



December 9, 1862.

E. W. H. Holdsworth, F.L.S., Esq., in the Chair.

Dr. Cobbold exhibited a series of microscopic preparations of rare Entozoa, which he had just received from Prof. Leuckart, of Giessen. Among the more remarkable were *Distoma heterophyes* and *D. hæmatobium* (from Egypt), an adult *Trichina spiralis*, *Tænia nana* (Egypt), *T. cænurus*, *T. echinococcus*, and the new *Bothryocephalus cordatus* of Leuckart, from Greenland.

The following papers were read :—

1. NOTES ON THE ANATOMY OF PITHECIA MONACHUS (GEOFF.).
BY W. H. FLOWER, CONSERVATOR OF THE MUSEUM OF
THE ROYAL COLLEGE OF SURGEONS.

(Plate XXXVII.)

I confess to some hesitation in giving the above specific name to the subject of the present communication, as the original description of the species (Tableau des Quadrumanes, 'Annales du Muséum,' tom. xix. 1812) is too brief for satisfactory identification, and I have had no opportunity of examining the type specimen in the Paris Museum. It is exceedingly like the *Pithecia irrorata* of Dr. J. E. Gray, described and figured in the 'Zoology of the Voyage of the Sulphur' (1842), part 1, p. 14, of which the type is in the British Museum, and which differs from the previously described *P. hirsuta* of Spix (Simiarum et Vespertilionum Brasiliensium Species novæ, 1823, p. 14, and plate 9) in wanting the short, bristle-like, whitish hairs on the cheeks; but as the present specimen agrees in this respect with Spix's species rather than Gray's, I have little doubt that it ought to be referred to the former, if they are distinct.

In the 'Catalogue Méthodique de la Collection des Mammifères du Muséum d'Histoire Naturelle de Paris,' 1851, by M. Isidore Geoffroy Saint-Hilaire, there is but one species with which, as far as can be ascertained by the short specific characters there given, it agrees; and this is the *P. monachus* of the elder Geoffroy; and as the learned author of the catalogue has satisfied himself as to the identity of this species with *P. hirsuta* of Spix, it becomes necessary to discard the latter name, and retain the one which has the priority of date.

The dimensions of my specimen are rather inferior to those assigned by Spix to *P. hirsuta*, and to those of the examples of *P. irrorata* in the British Museum; but it must be considered that it is a scarcely adult female, and at the time of death was in extremely poor condition, which last circumstance may also account for the hair, especially on the tail, being less crisp and curled than in the above specimens. It also seems to differ from them somewhat in the relatively greater length of the tail*.

* Since writing the above, the skin was taken to Paris by my friend Dr. Murchison, and, with the valuable assistance of M. Pucheran, compared and pronounced to be identical with the specimens of *P. monachus* (including the original one described by Geoffroy) in the Muséum d'Histoire Naturelle.

As I am not aware of any anatomical observations upon this genus, it appears desirable to put on record some notes made at the dissection of this specimen. It was not to be expected that any striking character would be found in which it would differ from animals of allied genera; the principal point of interest, in fact, was the brain, a description of the form and convolutions of which has hitherto been a desideratum, being one of the few omitted in M. Gratiolet's great work on the Cerebral Folds of the Primates.

The animal died in the Gardens of the Zoological Society, on the 24th of October, 1862, after having lived there about a fortnight, during which time Mr. Wolf was able to make the characteristic sketch which accompanies this communication (Pl. XXXVII.).

It was a female, nearly adult. All the permanent teeth were in place in the lower jaw; but the posterior upper molars had not cut the gum on either side. The state of emaciation to which it was reduced could scarcely be exceeded. In this condition the weight was 19 ounces avoirdupois. The dimensions were as follows:—

	inches.
Length from the vertex of the head to the root of the tail .	11
Length of tail (including $1\frac{1}{2}$ inch of hair only)	18
— head, from tip of nose to occiput	2·9
Greatest breadth of head	$1\frac{3}{4}$
Length of upper arm	$3\frac{1}{2}$
— forearm	$3\frac{1}{2}$
— hand	$2\frac{1}{2}$
— thigh	$4\frac{1}{4}$
— leg	$4\frac{1}{2}$
— foot	4

The large hood of long loose hair upon the upper part of the head, neck, and shoulders, from under which the comparatively bare face emerges, gives a very peculiar appearance to the general physiognomy. The face is long and narrow; the nose large and full, its breadth ·6 inch; the nostrils wide apart, quite lateral in situation; the chin rapidly retreating. The eyes of moderate size, their axes directed straight forwards; the width of aperture ·45 inch; the diameter of the iris ·3 inch; colour of the iris hazel-brown. The skin of the face is of a dark purplish brown, almost black upon the nose, and paler around the eyes; it is sparingly covered with short coarse hairs of a whitish colour. Rather more than half an inch of the forehead is clothed with these short hairs, directed upwards in the middle, and outwards on the sides. Above this comes the hair of the hood, directed forwards. On each cheek is a well-marked patch of yellowish white hair, directed downwards and forwards, terminating in front by a distinct line extending from the inner canthus of the eye to below the angle of the mouth. In front of this line the dark colour of the skin predominates over the white of the short scattered hairs, except along the margin of the upper lip, where these are longer and more abundant. The ears are large, and roundish in form, quite naked, and of the same colour as the skin of the face; a considerable patch of skin behind them is free from hair.

The hair on the body is rather harsh in texture, long, loose, and sparing in quantity, so that when separated the skin is readily seen. It is particularly long on the shoulders, and stands out from the body, giving great apparent fulness to all this part. On the back of the neck and top of the head it is directed forwards, forming the before-mentioned hood.

An individual hair from the shoulder measures 3 inches in length. The first inch from the root is very fine, and of a brownish-black colour; then it becomes thicker, and of a deeper black; and in the last half-inch it tapers to a point, and is of a dirty yellowish white. Hair of this character covers the upper part and back of the head, the neck, shoulders, back, arms, thighs, and tail, the terminal portion on the posterior part of the body being pale yellowish brown. On the forearm it is shorter, black tipped with white. On the legs the black predominates. The dorsal surface of the hands and feet, including the toes, is covered with short, perfectly white hair, through which the black skin of these parts is scarcely seen. The throat, breast, belly, and inside of the thighs are very sparingly covered with fine, pale yellowish brown hair. The tail is entirely covered, to an equal extent all round, with long, coarse, curved, black hair, tipped with pale brown. The hair is longest and the tail appears thickest near the body, and gradually tapers towards the end. I may here observe that the curling condition of the hair so conspicuous in the specimens in the British Museum, and in the figures referred to above, is almost absent in this individual—a circumstance, as before said, probably due to the bad health of the animal for some time previous to its death; and hence the tapering instead of the bushy end to the tail.

The hands are rather small. The thumb is short, and appears naturally to lie in the direction of the other fingers. Its extremity is level with the distal end of the first phalanx of the second digit. The second and fifth digits are of equal length, extending as far as the distal end of the second phalanx of the third and fourth, which are also of equal length. The nails are black, subcompressed, and pointed, that of the thumb slightly more flattened, and broader at the base, than the others.

The sole of the foot is long and narrow; the hallux well developed, widely separated from the other toes, with a flat, subtriangular, pointed nail. In relative length the other toes stand in the following order—second, fifth, third, and fourth; but the difference between them is not very great. Their nails are long, curved, compressed, and pointed.

The orifice of the vulva is a narrow longitudinal cleft situated on the lower part of the symphysis pubis. Immediately in front of it is a subcylindrical and slightly tapering tongue-like clitoris, a quarter of an inch long, and of a pink colour. On its under surface is a groove continuous with the orifice of the vulva. The perinæum is about $\frac{1}{3}$ inch in length.

The brain weighed, immediately after removal, 460 grains, or $\frac{1}{18}$ th part of the entire (very emaciated) body. The general form as seen from above is a regular oval, nearly as broad before as behind (fig. 1).

The whole of the cerebellum and the olfactory lobes are covered by the cerebrum. The length of the cerebral hemispheres is 1·8 inch; their greatest breadth 1·5 inch; their height 1·2 inch. The upper surface is arched, the parietal region being well developed. The occipital lobes are full and broad, but not much elongated posteriorly, so that they scarcely do more than cover the cerebellum in this direction. The frontal lobe is depressed, and deeply excavated below; the temporal lobe well developed. In general form the cerebrum resembles that of some of the *Cebi*; it is less pointed in front than the brains of most of the Old World Apes, and less elongated and depressed than in *Nyctipithecus*, *Callithrix*, and *Hapale*. The olfactory lobes are smaller than in most of the allied forms. There is nothing calling for particular notice in the base of the brain (fig. 2), except that the

Fig. 1.

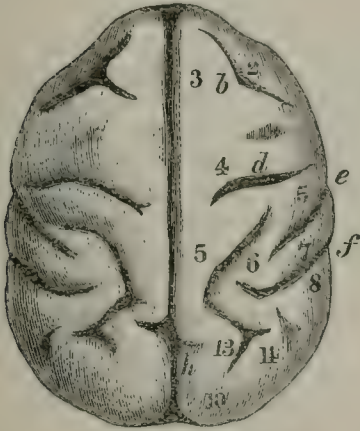
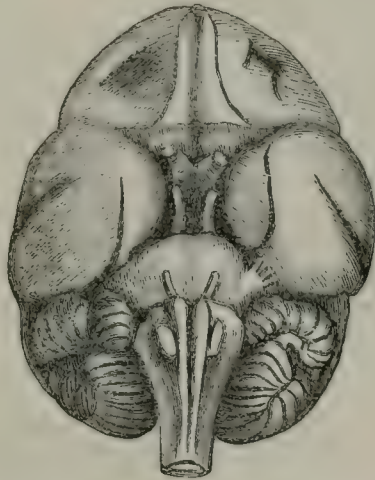


Fig. 2.



corpora albicantia are not confluent, and the olivary bodies form distinct projections on the medulla oblongata ·2 inch long. The cerebellum is large, the flocculi being particularly well developed.

Fig. 3.



The corpus callosum is ·7 inch long; the portion of the cerebrum anterior to it ·4; that posterior to it ·7 inch.

The outer face of the cerebral hemisphere (fig. 3) is marked by a

few, but deeply cut, and characteristic sulci*. 1. The *fissure of Sylvius* (*e*) slopes upwards and backwards to about two-thirds of the distance between its commencement and the margin of the great longitudinal fissure, and then ends abruptly without joining the antero-temporal. 2. On the frontal lobe is a deeply marked fissure (the *supero-frontal*, *b*) running transversely backwards and outwards, bent at an obtuse angle in the middle. 3. Separated by a wide interval (antero-parietal gyrus) from this is the simple, straight *postero-parietal* (fissure of Rolando, *d*). 4. Behind this is the sulcus bounding the upper border of the angular gyrus, having the form of a broad pointed arch. 5. The long and deeply marked *antero-temporal* sulcus (*f*) runs from the apex of the temporal lobe, upwards beyond the end of the fissure of Sylvius, curving slightly forwards at its termination near the point of the aforesaid arch. 6. Of the *temporo-occipital* (external perpendicular, *h*) the traces are but small; its commencement is seen above, in a notch on the border of the hemisphere, and again there is an indication of it at the posterior termination of the angular sulcus, but it does not interrupt the perfect superficial continuity from the parietal to the occipital lobe of both first and second external annectent gyri (13 and 14). In this respect *Pithecia* agrees with *Ateles* rather than *Cebus*. The absence of this fissure (so constant in the Old World Apes) in all the smaller American Monkeys, and its imperfect condition in others of the family, show that it is a less important characteristic of the Simian brain than is the antero-temporal or even the angular.

On the inner face of the hemisphere (fig. 4), the sulci present the

Fig. 4.



ordinary and typical character of the Primatial type of brain, in a simple form. The *calloso-marginal* sulcus (*i*) is very well marked, and inclines upwards almost to the margin of the hemisphere at its hinder end. It has several small secondary sulci connected with it. The *occipito-parietal* (internal perpendicular, *k*) runs down from the margin of the hemisphere, and then bends abruptly forwards. That most characteristic sulcus, the *calcarine* (*l*), the bottom of which corresponds with the hippocampus minor in the posterior cornu of the lateral ventricle, is deeply cut, runs directly backwards, and

* For the nomenclature of these parts of the brain, see a paper by Prof. Huxley, "On the Brain of *Ateles paniscus*," Proc. Zool. Soc., June 11, 1861.

divides posteriorly into two branches, of which the lower is the longer. The *collateral sulcus* (*n*), instead of passing downwards and forwards along the inner side of the temporal lobe, turns abruptly outwards, and appears on the outer face, in the rather sharp angle on the inferior border of the hemisphere at the junction of the occipital and temporal lobes.

The dental formula is, I. $\frac{2-2}{2-2}$, C. $\frac{1-1}{1-1}$, P. $\frac{3-3}{3-3}$, M. $\frac{3-3}{3-3}=36$.

The incisors of both upper and lower jaw project forward, so that their anterior edges form together an angle of 100° . The upper central incisors are of moderate size, and rounded at the edges. The upper lateral incisors are extremely small; there is a considerable diastema between them and the canines, which are strong and conical, and project downwards and somewhat outwards. The two rows of the upper molar series are perfectly straight and parallel. The premolars increase in size from the first to the third, the first being notably smaller than the others and unicuspidate. The first molar is rather larger than the second; their crowns are square, nearly flat, but grooved longitudinally in the middle, the raised edge on the outer and inner sides being slightly divided into two tubercles. The crown of the third molar is just beneath the gum. The four lower incisors are long and narrow, of nearly equal size, the outer ones slightly rounded at the corners; their outting edges form a continuous gently curved line. A very small interval exists between them and the sharply pointed conical canine, which is of very nearly the same size as the upper one. The first premolar is very small; the two succeeding ones increase in size. The first and second molars are nearly equal, and the third not very markedly inferior. As with the upper series, these teeth are very slightly tuberculated; they have the appearance of being considerably worn, but, as the animal was so young, this is scarcely probable. There is a carious spot on the posterior part of the third premolar on both sides.

The length of the tongue, from the base of the epiglottis to the tip, is 1.4 inch; its breadth .5 inch; its sides are parallel, the end square, with the corners slightly rounded. The sublingual organ is fleshy, except towards the end, which is sharp-pointed and cleft at the extreme tip; it is free to the extent of .25 inch, and its apex is .3 from the tip of the tongue.

The left lung has two lobes, quite separate from one another, each having a special division of the bronchus; the right lung is composed of four distinct lobes. The main arterial trunks are given off from the aorta as in man, the innominate dividing into right subclavian and right carotid, and the left carotid and left subclavian coming off separately.

The stomach is simple, its general form nearly globular, but the pyloric portion is lengthened and tubular. The cardiac and pyloric orifices are much approximated. The small intestine, from the pylorus to the ileo-cæcal valve, measures 50 inches; its diameter is nearly uniform throughout, about .4 inch. Peyer's agminated glands, the largest $1\frac{1}{4}$ inch long, are scattered at tolerably regular distances

all along the canal almost to the duodenum. There are no valvulæ conniventes, and nothing to distinguish the ileum from the jejunum. The length of the colon, from the ileo-cæcal valve to the anus, is 22 inches : it is rather smaller than the cæcum in calibre, rapidly diminishing for the first 3 inches, then acquiring a uniform diameter of about $\cdot 4$ inch, which is somewhat increased in the descending portion and rectum. The cæcum is large and long, of greater calibre than the colon, from which it is distinctly marked off by a constriction, passing obliquely round the intestine, and slightly diminishing in size as it approaches its terminal end, which is obtuse and rounded. It presents a tolerably uniform curve, almost a semicircle in the same plane. Its length is $4\frac{1}{2}$ inches ; its diameter, at 1 inch from the ileo-cæcal valve, 1 inch.

The liver weighed 190 grains. Its anterior margin is deeply cleft by three fissures, dividing it into four lobes. Of these, the first (from the left) and the third and fourth are of about equal size. The second is double the size of either of the others, and notched on its anterior margin by the fissure of the round ligament, while the gall-bladder lies on its under surface. The Spigelian lobe is distinct. The cystic duct is $\cdot 6$ inch long, and joins the hepatic duct at a very acute angle. The common bile-duct, rather more than an inch in length, enters the posterior part of the duodenum, with the pancreatic duct, half an inch from the pylorus. The spleen is simple, long and narrow, tapering at the lower, more obtuse and notched at the upper end, $2\frac{1}{2}$ inches long, and $\cdot 4$ inch wide at the middle.

The suprarenal bodies are very obtuse (slightly flattened) cones, their axis measuring $\frac{1}{4}$ inch, and the longest diameter of their base about the same. The weight of each is 3 grains. Their colour is dark purple, deeper than that of the kidney. The base of the right is closely approximated to the corresponding kidney. The left, which is more rounded in form, is less closely connected. The kidneys are of the same form as in the human subject. Their length is $\cdot 85$ inch. The right is placed slightly lower than the left. The left kidney weighed 24 grains ; the right about a grain less. The urinary bladder, when distended, is capacious, of an elongated pyriform shape, having a globular fundus and a cylindrical or rather fusiform neck. The uterus is very small, elongated, and cylindrical, not bifid ; $\cdot 75$ inch long, and $\cdot 2$ inch in diameter. The ovaries are $\cdot 3$ inch long, narrow, pointed at each end, and slightly flattened, of a pale pinkish colour.

The vertebral formula of this specimen is, cervical 7, dorsal 13, lumbar 6, sacral 3, caudal 26.

There is considerable variation in the number of the vertebrae in the different genera of American Monkeys ; and even among species of the same genus, and individuals reputed (though perhaps on insufficient grounds) to belong to the same species, the number is not constant. The specimens contained in the British Museum (Catalogue of the Bones of Mammalia, 1862) and in the Museum of the Royal College of Surgeons give the following results. Those marked with an asterisk belong to the last-named collection ; the numbers in the others are given on the authority of the above-named Catalogue.