3. The facility granted to the house-surgeon for restraining, and to the patient for escaping, secondary hæmorrhage.
4. Freedom from pain, exclusion of air, and adaptability for perfect drainage.
5. The symmetrical appearance and utility of the stump.

ABSTRACT OF LECTURES

ON THE

ANATOMY, PHYSIOLOGY, AND ZOOLOGY OF THE EDENTATA.

Delivered at the Royal College of Surgeons of England.

By W. H. FLOWER, LL.D., F.R.S.,
Hunterian Professor of Comparative Anatomy.

LECTURE V.—FAMILY MYRMECOPHAGIDÆ.

THE animals constituting this family are externally clothed with hair. They have no teeth. The mouth is tubular, with a small terminal aperture, through which the long vermiform tongue, covered with the viscid secretion of the enormous submaxillary glands, is rapidly protruded in feeding, and withdrawn again with the adhering particles of aliment, which are then sucked into the pharynx. In the manus, the third toe is greatly developed, and has a long falcate claw; the others are reduced or suppressed. The pes has four or five subequal digits with claws. The posterior dorsal and lumbar vertebræ have additional interlocking zygapophyses. The tail is long, and sometimes prehensile. The placenta is subsigmoidal or dome-like, and apparently deciduate as in the sloths; and the penis is rudimentary. The mammae are two, pectoral.

The animals of this family are the Anteaters *par excellence*. They feed exclusively on animal substances, mostly insects. One species is terrestrial, others arboreal. None burrow in the ground. They are all inhabitants of the forest regions of South and Central America. There are only three species of the family known with certainty, which differ so much from each other in structure and habits, that each is placed in a separate genus.

Genus *Myrmecophaga* (*M. jubata*, the Great Anteater or Ant Bear).—The skull is greatly elongated and narrow, its upper surface smooth and cylindriciform. Anteriorly, the face is produced into a long tubular rostrum, rounded above and flattened below, with terminal nares, and composed of the mesethmoid ossified for more than half its length, the vomer, the maxillæ, and the long and narrow nasal bones; the premaxillæ being extremely short, and confined to the margin of the anterior nares. The zygomatic arch is incomplete, the styliform malar only articulating with the maxilla in front, and not reaching to the very short zygomatic process of the squamosal. The lacrymal foramen is in front of the margin of the orbit, as in the sloths. There are no post-orbital processes to the frontals, or any other demarcation between the orbits and the temporal fossæ. All the parts to which the muscles of mastication are attached are most feebly developed. The palate is extremely elongated, and produced backwards as far as the level of the external auditory meatus by the meeting in the middle line of the largely developed pterygoids. The glenoid fossa is a shallow facet, with its longitudinal diameter from before backwards. The mandible is very long and slender, with an exceedingly short symphysis, no distinct coronoid process, and a slightly elevated, elongated, flattened condylar articular surface. The vertebræ are seven cervical, fifteen or sixteen dorsal, two or three lumbar, six sacral, and thirty-one caudal. It was till lately always stated that the clavicles were absent, but they have been found in a rudimentary state in two examples lately dissected by Mr. Forbes at the Zoological Gardens. The scapula has the suprascapular notch converted into a foramen, as in the sloths; but the acromion is not united to the end of the coracoid. The humerus has a large supracondylar foramen. The radius and ulna are distinct. The hand is of remarkable formation: its first digit is very slender, the second also slender, with compressed phalanges of nearly equal length; the third digit is immensely developed. Though its proximal phalanx is extremely short, its ungual phalanx is so long, that the entire length of the third digit exceeds that of the second. The fourth has a long and rather slender metacarpal bone, and three phalanges diminishing in size, the ungual phalanx being very small. The fifth has the metacarpal nearly as long, but not so stout as the fourth, and is followed by two small phalanges, the last of which is rudimentary and conical. Claws are developed upon all but the fifth. In walking, the toes are kept strongly flexed, and have their joints turned

upwards and inwards, the weight being supported upon a callous pad over the end of the fifth digit, and by the dorsal surfaces of the third and fourth digits. The hind feet are short and rather broad, with five subequal claws, the fourth rather longest, and the first shortest; the whole sole is placed on the ground in walking. The tail is about as long as the body, and covered with very long hair, disposed chiefly in a ridge above and a larger one below, making the whole organ something like a large feather. It is not prehensile, and in sleeping is turned over the body, which it covers as with a warm blanket. The ears are small, oval, and erect. The eyes are very small. The cavity of the mouth is remarkably long, not only occupying the under surface of the skull, but extending for nearly the greater part of the neck, the hyoid bone and larynx being placed at a distance of nearly six inches behind the cranium. This is to give room for the very long, cylindrical, tapering, vermiform tongue, which ends posteriorly in a pair of retractor muscles, attached to the inner surface of the sternum. Its surface is covered with very minute, backward-directed horny papillæ, and there are two small circumvalate papillæ on the dorsal surface near the base. The parotid gland is rather small in proportion to the size of the animal, placed in the usual situation, and of flattened triangular form. The duct, which is eleven inches in length, terminates near the anterior angle of the mouth. The submaxillary glands, on the other hand, are enormously developed, and unite below in the middle line for a considerable distance. Posteriorly, they lie over the front part of the sternum, and are notched on each side for the prominence of the shoulders. The length of each gland from before backwards is sixteen inches. There are three ducts on each side, commencing in distinct portions of the gland, and running forwards to very near the anterior part of the floor of the mouth, where they pour out their viscid secretion in such a way that the tongue must be lubricated by it as it passes out. Ants adhering to it as it is withdrawn into the mouth are swept off by two projecting ridges from the upper edge of the rami of the lower jaw, and then swallowed. The want of teeth is compensated for by the structure of the stomach, which consists of a subglobular sac of moderate capacity, lined by soft vascular secreting membrane, into which the œsophagus enters, and of a smaller pyloric portion, with a dense epithelial lining and thick muscular walls, not unlike the gizzard of a bird. The intestinal canal is slung on a simple continuous mesentery (as in reptiles), without the usual mammalian constriction at the duodenum. The colon is short, and there is no ileo-colic valve; and the cæcum is represented by an ill-defined dilatation of the commencement of the colon. A conspicuous ridge of mucous membrane runs along the greater length of the small intestine, projecting into the cavity, opposite to the mesenteric attachment. There is a gall-bladder. The great arteries of the limbs and of the tail are surrounded with *relia mirabilia*, as in the sloths. The external orifice of the genital, urinary, and intestinal organs is not quite a cloaca, as in the sloths, as the anterior and posterior outlets are separated by a slight perinæum of true skin. The penis is quite rudimentary, consisting of a pair of small corpora cavernosa, no larger than the clitoris of most mammals of corresponding size. The testes are abdominal, and there are distinct vesiculæ seminales and Cowper's glands. The uterus is simple, and pyriform; but the vagina has, at all events in the virgin state, a median septum. The gravid uterus and foetal membranes have not yet been examined.

THE TREATMENT OF CHRONIC RINGWORM OF THE SCALP: A NEW METHOD OF EPILATING THE DISEASED HAIRS.*

By MALCOLM MORRIS, F.R.C.S. Ed.,
Joint-Lecturer on Skin-Diseases at St. Mary's Hospital Medical School.

THAT chronic ringworm of the scalp is a difficult disease to cure, every practitioner will admit. There are two propositions, as regards treatment, which I desire to bring under the notice of the profession. But, first, I must briefly refer to the factor in the problem we are called upon to consider—a fungus growing on and in the hairs, extending deeply into the follicles as far as the roots.

In a paper published in the early part of last year, I pointed out that two things were essential in the treatment of this disease: first, some drug which is capable of destroying the fungus, and so preventing its further development; and, secondly, some vehicle to carry this drug to the part of the follicle where the fungus exists and grows. Arguing, from analogy, that certain chemical substances, called antiseptics, had the power of destroying certain low forms of vegetable life, such as bacilli, micrococci, and bacteria, I suggested

* Read at a meeting of the East and West Surrey Districts of the South-Eastern Branch.

that thymol or menthol should be used as the parasiticide, and that chloroform would answer the purpose as the absorbent. But, as the latter was volatile, I added oil to the compound to prevent evaporation. While trying this liniment, of thymol, chloroform, and oil, in a large number of cases, I was struck with the fact that in some of them, in spite of the constant application of the remedy, the disease appeared on other parts of the body, and also on other parts of the head previously free. It seemed difficult to understand that, in a strictly antiseptic medium, spores could be carried from part to part and live; but such seemed to be the case, for in some instances, when the liniment had been used too freely, and had run down the neck, fresh spots of the disease showed themselves in that region. During the time I was considering this difficulty, I found that Koch, in Berlin, had been making experiments on bacillus spores with various antiseptics, and found that these spores lived and developed even after being placed in carbolic oil (one part in twenty) for one hundred and ten days. This, I think, is a very strong argument that neither oil nor fat of any kind should be used when the full action of an antiseptic is required.

Of course I am fully aware that all the best authorities recommend strong ointments, mercurial or otherwise, though for a very different reason from that I have been describing. They care little or nothing about the antiseptic action, so long as inflammation of the follicle, more or less severe, be produced. The spores are said not to live in inflammatory products (Thin). But surely cases are not uncommon in which the disease is transplanted to healthy parts by means of the discharge. I have seen a case in which croton-oil was used to a single patch, and in a short time the head was covered with small centres of infection. In this case, the spores were carried in the discharge.

And, again, have not all the old chronic cases we see in practice—some of them of four or five years' duration—been cases treated by constant attacks of inflammation, and yet with the result that spores have been found with ease? My view is that to produce inflammation of a slight kind is useless; and that a severe kind is unjustifiable, on account of the risk of destroying the follicles altogether, and producing baldness.

To return to the question of fats: if fat of any kind from without protects the spores, as Koch asserts, the natural fat or sebaceous matter must have a similar effect. For this reason, I have tried to remove the fat by means of ether, and have abstained from using ointments or oil in the treatment. I wash, or more strictly dab, the patch each morning with ether, rectified spirits of wine, and thymol, in the following proportions: ether, five drachms; rectified spirits of wine, two drachms and a half; and thymol, half a drachm—applying during the day glycerine with a very small trace of perchloride of mercury. Petroleum may be used in the place of the ether and spirit. One drachm and a half of petroleum-oil takes up five grains of thymol. The ether or petroleum is of greater value than would at first sight appear, and for the following reason. There is a disease of the scalp known as *seborrhoea sicca*, the chief characteristic of which is the falling out of the hair. This is caused by the absence of the natural fat in the sebaceous matter. It is cured by stimulating the glands to action, and by adding fat artificially. In the ringworm patch, we want the diseased hairs to fall out; and, by producing a condition similar to *seborrhoea sicca*—that is, by making the part very dry—we can actually produce this effect. Instead, therefore, of epilating by means of forceps—which is useless, as the hair breaks at the neck of the follicle, leaving the diseased part behind—we can epilate by dissolving the fat, and thus loosening the hair. In this way, we can in a few days remove all the broken and diseased hairs.

LEFT INGUINAL COLOTOMY IN RECTAL STRICTURE.

By H. A. REEVES, F.R.C.S. Ed.,
Assistant-Surgeon to the London Hospital.

THIS preliminary note is published with the view of drawing professional attention to a method of treating rectal stricture which appears, as far as present experience goes, to offer certain advantages. I have already operated on three cases, the last two of which were done non-antiseptically, and all of them have resulted very well. Up to date, I have had occasion to perform forty-six colotomies for rectal or colon obstruction. Most of these have been left lumbar, and the large majority have been in women. Only once have I done the right lumbar operation, and in this case the stricture was high up in the colon. Until lately, my inguinal colotomies were performed on infants for one or other of the forms of improperly developed rectum, and, like the recent ones, were in the left inguinal region. I may add that many other cases suitable for colotomy have come under my care; but, either through the patients declining operation when the object

and result were explained to them, or through their getting tired of waiting for a bed, I lost sight of many of them.

The inguinal operation avoids the risk of unintentionally opening the peritoneal cavity, which has often fatally occurred in the lumbar operation. In fact, the operator deliberately prefers to go through two layers of that membrane, the parietal and that covering the bowel; and the probability of the occurrence of prolapse is, I think, much diminished; but the days are yet early to speak definitely on this point. If the operation be undertaken for innocent stricture, this method of operating offers the advantage that a bougie may be carefully passed through the stricture from above, when it may be impossible or dangerous and difficult to do so from below.

As regards æsthetic considerations, I find that, when the objects and the resulting conditions of the inguinal and lumbar methods are put clearly to the patients, they are usually indifferent, leaving the matter to me; so that it would seem that even married women think more of present relief to pain than of future consequences. I think that the situation of the opening matters little from a sexual point of view, because it is protected by a suitable apparatus, which is not more unsightly than a truss; and because, wherever the incision be, the odour is much the same. This annoyance may be to a great extent kept under by suitably scented compresses.

I make the incision a little higher than that advised in the books—*i. e.*, rather more than an inch above Poupart's ligament, and extending from just external to the internal inguinal ring to a little external to the anterior superior spine of the crest of the ilium. I found that, by doing this, the intestine (sigmoid flexure) was more easily reached at the lower part of its course, and that its tendency to drag away from the stitches to the abdominal wall after operation was diminished. An appendix epiploic will usually be seen; and, if this be steadily drawn out, the bowel will follow.

In my first case, I did not open the bowel at the time of operation, but stitched it to the parietal peritoneum, and not to the skin. The wound was kept open by oiled lint; and, as the patient was a very stout multiparous woman, and had a fat pendulous abdominal wall, this was not a very easy matter. On the third day, it was difficult to recognise the bowel, which was coated over with a thick layer of lymph, and deeply placed at the bottom of the wound. The patient, who was suffering from malignant disease of the rectum, was much relieved by the operation.

In the second case, to avoid difficulty in finding the bowel, I stitched it to the parietal peritoneum and to the skin; but on the fourth or fifth day I found that the stitches had ulcerated through the intestinal coats, and that the bowel was covered with lymph, and deeply placed at the bottom of the wound. At one spot, it seemed as if the serous coats of the abdominal wall and bowel had not united; but the case has done beautifully. This patient is only twenty-five, and has malignant disease of the rectum.

The third patient was a woman aged 50, with extensive disease of the rectum involving the vagina; and in her case I stitched the bowel to the abdominal wall, and opened it at once. She has progressed most favourably.

It is important that the opening in the parietal peritoneum should be sufficiently free, so that, when the bowel is pulled through it, there should be no strangulation on account of its passing along a too small opening. Although the abdominal incision was a little higher up than usual, small intestine did not present, and was not even seen, in any of these cases. I mention this, not so much on account of a possible difficulty in distinguishing a thickened piece of small intestine, but because of the inconvenience which would arise if it bulged at the small opening; as to return it and keep it in place while the operation is being completed is not always an easy matter. All bleeding must be stopped before the peritoneum is opened. I give morphia after, and also a night or two before, the operation, to lessen peristaltic action, and to make the fæces solid, so that no fluid matter may escape along the track of the sutures and set up peritonitis. Should some solid faecal matter be taken up by the needle as it transfixes the bowel (and this may generally be avoided by making sure that the fold of intestine between the fingers does not contain any solid motion), its point will be cleansed by the mucous and muscular coats of the opposite wall before it penetrates the serous coat; but the operator should look to this, and, if necessary, cleanse the needle's point before passing it through the parietal serous membrane. It is advisable to let the patient lie half over on the abdomen, either on the left or the right side, to prevent the dragging on the stitches which occurs in the dorsal position. This tendency to fall back is partly due to the weight of the bowel, and partly to a rather short sigmoid meso-colon. I may here state that the bowel may be reached on its posterior surface, and without opening the peritoneal cavity, by proceeding very nearly as if for tying the external