

soft, dark in colour, or iridescent and soapy ; and more or less all over the carcase I have found the lymphatic glands enlarged, softened and charged with lymph ; moreover I have seen deposits of tubercular matter in fat and other structures of carcasses dressed for the market, and in organs exposed for sale for human consumption.

I can, in conclusion, only express astonishment that there are yet to be found medical men (and veterinary surgeons) who are prepared to defend the use of the flesh of tubercular animals as an article of diet (as witness the remarks made by some of those who discussed the subject at the recent meeting of the British Medical Association) in face of the virulent nature of the disease, its ready transmissibility, its intractable nature, the revolting and repulsive aspect of its lesions, and the large supply of healthy and untainted flesh ready to the hands of the meat consuming population.

CASTRATION.

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WHEN writing a paper on "Castration" for the last meeting of the National Veterinary Association at Glasgow, I did not expect that the severest criticism would be directed by those who are considered "men of light and leading," — men whose names are household words in the profession—against the most scientific views expressed in the paper. And, unfortunately, these men speak with an air of authority and an assumption of superior knowledge which would only be amusing were it not so pernicious, and so detrimental to the advancement of veterinary science. There were no doubt grand teachers in our veterinary colleges thirty or forty years ago, men like Spooner and Gamgee and Dick, but, to its credit be it said, the profession has been advancing with the times, and the opinions held and taught by them regarding many subjects are now well known to have been erroneous. And had these men lived now would they not have gladly availed themselves of our improved appliances and modern methods, and have probably stood out as conspicuously from the rank and file of the profession as they did then? Would they have been satisfied with the finality of the teachings of their predecessors, and have been content to stand stock-still like the sun over the plain of Ajalon? Would they not rather have been zealous earnest searchers after truth by every available method? There is no stopping the march of improvement. There is certainly no finality in surgery, and the surgeon will soon be hopelessly in the rear who is not continually striving to perfect his methods and improve on his practice. As our late poet-laureate puts it, we ought all to "rise on stepping-stones of our dead selves to higher things."

The courage of anyone who, in an assemblage of professional men, in this the last decade of the nineteenth century, can express his firm conviction that there is no more pain inflicted and no more barbarity exercised in making a wound in healthy tissues with a red-hot iron than in making it by a clean sharp scalpel, may extort our admiration at the moment, but a more permanent feeling remains,

difficult to describe,—perhaps something akin to pity. However rapidly the wound is inflicted by the red-hot iron, it is impossible to avoid a chemical action, apart from the mechanical, which is described as beneficial, but which tends to pathological changes that are not desirable, and ought if possible to be avoided.

In my reply at Glasgow I stated distinctly that in the castration of colts I endeavoured to promote healing by the first intention. The amount of substance removed—the testicle—is small, the displacement in the walls of the scrotum is inconsiderable, so that the necessary coaptation of the edges of the wound may take place spontaneously, enabling the wound to heal by primary adhesion. In stallions arrived at maturity this result is not so probable. The testicles are much more bulky, the wound must necessarily be larger, the shrinking and displacement of the walls of the scrotum are very much greater, and consequently in any resulting hæmorrhage the blood is much more likely to lodge within the wound. Owing to this empty relaxed condition also, air is more liable to be drawn in and forced out of the wounds as the animal moves. But why should the washing and cleansing of castration wounds be considered unprofessional and a thing to be avoided? It looks as if the practitioner considered it derogatory to his professional reputation. He wishes to be able to say that his patient never seemed a bit the worse, and that the wounds never required to be touched,—“he never looked over his shoulder” is the usual expression. In doing this he puts himself in a false position. If his patient recovered fairly well without it, might he not have done much better had his wounds been cleaned and dressed? If a simple superficial abscess is opened, or if an animal gets a skin wound or an abrasion about a fetlock, it is thought necessary to clean and dress these daily. Then why should it be considered *infra dig.* to clean and dress castration wounds—wounds made in the performance of a serious operation involving the removal of the chief organs of the reproductive system and the opening of a diverticulum of the largest scrous cavity in the body?

Casting horses for operation, and injuries connected with it, form a tempting subject, but that would require a paper to itself.

The reporter construed my answer regarding the cause of death in lambs after castration in an opposite sense to that intended. I *did* examine the lambs, otherwise I could not have given the *post-mortem* appearances. But I did not make a microscopical examination. It seemed to be the opinion of the meeting that the cause of death was quite easily understood—it was simply septicæmia. Then what is septicæmia? If by septicæmia is meant the absorption or introduction into the blood of some chemical product—ptomaine or albumose—formed in a wound during the decomposition or putrefaction of dead or dying tissue or retained discharges, then these lambs did not die from septicæmia.

If, on the other hand, it means the introduction into the system of, it may be, an infinitesimal quantity of some material which has the power of self-multiplication within the body of the animal, and which in itself acts as a poison or secretes some principle or principles which act as poisons, septicæmia is more likely to have been the cause of death. But if the latter definition is held to be correct, what about

anthrax? What about black-quarter? What about malignant œdema even? Do they not all answer to the same definition? May not each be considered a *septicæmia*? Is not the distinction due to the fact that in these diseases the specific infective principle has been recognised, isolated, and cultivated, that its action has been studied until it is known to give rise to a more or less definite train of symptoms, while in what is usually termed septicæmia in the domestic animals we simply do not know what specific organism is the cause? If that is the case, then septicæmia may be considered a generic term which, in all probability, includes a number of different pathological processes that have not yet been specifically recognised and differentiated—a convenient generic term in the present state of our pathological knowledge.

In the case of the lambs I am inclined to the opinion that the infective principle did not multiply in the blood stream, but, gaining access to the wound, spread by contiguity of texture through the spaces of the surrounding areolar tissue, and that its local effect, apart from the poisonous action of any substance that might be secreted by it, was almost sufficient to account for death. A country practitioner in a wide practice may make accurate clinical observations, but, unfortunately for the progress of science, he has not much time for bacteriological investigation.

The time left at my disposal at the Glasgow meeting was too brief to admit of a full reply to the various criticisms on the paper, and, unfortunately, that reply as it appeared in the report was in many parts rendered quite unintelligible. But had it not been for numerous inquiries received since regarding my methods, more especially regarding the mode of operating on the horse in the standing position, this communication would not have appeared.

I have been further induced to write from the fact that since then articles have appeared in some of the professional journals, written as if there was but one way of castrating horses standing, and that by the wooden clam. There are also advertisements of clams, instruments, etc., giving colour to the same opinion. Now, I have operated on hundreds of horses by the wooden clam, and have no hesitation in saying that castration by the *ecraseur* is a better method if it can be depended on to prevent hæmorrhage. And I think that with improved instruments the risk of hæmorrhage can be reduced to a minimum. There is no dead tissue left to slough off and keep the wound open, exposing the animal to more serious risks, and it is possible to obtain healing of the wounds by the first intention.

The preparatory treatment of the horse is of the usual kind, but, seeing that he is not to be cast, there is not the same necessity for the stomach and bowels being empty. I prefer to have the horse in a box rather than a stall, and if convenient to have three men to assist, although I have operated with only a man at the head and a boy to hand the instruments. Get the tail tied up out of the way, and put a bridle with blinkers on his head. Draw him up at the off side of the box without putting him into either corner, and put a twitch on him in the usual way. If the bridle is not thoroughly reliable, get a small clean hard cord like thin plough line, and with the middle of it put a double or clove hitch round his lower jaw—not too tight—and give it to the man at the head to hold instead of the bridle reins. For

some years I have been in the habit of using a solution of creolin to wash the hands and soak the scrotum and instruments with in ordinary castrations. All being ready, with one man at the head and another beside him with a hand on the horse's neck or shoulder, approach the horse at the near shoulder, slip the left hand down the back until it rests over his loins, then slip the right down the belly, and back over the prepuce until the scrotum and testicles are reached and freely handled. An assistant holding the vessel near, moisten the scrotum and all around well with the creolin solution. Remove the left hand from the loins, soak it in the solution, and handle the testicles with it, the right hand resting on the quarter. Get the attendant to lift the near fore foot and keep a good hold of it. Grasp the scrotum between the testicle and abdomen, enclosing the left cord in the left hand, press the testicle downwards, and get as firm a hold as possible. Lie against the horse's flank, dip the right hand in the solution, take a firm hold of the knife, carry it between the hind legs from behind, and without any hurry make sure that it is applied in the proper position, and with one firm smart incision from before backwards liberate the testicle. Give up the knife to the assistant, place the right hand over the anterior spine of the ilium, allow the scrotum to slip through the hand until it holds the testicle by the bare cord, get the attendant to drop the foot, and wait a few seconds till the horse steadies. Then dip the right hand in the solution; and, while the left hand still grasps the cord, push the chain of the ecraseur over the testicle with the right, and grasp the testicle with it. Let go with the left hand, and take a fresh hold with it below the chain of the ecraseur; adjust the chain with the right, making sure that all the epididymis is enclosed in the chain and none of the dermal covering of the scrotum, and, holding cord and chain in the left hand, tighten up the ecraseur rapidly with the right, until it begins to grasp the cord. Examine the cord and chain again by manipulation to ascertain that everything is right, and with both hands to the ecraseur screw it slowly up. Do this very slowly as the strain increases, to give time for the cord to be crushed, and finish up rapidly when the strain is felt diminishing. As some shreds of tissue are generally pulled through with the chain of the ecraseur, hold the instrument in position with the left hand, dip the right in the solution, grasp these shreds between the finger and thumb of the right hand, and separate them from the ecraseur by pressing them back in the direction of the scrotal wound.

The right testicle is removed in the same way and from the same side, an attendant holding up the near fore foot again until the incision is made.

The horse usually stands quiet until the incision is being made, and once the testicle is exposed there is much less risk of the operator getting kicked. The horse generally moves round towards the operator, especially when operating on the near testicle; and it is better to let him come, allowing the man at the head to guide him as much as possible. *Do not* get four or five men to lie on to him and press him up against the wall or he will give them plenty to do, will press against them, and perhaps throw himself down. Rather move away from him, and allow him to move a step or two backwards or forwards, than hold him too firmly. The operator can easily move with him, holding the ecraseur in his right hand, his left resting on the

horse's back. Young colts are very apt to throw themselves down, and should be allowed all the liberty possible. Do not lay a hand on or against them that can be avoided, and the fore foot should be dropped the moment the incision is made. In fact, I often operate on them without a foot up at all. Some of them will, unless carefully handled, throw themselves down on the off side when the right testicle is being operated on.

It is my invariable practice to order the horse to be exercised twice daily, beginning the morning after the operation, and to have him trotted smartly 50 or 100 yards, several times, each time he is at exercise. I try to avoid sweating the horse, but it makes him shake himself and put his legs in motion. I also order the wounds to be well cleaned twice daily with clean warm water and a clean cloth, and after drying to be soaked each time with the creolin wash. I do not object to the horse being put to the yoke a short time for exercise if the draught is light and he is not heated. He is generally fit for ordinary work in eight or ten days.

The horses I have operated on standing have all been Clydesdales, except two or three half-bred colts, and I have had several inquiries as to whether this method is reliable for thoroughbred and hunting horses. Not having any experience of it with these animals, I cannot speak with the same confidence, knowing that many a thoroughbred will kick as smartly and even more viciously with a fore-foot up than the average cart-horse will do with the freedom of all his legs. On the other hand, thoroughbreds, as a rule, stand pain better—such as the firing-iron—than coarser bred horses. I have fired these without any restraint except a twitch without their moving a muscle. Certainly there would be more risk with light bred horses, but that need not prevent us trying it.

After writing the paper referred to and before leaving Aberdeen I castrated 15 horses. Of these 3 were one-year-olds, 5 were three-year-olds, 6 were four-year-olds, and 1 was six years old. Excepting the one-year-olds and one of the three-year-olds, they had all been used for breeding purposes during the season. Five had travelled all the season; the others had only been used more or less in their own neighbourhoods.

Of the one-year-olds, 1 was cast with the ropes and castrated by torsion, and the other 2 by the *ecraseur* standing. Of the three-year-olds, 2 were cast with castrating hobbles and castrated by torsion, and 2 by the *ecraseur* standing; the fifth I will refer to after. Of the four-year-olds, 1 was cast and castrated by torsion, and 5 by the *ecraseur* standing; and the six-year-old also by the *ecraseur* standing. Of these horses 3 deserve some further notice.

A three-year-old cast and castrated by torsion on the 10th August. When operating it was observed that the left testicle was larger than the other, that, instead of the usual white appearance of the tunica albuginea, it showed towards its anterior extremity a yellowish-inclining to a brownish-amber colour, and that the cord was also thickened—nearly as thick as a man's wrist, and dark in colour, but soft and œdematous. Consequently, as much of the cord was removed as possible. I called back to him the same evening, and found a large vascular mass, bigger than a fist hanging down several inches from the left wound. On

examination it was found to be mostly composed of blood entangled in the meshes of the loose areolar tissue between the scrotum and tunica vaginalis, and a good squeeze in the hand reduced it to about one third of the size. Still, there it dangled, although the horse drew it partly up when it was handled. I put the chain of the ecraseur round it as high as possible and removed it. It consisted of less than two inches of the strong fibrous tissue with its endothelial lining, the rest being loose connective tissue and blood. I did not see him again until the 13th, when I found him getting on all right, and he made a good recovery.

The other two, castrated by the ecraseur standing (a three-year-old on the 22nd August, and the six-year-old on the 6th September), bled considerably, so much so that the owner of the three-year-old became frightened, and I was called back to him. Nothing was done to either of them except to apply cold-water cloths over the scrotum and cover their bodies with good rugs. They both made good recoveries,—the three-year-old about as good as any of the lot.

The fifth three-year-old—a big high-standing brute—was a unilateral cryptorchid, the left testicle being retained within the abdomen, and he had been used carting for some time in the neighbourhood of the city. I have still sufficient confidence in my method to continue operating by it, and will describe the operation.

The horse got very little food the previous day, and only a few mouthfuls of water on the morning of the operation—the 23rd August. Before he was taken out of the stable his rectum was emptied by enemas of warm water. He was cast in a grass field in the manner described by Mr Donald of Wigton, except that as usual both ends of the rope were kept the same length. I think it a disadvantage to have one rope longer than the other. One man, at least, is required on each side to steady the horse straight on his back, and he will steady him all the better that he has the end of a rope to hold by. The ropes were put on to the horse, and he was cast in the usual way, going down on his right side. The upper or near side rope was then gradually slackened until the hind fetlock was not much farther forward than the flank, and a single hitch put round the near hind pastern in such a manner that the rope, after passing round the pastern from within backwards and outwards, passed up the inside of the first length of rope coming back from the collar, over above it, and down the outside towards the flank. It was then drawn tight under the croup, care being taken that from the flank the rope passed in front of the anterior spine of the ilium, and was given to an assistant to hold. He was then put on his back, the rope on the right side slackened, hitched on the right hind pastern, and put in a similar position to the first one. It was then pulled tight under the croup, up behind and inside the left thigh, and given a double or clove hitch round the left hind pastern; the ends of the rope forming the hitch were kept on the inside, and the free end was given to an assistant to hold. The other rope was fixed in a corresponding way and also given to an assistant to hold, one on each side. The forefeet were each fastened by a soft strong cord 6 or 7 feet long; this was doubled in the middle, a loop formed on the doubled end, slipped over the pastern, the foot pulled firmly down to the elbow, and the free ends brought one on each side of the arm, and tied tightly in a bow on the front of it.

The horse was kept straight on his back. An assistant washed out the prepuce and penis. After soaking the instruments, washing my hands in a solution of creolin, and moistening the horse's scrotum, prepuce, and inside of his thighs with a half per cent. solution of mercuric chloride, I took a firm hold of the front of the prepuce to keep it tight, and made an incision into the scrotum about six inches long and fully an inch to the right (the horse being on his back) of the median raphe, through into the loose cellular tissue with an ordinary scalpel, guarding it with the finger to regulate the depth. Then with a large blunt seton needle (not probe pointed) I separated the soft tissues down to the internal inguinal ring. Having cleared the ring, I sent the needle through its upper and outer part with a smart push or jerk (the back or convex side of the needle being towards the thigh), introduced two fingers, and in a few seconds got hold of the vas deferens, drew it into the ring, caught it with a dressing forceps, and, hold over hold, pulled the testicle through the opening, put the chain of the ecraseur round it, screwed it up slowly, and removed it.

The other testicle I removed by torsion, inserted two deep silk sutures in the external wound of the abnormal side, wiped off all blood, moistened the scrotum again with the mercuric chloride solution, wiped it lightly off with a clean towel, liberated him, and let him up. No instrument was introduced into the wound, nor were the fingers reintroduced without being dipped in the mercuric chloride solution. The testicle weighed over four ounces.

I did not see him again until the 27th (fourth day). Pulse 54, temperature 101.4° , feeding well and lively; some swelling about the prepuce, but quite loose; cut both stitches. He was a little stiff and lame on the near hind leg on coming out, but after a few minutes' exercise he trotted sound. 31st (eighth day). Pulse 44, temperature 100.8° , swelling and stiffness almost gone, and improving rapidly. Three days later (the eleventh day) I saw him turning the corner of a street with a load of potatoes, but did not get within a dozen yards of him.

The wish was several times expressed at the Glasgow meeting that a demonstration of the method of operating in the standing position had been given. This could easily be done at any convenient time, were it desired, and the material provided, anywhere on this side of the Channel.

SOME JOINT DISEASES OF THE HORSE.

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(Continued from page 230.)

NON-SUPPURATIVE DISEASES OF JOINTS.

I have previously said that it is impossible to draw a hard and fast line between the causes leading to a suppurative and non-suppurative joint disease, and I must here at the risk of repetition reiterate the statement; a horse, for example, receives a kick over the ulna which fractures the bone, and this may or may not suppurate; for the purpose of this paper I will regard it as a non-suppurative form of injury.