On the bush-dog (Icticyon venaticus, Lund.) / by William Henry Flower.

ON

THE BUSH-DOG

(*ICTICYON VENATICUS*, Lund.).

BY

WILLIAM HENRY FLOWER, LL.D., F.R.S., P.Z.S.

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(Plate X.)

The death, on the 12th of December last, of the Bush-Dog from British Guiana, which was presented to the Society by Mr. Ernest Tinne on the 20th of August, 1879, has enabled me to place on record some notes on the anatomy of this somewhat aberrant member of the canine family, the viscera of which have not hitherto been examined.

The first notice we have of this animal is by Lund, who described it under the name of *Cynogale venatica*[1]. Afterwards a more full description with osteological details and figures of the animal and skull were given by the same author; and the generic name first imposed, having been already used by Gray for one of the Viverridæ, was changed to *Icticyon*[2]. An extinct species from the Brazilian caves, *Icticyon major*, was also doubtfully referred to the same genus.

In the 'Annals and Magazine of Natural History,' vol. xvii. p. 293 (1846), Dr. Gray, unaware of Lund's memoir, described a specimen

[1] P. W. Lund, "Blik paa Brasiliens Dyreverden för sidste Jordomvæltning. 4de Afhandling," Kong. Danske Videnskab. Selskabs, nat. og math. Afhandlinger, ix. Deel (Kjöbenhavn, 1842), p. 201.

[2] *Ibid.* 5te Afhandling, XI. Deel (1845), p. 62, Taf. xli. & xliii.

received at the British Museum from the Brazils under the name of *Cynalicus melanogaster*. It may here be noticed that the reference by the same author[1] of *Canis brachyotus*, of which the skull and teeth are figured by Blainville ('Ostéographie,' gen. *Canis*, pls. viii. & xii.) to this species, is incorrect; but Van der Hoeven has given a good figure of the same parts[2]. Very recently Cope has described (without figure) an extinct species from Oregon, which he refers to this group, under the name of *Icticyon crassivultus*[3].

In consequence of the dental formula, and some superficial resemblance in external form, this animal has often been placed by systematists among the Mustelidæ; but its true position as a dog has been recognized by all who have closely investigated its structure. The living specimen much recalled in appearance a young Fox, and had the manners of a playful puppy. It was a female, and at the time of death nearly adult. All the permanent teeth were in place; but the canines were not fully protruded, and the epiphyses were not united to the ends of the long bones.

The only decided character by which it has been separated generically from *Canis*, besides the shortness and broadness of the skull, is the reduction in development of the true molar teeth. In the upper jaw the posterior molar of *Canis* $\left(\frac{m.\,2}{}\right)$ is stated to be absent, and $\frac{m.\,1}{}$ is smaller and simpler than in the Dogs generally. In the lower jaw, whereas *Canis* has usually three true molars, *Icticyon* has but two; and the last which is developed is considerably smaller than its homologue in the ordinary forms. This appears to have been the case in all the specimens hitherto examined; but the present example presents an interesting variation, as, in addition to the teeth usually described as being present, it has a pair of very small tubercular molars above, the crowns of which are divided into an outer and an inner cusp. The dental formula, therefore, is $i.\frac{3}{3}$, $c.\frac{1}{1}$, $pm.\frac{4}{4}$, $m.\frac{2}{2}=\frac{10}{10}=40$, corresponding with that of *Canis primævus* of Bengal, constituting the genus *Cuon* of Hodgson, to which animal *Icticyon* comes nearer, in the general form of the skull, than to any other of the group. The presence of these small teeth may be an individual peculiarity; or it may be that they are normally developed in the young animal, and are early deciduous, so that in the older specimens previously examined they have escaped notice. In any case they show a most interesting transitional character, and point to the fact that, in the reduction of the molar teeth, *Icticyon* is modified from a more generalized canine type. Another slight peculiarity in the dentition is that the inner tubercle of the upper sectorial is placed rather further from the anterior edge of the tooth than in *Canis*.

[1] 'Catalogue of Carnivorous, Pachydermatous, and Edentate Mammalia in the British Museum,' by J. E. Gray, 1869, p. 183.

[2] J. Van der Hoeven, "Over het geschlacht *Icticyon*," Verhandelingen der Koninklijke Akademie van Wetenschappen,' Derde Deel (Amsterdam, 1856).

[3] E. Cope, "On the Genera of Felidæ and Canidæ," Proc. Acad. Nat. Sciences Philadelphia, July 8th, 1879.

The length of the animal, from the tip of the nose to the end of the tail, was 25½ inches, of which the head measured 5½ inches, the neck and trunk 15½, and the tail 4½ inches.

There are four pairs of mammæ, situated nearly equidistant on the ventral surface: the anterior pair over the ribs, nearly 2 inches behind the elbows; the second pair on the abdomen, slightly in front of the umbilicus; the third pair opposite the knee-joint; the last pair 2 inches in front of the vulva.

The relative length of the toes and form of the palmar and plantar pads can be best understood by a reference to the accompanying figures (figs. 1 and 2).

Fig. 1.

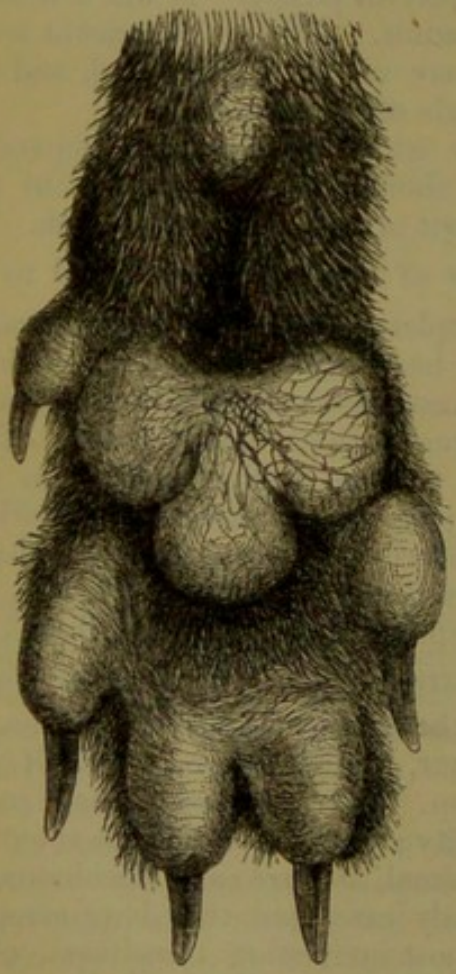


Fig. 2.

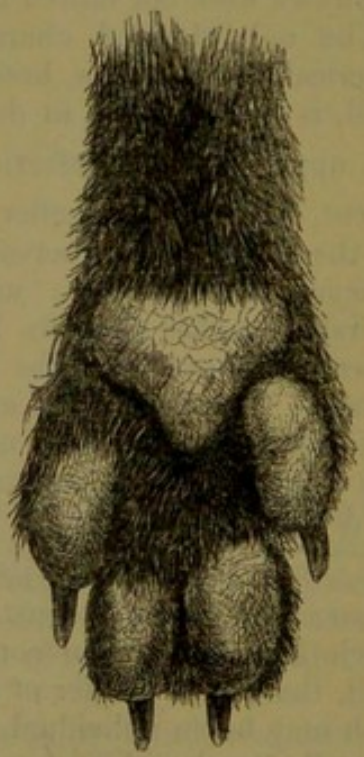


Fig. 1. Under surface of right fore foot of *Icticyon*; natural size.
Fig. 2. Under surface of right hind foot of *Icticyon*; natural size.

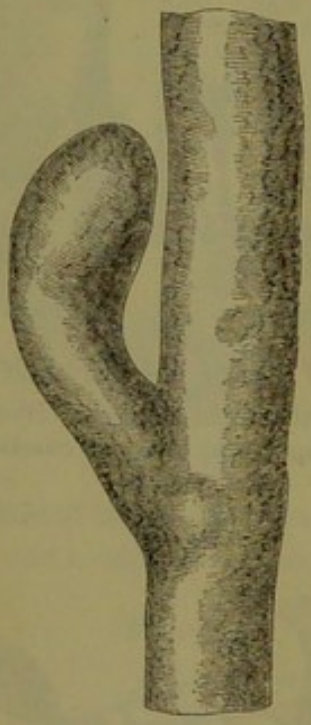
The tongue has a well-developed lytta and four small circumvallate papillæ on each side.

The stomach, as in the Dog, consists of a subglobular cardiac portion and a narrower pyloric portion, separated by a constriction. The small intestine measured 46 inches in length, and the large 10 inches. The only difference which the alimentary canal presents from the usual canine type is in the cæcum (fig. 3), which is very small,

only one inch and a half in length, slightly curved, and with a conical apex. This adds another to the list, given in the notice of the cæcum of the Red Wolf[1], of Canidæ with small simple cæca. The liver (figs. 4 and 5) only differs from that of a small Terrier Dog[2] in a slight variation in the relative size of the lobes, perhaps not greater than would be met with in comparing this organ in a series of individuals of the same species.

The anal glands are large, oval, thin-walled sacs, with a muscular covering and smooth lining membrane, each ·9 inch in length and

Fig. 3.



Cæcum of *Icticyon*; natural size.

·7 inch wide, and opening by a single orifice, large enough to admit a bristle, at the lateral margin of the anal aperture.

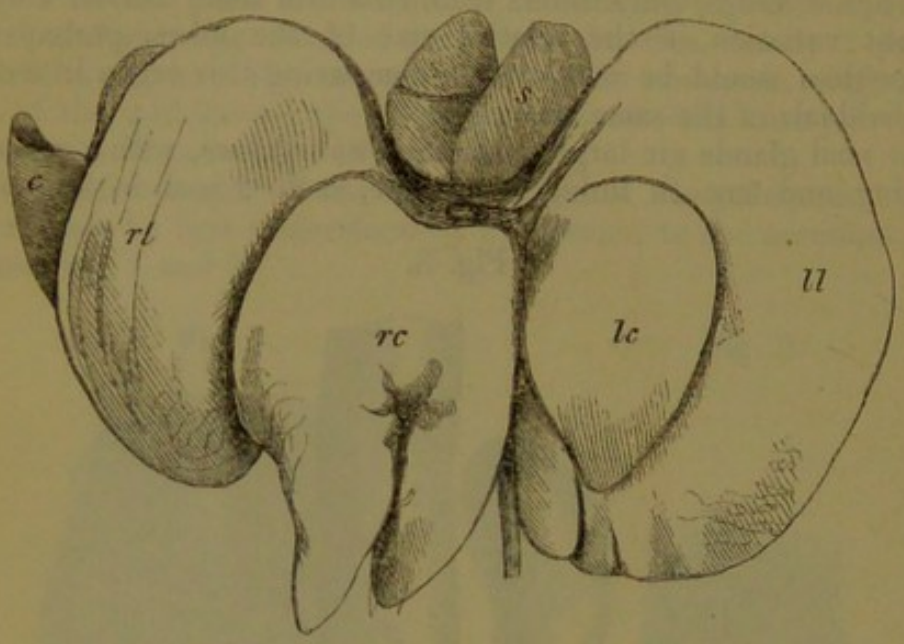
The brain (figs. 6 and 7, p. 75) is characteristically canine, except that, on the left side, the gyrus immediately surrounding the Sylvian fissure (fig. 6 *i'*, *i'*) is not marked off by a complete sulcus at its upper curved part from the one above it, and therefore almost reproduces the condition met with in the Felidæ, from which form, according to the view of the late Professor Garrod, the canine brain has been derived by complete division of the lower or external gyrus into an outer and inner segment[3]. Although I have no doubt, after examining a larger number of specimens than were available when attempting a classification and comparison of the cerebral convolutions of the

[1] See P. Z. S. 1879, p. 766.

[2] See "Lectures on the Comparative Anatomy of the Organs of Digestion in the Mammalia," 'Medical Times and Gazette,' June 1, 1872, p. 622, fig. 23.

[3] "Notes on the Visceral Anatomy of *Lycaon pictus* and of *Nyctereutes procyonides*," P. Z. S. 1878, p. 377.

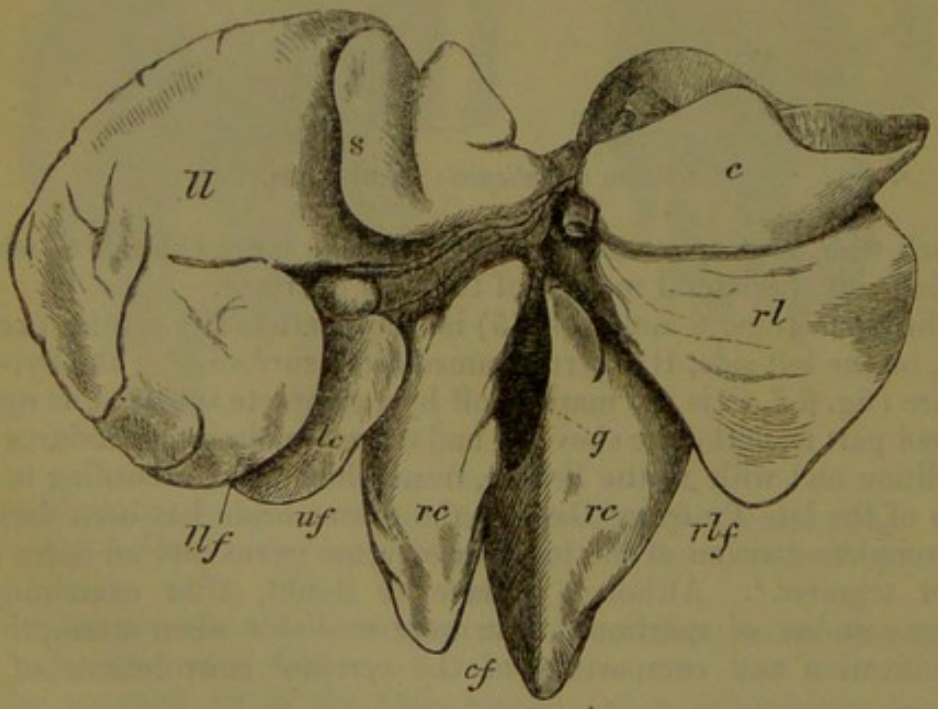
Fig. 4.



Upper surface of liver of *Icticyon*; half natural size.

rl. right lateral lobe; *rc.* right central lobe; *lc.* left central lobe; *ll.* left lateral lobe; *s.* Spigelian lobe; *c.* caudate lobe.

Fig. 5.

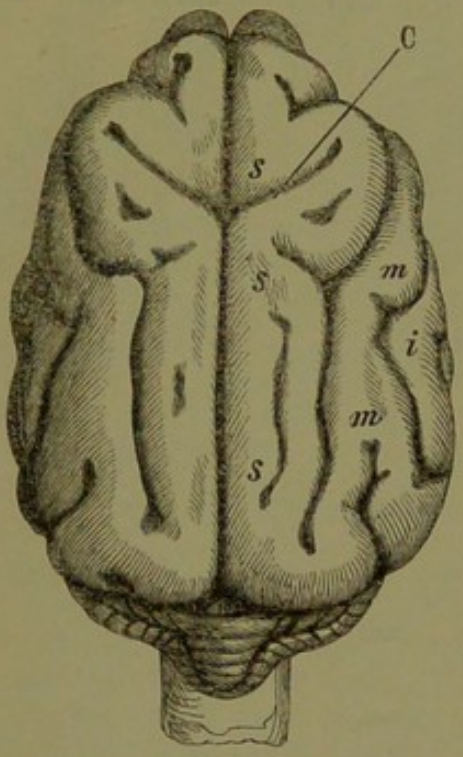


Under surface of liver of *Icticyon*; half natural size.

uf. umbilical fissure; *cf.* cystic fissure; *llf.* left lateral fissure; *rlf.* right lateral fissure; *ll.* left lateral lobe; *lc.* left central lobe; *rc.* right central lobe; *rl.* right lateral lobe; *s.* Spigelian lobe; *c.* caudate lobe; *g.* gall-bladder.

different groups of the Carnivora[1], that the fourth (counting from the middle line) or inferior gyrus of the Dog is represented by the outer or inferior portion of the third (counting in the same way) of the

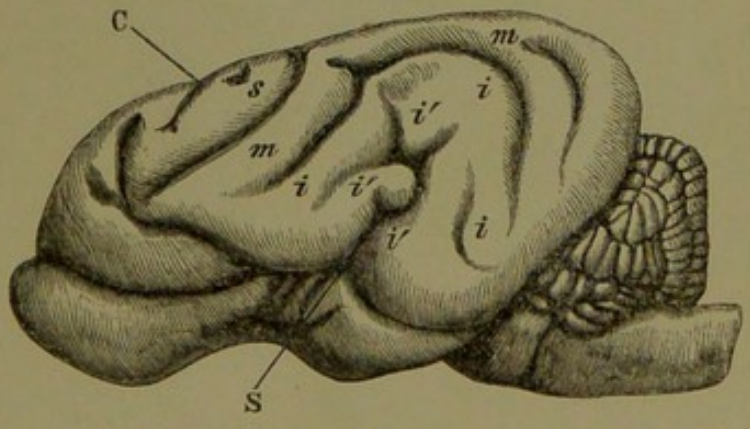
Fig. 6.



Upper surface of brain of *Icticyon*; natural size.

c. crucial sulcus; *s*, *m*, and *i*. superior, middle, and inferior lateral gyri.

Fig. 7.



Side view of brain of *Icticyon*; natural size.

S. Sylvian fissure; *c*. crucial sulcus; *s*. superior lateral gyrus; *m*. middle lateral gyrus; *i*. inferior lateral gyrus; *i'*. imperfect second inferior lateral gyrus, usually complete in the Canidæ.

other Carnivora, and is in many Æluroids already partially marked off by an interrupted sulcus, I am not prepared on that account to accept the conclusion that the Dog is a further modification of the

[1] See P. Z. S. 1869, p. 482.

highly specialized æluroid type. Very little else in the structure or the palæontological history of the Dog indicates that it has passed through a feline stage in its development; and its more complex brain may have been evolved quite independently from a primitive form. A comparative study of the development of the convolutions of the brain in the Dog and other Carnivora would throw light upon this subject.

J. Smit lith.

Hanhart imp.