with his left hand, the fingers being placed beneath the tendons and the thumb above them. In this way we can, to a slight extent, separate one tendon from the other, so as to feel distinctly the space between the two.

At this point plunge the small bistoury through the skin and outer connecting cellular tissue, which is more dense than that which is situated between the tendons forming their bond of connexion. The small puncture is to be made in a line from above downwards. In making this, the horse, in all probability, will struggle, which the operator must be prepared for, so as to withdraw the knife as soon as there are any indications of this taking place, thus preventing other parts being wounded. The struggle being over, and the foot still flexed, grasp the tendons as before, and introduce the bistoury again in a flat position with the tendons, the cutting edge being directed either upwards or downwards, as may best suit the operator; then force it through to the outer border of the tendon to be divided. This being done, the handle of the knife must be held firm in the hand, but at the same time the operator must be prepared to relax his grasp, and, if necessary, to withdraw the instrument should the animal struggle much. The assistant at the foot is now desired to use gentle traction, and increase it as directed. When traction has begun, the edge of the knife is to be turned and pressed against the perforans tendon, nearly severing it; so that on a slight sawing motion or two being made—and sometimes, if the tendon be small, not any—the tendon will be suddenly divided. This is indicated by a snapping noise, that is, if no adhesions exist. Some persons have recommended that the section through the tendon should be made in an oblique direction: I see no advantage from this, therefore I should neither recommend nor adopt it.

Adhesion often requires the division of both the perforatus and perforans. In some cases the necessity to do so is easy to be determined, but in others it is not. Occasionally the effused matter is not so copious, or so fully developed, as completely to unite the two tendons into one solid mass. In such cases section of the perforans may be sufficient; after which traction to a considerable extent may be applied, thus in part breaking down the connecting medium. But, should this not be accomplished to the full extent we wish, so as to enable the foot to resume its normal position, then, by the use of a shoe having a piece of iron projecting from the toe about three inches long, the horse would be compelled to throw his weight on the posterior part of the foot, and thus cause the connecting tissues gradually to elongate, and this, perhaps, to as great an extent as we wish. But having divided the perforans, and finding the force used produce no effect on the position of the limb, the knife must be again introduced, and traction resorted to as before; the edge of the instrument being, of course, directed against the posterior tendon (cutting backwards instead of forwards), when a sawing movement or two being made, the tendon will be divided. In other cases, the state of the parts will at once enable us to determine upon the necessity of dividing both tendons. In such I should make the puncture a little behind the anterior border of the tendon; then, with the leg flexed as before recommended, pass the bistoury between the tendon and the nerve, the metacarpal artery and vein (see P, Q, S, *Fig.* 6), pushing those forwards with the back of the knife, by directing its cutting edge against the anterior border of the tendon. This direction only applies to the fore leg, for the metatarsal artery takes a different course from that of the metacarpal by passing down the outer surface of the hind leg. Considerable force will be required to cut through the united mass, especially if of long standing; but, when accomplished, it will be indicated by the same phenomenon that we have alluded to. We may operate on the fore leg at the upper part of the inferior third, while on the hind leg we may go a little higher up, if we think proper. By choosing such a situation we shall be clear of the two large vaginal bursæ, which we have before spoken of.

Division of the suspensory ligament is an operation I have not performed; but in some congenital malformations I have no doubt that it may be adopted with advantage, and certainly I should have recourse to it, did a case come under my hands requiring it. The point I should choose for the section would be immediately above the bifurcation of the ligament, adopting the same course, as far as preparation and the securing of the limbs are concerned, as for division of the tendons. With the leg a little flexed I should pass a very narrow bistoury, in a flat position, transversely across the posterior surface of the ligament. Traction is now to be made at the foot, while the operator turns the edge of the instrument firmly against the ligament, using a little sawing motion with the hand, when the organ will be divided. We should be prepared to turn back the knife as soon as this is accomplished, otherwise we might sever some bloodvessels which are situated between the ligament and the bone. Nor is this likely to be altogether a bloodless operation; as branches of the small metacarpal arteries, and recurrent ones from the large metacarpal artery, may be wounded; but if this should occur, no importance need be attached to it, as the hæmorrhage would be easily arrested.

The operation in either case being performed, the animal is to be released from the hobbles, and led to his stall or box. A small pledget of lint or tow, wetted with a little spirits of wine and water, is now placed over the puncture, and secured with a light linen bandage. The limb is afterwards to be kept wet with the same, or some other evaporating lotion, or cold water merely. His diet must be regulated according to age and condition, and also the state of the wound during the reparatory process. It is astonishing with what rapidity the divided tendon is restored. The space is filled up with plastic effusion, which becomes organised and consolidated into tissue, analogous to the original, and, perhaps, equally as strong. Its fibres, however, do not seem to take that straight direction they do naturally, but are interwoven with each other in various ways.

The operation itself is simple. The great object is subsequently to place the limb in such a position, and by mechanical or other contrivances so to keep it as to ensure a proper length when the new part becomes consolidated. When the perforans only has been divided, at the expiration of the second week the heel of the shoe must be lowered; and to cause that part of the foot to be placed on the ground, the elongated toe must be employed for a long time. If, on the other hand, both tendons are divided, the suspensory ligament only supporting the weight thrown on the limb, the probability is that, although reparation by new material is complete, the tendon will ultimately be much too long. This I have known to occur to such an extent as to allow the fetlock to come to the ground; and the animal was destroyed as useless. It must be obviated by using for some time the high-heeled shoe; and, in some instances, other support will likewise be needed. But in due time the heel may be gradually lowered, so as to elongate the newly-deposited material.

As a certain period is necessary for Nature to restore the parts, I think it not advisable to allow exercise before three weeks have elapsed from the time the animal was operated upon. At the end of seven or eight weeks he may perform some slight work; but at this period the tendon has not acquired its full solidity and strength, consequently I should not exact from him his full share of work under three months. Neglecting these precautions, the veterinary surgeon is likely to be disappointed in the results of tendiotomy.

A Case of Disease of the Mesenteric Arteries in a Horse.

By Mr. W. Robinson, *M.R.C.V.S.*

[The date of the following case will not detract from its worth. "Good wine improves by age." It was found carefully laid up among the archives of the College, and the preparation to which it refers has for a long time occupied a conspicuous place in the Museum of that Institution. It is, perhaps, to be regretted, seeing that its anatomical and physiological descriptions so entirely belong to the days of yore, that publicity was not given to it long ere this. However, we may say with the Roman philosopher, but in far less stoical spirit than Seneca himself would do,

"Sera nunquam est ad bones mores via."]

Dear Sir, *Tamworth, June* 24, 1812.

I duly received your's of the 15th instant, expressing a wish to possess the diseased portions of the mesenteric artery which I informed you I had obtained from a horse after death. Most cheerfully do I also comply with your wishes to give you the particulars, in full, of this interesting case; feeling a perfect conviction that the subject will receive from Professor Coleman and yourself every elucidation which your professional skill and ability can give to it.

The horse affected with the disease of the mesenteric arteries was a valuable hunter, having a *narrow chest*, and belonging to Charles Boultbee, Esq., of the 10th Regiment of Hussars. He was admitted into our stables on the 3d of April, 1811, to undergo the operation of firing for lameness in his fore legs; and was sent away on the 3d of May following to grass, apparently in good health, where he continued till the 12th of August; on which day he was re-admitted into the infirmary with an enlarged bursæ mucosæ of the hough joint. I think we may consider that the disease of the bloodvessel had commenced at this time, from his bodily appearance and condition having rapidly declined without any visible cause. This latter circumstance induced me o attribute his falling away in flesh, and also the existence of the swelling on the hough, to those provoked exertions which horses are observed to make when at grass at this period of the year, occasioned by the continued irritation of flies. His appetite was very voracious, and this we endeavoured to satisfy by a liberal allowance of nutritious food. At the expiration of ten days I ordered him a mild purge, and afterwards a continued course of tonics. On the 23d of September he again left us, but without any amendment in his condition. I was next called to visit him on the 24th of November at John Boultbee's, Esq., of Baxterley Hall, near Atherstone, on which day the actual cautery was applied over the whole extent of the enlarged mucous bags of the hough joint; and it was agreed between us that he should have the advantage of a straw-yard during the winter, as all hopes of recovering his condition so as to enable him to perform the severe duties of a hunter were despaired of. I must here observe that, from his emaciated appearance, the lymphatic vessels seemed to have been most actively employed in the removal of his flesh and other soft parts since the period he left us in September. He continued in the stable after firing the usual time required for the inflammatory action set up in the parts to subside, when he was turned into the straw-yard; every possible care and attention being taken to supply him with all necessary food. He remained in this situation till Jan. 1812, when I was again requested to see him. I found him in the most debilitated state possible, scarcely possessing sufficient strength to support himself in a standing position: he looked miserable, and was entirely incapable of raising himself, after he had lain down for the purpose of obtaining a temporary renovation of his exhausted strength. Under these circumstances I ordered him sal. martis ʒij, gum asafœtidæ ℥iij, mellis et pulv. sem. lini q. s. fiat glob.; and likewise gave instructions for three or four feeds of corn to be given to him daily. His appetite continued unimpaired, and his pulse was about 42. He had likewise all that fierce animation depicted in his eye which is characteristic of this noble animal when in the possession of perfect health. From the frequency of his lying down, and the extreme difficulty in raising him even by assistance, he was supported by a well-constructed swing, from which he was occasionally removed to give him a little walking exercise. In this situation he continued, eating with the most ravenous appetite daily three or four feeds of oats and beans, and a considerable quantity of carrots, turnips, grass, and sweet hay, until the morning of the 1st of June, 1812, when he was destroyed.—It may not be superfluous to remark here, that, after taking from the jugular vein three quarts of blood, his respiration became quickened; his pulse small and tremulous; the pupil of his eye dilated, accompanied with many other symptoms of approaching syncope; and that, upon introducing a small quantity of air into the vein, he expired instantly, and without a struggle.

I will now give you the best account I can of the appearances after death. On proceeding to the examination, I was fully impressed with the necessity that every part should be carefully investigated, and more particularly the viscera of the thorax and abdomen. I commenced by removing the true ribs of the left side, and next detached the heart and lungs from their connexions: they presented the usual appearances of those organs in perfect health. I then divided the thoracic duct, opposite the articulation of the fifth rib with the dorsal vertebra, and observed that a greyish-coloured fluid escaped from the tube. The cavity of the abdomen was next opened, and its contents presented a most healthful appearance. The liver, I thought, was much less in size than that of horses in general, but it was perfectly free from disease. The whole length of the mesentery I carefully examined, but was disappointed in my expectations, as I had formed an opinion, while the animal was living, that a disease of its glands and of the lacteals was the cause of his emaciation. The small intestines were then removed, by dividing the mesenteric vessels close to the aorta. After their separation, a quantity of aqueous fluid was seen to issue from the extremity of the larger lacteal trunks, but which in appearance did not possess any quality that could give it the character of chyle. This led to an examination of the mesenteric artery; the opening of which clearly demonstrated both to myself and his attendants the immediate but obscure cause which had triumphed over every effort that had been made to relieve his sufferings. The vessel was found with a partial loss of its cuticular (inner) coat, the muscular and the elastic being, however, morbidly thickened. A great quantity of coagulated lymph with other matter was adhering to the inner surface of the muscular tunic, together with a large number of white worms (ascarides?), and to which this deposit of morbid matter seemed to afford a security against their removal by the circulation of the arterial fluid. The anterior mesenteric artery and its branches were in this state of disease for about ten inches in length from the origin of the vessel. The posterior one was not diseased at its origin, but found to be affected in the same manner in its course throughout the entire length of the colon, with the exception of short intermediate portions, where it only displayed inflammatory patches on its cuticular (inner) coat. The arteries of the cæcum and rectum did not present the least appearance of disease. The whole length of the intestinal canal was afterwards opened, but in it there was not found a worm of any description. The stomach was likewise free from bots.

I candidly acknowledge my inability to explain the cause of these diseased branches of the arterial system, though I feel desirous to offer, but with much deference, some ideas which occur to me on reviewing the history of the case. I am inclined to consider the disease as having originated in inflammation of the artery, occasioned, in all probability, by the great peristaltic motion that is known to exist under peculiar circumstances in horses *possessing narrow chests.* During this inflammatory state the cuticular (inner) coat would experience a great increase of sensibility; for the blood, in its circulation, coming in contact with this tunic, would now prove a powerful stimulus in causing that irritation on its surface which seems to have been produced from the increased action of the vasa vasorum of the artery, by the deposit of coagulated lymph and other morbid matters found in its cavity; and although the lymph was attached to the interior surface of the vessel by its own adhesive power and the pressure of the arterial stream, it evidently did not possess the least organization, if I may be allowed the term; therefore it may be considered as animal matter destitute of the living principle. If such be the case, I would ask, What is there to controvert the idea of the production of those animalcules which are known to be generated in animal matter in the same state apart from the body, although protected from the access of atmospherical air? By the admission of such a theory, we may conclude there could be no impediment to their progressive growth into that species of worm found in the artery; which order of production I have been more anxious to state, from the great numbers of small worms found intermixed with the larger ones between the layers of this morbid matter; and in one vessel, particularly, upon separating the lymph from its sides, very great numbers were observed, and these so extremely small and slender that it was with difficulty the naked eye could discern them.—Having before detailed the effects which this diseased vessel produced upon the animal frame, I will here only state the view I entertain of the manner of its operation. The diseased mesenteric artery could not receive from the aorta that full quantity of blood the intestines required for the secretion of the enteric juice and other fluids necessary to promote chylification; which deduction of the arterial fluid in the mesenteric vessels would occasion great imperfection in that important process by which the nutritious parts of the intestinal contents are converted into chyle; therefore the small quantity of chyle produced, and that perhaps of an inferior quality, would not be adequate to supply the sanguiferous system with the requisite amount of blood, from which cause the vessels of the lymphatic system would be excited into greater action, so as to supply that deficiency; and this was fully exemplified by the state of the body at the time the animal was destroyed. The wisdom of this part of the animal economy cannot, I think, be sufficiently admired, as it is enabled to afford support and to preserve animal life for a considerable time, when all its other sources are suspended by disease or other causes. Perhaps we may attribute the small size of the liver to the decreased quantity of blood that organ received from the intestines, notwithstanding that gland derives its nourishment and growth from the blood conveyed to it by the hepatic artery.

I have enclosed a part of the anterior mesenteric artery, which you will find, from its branches, was taken immediately from the aorta, accompanied with a few of the worms that were found in the vessel.

I am, dear Sir,

Your's, very sincerely.

To W. Sewell, Esq., &c.

Case of Rupture of the left Auricle of the Heart of a Horse.

By Mr. T. W. Gowing, *M.R.C.V.S., Camden Town.*

Dear Varnell, *August* 22, 1850.

In accordance with your wish, I send you the following brief history, it being all I can glean of the case of ruptured auricle of the left side of the heart I told you of. As you kindly examined the organ, and observed the lesions that had taken place, perhaps you will further make me your debtor by offering such remarks as your examination might call forth. By so doing you will confer a favour on,

Your's most truly,

T. W. Gowing.

In the month of June I was requested to attend a coach-horse, then working in a fly, as he had suddenly fallen down by the roadside, where he was standing to take up a passenger. He had previously been driven slowly from Holloway, a distance of about three miles, and shewed no symptoms of distress when he arrived at his destination; but while there he suddenly fell forwards, his head and neck inclining on the bank, and his body lying in the channel of the road. This was the position that I found him in when I arrived, and I at once pronounced him to be dead. The membranes were quite blanched, and I gave it as my opinion that the horse had died from internal hæmorrhage, and requested I might be allowed to make a post-mortem examination. There is one thing I am unable to account for; that is, the animal standing perfectly quiet after his arrival, shewing no symptom whatever of distress, and then suddenly falling and expiring, the auricle giving way at the time the animal was passive. Your remarks upon this head will further oblige. I will only add, the old horse had been suffering for a long time under navicular disease, and that in its worst form.

Observations on the above Case, by Mr. G. W. VARNELL.

I carefully examined the heart sent to the College by my friend Mr. Gowing, to whom we are much indebted for many valuable specimens in morbid anatomy. Well do I know that he spares neither time nor trouble in investigating, not only those cases that are of more than ordinary interest, but all animals, or nearly so, that may happen to die in his own practice, with many others that he accidentally hears of; always carefully noting down what he sees. If this plan were generally adopted by veterinary practitioners, what a fund of pathological facts might be recorded! and which if faithfully done, stating only that which could be "seen, felt, measured, weighed, or smelt;" such a method would, in my opinion, furnish us with that which, pathologically considered, would be of inestimable worth—veritable reports of a large number of cases of high interest, and on which firm reliance might be placed. The veterinary surgeon has many opportunities to prosecute these investigations, for he is seldom debarred from examining, *post-mortem*, any animal that may die under his care: indeed, on the contrary, by the proprietors such examination is generally courted. In many malignant or incurable diseases, too, he often has the advantage of having the animal destroyed at any stage of the disease he may please, which affords him an opportunity of seeing the state of the affected parts before decomposition or organic change has effaced the true character of the malady. Such facilities as these the human surgeon is deprived of; we, therefore, as veterinary surgeons, ought to avail ourselves of the privilege whenever it is presented to us, since by so doing,—if it be done honestly, as I have already said,—science could not fail to be benefitted.

But I must advert to the heart, which, I have stated, I carefully examined. Its general aspect was rather pale, and as it laid on the table its walls were collapsed. Speaking generally, there was a want of that plump and ruddy appearance observable in the heart when it is normal. In magnitude it seemed to correspond with the usual size of this organ, therefore I was not induced to weigh it. My attention was next directed to a large rent at the base of the left auricle, which extended nearly from one end of the auricular septum to the other; the opening being as much as three inches in length. I now proceeded to examine the organ more fully; first, by laying open its cavities, noting the thickness and consistence of their walls; their dimensions; the tricuspid and bicuspid valves at the auricular ventricular openings; and also the semilunar valves of the pulmonary artery; all of which seemed to be in a normal condition, excepting that which was first observed, namely, a flaccid state of the tissue generally. But on arriving at the aortic valves, they were found in that state which caused them to be incapable of supporting the column of blood above; being much attenuated, and perforated with many holes, producing an irregular kind of net-work or cribriform state of more than half the surface of each valve, thus rendering them inadequate to perform their functions. Those little nodules, one of which is situated on the margin of each valve at its centre *(the corpora aurantii)*, had nearly disappeared. In a normal state these would have been half as large again as similar bodies on the pulmonary semilunar valves. The aorta itself seemed to be neither dilated nor diminished in its caliber. These were the only lesions observed by me in the heart, with the exception of the rupture already alluded to. Although the muscular parietes of the auricle seemed not to be thinned, still there was evidence of softening. The long diameter of the rupture was parallel with the auricular ventricular tendinous zone; consequently the rent was transversely to those muscular fibres which cross the auricle, only separating those whose direction is in a line with the base of the heart around the auricle.

I should think the rupture took place suddenly, as I observed no indication of ulceration, or effusion of blood between the muscular fibres, which would have been the case had its progress been slow.

Although there were no signs of distress noticed by those who had the charge of the animal previous to his falling, still I think it likely that had my friend had an opportunity of carefully examining the horse before death occurred, he would have observed some disturbance in the circulation. Or had he quietly auscultated over the region of the heart, an abnormal sound, most probably, would have been detected; a sort of bellows sound, produced by the regurgitation of the blood, consequent upon the imperfect state of the aortic valves. But this he had no chance of doing, as he was not called to see the animal until he was dead.

This case is, certainly, a very interesting one; but as its etiology, with that of many other conditions of the heart, is little understood by us, I am forbidden speculating as to the immediate cause of the rupture in this instance; yet I would ask, May not the state of the valves already alluded to be the *remote* cause? I am inclined to think it was. And might not the *immediate* cause depend upon the irregularity of flow, and the accumulation of blood, in the left side of the heart?

This is the only case of the kind that I have met with; nor am I aware that a similar one has been recorded.

Case of Ruptured Stomach of a Colt.

By Mr. T. W. Gowing, *M.R.C.V.S.*

Dear Sirs,

The following case may not be uninteresting to your readers, occurring, as it did, in so young an animal, namely, a colt fifteen months and two days old. I had performed the operation of castration on him about eight weeks before his death, and saw him only two days previous, when apparently he was in health and vigour. The owner soon after called upon me and wished me to make an examination of the colt, he being found dead in the field on Thursday morning, September 5th. The owner also said he thought it might be caused by, or have something to do with, the previous operation. I told him I felt obliged to him for the opportunity, as I was certain we should find some lesion or rupture to account for the sudden death; and upon laying open the abdomen the cause was at once apparent, there being a large quantity of solid ingesta within the omentum. The stomach was enormously distended; and upon removing it, together with the intestines, a lesion was found to extend through the whole of that part of the organ that is covered with the villous coat. I caused the quantity of ingesta that was removed to be weighed, and its weight was sixty-four-and-a-half pounds.

I remain,

To the Editors, &c. Your's truly.

History and Description of an Ossifying Enchondroma connected with the Testicle of a Horse.

By Mr. Joseph Sampson Gamgee, *M.R.C.V.S.*

[*Illustrated with a coloured plate.*]

The diseased specimen which is the subject of the present remarks was removed from a horse in the operation of castration, and forwarded on the 28th May, 1850, to the Editors of The Veterinary Record, by Mr. Robert Cook, veterinary surgeon at Erith. He stated in an accompanying note, that " the testicle was taken from a four-year-old horse, which appeared to suffer no inconvenience from its presence, although he had always been in an emaciated condition. The scrotum on the side whence it was taken had the appearance of hernia, the gland being much more pendulous and pouched than its fellow, which was quite free from disease, and very large. On making an incision into the diseased testicle, nearly an ounce of dirty-looking serous fluid escaped."

The testicle (see *coloured plate, fig.* 1) measures six inches in its long axis, and three inches from above downwards. It is soft and flabby, except at the posterior part, where a moderately hard tumour, A, about the size of a small orange, is connected with it. The gland is invested by the reflected or visceral portion of the tunica vaginalis, T, whose attachment, by a considerable amount of areolar tissue, is much looser than in the healthy condition, as it could readily be stripped off; moreover, the membrane is abnormally thick and opaque. Its general colour is a dead white, but pinkish at the supero-anterior part, near the commencement of the cord. The anterior extremity of the epididymis and the cord appear to be of normal size, and to preserve their usual relative position. The intermediate connecting portion of the vaginal tunic has been torn asunder, and the extremity of the cord has been seared by the hot iron in the operation of castration. The spermatic artery measures $\frac{3}{16}$ of an inch in circumference; in its interior is a small quantity of coagulated blood, and in the structure of its coats no deviation from the natural condition can be detected by the aid of the microscope. The other constituents of the cord are apparently healthy. On dividing the testicle longitudinally, a hollow capable of containing a large pigeon's egg is exposed. The normal structure of the gland is nowhere presented to the naked eye; but from before backwards the tissue, indistinct in character and soft, gradually loses its red colour, becomes less in amount, and eventually degenerates into a dense white fibrous tissue, B, intimately connected with the diseased mass, A, which measures $1\frac{3}{4}$ inch from above downwards, $2\frac{1}{2}$ inches from before backwards, and, when cut longitudinally in the middle, $3\frac{1}{8}$ inches in the maximum transverse axis. The interior of the tumour being thus exposed, it presents two halves, of which the right is crescentic in shape, and measures $2\frac{1}{2}$ inches from before backwards, and $1\frac{1}{8}$ inch in breadth at the widest point; $\frac{6}{8}$ of an inch from its anterior extremity it is marked by a transverse groove. The left half is divided by one very deep and one shallow groove into three parts, of which the anterior and outer one is triangular, with its base turned forwards. united by a narrow and short slip of tissue, like the rest of the tumour, to the left half. The posterior portion is irregularly circular, and measures $1\frac{5}{8}$ inch transversely, and $1\frac{6}{8}$ inch from before backwards; between these two divisions of the left half is a third, much smaller, its longest axis not exceeding $\frac{7}{8}$ of an inch.

The cut surface of the tumour has a pale yellow colour, and is marked by numerous shallow grooves which irregularly intersect each other, so as to divide the mass into irregularly-shaped lobules. It presents additionally three cysts, C, i. e., closed membranous sacs, each about the size of a large bean; two of them are situated on the left half and one on the right. They were distended with a transparent reddish fluid, the albuminous nature of which is proved by its conversion into a coagulated mass, after preservation of the specimen in a saline solution containing a small quantity of corrosive sublimate.

The physical appearance of the surface is neither that of genuine adipose nor fibrous tissue, but is what would, *à priori*, be anticipated from an intersection of a mass of fat by bundles of fibres. The consistence of the tumour, in the greater part of its extent, is that of ordinary muscle ; but in the centre of the exposed surface are two narrow crescents, *b b* (with their convexities in mutual contact), similar to cartilage in consistence, and in their pale bluish-white or greyish colour. This cartilaginous material may be seen and felt extending laterally into each half of the tumour, imbedded in the surrounding yellow adipo-fibrous tissue, to which it is so closely adherent as not to be detached by the aid of the forceps. By grasping with two fingers the right or smaller half of the tumour, an osseous mass is felt in its interior, and more particularly towards the outer surface, near the tunica vaginalis, from which it is only separated by a small quantity of fibrous tissue : this being dissected off, a dirty white surface is exposed ; which is of bony hardness in a considerable part of its extent, but at one part yields to the knife. In this situation, a small piece of the apparently imperfect bone being removed, a cavity capable of containing a large filbert is exposed ; its boundary is constituted by a thin layer of bone resting on cartilage, and lined by a closely adherent white fibrous membrane.

By microscopic examination, the tissues entering into the formation of the tumour are ascertained to be, firstly, fat and fibrous tissue (white and yellow) ; secondly, cartilage ; thirdly, bone.

The yellowish tissue visible on the surface consists of fat cells (in no way differing from those of healthy adipose tissue) and fibres, which take a wavy and in some parts very irregular course between the fat cells. Some of the fibres are extremely fine and delicate, and may occasionally be seen placed side by side in considerable number to form fasciculi, while others present a well-defined outline, and are wider. The addition of acetic acid confirms the inference deduced from observation of the anatomical characters, *that the fibres are of two kinds*, white and yellow ; for, while the majority of them are rendered indistinct by the chemical re-agent, a few remain intact, are very tortuous, and may in some instances be seen to divide, and to terminate abruptly.

Imbedded in the fibrous tissue above described, and very closely adherent to it, is cartilage. A thin perpendicular section of this texture, with some of the adjoining fibrous tissue (see *Fig*. 2) being placed under the microscope, exhibits the true organization of cartilage; "nucleated cells disseminated in a solid mass or matrix." Those cells which are deeply seated, i. e., at a distance from the free surface, are irregularly oval and spherical, and their outline is indistinct. The nuclei are for the most part coarsely granular, and have a well-defined margin; their extreme measurements in the transverse direction are $\frac{1}{1000}$th to $\frac{1}{2000}$th of an inch. The remark made by Dr. Sharpey* may be here with justice repeated, "that it is often difficult to say whether a body contained within a cartilage cell is its nucleus, or merely the granular contents which have shrunk away from its sides and formed a mass of the same shape as the cell itself, in which the true nucleus is concealed." In some parts an eccentric nucleolus (from $\frac{1}{4000}$ to $\frac{1}{5000}$ of an inch in diameter) is seen within the nucleus; its outline is well defined, and the interior bright, bearing a resemblance to a particle of fat. It may be well to observe that those nuclei which possess nucleoli are less granular than others (see *fig.* 3). On approaching the surface—which is in contact with the fibrous tissue—the cell walls are scarcely visible, and some of the nuclei present an elliptical, others a fusiform and almost linear shape. In some parts the fibres may be seen extending in a transverse direction from the adjacent tissue, for a short distance, into the cartilage. A very large proportion of the fibres being rendered indistinct by the action of acetic acid, the cartilage nuclei then come into view; but their shape is so altered (linear), that their real nature can only be inferred by tracing the gradual transition from the oval and spherical shape.

The intercorpuscular substance or matrix is in some situations homogeneous and transparent, in others granular; and at wide intervals a few delicate fibres may be seen winding their course between the cells.

A transverse section of the bone seen under the microscope, by transmitted light, exhibits somewhat imperfectly the ordinary structure of osseous tissue. The Haversian canals are surrounded by lacunæ, which have a tendency to concentric arrangement, but are not so regularly disposed as in normal bone, and the candiculi appearing as dark tortuous lines, spread out from the sides and extremities of the lacunæ.

* Elements of Anatomy, by Jones Quain, M.D. Edited by W. Sharpey, M.D. and F.R.S., and R. Quain, F.R.S. Vol. I, p. cxxvi.

With a view to ascertain whether the bone owes its origin to intra-cartilaginous ossification, a perpendicular section of the cartilage has been made, including at one extremity a very small portion of the partially ossified structure. Under the microscope the walls of the cartilage corpuscles (see *fig.* 4) are observed to become very indistinct in proportion as the boundary of ossification is approached; they appear, in fact, to have become confounded with the matrix, which has undergone a change from its original character: it is more opaque and coarsely granular than in specimens of the unaltered cartilage (see *Fig.* 5), and the tissue appears mapped out into oval or irregularly-shaped figures, the boundaries of which are dark, while the interior is bright, and contains one or more nuclei, that are for the most part arranged in groups, are smaller, and more closely approach the circular form than do the nuclei at a greater distance from the seat of ossification. At the confines of the cartilage and bone, the opaque earthy deposit is evidently encroaching upon the matrix of the cartilage, and surrounding the corpuscles: some of these are completely enclosed by an opaque material arranged in concentric lines, within which the nucleus of the cartilage corpuscle is still visible. Some corpuscles, however, are not completely enclosed, but the earthy deposit is perceived advancing on each side of the cell, leaving it free at one part. On bringing a deeper and older portion of the bone into view, little oval cavities with dark boundaries are observed; their appearance and arrangement are very similar to that of the lacunæ in the piece of bone already alluded to, but no canaliculi can be detected. The quantity of ossifying cartilage obtainable in a section being extremely small, and the transition being apparently very sudden in the structure of the osseous tissue, from mere cartilage with earthy matter impregnating the matrix, to an imperfect appearance of Haversian canals and lacunæ, no sound inference can be deduced as to the mode of origin of the latter, or as to the eventual metamorphosis of the cartilage elements.

The precise structure of the morbid growth having been ascertained, the question arises, To what class of tumours does it belong? Insomuch as the naked eye characters differ from Müller's original enchondroma*, and microscopically the cartilage in the

* On the Nature and Structural Characteristics of Cancer, &c., by J. Müller, M.D. Translated by Charles West, M.D., 1840, p. 97 *et seq.*

tumour above-described presents the adult and not the embryonic type of that structure, reasons might be advanced for not citing the growth in question as an example of enchondromatous formation. It is, however, remarkble that, of all the cartilaginous tumours described by Müller, the only one which resembled the adult cartilage with isolated cartilage cells and intervening firm substance, was an enchondroma of the testicle*.

As Dr. Walshe observes†, "adventitious cartilage, at one time believed to take rank among the most common, is now known to be one of the rarest of new formations." True cartilage is undoubtedly the characteristic structural element of the tumour above-described, since positive proof is obtained of its conversion into bone; and appearances presented by a perpendicular section of the cartilage force on the observer's mind the idea that the deep-seated cartilage corpuscles, in their approach to the surface, are undergoing a gradual metamorphosis, eventually to form a part of the surrounding fibrous tissue. The difference in the naked eye characters does not appear to be a sufficient reason for not regarding this tumour as enchondroma. Though colloid, encephaloid, and scirrhus, are very different in their physical aspect, they are nevertheless regarded as varieties of cancer, since their anatomical characters and effects on the constitution are fundamentally alike.

Considering that the tumour above-described agrees with Müller's enchondroma in process of ossification, 1stly, in the essential identity of the structural elements, and, 2dly, in its benignant character‡, rather than create new pathological distinctions (always inconvenient and unprofitable, unless established upon very weighty reasons), we regard the tumour as an ossifying enchondroma, though, in the present state of knowledge, it must be considered a very rare, if not isolated, example.

* Op. cit., p. 125.

† The Cyclopedia of Anatomy and Physiology. Article, Adventitious Products.

‡ The benignity of the tumour is proved by Mr. Cook's statement (in reply to our inquiries), "that the wounds in the scrotum healed in the usual time, and the horse appears to have improved in condition since the removal of the testicle." Mr. C. adds, "the horse is the sire of several colts."

A Case illustrating the Power of Belladonna in diminishing Muscular Contractility.

By the same.

On the 4th of November, 1848, I was consulted with reference to a large dog of the mastiff breed, the property of a gentleman in this city. I found the animal in moderate condition, and very playful, although its jaws were perfectly closed. They had been in this state for the period of five weeks, and no cause could be assigned to account for it, except that on one occasion, the dog being unwell, its mouth was roughly handled with a rope during the administration of some medicine. No external injury could be now perceived. I was informed that the animal had subsisted upon liquid messes, which it was able to take in by suction; and of this fact I had proof the next morning, when I saw the dog thrust his head into the pan containing his food, and suck it in with difficulty. The strongest efforts made were of no avail to separate the closed jaws.

Nov. 7th.—Before I adopted any plan of treatment I consulted Mr. Varnell, whose opinion coincided so perfectly with my own, that neither in diagnosis nor selection of remedial measures had I any reason to modify the conclusions I had previously come to from observation of the symptoms. It being evident that some of the muscles whose office is to close the mouth by elevating the lower jaw were inordinately contracted, with a view to produce local sedative action, a belladonna plaster was applied over each masseter muscle, the hair being previously clipped short; I also ordered the animal to be well fed.

Nov. 11th.—The plaster is still adhering, and the dog is apparently in excellent health.

Nov. 13th.—The plasters have fallen off, and the lower jaw is more easily moved than at any previous time since the attack. Apply over each masseter muscle a linseed poultice containing belladonna extract ʒss.

Nov. 19th.—The poultice with the bellad. ext. has been daily repeated since last report, but, the animal being dull and so weak as scarcely to be able to walk, let its application be suspended. The lower jaw is more easily moved, and the animal now protrudes its tongue.

Nov. 26th.—The dog opens his jaws almost as well as in perfect health; he is in excellent condition, and very playful. Discharged cured.

Remarks.—It may be observed that in the diagnosis little difficulty presented itself, since the jaws were completely closed, and the lower one was never seen pendulous, a condition which would have presented itself had paralysis been the *causa morbi.* But while it was clear that some muscles were inordinately contracted, it is impossible to define them with precision, and to determine the cause of the affection.

With reference to the action of the belladonna, two points are worthy of notice; firstly, to it is due the cure, and not to the simple emollient application; which is proved by the fact that the jaws were more easily separated in proportion as the poisonous effects of the therapeutic agent were manifested in the system; secondly, the belladonna acted topically and generally, by being absorbed through the skin.

Note from Mr. Gamgee.

Gentlemen, 8, *Euston Grove*, 14*th Sept.* 1850.

Before the publication of the last number of your Periodical, but too late for the introduction of an appendix to my "Account of a Calcified Testicle of a Ram," my attention was directed to the following notice, in the Report of the Pathological Society of London, vol. i, page 346:—"*The Testicle of a Ram converted into calcareous Matter;* weight ten ounces and a half, length five inches, circumference eight and a half inches. The epididymis and spermatic cord were healthy." Exhibited by Mr. Crisp, 15th May, 1848. I shall therefore feel obliged by your inserting, in the ensuing number of the Record, the following observations on Dr. Crisp's interesting specimen.

I am, Gentlemen,

Your obedient servant,

To the Editors, &c. Joseph Sampson Gamgee.

I have called on Dr. Crisp, who has kindly shewn me the testicle, and offered me every opportunity of examining it, with permission of making my observations public. It is still invested by the dry and adherent visceral portion of the tunica vaginalis, which is semi-transparent (a condition favoured by its having been covered with varnish): apparently it is of normal thickness. A small portion of the calcified surface left uncovered is more nodulated than that of the specimen we have recorded, and the convolutions of the tubes are less distinct. The object being divided lengthways, is seen to be solid throughout, except in the centre, which is marked by a groove in form resembling the letter J, measuring in length about $1\frac{1}{4}$ inch, and $\frac{1}{6}$th of an inch in breadth. The boundaries of this groove are compact, smooth, and glistening; it does not reach either extremity of the testicle. On the whole, the calcified material is less compact, and the specific gravity lighter (in accordance with the fact that the bulk is greater and absolute weight less), than in the testicle described by us. In the interior of Dr. Crisp's specimen many of the hard and solid tubes are seen cut across, while the bendings of others remain perfect: the interior of the calcified tubes is whiter than the circumference, which, however, is not so dark and glistening as in the tubes we have described. A considerable amount of granular calcified material appears interspersed among the tubes, which, when examined with an inch pocket-glass, seem smaller than those of Mr. Folliott's specimen. In conclusion of this description, it may be advisable to mention that the appearance of Mr. Crisp's diseased production is not so much that of *bonâ fide* calcified testicle as is that of Mr. Folliott's; in fact, the latter may be regarded as an explanatory key to the former.

The existence of two specimens of calcified ram's testicle, and of drawings representing the incipient degeneration in both testicles of a goat, renders it not improbable that the disease is of more frequent occurrence in those animals than has hitherto been suspected. The characteristic feature of these morbid productions is, that the healthy tissue of the organs appears to have become impregnated with saline matters; for, while calcification of morbid deposits is not unfrequent, such degeneration of healthy tissues is comparatively rare. Collating Dr. Carswell's statement, that in the testicle which he figured, and in which the process of calcification was most advanced, "the vas deferens and its branches appeared to have preserved their original size;" and Dr. Crisp's statement, that, in the specimen in his possession, "the epididymis and spermatic cord were healthy," we infer that the calcific degeneration commenced in the testicles independently of any change in their afferent or efferent vessels. And again, comparing Dr. Carswell's first figure with the second, and this with the specimens in the possession of Mr. Folliott and Dr. Crisp, it seems warrantable to conclude that, in the testicle, the tubes were the first to become impregnated with saline matters.

Case of Ventral Hernia in a Horse.

By Mr. Charles Hunting, *M.R.C.V.S.*

Gentlemen, *Queen-street, Camden Town, Sept.* 17, 1850.

The following is the history of a case of ventral hernia, the result of external violence:—

On Wednesday, the 17th of July, 1850, a six o'clock, a.m., my attendance was requested to a chestnut carriage horse (gelding), the property of S. Christy, Esq., M.P. In reply to inquiries, I learned from the coachman that on the previous day he put the pair of horses into a stable about ten miles from London, and, being aroused by a noise, he entered the stable and found one horse loose, and the other (the subject of these remarks) trembling on one side of the stall. A considerable swelling appeared on the abdomen; but as the man had no idea of the serious nature of the injury, he drove the pair of horses to London, and on his arrival gave them water, hay, and bran mashes.

Symptoms.—The animal appeared to suffer but little pain; temperature of body and respiration normal; pulse 45, and full; fæces voided twice since the horse has returned, which were dark-coloured and dry. On the right side of the abdomen exists an enormous enlargement, which on examination proved to be caused by a protrusion of the intestines through an opening in the abdominal wall. It is of an oblong shape, widest anteriorly, and extends from the margins of the fourteenth and fifteenth ribs backwards and downwards to the middle of the prepuce. It measures twenty-three inches long and fourteen in width. Means having been adopted for maintaining the bowels in functional activity and preventing the horse from lying down, many-tailed bandages were resorted to for the purpose of effecting the reduction of the hernia, but without success. As no fæces were voided, they were daily removed by back-raking and enemata.

On the 19th of July the animal's general health continuing comparatively unimpaired, the reduction of the hernia was attempted; but such was its extent, and so violent were the animal's efforts of resistance, that although the viscera were replaced, yet to keep them in their situation proved impossible.

On the 20th of July I availed myself of the following plan for the reduction of the hernia, suggested by a friend, who has relieved me of much irksome labour, amidst my professional duties, by arranging the notes of this case. A broad bandage having been passed round the body of the animal so as to cover the posterior three-fourths of the tumour, an assistant tied it over the back, and then inserted beneath it a strong piece of wood, by twisting which he was enabled to exercise great pressure while I reduced the hernia. By a similar arrangement the remainder of the displaced viscera were returned, and, the pieces of wood having been sawn short and secured on the back, a leather case was made to fit the abdomen, and kept in apposition by straps brought over the back.

July 21st.—Fæces voided naturally: from this period up to August 6th a generous diet was allowed, and occasional aperients and enemata given. At one period the marked yellowness of the visible mucous membrane, in particular that lining the mouth, rendered necessary the administration of a dose of calomel, by which the functional activity of the liver was gradually restored. The fore shoes were removed, and the feet poulticed in consequence of the fore legs having on one occasion swollen considerably; they, however, gradually regained their original size.

August 6th.—The compress being removed, the hernia was observed to preserve its original width, but to have decreased eight inches in length, and that principally from the posterior part of it. The skin covering the walls of the abdomen was abraded, and in the vicinity of the prepuce and flank the excoriations were peculiarly deep. Fomentations were employed for the purpose of relieving the existing irritation. For several days after the removal of the compression of the parietes, the patient exhibited symptoms of general irritability and functional derangement of the bowels; but by the timely withdrawal of blood, and the administration of aperient and sedative medicines, health was perfectly restored on the 14th of August.

The question that now presented itself was, Is the animal to be destroyed, or are other surgical means to be employed for the reduction of the hernia? The absence on record of a sufficient number of well-authenticated cases of such extensive injury existing, at once appeared to justify a careful examination of the parts, with a view to operate if circumstances permitted: we therefore proceeded to Messrs. Christy's establishment, at Bermondsey, where the horse was cast, and put under the influence of chloroform. By manipulation it soon became evident that the chances of success likely to attend any surgical operation would, in all probability, be slight, if any at all; and, a small incision made through the integument having fully corroborated the suspicions entertained as to extensive adhesions existing, the horse was at once destroyed.

Post-mortem inspection.—The opening in the abdominal parietes was found to be nearly circular, and to measure eight inches in diameter. Anteriorly had been formed an extensive sac, the outer wall of which was formed by the skin and the panniculus carnosus, the inner by the external oblique muscle, and into this sac had protruded the apex of the cæcum, which had become adherent to the walls of the cavity. The greater portion of the cæcum and part of the ileum had also protruded through the opening, and become so strongly united by organized lymph to its circumference, that a man's strength proved inadequate to sever the bond of connexion. The edges of the lacerated muscles were very much thickened, and also tinged of a dark red colour for several inches around the aperture.

Reflecting on the most prominent features in the history of this case, the conclusion seems warrantable, that, when great pressure is employed for the purpose of keeping *in situ* viscera which have become displaced through a very large solution of continuity in the substance of muscles, if, after ten days or a fortnight, this be not repaired, but the hernia again protrudes, the adhesion will be so extensive and powerful as not to warrant recourse to a surgical operation. It is, however, to be borne in mind that, in the present state of veterinary surgery, any opinion advanced on a case so rare as this above recorded must be regarded as a probable truth rather than as an established proposition.

I am, Gentlemen,

Your obedient servant.

To the Editors, &c.

On Auscultation as applied to the Horse in Disease.

By Mr. G. T. Brown, *M.R.C.V.S.*

[Read at the closing Meeting of the Veterinary Medical Association, 1849-50.]

That a science which involves the necessity of so much observation as to demand the study of a life can only be considered in a very partial and imperfect manner in the limited space assigned to an essay, is an admission no liberal mind will hesitate to grant; and if, added to this, it be remembered that among English veterinarians there is not one who has given to the subject that thought which it so eminently deserves, there will need no other apology for this attempt, or extenuation of its imperfections. In considering the phenomena of disease affecting the respiratory organs in the horse, as indicated by certain distinguishable sounds, I shall retain the nomenclature of the human school so far as it may be expressive of the ideas I wish to convey; at the same time I shall be careful to exclude all diseases and sounds which I have not myself had an opportunity of investigating.

Catarrh.

The perusal of Lænnec on "Auscultation and Diseases of the Chest" distinctly leads to the conclusion, that the term catarrh is used by that author to indicate the same affection as that which some writers class under the head of bronchitis: in fact, he definitely asserts such to be the case; stating in explanation, that he considers catarrh forms the connecting link between congestion and inflammation, Without staying to discuss the propriety of this, we shall take advantage of the arrangement for drawing a distinction between the affection known as catarrh in the horse, which is not necessarily inflammatory, and the affection received under the cognomen bronchitis, which is acutely inflammatory in its character. Commencing, then, with the most common form of catarrh, as the result of altered temperature, we may assume the first stage to be congestive. Under the influence of certain exciting causes the vessels become charged with blood, motion being retarded; the consequence is alteration of function, and secretion is either arrested or changed. These effects may be confined to the nasal membrane, or may extend to the larynx and pharynx, and possibly to the bronchi. But I consider that, in the majority of cases of simple catarrh, the disease does not proceed beyond the larynx. There does not appear to exist the same tendency to the extension of the affection down the trachea in the horse as in the human subject; nevertheless this does sometimes take place, and it becomes important to ascertain when and to what extent. For convenience of description we may divide catarrh into *dry*, *pituitous*, and *mucous*.

Dry Catarrh.

This stage of the affection is not rare or difficult of detection: the character of the cough, even to the ordinary attendant on the animal, will serve to indicate it; while the absence of secretion connected with a congested appearance of the mucous membrane will furnish additional evidence to the scientific man.

Auscultation.—On applying the ear to the larynx in this condition, the alteration of sound will not be very obvious; but, providing the bronchi participate in the affection, the indication will be far more distinct: the soft vesicular murmur is apparently obscured, and the bronchial has become much graver than natural. It is somewhat anomalous that membranous thickening, consequent on vascular congestion, should be indicated by a grave note, when, in accordance with the laws of acoustics, it should be more acute; nevertheless it is so, and the fact was first noticed by Læennec in the human subject. After examining the chest by auscultating the bronchial murmur, I direct an assistant gently to irritate the larynx till coughing is produced, which materially assists the diagnosis. When the bronchial membrane is implicated, the inspiration of the atmosphere, after the prolonged and propulsive expiratory effort in the act of coughing, is attended with a grave sonorous râle, conveying an impression analogous to that felt on applying the hand over the thorax and speaking as much as possible within the chest, in that variety of voice known as the orotund, and which is attended with obvious vibration. In the event of the bronchial membrane being free from disease, the sound consequent on the rapid inspiration will be sharper and more hissing than ordinary, but devoid of any vibration or râle. This troublesome examination of a simple case of cough may be objected to by some as unnecessary and unprofitable, since the treatment will not be materially altered by the knowledge acquired; and if other symptoms plainly indicate mucous affection, it is a matter of slight import whether it is confined to the larynx or extends a few inches beyond it. To all such objections I answer, it must ever be a matter of paramount importance to the scientific practitioner, not only to ascertain the *nature* but the *extent* of the disease he is treating; and, further, that what to the tyro in the art will seem difficult and complicated is to the practical ear the work of a few seconds only. Familiarity with modified sound, gained only by frequent and laborious observation, has rendered his aural powers so acute, that an apparently slight investigation is sufficient for his purpose.

Pituitous Catarrh.

This stage of the affection is characterised by a thin mucous discharge of an altered character from the nasal membrane, and which most commonly immediately succeeds the congestive or dry stage, in which no secretion is apparent.

Auscultation.—In the human subject the affection is marked by the sibilous rattle, with mucous râle, analogous to the passage of air through a thin fluid; but in the horse I have not yet satisfied myself of the existence of any diagnostic sign over and above the nature of the secretion discharged. Bronchial respiration has not that deep tone, or the vibration after coughing, which it has in dry catarrh, nor have I detected any semblance of mucous râle; so that the evidences afforded by auscultation in the pituitous stage are rather negative than positive.

Mucous Catarrh.

When the harsh painful cough of dry catarrh is exchanged for the softer sound of pituitous or mucous, and the hot dry membrane is covered by a thin secretion gradually becoming more consistent, the symptoms are mostly held as favourable to the animal's speedy recovery, and experience proves the assumption to be well founded. The vessels, relieved by the excess of secretion, are enabled to transmit the circulating fluid with freedom, and soon recover their normal function. The nasal discharge at this stage is extremely thick, being at times curdled, and commonly very copious: the cough is soft and puffy in character at periods, at other times sonorous; and during the act large quantities of mucus are thrown up through the nasal and oral openings.

Auscultation.—If the amount of mucus be very considerable, there will be a soft mucous râle with large bubbles: a sound well exemplified by blowing gently into a mixture of soap and water, so as to raise a number of bladders. The larger the amount of secretion, the more obvious will this be. When it does not exist in sufficient quantities to offer any resistance to the passage of the atmosphere, the evidence of the mucous râle is absent; the murmur, possessing the character noticed in the pituitous stage, being free and soft, little altered, in fact, from the normal state.

Chronic Catarrh.

This obstinate disease, when attacking the horse, is commonly classed under the head of chronic inflammation. Without overstepping the province of this Essay to consider whether it be chronic inflammation or chronic congestion—although I think either or both may and do exist—we proceed to investigate the diagnostic symptoms.

The character of the cough will, of course, depend on the condition of the respiratory organs. The disease commonly termed *thick wind* is one attendant on catarrh of a peculiar kind; the sound being a short, dry husk, seemingly emanating from the larynx. The pathology of the affection essentially consists in abnormal deposition in the pulmonary structure, by which many of the air-cells and some smaller bronchial ramifications are obliterated, and others so materially altered in capacity as to interfere with the free passage of the atmosphere, thus lessening the respiratory surface; a defect which is, in some measure, compensated for by the increase in the number of respirations in the minute, these sometimes amounting to nearly double the normal number. The expiratory effort calls for the aid of the abdominal muscles, is quickly effected, and at one movement; the peculiar double action observed in vesicular emphysema not being present.

Auscultation.—The vesicular murmur is obscured, and the bronchial, possessing the character known in human medicine as the sibilous or hissing, is directly opposed to ordinary bronchial congestion, the murmur being heightened in pitch instead of rendered grave. The fact of the sound being more readily transmitted through the denser structure formed by the deposition of plastic material in the pulmonary tissues will, in a measure, account for this.

The cough diagnostic of broken wind, or vesicular emphysema, is very different in character to the one last considered. The sound, instead of being short and dry, is deep, prolonged, and sonorous. The evidences afforded by the partial expulsion of the air by the first expiratory effort, and its completion by a second and less energetic one of the abdominal muscles, with other symptoms, are too familiar to require any comment.

Auscultation.—I feel myself constrained to be almost silent on this head, from the few opportunities I have had of auscultating uncomplicated cases. The affection will, however, come under our consideration at a subsequent division, as also its frequent companion, Roaring.

Chronic Mucous Catarrh.

The variety of catarrh we may conveniently class under this title may exist independent of either roaring or broken wind. The animal shall be apparently in excellent health and spirits; able to undergo a fair amount of exertion, even to running with the hounds; and, in fact, give no evidence of functional or organic derangement beyond the existence of a cough. The sound undergoes certain modifications in the same animal at different periods.

When a quantity of mucous secretion is present, it is soft and puffy; when the membrane is dryer, clear and hard. At times some stringy mucus is forcibly expelled by the mouth and nostrils.

Auscultation will shew signs dependent on the amount of the secretion existing. Should this be excessive, the mucous râle will indicate it; and, on the other hand, the grave bronchial sound will evidence a dry and congested condition of the membrane. If neither of these effects be discoverable by auscultation of the thoracic cavity, we may fairly conclude the cause to be situated in the trachea or larynx. Auscultation of these parts, however, is seldom satisfactory; in fact, only in very well-marked cases. Did a quantity of secretion exist in either part, the soft mucous râle would be present; but the mere congestion of the membrane produces such a slight alteration in sound, that the ear must be well practised to discern it. The absence of any indications of disease in the bronchial membrane will, of course, direct our attention to other parts of the respiratory apparatus, while the observance of other symptoms will possibly lead us to a correct diagnosis. At any rate, although auscultation may not in this case shew us where the disease *is*, it will do some good by shewing where it is *not;* and if we have fair reason to conclude that the lungs are free, we have gained one very important point.

Roaring.

I shall not stay to consider the various causes that have been assigned by different individuals at different periods for this effect; the diagnostic symptom is so familiar to every one connected with the horse, that description would be superfluous. The abnormal sound, depending on some obstruction to the passage of the inspired or expired air, gives rise to the modification of *whistling, piping, roaring,* &c., and is in accordance with the nature and extent of the obstruction: it must, therefore, be a matter of importance to the veterinarian, under any circumstances, to ascertain, if possible, the situation of the impediment.

Auscultation.—Presuming the horse to be a known roarer or whistler, I first proceed to make a careful examination by auscultation while the animal remains in a quiescent state, for reasons which I stated in my former paper. (See Veterinary Record, vol. v, p. 333.) Possibly the vesicular respiration is clear and uncombined with crepitus or râle; the bronchial sound is then investigated, and this also proving normal, the trachea, larynx, and nasal chambers, are next subjected to a close examination; and if this be done without gaining any clue to the seat of the affection, the animal is then submitted to exertion, which is continued with increasing speed until he is found to make considerable noise in his respiration. The examination is then repeated rapidly, and the portion of the apparatus where the sound is most marked is the nearest to the seat of the affection. It is, however, a matter of no small difficulty to ascertain the precise spot whence a sound emanates, from the ease with which it is conveyed down the trachea or bronchi. In many instances I have been satisfied of the existence of the mucous râle in the bronchial tubes, when a closer examination has proved it to be in the larynx or nasal cavities: from this circumstance it becomes important to extend our investigation up the trachea, even when the râle is obvious on auscultating the thorax.

In the majority of cases of roaring which I have examined, chronic cough has been present; and here the grave bronchial sound has evidenced thickening of the lining membrane of the air tubes.

In cases where the emitted sound comes under the denomination of *whistling*, a cough is not so commonly present, while the cause of the sound seems located in the larynx or nasal cavities rather than the bronchi.

Broken Wind.

On this *questio vexata* I have but little to say. The cases I have examined have been complicated with roaring, the indications of which I have readily discussed: but on no occasion could I satisfy myself of any crepitous râle as indicating emphysema; on the contrary, the vesicular sound has been merged into the sonorous bronchial murmur. There is yet, I doubt not, much to acquire on this head, and probably at some future period I may be enabled to speak more definitely. The subject is an important one, and auscultation may, if perseveringly pursued in every marked case, tend to throw some light on the nature of the disease.

Acute Diseases of the Pulmonary Organs.

Leaving the consideration of catarrhal affections, we proceed to examine the more important effects consequent on acute derangement of the respiratory apparatus.

Acute Congestion.

Accepting Dr. Williams's definition of congestion, we may characterise this disease as being a determination of blood to the pulmonary vessels, with diminished motion; in other words, retarded circulation. The symptoms evidenced are exceedingly marked; but I need not stay to specify them, excepting so far as the respiration is concerned, which is invariably very rapid, especially in the first stage. I have in many cases counted fifty respirations in the minute.

Auscultation.—The vesicular murmur over the whole of the thorax is quite obscured in most cases, and the bronchial is very indistinct at the inferior and posterior part. At the supero-anterior division, the bronchial respiration is mostly audible, grave, and hoarse; while the sound at all other parts is well defined by the word *confusion.* It seems as if a quantity of air were rolling in a considerable space without being confined to any special tubes; and even at the part where the bronchial sound is most marked, the rapidity of the respiration prevents the distinguishing of inspiration and expiration. In cases where congestion seems a consequence of other affections, and which I term symptomatic (for instance, in tetanus, severe pain from wounds, &c.), the same evidences will be afforded by auscultation, and the pulse will mark the distinctive; for while in acute idiopathic congestion it is oppressed, in symptomatic it is full and bounding, indicating general systemic excitement. A separation of the two is of immense moment as it regards treatment, because the first would inevitably require the exhibition of stimulants, while the latter would call for the opposite class of therapeutics.

The termination of the disease will comprise resolution, or death; its results, inflammation or effusion.

The first sign of approaching health which auscultation develops, is the extension of the bronchial sound over a greater part of the thorax, its gradual subsidence, and the restoration of the vesiculur murmur. On the contrary, should the congestion continue obstinate, death soon takes place; the confused sound becomes almost lost, the bronchial murmur at the anterior part more distant, the respiration more laboured, and accompanied by a suppressed grunt at intervals; the eye is amaurotic, the integumental covering cold, and the animal dies from asphyxia.

Pleuro-Pneumonia, or Inflammation.

For a definition of inflammation I shall again recur to Dr. Williams, who holds the pathology to consist in a determination of blood to a part, with motion partly increased and partly diminished. I have annexed the term pleuro-pneumonia to the disease attacking the lungs of the horse, because I think a case of pure pneumonia is a rarity in that animal, as, indeed, is also one of uncombined pleurisy, although, doubtless, either may exist. Inflammation, however, most commonly attacks both the lungs and pleura.

Auscultation.—The sounds which first mark the commencement of inflammatory action I have not had an opportunity of investigating; attention seldom being directed to the animal until the symptoms have become acute, and then the bronchial murmur is very audible over the superior part of the thorax, with a confused rumbling in places where congestion exists; and providing, as is commonly the case, only one lung is affected, the sound will be most audible in the healthy one, the rumbling, of course, being absent.

The number of respirations is less than in congestion, and more laboured, especially the expiratory effort.

Bronchitis

May exist conjointly with the above, or uncomplicated. It consists in acute inflammation of the mucous lining of the bronchial tubes, and is necessarily accompanied with a cough.

Auscultation will give the same general results, whether the disease be complicated or not. The bronchial murmur is hoarse and grave; the respiration very quick and short, evidently giving pain. If we connect with these the cough, the evidences will be complete. Bronchitis may terminate in resolution without proceeding to another stage, or the vessels may relieve themselves by excessive secretion. In the latter case the mucous râle will be readily recognised. The signs of returning health in either of these cases will be decrease of the bronchial sound, and a gradual recurrence of the vesicular murmur.

Hydrothorax.

As the result of acute congestion, pleurisy, or pleuro-pneumonia, this is indicated by various symptoms both negative and positive; but I have only to consider the evidences afforded by the appliance of the ear to the sides.

Auscultation.—The sounds indicative of the existence of fluid in the thoracic cavity are by no means so clearly defined as some would represent them to be. The noise made by the action of the lungs in the liquid is commonly asserted to be very distinct. However, in only one case could I perfectly satisfy myself of such a sound; while in many instances the borborygmus has appeared so much anterior, and so analogous to the shaking of a bottle of water in the chest, that I have felt quite certain of finding fluid, but, in reality, none was present. If on exploring the thorax you find the hoarse bronchial sound superiorly gradually becoming "beautifully less" as you proceed inferiorly, the lower half or third being devoid of any murmur, or possessing only a very faint one, you have strong reason to suspect the effusion has taken place, and, if this is discoverable on both sides, you may almost affirm it; at any rate, you have ample grounds for puncturing the chest. There seems to be a strong prejudice in the minds of owners, and also of some practitioners, against the operation of paracentesis thoracis, until the indications of fluid within the chest are so clear that " he who runs may read;" at which time the operation is as much "honoured in the breach as in the performance." The great obstacle in the mind of the surgeon seems to be the possibility of mistake; but this is a mere phantasy. If a horse be examined for lameness, no one scruples to remove the shoe to ascertain if there be a nail in the foot, and no one is charged with committing an error if it be not found. Now, I do not hesitate to say that the removal of a horse's shoe is a far more complicated and important operation than puncturing his chest; and I further assert, that the use of the trochar at the first indication of effusion is the only possible means of ensuring benefit from the operation; since, when fluid exists to any extent, its removal is of very little advantage. The instrument I use is a small one, not thicker than an ordinary quill; and I do not scruple to resort to it in every suspicious case. If fluid be discovered, a certain plan of treatment is indicated; if not, you are in a much better position, and in either case you are no longer in doubt as to the nature of the effects you have to combat. The data, then, from which I draw my inferences as to the existence or otherwise of fluid are, the marked and sudden alteration of sound in the superior and inferior parts of the chest, the hoarse murmur above, and the absence of sound below; the time of effusion depending on that part of the lung being rendered impermeable to atmospheric air consequent on the pressure of the fluid: but he who lays the "flattering unction to his soul," that he will be enabled to diagnose effusion by hearing the fluid splash within the thorax, will find it likely to prove "a cheat, a delusion, and a snare."

The sounds I have considered will be sufficiently clear in all cases of ordinary effusion, but many instances occur in which the distinctives are wanting. Suppose a horse has been affected with inflammation, the acute symptoms subside, and the appetite in a measure returns, nevertheless the respiration continues a little accelerated, the coat unthrifty, and the bowels irregular. I suspect effusion to exist, and proceed to auscultate: the vesicular murmur is obscured, and the bronchial sound hoarse superiorly, as I anticipate; but proceeding below, I find the murmur more sonorous, and I conclude from this that my suspicion was unfounded, and that fluid does not exist. The animal dies the next day, and several gallons of serum are found in his thorax; but in connexion with this there are numerous adhesions and vomicæ, affording at once a clue to the cause of the sound being heard at the inferior part of the chest. The case I have imagined is one of a great number I have had an opportunity of examining, in which indications of cavities in the lungs were evident, but altogether unconnected with any sign of effusion, although it had taken place to a considerable extent. In all such cases as these we must rest on other diagnostic symptoms.

Hepatization.

The deposition of fibrinous matter in the pulmonary tissues, giving a liver-like character to the lungs, as the term implies, is generally connected with some effusion, the fluid apparently being forced out during the consolidation of the liquid fibrin.

Auscultation.—Superiorly the grave bronchial sound, and inferiorly dry crepitus, I have found to be the first indications, and these mostly confined to one lung; the bronchial murmur being clear and sonorous over the whole of the side not affected. As the disease progresses, crepitus extends upwards, the sound becoming less distinct, until, by the end of the second or third day, all murmur is obscured, excepting at a small space behind the scapula, where the bronchial sound is sibilous or hissing, and possessing a peculiar distant character, precisely as though it issued from the other side of the chest, and was conveyed directly to the operator's ear. Hepatization is complicated at times with abscess; and invariably, as far as I have observed, with some effusion when abscesses exist. Their situation is generally at the infero-anterior part of the lung, more commonly the right than the left lobe. The cavernous murmur or râle, if much matter be present, will point out the precise part so clearly, that in no one instance have I erred in diagnosing; in fact, the phenomena attendant on these affections are so obvious, when once understood, that mistake is a very remote contingency. In many instances I have described the morbid conditions prior to having the animals destroyed, and post-mortem examination has not required me to add any thing to them. Sometimes the whole of the left lung becomes consolidated, and the inferior part of the right; in such cases the abscess is most commonly found in the anterior part of the right lung, and is indicated by the cavernous sound conveying to the mind the idea of air entering a cavity. When the cavernous râle with large bubbles exists, it depends on the passage of the atmosphere through thick purulent matter.

In one well-marked case of hepatization complicated with effusion and extensive adhesion of the pleura, I had a beautiful instance of the metallic tinkle at the superior part of the left lung. The sound is well exemplified by dropping a grain of sand into a large tumbler; and arises, according to Lænnec, from water dropping from the sides or top of a cavity, or a cavity containing partly air and partly fluid. I regret to say my examination of the parts post-mortem was not sufficiently minute to discover a clue to the cause of the sound, therefore I cannot give it as determining the presence of any special morbid condition.

Tubercle.

The indications afforded by auscultation during the existence of tubercles in the lungs are not definite in the early stage. A diminution of vesicular sound is the principal. When numbers cluster together, suppurate, and form cavities, we of course have the symptoms previously described.

I am aware that I have left many sounds known in human medicine altogether unnoticed, and this simply because they have not yet occurred to me as diagnostic signs. Should future investigations shew to me the propriety of extending the list, depend upon it I shall not be slow in making such additions. The signs I have considered, I think, are definite as far as they go. I have attentively observed them in many cases, and satisfied myself of the presence of certain results by operation in cases of hydrothorax, and by destroying the animals when hepatization, abscess, or tubercles, had been diagnosed. I have yet a goodly field to traverse, one which can accommodate many labourers; however, if these work not with me, the alternative is evident,—I must work alone. Nevertheless, I could wish that others would deem the subject worthy of their investigation, for I have long since become a convert to the doctrine "that in the multitude of counsellors there is wisdom."

REVIEW.

On the Development of the Great Anterior Veins in Man and Mammalia; including an Account of certain Remnants of Fœtal Structure found in the Adult; a Comparative View of these great Veins in the different Mammalia; and an Analysis of their occasional Peculiarities in the Human Subject. By John Marshall, *F.R.C.S., late Demonstrator of Anatomy in University College, London, Assistant Surgeon to the University College Hospital. Communicated by Professor Sharpey, F.R.S.*

This contribution to comparative anatomy has been published in the first part of the Philosophical Transactions in the present year; a medium of publication, that, while bearing witness to the high esteem in which the communication was held at the Royal

Society, renders its perusal difficult to the great majority of members of the veterinary profession. Under such circumstances, rather than presenting our readers with a bare criticism of the memoir, or with the thoughts which its careful study has elicited in our minds, we shall epitomize those parts of the subject, which, as highly important to the students of the anatomy of domesticated animals, will enable them to acquire a knowledge of some original anatomical facts, form an independent judgment on the merit due to their discoverer, and learn, by example, the path and means by which alone truth must through all time be sought.

Announcing that the principal object of his paper is to state the result of observations on the changes which certain of the great veins undergo in man and mammalia, from their earliest appearance to their full maturity, Mr. Marshall remarks that

"It is well known that in the mammalian embryo the great veins entering the heart from the upper or anterior part of the body are originally symmetrical on the two sides; and that in man, the quadrumana, and most of the higher orders of quadrupeds, the venous trunk of the left side undergoes occlusion; whilst in other mammalia that vessel continues, and constitutes, in the adult state, a left vena cava anterior, which passes down in front of the left lung, and then along the back of the heart in the auricular ventricular groove to terminate in the right auricle."

Observing, that in man the terminal portion of the great coronary vein in the right auricle is dilated and muscular, so as to have merited the name coronary sinus (the extent of which is defined by a valve), that in those animals which possess a left vena cava superior, the great cardiac or coronary vein ends in that additional venous trunk, as seen, for example, in the marsupialia, many of the rodentia, and in the elephant; moreover, that in certain ruminant and other animals, as, for example, the sheep, in which a large left azygos vein exists, arching over the root of the left lung, and thence pursuing the same course to the right auricle as the left vena cava superior in the cases already alluded to, the coronary vein opens into this azygos-venous trunk, and, finally, that in the two last named conditions the lower part of the large left venous trunk is always dilated and muscular, and has a valve at the opening of the great coronary vein into it, the author was led to conjecture that "the dilated and somewhat muscular portion of the coronary vein, usually named the coronary sinus, together with its large and important opening into the right auricle, as seen in man, and such of the higher mammalia as have no left vena cava superior, or left azygos vein, was strictly analogous to the expanded lower portion and auricular orifice of those additional left venous trunks, as found in other quadrupeds: and, in fact, that it was the persistent lower part of the left anterior primitive venous trunk."

In corroboration, or rather in demonstration of the conjecture, that the coronary sinus is the lower pervious portion of the left primitive vein, Mr. Marshall alleges that in the adult heart of man, dog, cat, and monkey, he has always found, as remnants of its upper occluded portion, certain parts or structures always clearly distinguishable.

Simple as may appear the conclusion arrived at by Mr. Marshall, it is undoubtedly an important step in advance in philosophical anatomy, since it abolishes a supposed difference in the arrangement of certain structures in man and animals, and adds one more beautiful example of the fundamental uniformity in the plan of animal organization. Hitherto the great coronary vein has been said to terminate throughout the mammalia in three different ways; firstly, in man, and all those animals which have only one vena cava anterior, the coronary vein is said to end by a dilated portion (the coronary sinus), directly in the right auricle; secondly, in those animals possessing a left vena cava superior; and, thirdly, in those having a large left azygos, the great coronary vein has been said to be tributary to those vessels: but the discovery that the coronary sinus, in man and mammalia having only one anterior cava, is the lower pervious portion of the left anterior cava existing in the fœtus, justifies the statement, that the great coronary vein in man and the higher mammalia may be said to end in the so called coronary sinus at the valved orifice above described. Thus, throughout the entire mammalian series the great coronary vein in no case reaches the right auricle directly, but always pours its blood, like the posterior cardiac veins generally, into a large venous trunk.

Arranging the results of the entire investigation under three heads, the author first treats of the development of the great anterior veins, and alludes to the discovery of Rathke, that, in the vertebrata generally, the blood of nearly all parts of the embryo is returned to the heart by two pairs of venous trunks, i. e., an anterior pair, "the jugular veins," formed by branches from the head and neck; a posterior pair, which return the blood from the Wollfian bodies and the hinder part of the embryo, called the "cardinal veins;" and a median inferior or posterior venous trunk, which finally becomes the vena cava inferior. The cardinal and jugular vein of each side join to form a short wide vessel, named the canal of Cuvier; and eventually the two canals of Cuvier, opening separately into the right auricle, represent two superior venæ cavæ, one on each side. When the Wollfian bodies disappear, the cardinal veins diminish in size, and a transverse connecting branch is developed, across the lower part of the neck, between the two jugular veins. In man and mammalia, having only one vena cava anterior, that transverse branch forms the left innominate vein; whilst that portion of the original left jugular trunk which is situated lower down than the transverse branch, and also the left canal of Cuvier continuous with it, shrink and disappear.

Rathke observed, that in the sheep the upper part of the left cardinal vein and the left canal of Cuvier remain open to form the left azygos vein present in that animal; and that in those animals which, in the adult condition, have a right and left superior vena cana, the left primitive jugular vein, together with the corresponding canal of Cuvier, remains pervious throughout life.

These observations could not fail to suggest to so acute an anatomist as Rathke, that possibly the non-closure of the left primitive vein, as an arrest of development in the human embryo, might give rise to those instances of double vena cava superior in the human subject. But he only appears to have entertained this opinion as a probable supposition; it was left to Marshall to raise it to the high standard of demonstrated truth, by examination, firstly, of the development of the great veins in animals and man; secondly, by a comparative view of the great anterior veins in man and mammalia; and, thirdly, by analysis of the varieties of the great anterior veins in man. He has described and beautifully delineated the process of development, in the four following stages:—*a*. Formation of the transverse communication in the neck. *b*. Occlusion of a portion of the left primitive vein. *c.* Concurrent and subsequent changes in the pervious vessels. *d.* Changes at birth.

a. The earliest proofs of the formation of the transverse communication in the neck were met with in embryos from $\frac{13}{20}$ to $\frac{15}{20}$ of an inch in length, in the form of two little spur-shaped projections from the inner border of the jugular trunks, filled with blood, and in some cases united by an intermediate material, while in others no evidence of the continuity of the transverse branch was discernible. The fact that, even in the earliest period of the existence of the transverse vein, the extremities in connexion with the jugular trunks are more dilated than the intermediate portion, appears to us greatly in favour of the notion regarded as *possible* by the author, that the transverse communication is formed in the same way as the other great vessels, rather than, as has been supposed, by the enlargement of a previously developed vessel of almost capillary dimensions.

In proportion as the cross branch widens and shortens, the jugular veins approach each other, leaving their previous parallel course to assume a median position in the neck; and so marked and rapid is that change, that even in embryos $1\frac{1}{2}$ inch in length they join each other at a very acute angle, and almost coalesce, the transverse branch being apparently absorbed into them.

b. The portion of the left primitive vein, extending from the cross branch to the canal of Cuvier, becomes elongated with the growth of the thorax; and while it is found pervious in embryos 1 inch and $\frac{1}{12}$ in length, in others scarcely $\frac{1}{12}$ (1 line) longer, the vessel is already closed, and appearing first as a semi-transparent cord, extending from the point of junction of the jugular veins to the arch formed by the left cardinal vein and left canal of Cuvier (which remain pervious in the sheep to form the left azygos vein), it lies, at first, in front of the aorta, and then passes down close to the pericardium, on the left side of the ductus arteriosus, in contact with the left pleura below, having the par vagum behind it and crossed by the phrenic nerve. Soon the cord becomes imperceptible, but in its place is found a long ridge or elevation of the pericardium containing fibrous tissue.

c. Concurrent and subsequent changes in the pervious vessels in size; by enlargement of the right jugular vein and the right canal of Cuvier, while the left primitive vein is closing the superior vena cava is formed. Both the cardinal veins diminish in size on the disappearance of the Wollfian bodies; the right one constitutes the vena azygos of that side; while the left azygos, which, after the middle of fœtal life exceeds the former in dimensions, is formed by the left cardinal vein and the left canal of Cuvier, reduced greatly in width after the occlusion of the primitive vein, with the cord-like vestige of which it remains in connexion. In *position* and *direction*:—Changes in these respects occur simultaneously with changes in the position and size of the lungs. Thus the rudimentary right lung being, almost from the commencement, larger and somewhat higher up in the thorax than the left, the right cardinal vein reaches higher up than the vein of the left side: moreover, as the lungs enlarge and occupy more of the thoracic cavity, Cuvier's canals, which originally pass horizontally forwards and onwards, take a more and more oblique course in front of the root of the lungs to reach the heart. In consequence of the heart becoming slightly twisted in progress of growth, the right canal of Cuvier or anterior vena cava reaches the future right auricle sooner and more directly than the smaller left canal or left azygos venous trunk; and their respective orifices, nearly on the same level in the early stages, subsequently become differently situated; that of the vena cava being at the highest part of the auricle, that of the left azygos at the lower and back part of the same cavity. Another change concerns the serous layer of the pericardium, which is at first reflected over both the Cuvierian canals; but in time, whilst it covers only a smaller and smaller part of the anterior surface of the right canal or upper cava, it forms a more and more distinct fold or duplicature, in which the left canal or left azygos trunk is lodged, as it passes down in front of the left pulmonary vessels to reach the side of the left auricle immediately behind the appendix.

d. Changes at Birth. When, after birth, the short and wide ductus arteriosus shrinks, the long ridge of the pericardium with its contained fibrous tissue, already described as resting upon that vessel in the position of the occluded left vein, becomes closely applied to the left side of the aortic arch, and may be traced in the direction of a line drawn from the point of junction of the innominate veins at the root of the neck, down to the highest point of the arch of the left azygos vein.

Within the pericardium, the trunk of the left azygos occupies its proper fold of the serous membrane, and receives, shortly before its termination in the right auricle, the coronary vein of the heart and two posterior cardiac branches, besides a smaller one which might almost be said to end at once in the right auricle. The mouth of this left azygos venous trunk is situated to the left of the orifice of the inferior cava, close to the inter-auricular septum, and below and behind the fossa ovalis, like that of the left superior cava in the lower mammalia and in birds. It has no Thebesian valve, which is represented, in the sheep, merely by a slight ridge of the auricular parietes.

At the entrance of the coronary vein into the left azygos there is, however, a large distinct valve, consisting of one strong segment. The two cardiac veins succeeding it are each guarded by finer valves of two segments, and the third vein generally by a single segment. Along the course of the coronary vein there are from one to four other valves, consisting usually of one segment, but sometimes of two.

Lastly, the right azygos is now a much less important vein than that of the left side; it reaches from three to five inches higher in the chest, and is so small as to have been said by some naturalists, including Rathke, to be always wanting. Occasionally (once in five observations) it was found to be so trivial a vessel, that it was difficult to distinguish it, as the actual persistent representative of the right cardinal vein.

The principal object of the present review being that of communicating to veterinary readers those parts of Mr. Marshall's paper which immediately interest them, rather than give an account of his observations on the development of the great superior veins in man, and of his analysis of their varieties, subjects which have been investigated by him with remarkable correctness and success in the attainment of his object, a few extracts may be profitably made from his comparative view of the great anterior veins in man and mammalia.

"All the varieties of arrangement hitherto observed in the great anterior veins of the mammalia may be classified according to the amount of deviation which they present from the type pointed out by Rathke, as originally common to all the vertebrata, viz., that of four lateral primitive trunks."

In birds there is no deviation from the original type; but in mammalia there appears to be no instance in which some change from the common primitive type does not take place. So far as is known, the cross branch in the neck is an invariable addition to the jugular veins, and an additional change in the highest forms of adult mammalia and in man depends on one of two modes of partial occlusion of the left anterior primitive trunk. In this way three different permanent conditions arise; in all of them the transverse communication in the neck exists. The right venous trunk always constitutes the vena cava superior of that side; but the left vein either forms, A, a similar large venous trunk on that side, named a left vena cava superior, which receives the left jugular and subclavian veins, the left intercostals, and certain cardiac veins; or, B, it is reduced to a smaller left venous trunk, which receives merely the left intercostal veins and some cardiac veins; or, C, it remains as a still smaller vessel, receiving only a few cardiac veins from the substance of the heart. These three conditions, accordingly, are distinguished by severally representing,

Group A. A right and left vena cava superior. This condition exists in a large number of the lower mammalia; also in the elephant, hedgehog, and bat.

Group B. A right vena cava superior, and a left azygos venous trunk. This arrangement prevails in most of the larger quadrupeds, as in the hog, sheep, goat, ox, and horse. In the latter animal Mr. Marshall appears independently to have discovered the left azygos vein, which, however, has been previously described under the name "small vena azygos" by Lavocat.—*(Traité Complet d'Anatomie des Animaux Domestiques, Angeologie,* 2 *partie,* 1848, *p.* 72.*)*

Group C. A right vena cava superior, and a left cardiac venous trunk or coronary sinus. This arrangement prevails in several of the cetacea, carnivora, and quadrumana, and, lastly, in the human subject.

In conclusion, in the particular circumstances under which Mr. Marshall's paper has been reviewed in our pages, we feel bound to make a few remarks. It is not, like the majority of works which are subjected to critical review, intended to procure its author's fame, or its publisher's fortune, in the public market; neither can any opinion advanced by a periodical writer be supposed to affect a work whose merits have been acknowledged by the Council of the Royal Society of Great Britain: hence, however much we may have been interested at the author's discovery, and with the masterly manner in which the subject has been handled by him, we shall abstain from flattering comment. But at an age like the present, when the essayists in medical literature well nigh rival their readers in number—when, among the countless volumes published, a very considerable proportion are devoted to the defence of theories, creatures of the author's imagination, destined to allure the curious ardent in search of novelty, rather than to instruct the wise, ever-seekers after knowledge; and when the very science of medicine in all its branches, but more particularly in some, is infested by men who, rather than tread the humble, narrow, and ascending path of inquiry, cautious reasoning, and philosophical induction, hurl precipitately down the steep descent of hypothesis and surmise—it is pleasing to study the works of one who has selected the former course, as that in which he is sure to acquire fame and benefit mankind, and to hold it forth as a model to the rising generation of medical inquirers. Medicine—and here we allude not only to human, but particularly to veterinary medicine—is a science of observation and of facts; and in proportion as men adhere to these, they will be honoured as the promoters of science, and blessed as the benefactors of the human race.

Disappearance of the Pancreas.

M. Bernard exhibited, at a late meeting of the Société de Biologie, a dog, in whom a pancreatic fistula had been made. The animal died in a state of profound emaciation. On examination, no trace of the pancreas could be found. M. Bernard believes, that, having made too large an opening between the duodenum and the pancreatic duct, the bile penetrated into the pancreas, and produced the "digestion" of that organ.

Gaz. Méd., March 9.

TRANSACTIONS OF THE VETERINARY MEDICAL ASSOCIATION.

Continuation of Mr. Clements' *Essay* "ON THE ANATOMY, PHYSIOLOGY, AND PATHOLOGY OF THE LIVER OF THE HORSE."

Scirrhus and Indurated State of the Peritoneal Covering.

I HAVE often observed this disease to have existed in horses of which I have made post-mortem examinations; and yet these animals, during their lifetime, have never shewn any symptoms which lead us to suspect this disease to be present. It consists in a thickened and indurated state of the peritoneum which covers the liver; and we often observe it to be in patches, presenting a whitish colour. Combined with this, I have frequently seen adhesions to the diaphragm, thus evidently shewing that, at some antecedent period, we have had inflammation existing in this serous membrane.

Causes.—The same as would produce acute hepatitis.

Symptoms.—If the disease existed in a very acute form, we should have symptoms very much resembling peritonitis. The expression of pain will be greater in this disease of the liver than any other: the respiration will also be much disturbed, and even so much so that we might be liable to confound it with pneumonia or pleurisy, had we not other symptoms present to aid us in forming our opinion. The pulse will be quick, and rather contracted; tenderness evinced on the right side, and a slight yellowness of the membranes, but not necessarily so.

The Treatment will be similar to that which we should pursue in acute hepatitis. I should, however, recommend the more liberal use of the lancet.

Results.—Sometimes in restoration of the animal to a state of apparent health; but I believe we generally have a thickened and indurated state of the membrane, leaving marks that such disease had existed.

General Derangement of the Liver.

We often find the liver to sympathize with other organs of the body. For instance, in disease of the lungs we frequently find accompanying it, as a symptom, yellowness of the mucous membranes, evidently shewing that the liver is deranged in its function. We are, however, unable to take cognizance of any very marked symptoms which would lead us to the opinion that we had any one particular disease, this viscus seeming merely, as I have stated before, to sympathize with the other viscus affected ; and as it regards the lungs we need not be surprised that such should be the case, knowing that the office of these two organs is somewhat similar, namely, that of removing carbon from the system ; therefore, when the lungs are unable properly to perform their office, the liver is called into increased action. We also find that, in derangement of the digestive organs, the liver will frequently become affected : to this state I have given the term GENERAL DERANGEMENT.

The Treatment will be that of removing the cause; but at the same time we must attend to that which is the effect, namely, the derangement of the liver, and this may generally be accomplished by calomel being given in about scruple doses.

Unhealthy Secretion.

This consists in the bile becoming vitiated.

The Causes are various, and many times occult. The general ones, however, are exposure to the heat of summer, or sudden cold, and, in fact, any thing which will produce increased action in the liver.

Symptoms.—Yellowness of the membranes, loss of appetite, hurried respiration, and sometimes excessive purgation ; the evacuations being dark in colour and of an exceedingly offensive odour. As may be expected, if this purgation exists for any length of time, debility will be produced ; the pulse will become feeble, and very much increased in number ; and if the disease still continues, death will be the result, preceded by all the symptoms which would be present in death produced by super-purgation.

Treatment.—The course which we must pursue is, first, to alter the action of the liver, and the next to rid the bowels of the offending and irritating bile which they contain. The former we may succeed in effecting by the administration of calomel and opium, the latter by the exhibition of laxatives ; nay, we might even give mild purgatives, combining them with creta preparata, to neutralize the acid secretion of the mucous membrane lining the intestines. If much debility exists, we must give the animal nutritious food, such as starch, gruel, &c.

Result.—Oftentimes death, from the excessive debility which is so soon produced.

Post-mortem Appearances, the Result of Diseases of the Liver.

Mr. Kiernan has proved that, in consequence of its double circulation, the liver is naturally in a state of sanguineous congestion after death; and he has also pointed out the different kinds of congestion which are observable in this organ: he states that it is either general or partial. General congestion affects the whole substance of the liver, which presents a general diffused red colour, the central portions of the lobules being commonly deeper in hue than the marginal portions. Partial congestion is of two kinds,—hepatic venous congestion, and portal venous congestion. Hepatic venous congestion may exist in two stages; in the first and most common stages (says Mr. Kiernan) the hepatic veins, their intralobular branches, and the central portions of the lobular venous plexus, are congested. The congested substance is in small isolated patches of a red colour, and occupying the centres of the lobules it is medullary: the non-congested substance is of a yellowish white, yellow, or greenish colour, according to the quantity or quality of the bile it contains; it is continuous through the liver, and, forming the marginal portion of the lobules, is cortical: this is the usual and natural state of the organ after death. In the second stage the congestion extends through the lobular venous plexuses to those branches of the portal vein situated in the interlobular fissures, but not to those in the spaces, which being larger there, and giving origin to those in the fissures, are the last to be congested. When these vessels contain blood, congestion is general, and the whole liver is red: in this stage, the non-congested substance appears in isolated circular and ramous patches, in the centre of which the spaces and fissures are seen. This form of congestion very commonly attends disease of the heart and acute disease of the lungs or pleura: the liver is larger than usual, in consequence of the quantity of blood it contains; and is frequently at the same time in a state of biliary congestion, which probably arises from the sanguineous congestion. Although, in the first stage, the central portions of the plexuses, and, in the second, the greater portion of each plexus and those branches of the portal vein occupying the fissures are congested, and although the plexuses are formed by the portal vein, yet, as this form of congestion commences in the hepatic veins, and extends towards the portal vein, and as it is necessary to distinguish this form from that commencing in the portal vein, the term of hepatic venous congestion will not probably be deemed inapplicable to it. The second stage of venous hepatic congestion, generally combined with biliary congestion, gives rise to those various appearances which are called dram-drinkers or nutmeg liver. This, I need not state, is seldom seen in the horse. Portal venous congestion is of very rare occurrence; in this form the congested substance never assumes the deep red colour which characterises hepatic venous congestion. The interlobular fissures and spaces, and the marginal portions of the lobules, are of a deeper colour than usual: the congested substance is continuous and cortical, the non-congested substance being medullary, and occupying the centres of the lobules.

Acute Hepatitis.—The appearances which will be present post-mortem will be such as we should expect to find in any other viscus labouring under acute inflammation.

Chronic Hepatitis.—The above remarks will also apply to this form of disease.

Fatty Degenerations.—The liver will be found to be changed into a fatty substance, which, when we handle, will grease our fingers; and we usually find it soft and flabby: at other times it is greyish or whitish.

Encephaloid Disease.—The liver will be found to be studded with tumours of various sizes, of a whitish appearance, and, when cut into, we find their contents to be a brain-like substance.

Jaundice.—The post-mortem appearances of this may be various; they may be those present in acute hepatitis, &c., and we shall find the various tissues in the body of a yellow colour.

Biliary Calculi.—These are but very seldom met with in the horse. They are of a waxy nature; sometimes rough and sometimes smooth; and are found in the biliary ducts.

Rupture of the Liver consists in a dissolution of continuity in the substance of the viscus. We shall often find the liver disorganized in its structure, being softened in texture, easily torn asunder, and of a clay colour. At other times its texture is not the least impaired, but the gland is enormously engorged with blood. We shall find the various tissues in the body pallid, owing to the hæmorrhage which has taken place, and the abdomen will contain a great quantity of blood; at other times I have seen a great effusion of blood between the peritoneal covering and the liver, forming a kind of bladder: these appearances will also apply to hæmorrhage of the liver.

Abscesses in the Liver.—Here we shall find the viscus containing sometimes one abscess, at other times more. These will often attain to a very great size, and contain much pus. Their contents are, generally, thin and dark-coloured.

Scirrhus and Indurated State of the Peritoneal Covering.—The peritoneum will be perceived to be much thickened, and of a white opaque colour; it is also easily pealed from off the liver. Sometimes we find adhesions to exist between it and the diaphragm.

Unhealthy Secretions.—Here we find the mucous membrane of the intestines much inflamed, and in the intestines themselves a nasty bilious ichorous fluid, mixed with fœtid ingesta in a semi-fluid state. The liver will be found so structurally changed as often to amount to approaching disorganization.

Spiritus Argumenti.

Mr. Brown, after having made some observations complimentary to the author of the Essay for the industry and research he had manifested, strongly objected to the distinctions made by him between what he had designated the *results* and the *termination* of inflammation. The terms, "termination of inflammation" in suppuration, ulceration, interstitial deposit, mortification, &c., were, he said, used by the best writers, and universally accepted by the medical world. But if there were one distinction against which he felt himself more disposed to enter his protest than another, it was in death not being a termination of inflammation. Why, the very word itself implied it. What is termination but an end—the limit—the conclusion? Surely this was enough to prove the applicability of the term. The *end* must terminate the thing, be it what it may.

Again; adhesion is surely a termination of inflammation. What have we effected? The throwing out of lymph forming interstitial matter, or otherwise. This becomes organized, and may remain a part and parcel of the frame for aye and for ever.

Will it, can it, be said that inflammation is existing all this time? It is true vascularity exists, blood being sent to this newly-deposited matter for its support; but this does not constitute inflammation, this latter being the result of a morbid or diseased action set up in the capillary system, in which the nervous is necessarily implicated.

Mr. Clements maintained that death was merely an *arrestation* of inflammatory action, and that by the effusion of lymph the reparative process was set up in the organism. It was an effort on the part of Nature to restore that which had been lost, or to strengthen that which had been weakened by disease; and he would go so far as to state that a degree or kind of inflammation always existed as long as this deposit remained. The only true termination of inflammation, he contended, was in resolution, or a restoration of the parts to perfect health.

Mr. Brown did not think that effusion of the fibrinous part of the blood could in any sense be accepted as a reparative process, but as simply the result or termination of inflammatory action. Would the false membranes thrown out in pleurisy, forming adhesions, be considered as such? And, during their existence, have we necessarily inflammation present? Do they not often exist during life, and participate in no degree whatever in bringing about death?

Mr. Gamgee considered that, for the better understanding of the argument, it was necessary that this question, mooted by Mr. Brown, should be set at rest. If the words were to be accepted according to their general meaning, then *result* and *termination* were merely synonymous terms.

Mr. Clements, in explanation, said, by *termination* he meant to be conveyed the idea of the end or cessation; by *result*, the produce or the effects; and by *arrestation*, stoppage. After what had fallen from Mr. Brown, he was disposed to view death as a result of inflammatory action.

Mr. Gamgee could not yield his assent to the validity of these definitions: they did not appear to him satisfactory, nor did he think it wise to attempt to overthrow, by the introduction of fanciful rather than real distinctions, the views taken by physiologists of all ages. Surely adhesion must be a true termination of inflammation, even if suppuration and ulceration are to be received as the results merely of diseased action.

Mr. Clements contended it was not, but a species or a form of resolution; and even resolution itself, he averred, is not always a termination of inflammation, but sometimes a result merely.

Mr. Brown believed that quite enough had been conceded by Mr. Clements to shew that both death and adhesion, or the deposition of interstitial matter, were terminations of inflammatory action, and the latter could not be classed with that which is generally known by the name of resolution.

Acute Hepatitis.

In this form of disease of the liver, Mr. Gamgee stated that there were symptoms not alluded to by Mr. Clements, which were, as he believed, truly diagnostic; and there was one sign, which he considered pathognomonic, that he denied the existence of altogether; employing terms which he felt convinced had accidentally fallen from his pen, rather than their being the result of deliberate judgment and thought;—he referred to the existence of pain and lameness of the right leg of an animal when labouring under this affection. Nearly all human and veterinary writers, both continental and English, have alluded to it, and he believed it to be very frequently present, although it was not always recognised by the medical attendant. Among the former authors, Baillie, Cline, and Cooper, give it as a characteristic sign; and among the latter, Hurtrel d'Arboval and Professor Lessona (French and Italian authors).

Mr. Percivall has recorded a most interesting case, in his "*Hippopathology*," of a horse being excessively lame in the off fore leg, so much so that he with difficulty projected the limb when walking. It resisted all the ordinary modes of cure, and the animal was, at last, destroyed on account of it. The limb, on dissection, appeared perfectly healthy; but in the liver "a thorn of considerable length was found sticking." Pain, there could be no question, interfered with the function or use of a part, and hence the cause of the lameness present.

Mr. Brown believed that, in hepatitis, pain, and its language or expression, lameness, often existed, although not detected; for who would think of trotting a horse out when labouring under an acute attack of this disease to see if he were lame or not? Nor could he conceive of the existence of pain without a corresponding alteration in function; this, of course, differing in degree according to the intensity of the first-named.

Mr. Weston related a case of acute hepatitis in a horse, in which severe lameness of the off fore leg was present. No external appearances, either of the leg or of the foot, indicated the cause to be existent in the limb itself; there being no increased heat nor swelling, nor any abnormal condition. The horse died in four or five days, and the only disease found, on a post-mortem examination, was a highly disorganized state of the liver, the result of inflammatory action.

Mr. Clements replied, that he believed comparatively few instances of this symptom being present are on record, and rarely did he think the pain to be so intense as to interfere with function. As to calomel not being a stimulant to the liver, a position objected to by Mr. Gamgee, he believed he did not stand alone in the view he had thus taken; and, as to its applicability and usefulness in this disease, its beneficial influence could be otherwise accounted for.

Mr. Gamgee stated that by far the majority, and these the best, writers on materia medica considered the action of this therapeutic to be an excitant to glandular structures, and especially the liver; and even Mr. Clements himself, in subsequent parts of his Essay, had stated that it increases the secretion of bile. For his part, he did not feel disposed, with his present impressions, to advocate its employment when active inflammation of the liver was present; yet more mature reflection might induce him to change his opinion. He considered it was adding "fuel to fire," and that we should rather endeavour to allay irritation, than set up a greater amount in an organ already inflamed. He was quite aware that many practitioners favour its administration, but of these the greater number has resided in India; others, as Abernethy, Erasmus Wilson, Christison, and Pereira, condemn its use.

Mr. Clements said he had observed great benefit to result from its employment, and many of those who once condemned it now had become its advocates.

Mr. Brown did not think there could be a question respecting its stimulating action. The peculiar state of the alvine dejections was a sufficient proof of an increased quantity of bile being poured into the intestines; coupled with this was the fact, that when once this viscus—the liver—has been excited into increased action by it, it is with extreme difficulty again restored to its normal and healthy action. There was a way, however, in which its beneficial influence in hepatitis, even viewing it as a stimulant to the liver, could be accounted for; namely, that, by setting up a new action in this gland, it overcame the existing diseased action. But especially was its exhibition to be commended when given, as advised by Mr. Clements, in combination with opium, which he considered an admirable plan; this last-named drug, by its sedative influence, correcting any undue action that might otherwise be induced, a sanitary influence being thus brought about by both conjoined, which neither, if alone administered, would effect. In reference to the use of the water of ammonia as a counter-irritant, Mr. Brown stated that, in the hands of Mr. Gowing, this agent had caused action nearly equal to that of the cautery: it was, therefore, one on which reliance could be placed, and deserved general adoption.

Mr. Lord asked, if calomel might not be considered to act by de-fibrinizing the blood, and thus lessen inflammatory action?

Mr. Brown was not aware that this therapeutic operated in this manner; and if it did, he should then question the propriety of its administration. Already the vital powers were being weakened by having to contend with an acute disease in the organism, and that which still further depressed them would be, he thought, highly objectionable; and more especially an agent which impoverishes that fluid, by which we hope, after having subdued the diseased action, to bring about the reparative process.

Fatty Degeneration of the Liver.

Mr. Gamgee, speaking in reference to this structural alteration, said that he considered the deposition of fat to be the result of disease, and that the animal would die long before it would be removed by the process of starvation; he also cited cases in which, after death, large quantities of fat were found within the bodies of animals, although they had apparently died of inanition.

Mr. Lord accounted for the deposition of fat within the parenchyma of the liver to depend upon the want of reciprocity in action between this organ and the lungs, the function of which in the animal economy is similar. Whenever the latter became diseased, and combustion of the hydro-carbonaceous matters did not take place, the liver sympathised, and, being unable to remove these matters, they were deposited in the form of fat. With respect to what had fallen from Mr. Brown, he would ask, did not the fibrine of the blood become increased and more highly elaborated during the existence of inflammation than in health?

Mr. Brown replied, it might admit of a question as to the quantity being augmented: authors, however, state that it is. As to its being more elaborated, by which he understood increased in vitality, he had no hesitation to express his conviction that it was not. This was proved by the longer time the blood took to coagulate, and the formation of what is called the *buffy* coat, when the red globules are precipitated through the coagulable lymph.

Between induration and scirrhus of the liver he believed a marked difference to exist. Induration is simply the effect of chronic inflammation, when we have a hardening or an increase of the natural consistence of the organ. It is true that scirrhus is associated with induration; but the term is usually applied to the early stage of cancer, that which precedes the ulcerative stage.

Hydatids and Filariæ.

Mr. Gamgee could see no advantage that was derived from a division or a classification of diseases affecting the same organ, in which no difference existed either in the symptoms or mode of treatment. And, Mr. Clements having referred the origin of these parasites to equivocal or fortuitous generation, this idea was strongly repudiated by him, and also by Mr. Brown and Mr. Lord, who considered such a supposition merely a cloak for our ignorance, or a proof of our pride; further, that it was subversive of investigation, and opposed to all the order and indications of wisdom and design we see around us. The plastic energy of the ancients, said Mr. Gamgee, could not be substituted for the general economy of nature, or new kinds of animals would be from time to time formed; whereas we now find all to exist that ever existed, except that, from certain causes in operation, a few genera have become extinct. We have no new order, nor even new forms, of animals introduced; and although it may be difficult satisfactorily to assign the origin of organized beings, and to trace their development from the egg—"*omne vivum ex ovo*"—yet this is no argument whatever against its existence. It would be far wiser to express our ignorance here, since generation is a mystery, and we know nothing about it beyond its effects. Well has it been said by one we all know, that it is as easy to conceive the spontaneous generation of a man as a monad, of the stately oak as the lowest conferva. In the one, however, the causes in operation to produce the phenomena are apparently more obvious; in the other they are occult, and, because we cannot demonstrate them, we deny their existence. Science will continue to investigate, and true humility will not hesitate to confess its inadequacy to attain to so profound a height as that of generation. Man is a finite, not an infinite, being, and many things are beyond the limit of his reasoning powers. Arguments, forcible and specious, may be adduced on both sides it must be confessed, and as yet the question may be considered as unsettled; nevertheless, the universal diffusion of germs, with a fit state of the viscus or the tissue in which they may become located for their development, will go far to explain the production of *entozoa*, and supersede the theory of equivocal or fortuitous generation.

Mr. Clements, in explanation, stated that during the existence of parasites the symptoms would resemble *chronic* hepatitis rather than acute, and the liver would be functionally deranged, indicated by the character of the secretions, the state of the visible mucous membranes, &c.; yet it must be confessed there were no signs that could be designated as pathognomonic.

Hæmorrhage from the Liver.

Mr. Brown strongly deprecated the use of the lancet when rupture of the bloodvessels of the liver existed, even although an escape of blood might not take place into the abdominal cavity through a laceration of the peritoneal coat. He adduced in illustration a case that had recently occurred in his practice, in which the withdrawal of a pint only of blood aggravated all the symptoms, and, as he believed, hurried on the death of the animal. On no principle, he contended, could the act of blood-letting be substantiated. Already, it might be safely stated, the system was having blood abstracted from it; and to add to this, was only more quickly and more effectively to bring about the result that must inevitably follow, namely, death.

Mr. Clements defended it, on the grounds of its being a means by which the current of blood would be diverted. Instead of this fluid going to the liver, by which a rupture of its investing tunic would be sure to be effected, it would be determined to other parts, and its quantity in the system at the same time lessened. Several pathologists, he stated, had on this hypothesis recommended a trial of the lancet. In cases of abscess of the liver, when a rupture of its capsule did not take place, the symptoms present would resemble those of peritonitis; but when an escape of pus had taken place, it would, of course, find its way into the abdominal cavity, the consequences of which needed not be dwelt upon.

February 8, 1848.

Mr. W. Clements, *V.P., in the Chair.*

On the table were laid the morbid parts referred to in the following communications:—

Removal of a Fœtal Calf of which the common Integument was absent.

By Mr. T. Barrell.

Dear Sir, *Keynsham, Feb.* 11, 1848.

I have forwarded an interesting specimen of a malformed calf, which you will oblige me by laying before the members of the Association.

Last Sunday afternoon a messenger came requesting my immediate attendance on a cow, which he informed me had been trying to calve for several hours, and she had got her waive* out. On my arrival, I found her down. The throes were violent, and the water-bag presented, which I punctured, and then proceeded to make an examination. I found the parts prepared for the passage of the fœtus, and that I had an unnatural presentation; but all I could feel were the bare ribs at the curve of the body of the calf. The intestines also were floating on the outside of the abdomen, and portions were brought away in my hand. It was then I suspected the existence of a monstrosity. I therefore got the cow's hind quarters elevated, and after long and unremitting exertions reached the tail; but now I was beaten to a stand-still. There were present several farmers, and some of them experienced in things of this kind; I therefore asked them to assist, as I needed a little rest, my hand and arm being completely benumbed. They all tried to remove the calf, but were unsuccessful, saying it was an impossibility to get it away, and recommended the owner to have the cow killed; but to this I would not consent, while the fact of their giving it up for a bad job stimulated me afresh. I again went steadily to work, and by various manipulations, &c., too numerous for insertion, and much more easily described than performed, I succeeded in getting hold of the hock, around which I passed a slip knot, and at last got the leg up. I experienced almost as much difficulty in getting up the other leg; but at last the calf was placed in a fair position for extraction. By this time the powers of the cow seemed completely exhausted, and the throes had entirely ceased; I therefore administered secale cornut. ʒiij in some warm ale, waited till the throes returned, and, after three hours' more hard labour, I succeeded in getting this monstrosity away. The placenta followed almost immediately. I ordered the cow to have gruel, and gave some sp. etheris nit. in it, leaving an aperient draught to be given in two hours. I saw her the next morning: she was chewing her cud; the bowels were responding to the aperient, and she had plenty of milk. On the following morning she appeared convalescent; she ate and drank well, and a foster calf was placed with her. The owner told me this morning she appeared as well as ever she was.

* Waive is a term used by farmers and cowleeches in this neighbourhood, signifying inverted uterus.

This case shews what difficulties may be overcome in parturition by perseverance. Had I listened to the bystanders, the life of a valuable cow would have been sacrificed, and, no doubt, many have been sacrificed for want of patience on the part of the operator.

I remain, dear Sir,

Your's truly.

To J. B. Simonds, Esq.

Case of Abscess in the Stomach of a Colt.

By the same.

Dear Sir, *Keynsham, Feb.* 5, 1848.

You will receive per rail a diseased stomach. The animal whence it was taken was a cart colt, coming two years old. A few weeks since he became affected with what was then considered to be stringhalt. He was addicted to breaking out of the fields, but after this occurring two or three times he was placed in a straw yard. About three weeks afterwards he shewed symptoms of strangles, and abscesses formed between the jaws; then suddenly enlargements around the parotids and throat presented themselves, attended with febrile disturbance. A very large abscess formed on the parotid gland on the left side, of an indolent character, and calling for active measures to bring it to maturity. The pus I evacuated, and immediately upon this another abscess, similar in character and occupying the same position on the right side, formed. During the formation of this abscess great constitutional excitement was evinced by the animal, which was combatted, in a measure, by febrifuges, tonics, &c. After having given exit to the pus contained in this abscess, I expected a change for the better, but in this I was disappointed, for the animal still continued in the same dull and listless state, refusing food, &c., and ultimately died without having evinced symptoms of any acute pain from first to last.

The post-mortem appearances were indicative of a complication of diseases. The muscles of the hind extremities were extremely pallid, and the absorbents considerably enlarged. In the abdomen there was a large quantity of red serous fluid. Both kidneys had undergone disorganization, being considerably enlarged, very soft in texture, and of a greenish colour. The pelvis of each contained a quantity of fluid analogous to bile. The cellular texture surrounding them was infiltrated, and the intestines lying in contact with the diseased parts were tinged with the coloured fluid.

The liver was clay-coloured, and soft. Near the pyloric portion of the stomach you will perceive there is an abscess containing pus. This morbid specimen, connected with the history of the case, I thought might prove not uninteresting to the members of the Association.

The mesenteric glands were enlarged, also the spleen; and great sympathy existed in the whole of the absorbent system.

On laying open the thorax, a quantity of serous fluid escaped. The lungs were congested, and the anterior portions of both right and left lobes appeared to be gangrenous: the pleura, of course, sympathised.

The heart and pericardium were normal.

I would have procured the whole of the diseased parts and sent them to you, but the disease of the stomach I considered to be the most interesting, and of rarer occurrence.

I remain, dear Sir,

Your's most truly.

To W. J. T. Morton, Esq.

—

Mr. Varnell described the abscess as situated between the openings into the stomach, at the smaller curvature of that organ, and near the pylorus. On cutting into it a considerable quantity of laudable pus escaped. The walls of the cyst were not much thickened, and only a slight inflammatory blush pervaded the contiguous parts.

Mr. Clements considered the case communicated by Mr. Barrell to be one in which the formation of abscesses had not freely taken place, which is so desirable in strangles; and hence the existence of these formations in other parts of the body may be said to have arisen from the absorption of pus into the general circulation. By all justifiable means the discharge of an abscess should be promoted whenever it presents itself in the locality that nature has selected, as any interference will determine the formation of another elsewhere. We have, however, yet to learn, he said, for what purpose this depuration of the system takes place.

The remainder of the evening was occupied by the consideration of a paper introduced by Mr. Robert Gray, entitled "THE VARIOUS ACCIDENTS TO WHICH BONE IS LIABLE." The argument that took place lacked not spirit, although but little possessing any novelty was elicited.

Spiritus Argumenti.

Mr. Lord dissented from the author of the thesis in his objections to the use of bandages in cases of fractured ribs, since it did not always follow that the bone splintered inwards, while by them the edges might often be kept in apposition, so as to facilitate their re-union.

Mr. Gray had seen several cases in which, without their aid, nature had effected a cure, and therefore felt inclined to discard them, from their occasionally proving prejudicial. In answer to the question propounded by Mr. Gamgee, he explained the manner in which a fractured bone becomes re-united; and also stated that, should inflammatory action run too high, we should be very likely to have mortification follow; there being, however, certain changes occurring before this change, which is destructive, takes place. Occasionally, though it is very rare, there is too little inflammatory action set up, and then it will be required that means be adopted to excite it; since, unless the fibrinous matter be thrown out from the blood, no hope of re-union can be entertained.

Mr. Meredith had seen a seton inserted contiguous to the divided ends of a bone prove effective for this purpose.

Mr. Shorten had witnessed the successful application of mild blisters in cases of fracture; the action of which Mr. Weston attributed rather to the effused serum into the cellular tissue operating as a bandage around the part than to the determination of blood to the broken bone, since this would be to the skin. He was not favourable to the promotion of the suppurative action by the aid of setons. He had heard of exercise being given to the animal, and also of the ends of the broken bone being rubbed together; a practice worthy only of the dark days of farriery, and justly to be reprobated. As to the diet on which the animal should be placed, this would depend on the stage or period of the reparative process. During the existence of inflammation a restricted diet only should be allowed; but, when reproduction had become established, then a more liberal is admissible.

Mr. Gray considered a fractured bone to be often rendered stronger than it was before the accident, which Mr. Weston thought was referrible to the increased size it acquired during the re-union by callus.

Mr. Lord demurred. Chemically speaking, he believed it was weaker; how, then, can it become physically stronger?

Mr. Brown stated that the general opinion of physiologists was, that a fractured bone was rendered stronger by Nature in her endeavours to heal the lesion, although he was ready to confess he had no opinion of his own to advance on this head.

Mr. Gamgee believed it to be stronger, on account of more solid matter being thrown out; thus, that which otherwise would be a hollow became a solid; and instead of a net-work of bone constituting cancelli, we have solidity of structure; and surely a solid is capable of offering more resistance than empty spaces, these being mere nonentities.

Mr. Lord could conceive it possible that Nature, in her endeavours to repair an injury in the frame, would make it as strong as the original was; and as it respects the arrangement of solid matter, we have in the cylinder the best and greatest proof of strength, coupled with smallness in amount of matter. This is likewise seen in the strength of the stems of grasses, and also in an egg, the ends of which call for an immense power to press together. He therefore doubted that the bone would be really stronger if solid matter did fill up its centre; for it would be borne in mind that this would be at best a disgregated mass, being less perfectly arranged.

Mr. Gamgee in reply to this asked, Why then, in the formation of an arch, which is a segment of a sphere, is solid matter employed to fill it up? Does not this prove the necessity of support? and where support is called for, is not weakness implied?

Mr. Brown concurred with the statement, that a certain amount of matter being given, in no other form so as to possess strength and to offer resistance could it be more economically arranged than in that of the cylinder; yet were two cylinders taken, these being of equal diameters and made of the same materials, the one hollow and the other solid, surely that would be the strongest in which the greatest number of solid particles existed, as every particle of matter is capable of offering resistance.

February 15, 1848.

The Treasurer *in the Chair.*

On the table were laid several morbid specimens, descriptions of which have already appeared in the pages of this Journal.

Mr. S. Weston presented for discussion an Essay "On the Anatomy, Physiology, and Pathology of the Stomachs of Ruminants," which, for reasons already assigned, we are compelled to withhold.

February 22, 1848.

The President *in the Chair.*

This evening was occupied by the description of many morbid parts, with the histories of the cases in which they had occurred, forwarded by members, and which elicited much profitable conversation, more especially to the student.

February 29, 1848.

Mr. G. Varnell, *V.P., in the Chair.*

Mr. Greaves' caoutchouc tube, for keeping bandages or coverings over inflamed parts wet with warm or cold water, was laid on the table.

Mr. G. T. Brown directed the attention of the members to the lungs of a horse that had died of glanders, the disease having proved extremely rapid in its progress, although there was reason to suppose that the virus had lain for some time comparatively dormant in the system.

Mr. Varnell commented on the lesions that had taken place, and related a similar instance that had fallen under his notice.

The remainder of the evening was occupied by the further consideration of Mr. Weston's paper.

March 7, 1848.

Mr. H. Fitter, *V.P., in the Chair.*

On this, the closing meeting of the Session, Mr. J. S. Gamgee read an admirable Essay on "Inflammation, its predisposing Causes, Phenomena, Termination, and Treatment," and to which allusion has been already made. The discussion that supervened was one of much interest, and highly creditable to those who took part in it.

SECRETARY'S REPORT for the FOURTEENTH SESSION, 1849-50.

"Let us, then, grant esteem,
Or grudge it with precaution only; never
Forgetting that rash haste right judgment mars."

To chronicle the transactions of a Society which, from its commencement, has been but one uninterrupted advance, even more than realizing the most sanguine expectations of its originators, is neither an onerous nor a disagreeable task, but precisely the converse, light and pleasing. Yet it is feared, from the duty having hitherto always devolved on one person, that a sameness has pervaded these Reports, and a tedium crept over the mind, during their perusal, which has rendered them spiritless and insipid: 'tis well, then, a change is about to take place, even were it only on this account.

Allusion has in a previous Report been made to the fact, that, when the Veterinary Medical Association was first formed, there were not wanting those who boldly prognosticated it would not, could not, go on; indeed some, with a still greater degree of temerity, asserted it *should* not, and these even resorted to covert acts to accomplish their destructive purposes. But the touch of Ithuriel's spear at once disclosed and defeated their malign intentions, and they stood naked and exposed to justly merited obloquy.

> "No falsehood can endure
> Touch of celestial temper, but returns
> Of force to its own likeness."

The Association, nevertheless, has gone on; nay, more than this: with each returning Session, like some mighty river which, as it wends its way to its parent ocean receives fresh tributary streams that serve to augment the volume of its waters and render them of greater worth, so this Institution has had to record greater and greater advances that have been yearly made, and new increments of knowledge periodically added to the general stock, every one of which has contributed to the accomplishment of the end for which the Institution was established. And, surely, a Society so eminently calculated to advantage the science of veterinary medicine deserves all the support that can be given to it by its members. The well-being of the one and the well-doing of the other are correlatives. Ours is an ennobling, and, through His creatures, a God-honouring profession. A community of interest, too, is ours; the end, the aim, the object are the same,—the amelioration of the sufferings that we have entailed on animals; for until sin entered, and "death by sin," disease and death were not. When man, in disobedience of the command of heaven, had eaten

> "The fruit
> Of that forbidden tree whose mortal taste
> Brought death into the world, and all our woe;
> *   *   *
> *   *   Sin among the irrational
> Death introduced."

Let the aspiration then arise, that, as years increase, so in importance and estimation may increase the Veterinary Medical

Association; and to accomplish this, it is only requisite that the same cordial co-operation be maintained as that which has hitherto existed among its constituents, and the same spontaneity of action.

The subdivisions that hitherto have been attempted in the Annual Reports will be adopted in this.

Pathological Contributions.

The earlier meetings of the past Session were marked by abundant proofs of the continuance of the kind support of our friends. During the recess many morbid parts were received, with communications containing the histories of the cases in which they occurred. They consisted of a lacerated rectum, forwarded by W. Sweeting, Esq.; also, of the stomach and portions of the intestines of a horse poisoned with arsenious acid, sent by Mr. J. Tombs, of Stratford-on-Avon; a diseased kidney and ureters taken from a pig, transmitted by Mr. W. A. Cartwright, of Whitchurch; the scirrhous uterus of a mare, by Mr. W. Stanley, of Leamington; intestinal calculi from a horse, by Mr. B. Cartledge, Sheffield; and a vascular tumour extirpated from the penis of a bull, by Mr. J. Hazell; and for these the acknowledgments of the Association were duly returned.

Subsequently Mr. J. Markham, Rugely, forwarded a very unusual specimen of hydatids existing on the larynx of a horse; Mr. W. C. Sibbald, a ruptured stomach, occurring in a horse labouring under mesenteric disease, the history of the case having also been furnished by him; Mr. G. T. Brown, the ruptured liver of a horse, and abscesses existing in the brain, the history of the cases being likewise communicated by him; Mr. B. Short, a very uncommon instance of congenital ascites in a calf, the weight of which was 162 lbs, and its form that of a monstrosity rather than a naturally formed animal, arising from the very large amount of effusion that had taken place into the cellular tissue generally. Nor less unusual was the calcified testicle of a ram, exhibited by Mr. Hussey; indeed, this might fairly be designated an unique specimen, for, although in other animals the like disease has been met with, in none has it involved the whole of the gland so perfectly as this was. We were indebted to Mr. J. Gamgee for a description of this metamorphosed organ, which has appeared in The Veterinary Record. Mr. Wragge exhibited a triple phosphate calculus that had been voided by a horse after the exhibition of a dose of purgative medicine, and which had for its nucleus a button. Mr. W. P. Toll forwarded an encysted abscess taken from the liver of a horse; and Mr. Austin the ossified larynx of a roarer, each communicating the history of the case in which these lesions had occurred.

The abnormal urine taken from a horse labouring under *oxaluria*, with that from another animal affected with *hæmaturia*, afforded an admirable opportunity for observing this secretion in two opposite states or conditions: these peculiarities were demonstrated by the Secretary, and the salts contained in the urine exhibited by the aid of the microscope by Mr. Simonds. An interesting specimen of fracture extending into the articulation of the tibia and femur of a horse in an oblique direction, and which was not made manifest until seven days after the accident occurred, was sent by Mr. T. W. Gowing. A series of specimens, so to speak, of purpura hæmorrhagica in a heifer were forwarded by Mr. H. Lepper: they consisted of the heart, and portions of the kidney, spleen, and brain, the eye, the stomach, and the bladder, all beautifully shewing the effects of this disease. At the closing meeting of the Association for the session on the table were laid a splendid renal calculus taken from a horse, and a hair ball from the stomach of a heifer, both forwarded by Mr. R. Sanders, of Beverley. Also a displaced ear of a calf, sent by Mr. J. Stevenson, of Whitby, the cartilaginous concha being in the posterior nares, and thus necessarily interfering with the respiration of the animal during life.

Essays.

The Prize Essay on the Anatomy of the Larynx, Pharynx, and Tongue of the Ox, by Mr. Gamgee, will have been perused with gratification; and it adds another to the proofs he has already given of his love to the profession he has chosen, and his earnestness to promote its advancement. Towards the close of the session he also introduced a second Essay on "Inflammation," which contained an admirable consideration of the views entertained by modern physiologists on this very important subject.

The first paper introduced for discussion by Mr. Blakeway, on the Anatomy and Physiology of the Skin of the Horse, presented but little that was very novel, nevertheless its importance none will attempt to gainsay. To this succeeded an Essay on Parturient Apoplexy in the Cow, by Mr. R. Wilson, which was followed by one on Broken Wind in the Horse, by Mr. C. M. Baker. Mr. J. Paradise presented a thesis on Diarrhœa in Calves; and Mr. Hunting perfected what Mr. Blakeway had begun, by giving the principal Diseases that affect the Skin of the Horse. Mr. Carrington's Observations "On the Condition of the Hunter," although not a medical subject, is nevertheless one so intimately connected with the avocation of the veterinary surgeon, that it could not fail to be estimated, while its worth was enhanced by the remarks and advice given being of a thoroughly practical nature. Mr. Gudgin's paper on the Eye was lucidly drawn up, but, almost of necessity, contained little that was new. To this succeeded a valuable paper on the Action of some of the Compounds of Iodine on the Horse, by Mr. G. T. Brown, which will often be referred to hereafter with profit, as will his thesis, with which the meetings of the Association was closed, "On Auscultation as applied to the Horse in Disease;" a continuation of a subject which he has almost made his own by the careful observations and numerous experiments he has instituted. Mr. Mason's paper on Tetanus presented no new feature, either as referring to the nature of this disease or its treatment, with the exception of his advocacy of etherized enemata. Mr. Carter's, on Abortion in Cows, contained many observations of practical value, and which were, doubtless, the result of experience. Mr. Waller's, on some of the Diseases of the Horse peculiar to India, namely, "Bursauttee," "Kumree," "Worm in the Eye," and "Stroke of the Land-Wind," cannot fail to be interesting to those of the profession whose destiny may be cast in that part of our possessions; a rich field for investigation, and from which, as yet, but little fruit has been obtained.

Mr. John Gamgee's paper, "On the General Pathology and Treatment of Dropsical Effusions," possessed much of interest. To this succeeded Mr. Batt's, "On Parturition in the Cow," in which the various forms of presentation were considered; and the session closed with an admirable continuation of the important subject of Auscultation, by Mr. G. T. Brown, which has been already alluded to.

From the above it will be seen that, in number, the Essays introduced have exceeded those of antecedent sessions, and many of them redound highly to the talents and industry of their respective authors; nevertheless, it is to be regretted that the discussions awakened by them have not been of so animated and searching a character as we have known them to be. It appears to be the opinion of some members, that, an Essay being introduced, all has been done that is required of them. Not so, however. Doubtless this is an important part of the duty of each member; but much more is to be derived from a spirited debate than from the mere reading of the most elaborate essay. This being borne in mind, the Essays need not be so lengthy; for although to the authors the study necessarily required to draw them up is profitable to them individually, yet others do not reap a corresponding benefit. "Iron sharpens iron," we are told; and facts elicited by argument become indelibly impressed on the mind; and the spirit of emulation thus excited results in a mutual advantage; for knowledge is, like mercy,

> "Twice blessed;
> It blesses him that gives, and him that takes."

We would, therefore, that the Essays be shorter, and the debates be allowed to take their wonted place. The apprehension that has been entertained by some members should never for a moment have found a place in their minds. Fear paralyses effort and damps exertion, whilst it is the sure precursor of defeat; and thus the object in view is never attained. This word of admonition, it is hoped, will be accepted in the spirit in which it is given, for but one desire actuates the writer: he would have the Essays themselves concise and pointed, while the debates should be broad and comprehensive.

Communications and Cases.

To Mr. J. R. Cox we are indebted for a very interesting account of Metastasis recurring several times in the same animal. To Mr. W. C. Sibbald, for a case of Mesenteric Disease in the horse. To Mr. R. Girling, for cases of Purpura Hæmorrhagica and of Chronic Disease of the Ileum in the same animal. To Mr. J. Gutteridge, for the account of the beneficial influence of the Extractum Taraxici as an alterative and tonic in Cattle and Sheep.

Subsequently he communicated cases of Jaundice in the Cow, which had been by him successfully treated by this agent, and also of Rot in Sheep.

To Mr. J. Rose, of Worcester, for cases of Poisoning in the Horse, both by Savin and the Daphne Laurel. To Mr. Cleveland, for a case of Malignant Scarlatina succeeding Catarrh. To Mr. E. T. Barker, for a case of Amputation of the Penis of a Horse, the mass weighing nine pounds. In this division there has been experienced a falling off: probably this has arisen from the difficulty felt in forwarding any thing that is now new to us as well as interesting.

New Instruments.

Mr. Gowing laid on the table, at the first meeting of the Association, an admirably contrived portable Medicine Chest for the Veterinary Surgeon, in which he has displayed his usual ingenuity in the arrangement of the several compartments, and the allocation of the different substances; likewise an Inhaler for either simple or medicated Vapours. Subsequently he exhibited his valuable Dental Instruments, the majority of which have been engraved and published in the Journal of the Association, The Veterinary Record, giving a lucid description of their application; and explained the improvements he had made in the Tracheotomy Tube, to which he directed the attention of the members in a previous Session.

Mr. Varnell's Improvement on the old form of the Balling Iron, carries with it a conviction of the advantages that must result from its general adoption. Nor unworthy of commendation was the improved form of the same instrument as suggested by Mr. W. P. Toll.

Mr. M. Mavor forwarded his Apparatus for the Application of Steam to the Horse, an account of which has been given in the Abstract of the Proceedings of the Association for 1838-9, and which continues to answer its intended purposes.

The Library has received some few additions by purchase and presentation. But the most pleasing feature, perhaps, is, that requests have been made by other Societies, and the Editors of other Periodicals, for an exchange of Journals: these, it is quite unnecessary to say, were hailed with the highest delight, at once acquiesced in, and the honour conferred sensibly felt and acknowledged.

The Books have been in pretty general request by the Members during the Session.

The Funds of the Association present a favourable appearance, and the outstanding liabilities are in order of disbursement.

The number of members has continued yearly to increase.

Obituary.

The circular addressed to the profession has been the means of acquainting us that the following members have passed from time into eternity:—

Mr. Thomas Dean,	late of	Waltham, Berks.
Mr. R. Thompson,	,,	London *(half-pay)*.
Mr. T. Burrowes,	,,	Blackburn *(captain — Regiment.)*
Mr. R. Read,	,,	Crediton.
Mr. J. Ions,	,,	Waterford.
Mr. H. W. Alger,	,,	Ashton-under-Lyne.
Mr. W. Burley, sen.,	,,	Leicester.
Mr. Jos. Trump,	,,	Rhymney.
Mr. J. H. Robinson,	,,	Greenock.
Mr. J. T. Brewer,	,,	Holsworthy.
Mr. C. E. Short,	,,	Hindon.
Mr. S. Goodworth,	,,	Great Driffield.
Mr. J. Sinclair,	,;	Glasgow.
Mr. W. Fox Wilkinson,		Macclesfield.
Mr. R. S. Taylor,	,,	Pontefract.
Mr. Abraham Fowler,	,,	Tonbridge.

And since this Report was read, we have been informed of the death of

Mr. F. W. Moss,	late of	Stockwell.
Mr. James Chase,	,.	Brooke.
Mr. J. M. Corbet,	,,	Limerick.
Mr. C. S. Hussey,	,,	Tilshed.

'Tis a long, sad list. The aged and the young are here. He who had retired from the duties of the profession with a competency, and he who had just entered on its anxious responsibilities. Alike in both, and in all, the separation of the ever-living spirit from the decaying flesh has taken place: the one is gone to fathom the mystery of a spiritual existence; the other to the grave, and companionship of worms.

These annual announcements of the death of friends and members of the profession should to us

> "Only a deeper impulse give
> To solemn thoughts that soar to heaven,
> Seeking a life and world to come."

There is no discharge in this war. The mortal part must return to the earth out of which it was taken, and the spirit unto God who gave it: when we know not, for the future is all to us unknown. "Whether the years that are to come shall come dancing in sunshine, like bridesmaids to a bridal; or whether they shall approach clothed with sackcloth and covered with crape, as mourners to a funeral, we are alike ignorant of;" but we are sure that we must fold up our tents, like the Arabs, and as silently pass away. Another hand will soon have to record *our* departure hence; still

> The sun will shine as brightly,
> The thistle-down float as lightly,
> And the lark sing as blithely,

then as now; nevertheless 'tis as well, perhaps, to remember, that

> "When our souls shall leave this dwelling,
> The glory of one fair and virtuous action
> Is above all the 'scutcheons on our tomb,
> Or silken banners over us."

During the earlier part of the Session an appeal was made by the Central and National Veterinary Society of France on behalf of the widows and families of Professors Dupuy and Rodet, lately deceased. It was the first application of the kind ever made, and we are glad to be able to record that the appeal was not made in vain. A sum of £57 has been transmitted to the secretary, M. Bouley, the receipt of which was duly acknowledged by him.

In offering this his last Report of the Proceedings of the Veterinary Medical Association, the Secretary feels that he is withdrawing himself from a Society in the success of which he has always felt a warm and a sincere interest, from his believing it to be an institution eminently calculated to advance veterinary science by instilling into the inquiring mind a love of principles, and awakening a spirit of laudable emulation among the junior members of the profession. Nor is it among the least of its advantages, that at the same time a degree of confidence is given to the student by his mingling in the debates that occur, which in after-life proves of inestimable value to him; while the truths elicited during these debates become so deeply impressed upon his mind as never to be forgotten.

The inquiry, therefore, that naturally arises in the minds of some may be, Why, then, withdraw yourself? The answer is simply this:—It has appeared to him that, by so doing, an opportunity will be afforded of giving a fresh impetus to the Society. Another may perceive that to be beneficial which has escaped his limited powers of penetration and discernment. For these many years past the same beaten track has been gone over and over again by him. He has become like an old cart-wheel traversing the same rut, until it has become so much deepened that it cannot be got out of it. The road may be, nay indeed is, good; but these deep ruts certainly do not improve it. Moreover, he sees himself surrounded by those younger and abler than himself, and who, impelled by the zeal and energy of youth, will, doubtlessly, infuse into the Society that spirit which he has failed to awaken. But his earnest and best wishes can never cease to be for the onward progress of an institution in the formation of which he may be permitted, without egotism, to say he took an active part. He was present at its birth, cradled it in its infancy, and has watched its growth up to a mature age. Like the sapling of the forest, at first it yielded to the passing winds, but these have served only to enroot it more deeply: it has grown and become strong, and its branches now extend both far and wide. To him, therefore, it ever will be extremely gratifying to remember, that, during the fourteen years he held the office of Secretary, rarely did an instance of any unpleasantness occur. From the members, both individually and collectively, he always met with the utmost urbanity and the greatest kindness; consequently, to separate himself from them is a painful act; but he has long felt it to be his duty, and now, again and again breathing his most fervent wishes for the continued and even increased prosperity of the Association, and reiterating his thanks for the many kindnesses conferred on him, he has only to add the memory-awakening word—farewell! Much, he fears, that he ought to have done has been left undone, and more might have been better done, by him; but to "err is human." Each has his niche to fill; and 'tis well, perhaps, to remember, that that man lives to very little purpose whose aim is not the fulfilment of those duties which are allotted to him. Time is given to him for this purpose, and it has been said

"Man is immortal till his work is done."

Nevertheless, it may be the case, nay indeed, it often has been the case, that offices have been retained by their occupants to the detriment of a society rather than to its benefit; and, lest it should be so in the present instance, has been one cause in determining the present act on the part of,

Dear Sirs,

Your's, still faithful and obliged,

W. J. T. Morton.

Royal Veterinary College,
April 9, 1850.

Meeting of the Council.

At a Meeting of the Council of the Veterinary Medical Association, held September 25th, 1850,

The Treasurer, Professor Simonds, in the Chair,

The silver medal was awarded to Mr. W. Waller, for his Essay "On the Anatomy, general and minute, of the Lungs of the Horse, illustrated by Diagrams."

The "Thanks of the Association" were adjudged to Messrs. T. W. Gowing, C. Hunting, T. Gudgin, G. T. Brown, J. S. Gamgee, John Gamgee, J. H. Carter, and W. Waller, for the best Papers introduced during the past Session, by which they rank as Honorary Fellows.

The Prize Subjects chosen for the coming Session were:—

For Practitioners.—"Functional and Organic Diseases of the Kidneys of the Horse, embracing Urinary Deposits."

For Students.—"The descriptive Anatomy of the Abdominal Viscera of the Horse."

Anatomical Preparation.

An injected Preparation of the Arteries and Veins of the Uterus, Bladder, and Vagina, *in situ*, of the Sheep.

TO CORRESPONDENTS,

AND SHORT NOTICES OF COMMUNICATIONS, &c., RECEIVED.

Civic Veterinary Surgeon.—We have great pleasure in directing the attention of our professional friends to an important suggestion made at a meeting of the Common Council of the city of London on the 29th July, 1850, to the effect that "the future inspector of live cattle in Smithfield Market, to be appointed by the Lord Mayor, should be a veterinary surgeon, or some one qualified to give a professional opinion as to the state in which any diseased cattle might be found." We are quite sure that this desire on the part of the Corporation of the first city in the world to carry out the intention of the Act of Parliament will give universal satisfaction.

We thank Mr. Edwin Harrison, V.S., Lincoln, for an excellent specimen of "Ossification of the *bursæ mucosæ* of the knees of a horse." In the note that accompanied the morbid parts, he says, "The animal was the property of Mr. F. J. Evens, Newport Cottage. He was purchased at two years old, free from speck or blemish, and put to work immediately. After working a few months, a slight enlargement of the bursæ was visible; but this not in any way interfering with the usefulness of the animal, no notice was taken of it, and, consequently, no treatment adopted. The horse continued to work till the day of his death, which took place last Thursday, at the age of twenty-seven years. The foreman tells me this horse was never either 'sick or sorry,' and never had a ball during the twenty-five years he was under his care. Here is an unthwarted instance of Nature's extra labour, fully shewing her boundless powers, and calling for early attention to this evil which the frame is sometimes heir to. Thinking the specimen would be useful for the Lecture Table and Museum, never having seen disease of the bursæ to such an extent before, I have been prompted to send it you."

We are obliged to Mr. C. Sayle, V.S., Rotherham, for a specimen of intussusception in a colt. Also to Mr. Turner, V.S., Carshalton, for a case of gastritis in the horse supervening on influenza; and Mr. F. Blakeway, for an account of rabies affecting a kennel of hounds.

We likewise beg to acknowledge the receipt of the "Report of the Proceedings of the Council of the Royal College of Veterinary Surgeons. *By Authority*."

The above was in type, but has been excluded by other matter. It will be seen that we have been obliged to increase our usual number of pages.

The following communication has been received from Mr. G. Lewis, Monmouth:—

"Monmouth, June 17, 1850.

"Dear Sir,—Since my last letter to you, I have been made acquainted with what seems to me two singular cases.

"Case I.—*Omental Hernia in a Colt.*

"A two-year-old colt had been castrated by a 'cutter' about three weeks since, and in a short time (some few hours afterwards) something was observed hanging from the right side of the scrotum, which he cut off. This morning I was desired to attend, as the colt appeared to be getting worse. Upon my arrival I found the omentum protruded through the scrotum for about two-and-a-half inches. The animal has fallen away in condition, and has a straddling gait; otherwise he appears to be healthy. I forgot to say that the portion of omentum protruded continues to increase in size. He is coming to my infirmary to-morrow, when I intend administering some aperient medicine, after which I shall operate by detaching all the sphacelated portions of omentum and reducing it; take off the indurated edges of the wound in the scrotum caused by castration, and then bring them together by metallic sutures, making a simple wound of it: but the difficulty to me remains, viz., the weight of the omentum upon the sutures, thereby preventing the adhesive process taking place.

"CASE II.—*False Presentation in a Heifer.*

"A fine two-year-old short-horn heifer, the property of a very extensive farmer near this town, could not calve, it being the first time of calving. My attendance was desired immediately, and being at home I at once went. There was a breech presentation, with the legs of the fœtus bent under its belly. I succeeded in getting up the legs, and then proceeded to apply force, so as to draw it away; but it was all to no purpose, for the projecting portions of the hams of the calf caught so firmly against the bones of the pelvis of the cow, that the calf could not be stirred. I advised the cow to be well supported with gruel, and stated that in the course of an hour I would return, which I did, calling for the owner in my way, when I was informed that he had gone to the cow, and was further told that a friend of his had taken up a farrier to cut away the calf against his (the owner's) consent. Upon his arrival he found the calf's two legs skinned to above the hocks, and that they had failed in even detaching a limb; upon which he ordered the cow to be destroyed immediately. I have had several cases of breech presentation in mares and cows this season, but never such an one as this. Had she been left alone, I intended to have tried what effect dividing the symphysis pubis of the calf, and then pulling by one leg at a time, would have had; but, of course, this was prevented. I confess that I am still at a loss to imagine how the calf could have been got away at all, impacted as it was in the pelvis of the mother, so that it would not move any way.

"I am, dear Sir,

"To Professor Spooner." "Your's, very truly.

We have to acknowledge the presentation of the following Works:—

"Des Races Chevalines de la Belgique et des Institutions Hippiques de l'Europe, par Douter Luigne, ainé."

"A Treatise on the Structure, Diseases, and Injuries of the Blood-vessels, by Dr. Edward Crisp."

"The Examination of a rejected Candidate at the College of Physicians, London." By the same.

"The London Medical Examiner and Monthly Review."

Also the following Journals received in exchange:—

"Bulletin de la Société Centrale de Médécine Vétérinaire," par M. H. Bouley.

"Journal de Médécine Vétérinaire publié a l'Ecole de Lyon."

"Monthly Journal of Medical Science."

"Pharmaceutical Journal and Transactions."

"The Veterinarian."

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Explanation of Plate 3, vol. VI.

Fig I. Represents the testicle, D, connected by the fibrous membrane, B, to the tumour, A; *b*, cartilage; *c*, cysts, of fibrous tissue mingled with fat; T, tunica vaginalis.

Fig. II. A perpendicular section of the cartilage; *c*, is the cell wall; *n*, the nucleus. On approaching the surface the cells are seen to be flattened, their sections being oblong, and in some parts almost linear. Magnified 300 diameters.

Fig. III. A section of the cartilage exhibiting well-marked nucleoli *n'*, also the granular matrix, *m;* the latter, however, is represented too granular and dark. Magnified 300 diameters.

Fig. IV. A section of the cartilage in process of transformation into bone. The cells are seen arranged in groups, and masses of granules to pervade the matrix. At *b*, the cartilage is impregnated with earthy matter, which at *c*, is seen advancing around a cartilage corpuscle. Magnified 300 diameters.

Fig. V. A section of the ossifying cartilage seen with a lower power: it has a mapped appearance, in consequence of the grouped arrangement of the corpuscles, and the irregularly shaped masses of granules pervading the matrix. Magnified 150 diameters.