

will be easily understood that, with such long delicate tails, great care is required in killing and setting them.

The specimens of *Antheraea dione*, *Cyrtogone herilla*, and *Jana strigina* emerged from a collection of pupæ (also from Sierra Leone) deposited in the Insect-house by the Hon. Walter Rothschild.

The specimens of *Attacus lebeaui* were all reared from cocoons received in October to November 1894. The gentleman from whom I obtained them had a pairing of these insects and succeeded in rearing some of the larvæ. Of these he sent me four, in their fifth stage, and he informs me that the larvæ in the first three stages are black with yellow tubercles, in the fourth stage they are green, with the same stripes in the folds of the segments as in the fifth stage, but not quite so well marked, and have besides rows of dorsal and lateral tubercles of a reddish colour. They ate oak, berberis, and privet; but after the first stage fed entirely upon privet. Of these larvæ, I herewith exhibit a sketch, made just before they spun their cocoons. These cocoons, I may add, are much larger than those imported.

On the 30th of May, 1894, two Goliath Beetles (*Goliathus druryi*) were presented to the Society by Capt. G. L. Mitchell. They fed principally upon bananas. During life they were a great attraction to visitors. One died on the 24th July and the other on the 21st August, and both specimens were sent to the British Museum.

Of Orthoptera, a very curious and rare locust, *Thliboscelus camellifolia*, was sent home by Mr. Leslie Jeyes, from Manáos on the Amazons, where it is called the "Tanana." It arrived in the Gardens on the 21st of August, but, I am sorry to say, lived only six days. It was very weak on arrival and would not feed, although we got roses (its favourite food) for it. Of this species there is only one specimen in the British Museum. In a wild state Mr. Jeyes says "it sings or chirps through its wings." During life it was of a beautiful pale green colour, and this together with its peculiar shape gave it the appearance of some kind of green fruit. The sender says they are very difficult to obtain dead or alive; it is therefore probable that they are, on account of their shape and colour, not easy to see.

1. On the Brain of *Gulo*. By FRANK E. BEDDARD, M.A.,
F.R.S., Prosector to the Society.

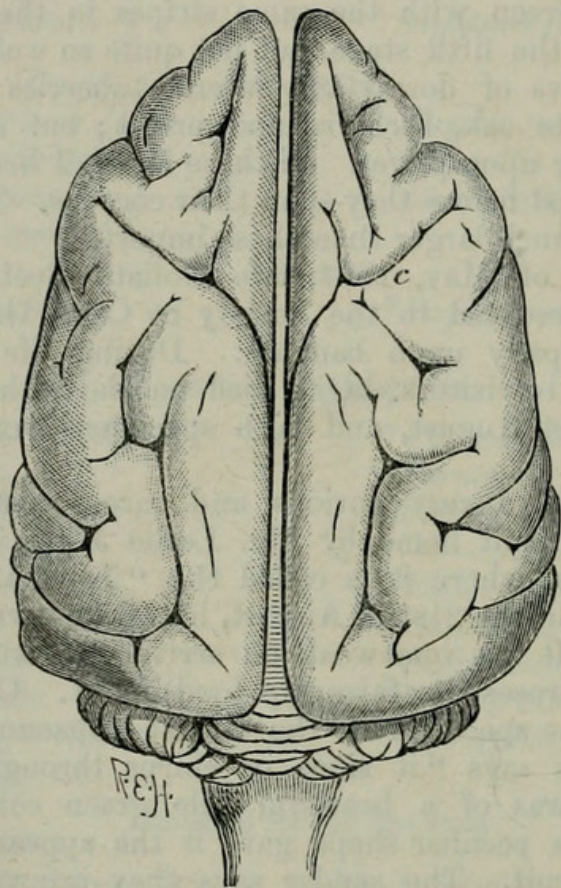
[Received January 21, 1895.]

One of the few important types of Carnivora the brain of which was not examined by Prof. Mivart¹ is the Glutton. As I have a well-preserved brain of this animal, it may be considered worth while to attempt to fill up this lacuna in our knowledge. We are not,

¹ "On the Cerebral Convolutions of the Carnivora," Journ. Linn. Soc. xix. p. 1.

however, absolutely ignorant of the characters of the convolutions of the cerebral hemispheres; for a cast of the inside of the skull has been described and figured by Gervais¹, whose paper is duly quoted by Mivart. It is, however, much more satisfactory to base a description upon the actual brain, which I now propose to do. I have compared the brain with actual specimens of the brains of *Nasua rufa*, *Meles taxus*, *Ictonyx zorilla*, *Galictis barbara*, and *Mustela foina*, which are among the Prosector's stores, besides, of course, with the descriptions and figures of Mivart and others.

Fig. 1.



Brain of *Gulo* (dorsal view).
c, crucial sulcus.

The outline of the brain of *Gulo* is, as will be seen from the accompanying drawing (fig. 1), remarkable. It is almost that of a square surmounted by a triangle, the line of division being the crucial sulcus. The cerebellum is largely hidden by the cerebral hemispheres, as is the case with some other Arctoidea, notably *Ictonyx*. *Mustela* stands at the opposite extremity, the cerebellum being in that animal but slightly overlapped.

The Sylvian fissure is long. As is generally the case with the

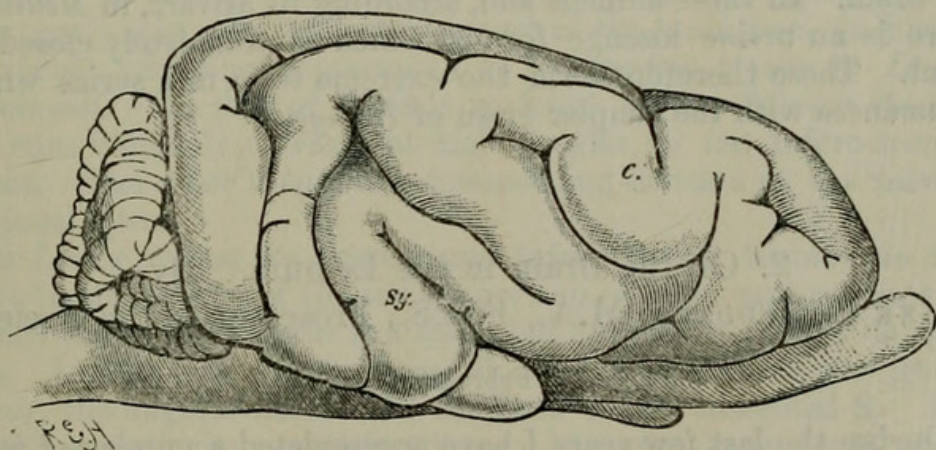
¹ "Mémoire sur les formes cérébrales propres aux Carnivores," *Nouv. Arch. Mus.* vi. p. 103.

Arctoidea, the anterior limb of the Sylvian gyrus is the longer. This is particularly marked above and leads toward the condition characteristic of *Meles* and *Nasua*, where the anterior limb of the Sylvian gyrus has the appearance of being tucked away in its upper part below the surface of the brain.

The parietal gyrus is connected by a bridging convolution with the sagittal gyrus. This is perfectly symmetrical on each side of the body and lies anteriorly on a level with the upper extremity of the Sylvian gyrus. At its extreme anterior end this gyrus becomes continuous with the Sylvian gyrus and, on one side, with the sagittal gyrus again.

The sagittal gyrus, as is the rule with the Arctoidea, is wide and complicated. That part of the gyrus which is at right angles with the rest, and reaches the margin of the pallium, is divided by a longitudinal furrow, of which there are only traces in *Galictis* and *Nasua* and no traces in *Meles*.

Fig. 2.

Brain of *Gulo* (side view).

Sy, Sylvian fissure; *c*, crucial sulcus.

I now come to the crucial sulcus (*c*), which is so important in the Carnivorous brain and especially in the Arctoid.

As in all Arctoidea, which are thus differentiated from the Ailuroidea, the crucial sulcus is situated comparatively far back. In *Gulo* the proportions of the lengths of the precrucial and postcrucial regions are 28 : 40. In *Meles* and *Taxus* they are more nearly equal, being 26 : 30. On the other hand, in *Galictis* they are 14 : 34. In *Gulo*, as in *Galictis*, the crucial sulci are nearly at right angles to the longitudinal axis of the brain. They do not reach the middle line, because in this region the hippocampal gyrus emerges from below on to the upper surface of the brain, and becomes continuous anteriorly with the sagittal gyrus. The margins of this eruptive portion of the hippocampal gyrus form with the crucial fissure a Y-shaped furrow on each side, the lines of the Y being widely divergent and forming with each other a very obtuse angle. The median portion thus enclosed has been

termed by Dr. Mivart the "Ursine Lozenge." Dr. Mivart has justly laid stress upon the prevalence of this definite area in the Arctoid brain. He defines the Arctoid brain by the presence of the "Ursine Lozenge." The "Ursine Lozenge" of *Gulo* is most like that of *Galictis* among the types which I have examined, thus confirming the justice of its placing by Dr. Mivart¹ and others. The brains of these two animals are intermediate in character between those of *Nasua*, *Ictonyx*, and *Mustela* on the one hand, and those of *Helictis*, *Meles*, and *Mellivora* on the other. In the former group the lozenge is absent owing to the absence of a precrucial sulcus. I found traces of it in *Nasua*, which genus, it will be remembered, approaches *Galictis* in the presence of a post-crucial bridging convolution between the hippocampal and sagittal gyri.

Both Prof. Garrod² and Dr. Mivart were, in my opinion, wrong in regarding the brain of *Helictis*, first described by the former, as "exceptional." In *Meles taxus* we meet with precisely the same appearance of the hippocampal gyrus upon the upper surface of the brain. In these animals and, according to Mivart, in *Mellivora* there is an ursine lozenge formed which is completely closed in front. These therefore form the extreme term in a series which commences with the simpler brain of *Ictonyx*.

2. On the Brain in the Lemurs. By FRANK E. BEDDARD, M.A., F.R.S., Prosector to the Society.

[Received February 11, 1895.]

During the last few years I have accumulated a number of well-preserved Lemurs' brains extracted from specimens that have died in the Society's Gardens. I have thought that it might be useful to publish an illustrated account of some of these in order to supplement the existing knowledge of the Lemurine brain. The brains that I have examined myself are the following:—

<i>Lemur mongoz</i> ,	<i>Galago crassicaudatus</i> ,
<i>Lemur brunneus</i> ,	<i>Galago monteiri</i> ,
<i>Lemur anjuanensis</i> ,	<i>Cheirogaleus coquereli</i> ,
<i>Lemur coronatus</i> ,	<i>Loris gracilis</i> ,
<i>Lemur albifrons</i> ,	<i>Nycticebus tardigradus</i> ,
<i>Lemur rufipes</i> ,	<i>Perodicticus potto</i> ,

besides *Hapalemur griseus*, of whose brain I have recently published a description³.

The literature referring to the Lemurine brain is not great.

¹ "On the Anatomy, Classification, and Distribution of the Arctoidea," P. Z. S. 1885, p. 340.

² "Notes on the Anatomy of *Helictis subaurantiaca*," P. Z. S. 1879, p. 305.

³ "Additional Notes upon *Hapalemur griseus*," P. Z. S. 1891, p. 456.



Beddard, Frank E. 1895. "1. On the Brain of Gulo." *Proceedings of the Zoological Society of London* 1895, 139–142.

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