

35 *a*. *OPHIOPEZA CONJUNGENS*, Bell. Specimens are known from the northern parts of Australia and from the "Indian Ocean"; thanks to Mr. Oates's gift I am able to give a definite point in the latter area. M.

38 *a*. *OPHIOGLYPHA KINBERGI*, Ljn. This species was collected by the 'Challenger,' both within (Torres Straits) and without the intertropical area (Port Jackson, Bass Straits). M.

52 *d*. *OPHIOTHRIX ASPIDOTA*, M. Tr. The Museum has also received this species from Kurrachee. R.

The only habitat hitherto given has been East Indies.

84 *a*. *FIBULARIA VOLVA*, Ag. R.

89 *a*. *ECHINODISCUS AURITUS*, Leske. R.

93 *a*. *MARETIA PLANULATA*, Lamk. M.

104 *a*. *CUCUMARIA SEMPERI*, Bell. Hitherto known only from Port Denison and Torres Straits. R.

105 *a*. *COLOCHIRUS QUADRANGULARIS*, Jäger. Tuticorin.

105 *b*. *ACTINOCUCUMIS TYPICA*, Ludw. R.

To the Echinoderms of the Madras coast Mr. Thurston has now added *Ophiactis savignii*, *Laganum depressum*, and *Thyone sacellus*.

Mr. Oates has, in addition to the novelties, brought from the Gulf of Martaban:—*Temnopleurus toreumaticus*, a young *Laganum*; *Astropecten polyacanthus*, and a young *Luidia*; and *Ophiactis savignii*.

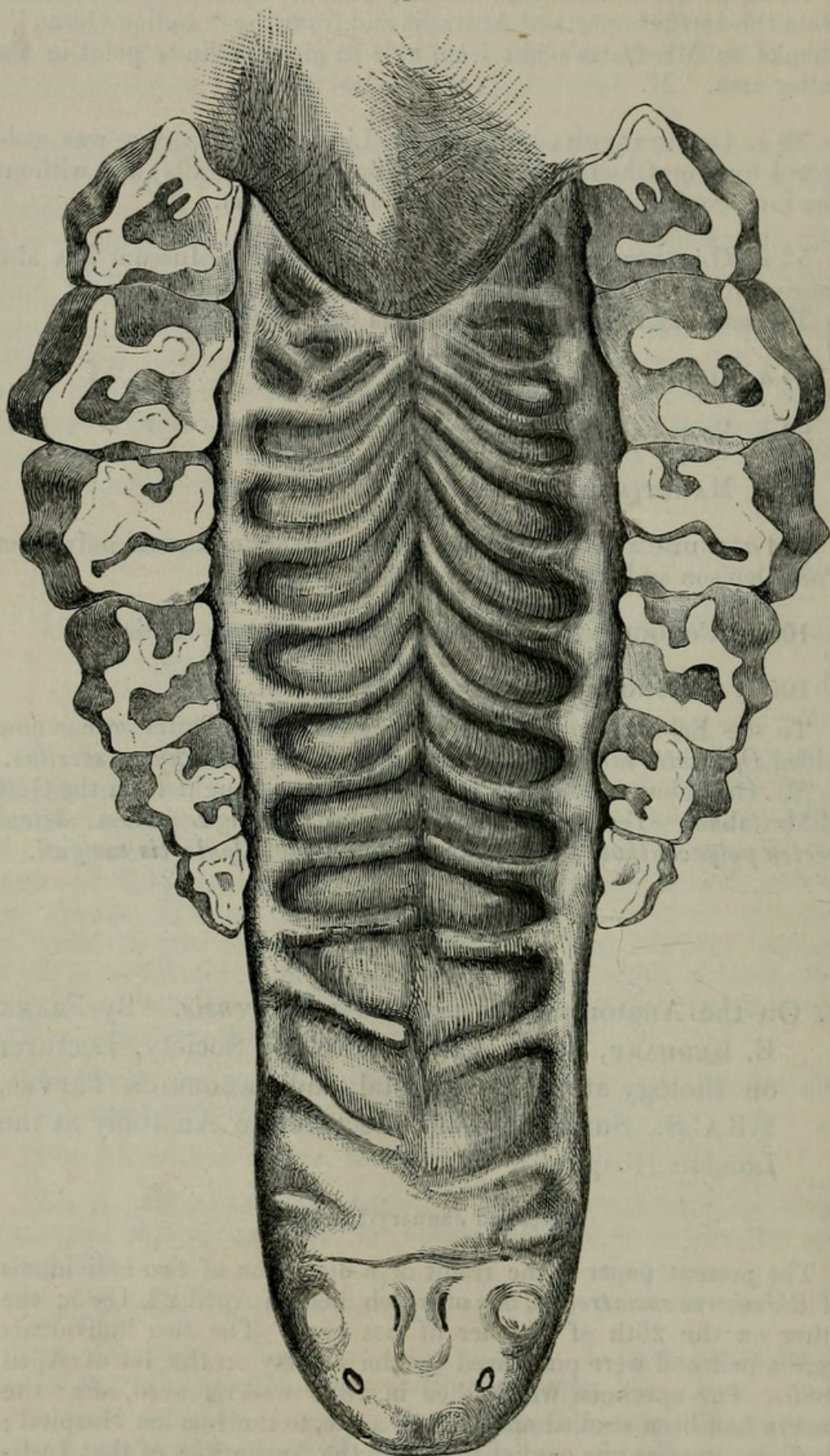
2. On the Anatomy of *Rhinoceros sumatrensis*. By FRANK E. BEDDARD, M.A., Prosector to the Society, Lecturer on Biology at Guy's Hospital, and FREDERICK TREVES, F.R.C.S., Surgeon to and Lecturer in Anatomy at the London Hospital.

[Received January 15, 1889.]

The present paper is the result of a dissection of two individuals of *Rhinoceros sumatrensis*, one of which died on April 22, 1885; the other on the 26th of October of last year. The two individuals were a pair and were purchased by the Society on the 1st of April 1885. The specimen which died in 1885 was removed, after the viscera had been studied and thrown away, to the London Hospital; we desire to offer our cordial thanks to the Authorities of that Institution for placing at our disposal a tank in which the limbs of the



Fig. 1.

Hard palate of *Rhinoceros sumatrensis*.



Rhinoceros were kept for some weeks while the muscles were in course of dissection.

In performing this task we were greatly assisted by Mr. Tonks, now Physician at the Free Hospital, Grays Inn Road; for most of the drawings which illustrate this paper (woodcuts, figs. 3-10) we are also indebted to that gentleman.

Both the individuals were referred on their arrival at the Gardens to *Rhinoceros sumatrensis*; subsequently Mr. Sclater considered that they were probably examples of his species *Rhinoceros lasiotis*, of which the type is still living in the Gardens. Without going fully into the question of the distinctness of *Rh. lasiotis* from *Rh. sumatrensis*, which cannot be done properly until the death of the type specimen, it may be remarked that there are no characters in the skull which would seem to justify such a distinction. In making a comparison of the skull of these specimens with *Rh. sumatrensis*, particular attention was paid to a paper by Prof. Flower in the 'Proceedings'<sup>1</sup> of this Society, in which a skull possibly identical with Mr. Sclater's *Rh. lasiotis* was compared with *Rh. sumatrensis*. Assuming that problematical skull to represent *Rh. lasiotis*, it is clear that neither of the individuals discussed in the present paper belong to that species, for in all the points raised by Prof. Flower these individuals are typical *Rh. sumatrensis*.

With regard to the visceral anatomy of this species we have not much to add to the description by Garrod; and the species does not differ materially from *Rh. sondaicus*, which we have described somewhat fully in the 'Transactions' (vol. xii.) of this Society.

Garrod describes the ridges upon the hard palate of *Rh. sumatrensis* but gives no figure of it. The accompanying drawing (fig. 1, p. 8) has been made for the purpose of a comparison with the hard palate of *Rh. sondaicus*, which has been figured by us in our memoir upon that Rhinoceros.

The cæcum and the neighbouring parts of the intestines have been figured by Garrod; and as his figure illustrates the principal points in the anatomy of this region of the gut, we have thought it hardly worth while to give a further illustration.

In the loop which is formed by the commencement of the colon, the distal portion is of a narrower calibre, as shown in Garrod's figure.

The mesentery which unites the opposite sides of the loop has a peculiar fold upon it which is illustrated in our figure of *Rh. sondaicus*. In that Rhinoceros the fold in question (*loc. cit.* pl. xxxiv. figs. 1-3) arises near to the cæcum and receives a branch from one of the divisions of the colic artery; at the opposite extremity of the colic loop the band divided into two, which were attached to the surface of the mesentery uniting the parietal sections of the colon; at this point the artery borne by the fold also divides and becomes continuous at two points with the colic artery. It appeared to us at the time we were investigating the anatomy of *Rh. sondaicus* that the azygos artery borne by this fold might serve to supply this

<sup>1</sup> P. Z. S. 1878, p. 634.



region of the gut with blood, if the circulation in the main arteries happened to be occluded.

In the Sumatran Rhinoceros the same fold occurs; but (at least in one specimen) it was of limited extent compared to the fold in the Sondaic Rhinoceros; it commenced at about the same point, but terminated at the beginning of the smooth portion of the colic loop. Furthermore this fold appeared to have no artery; or if an artery was present it must have been very small indeed.

The ileo-cæcal fossa figured and described by us in *Rhinoceros sondaicus* was present in the Sumatran species; but, instead of being large enough to contain the entire fist, it was only of the diameter of the fore finger; this difference is not at all commensurate with the difference in size of the individuals of the two species.

Fig. 2 (p. 11) represents the nasal diverticulum of this species; this organ, which is known to occur in the Horse and in the Tapir, has not yet been described in the Rhinoceros; as will be seen from the figure, it is not widely different from that of the Tapir. Our figure may be compared with the late H. N. Turner's figure (P. Z. S. 1850, p. 104) of the same organ in *Tapirus americanus*.

#### *On some of the Muscles of the Fore Limb.*

*Rhomboideus*.—A small muscle, 8 inches wide, fleshy. It is inserted into the whole length of the vertebral border of the scapula.

*Levator anguli scapuli*.—A separate one cannot be made out.

*Serratus magnus*.—An enormous fleshy muscle with very coarse fibres inserted into the venter of the scapula over a surface 10 in. by 6 in. Insertion comes between rhomboideus and subscapularis.

*Subscapularis*.—This muscle is aponeurotic on the surface, muscular beneath. Arises from whole of the venter of scapula beyond serratus magnus. In contact with supraspinatus above and overlapped origin of triceps below. Arises from aponeurotic covering of triceps. Lower border intimately blended with teres major. It is inserted into the trochanter by a wide tendon. It crossed capsule; bursa between it and capsule in communication with the joint.

*Latissimus dorsi*.—Crossed whole of triceps, then ran parallel with and underneath teres major. Inserted into front of humerus by a tendon. This tendon was below the trochanter and to the extensor side of the biceps, and under the coraco-brachialis; it was common to the latissimus dorsi and teres major. The great bulk of the latissimus dorsi ended in an aponeurosis. This blended with the aponeurosis of the triceps about four inches from the humerus; the rest passed down and joined the fascia of the forearm over the ulna.

*Teres major* (fig. 3).—It lies between subscapularis and latissimus dorsi. It arose from inferior angle of scapula, from part of its inferior border, and from aponeurosis at origin of the triceps. Joined the latissimus dorsi.

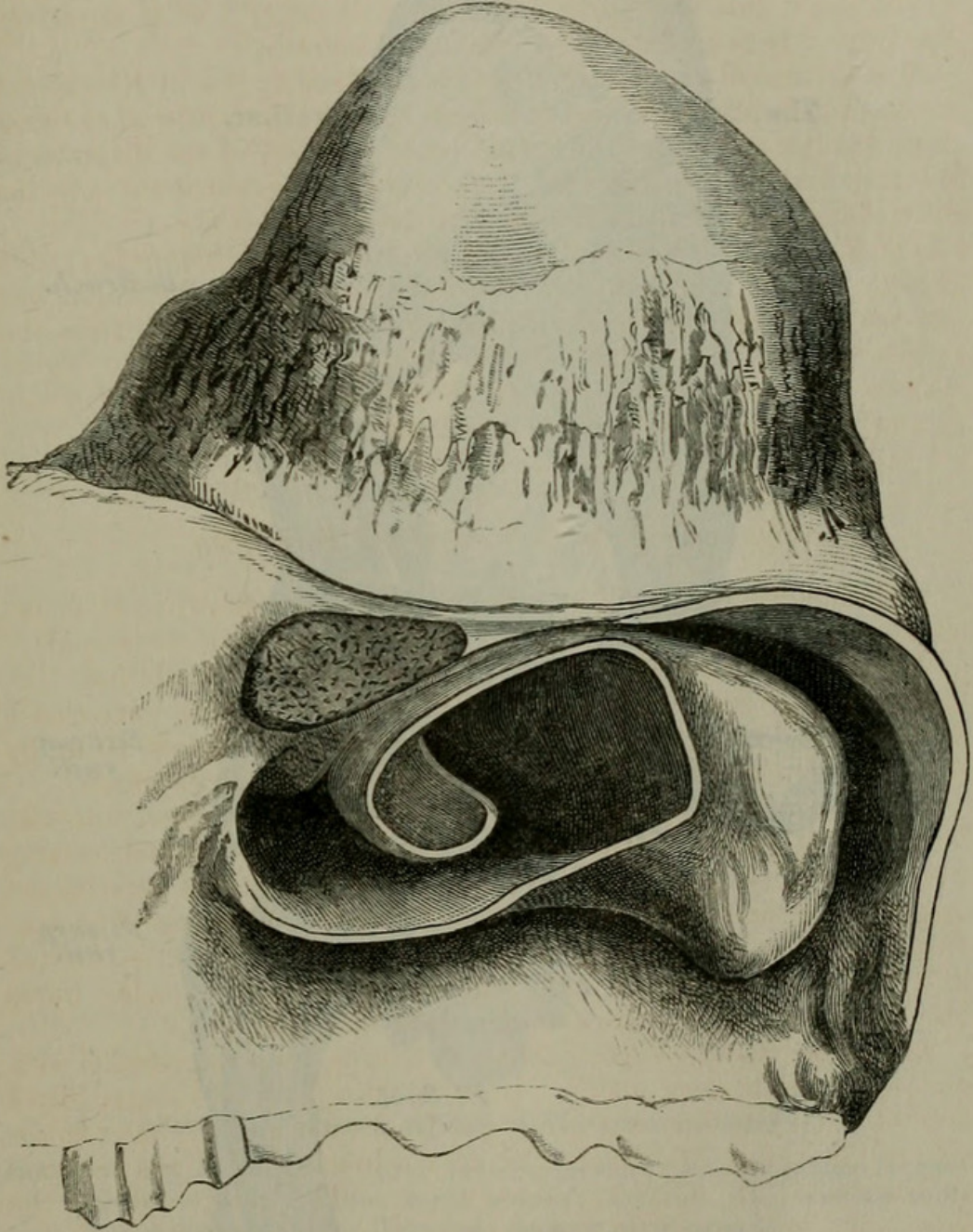
*Coraco-brachialis*.—Arises by a strong tendon from the coracoid



process. Inserted into front of the humerus below the latissimus dorsi and just above the condyle.

Its tendon of origin gave off an aponeurosis from its outer side ;

Fig. 2.



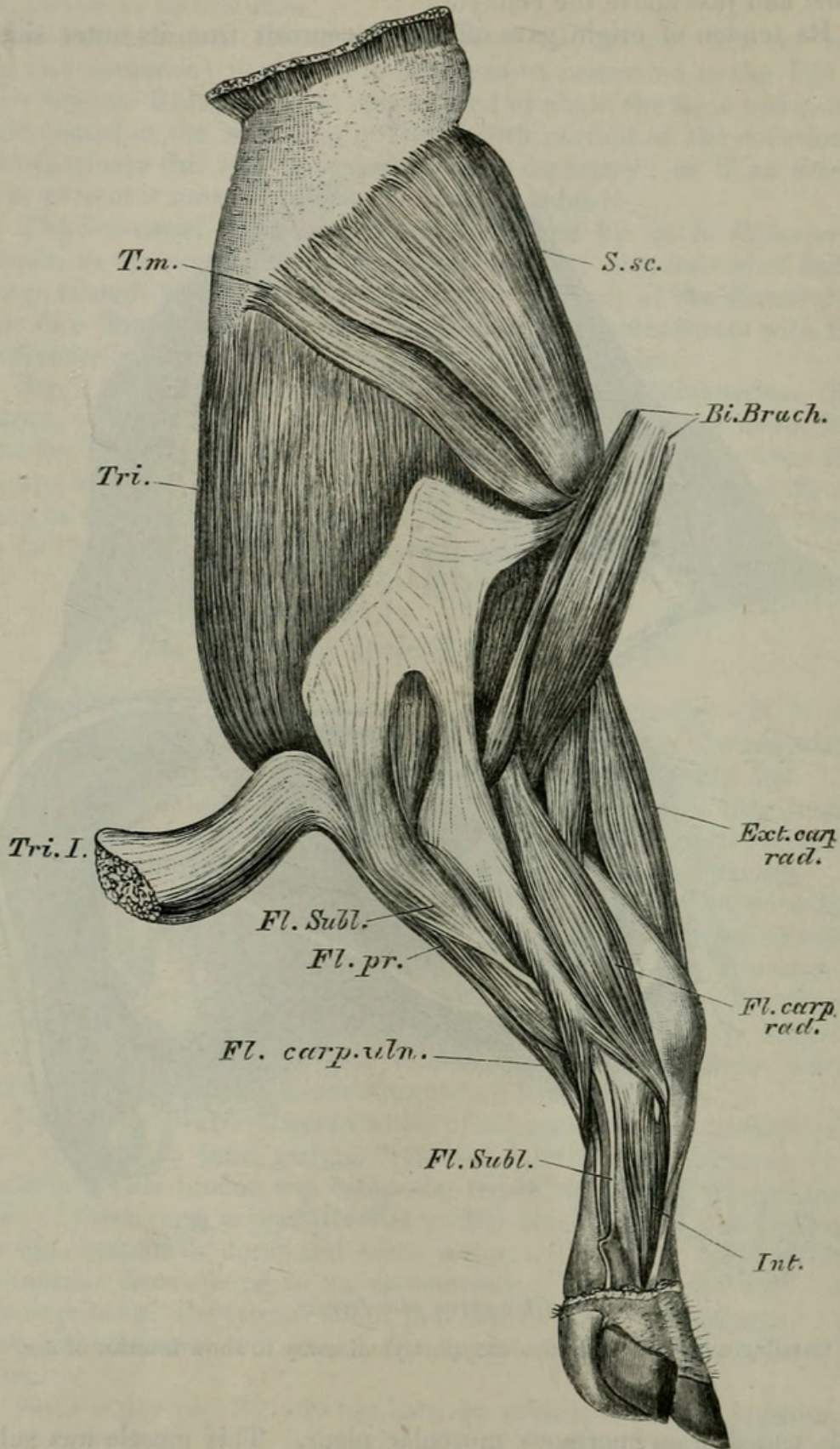
*Rhinoceros sumatrensis.*

Cartilages of nasal diverticulum, partly cut away to show interior of sac.

this ended in an enormous muscular plane. This muscle was sub-cutaneous ; it was attached to the tip of the trochanter ; it blended with the supraspinatus, and covered the biceps ; part of it passed back to join the cutaneous part of the latissimus dorsi, and in so



Fig. 3.



Fore limb (inner side) of *Rhinoceros sumatrensis*.

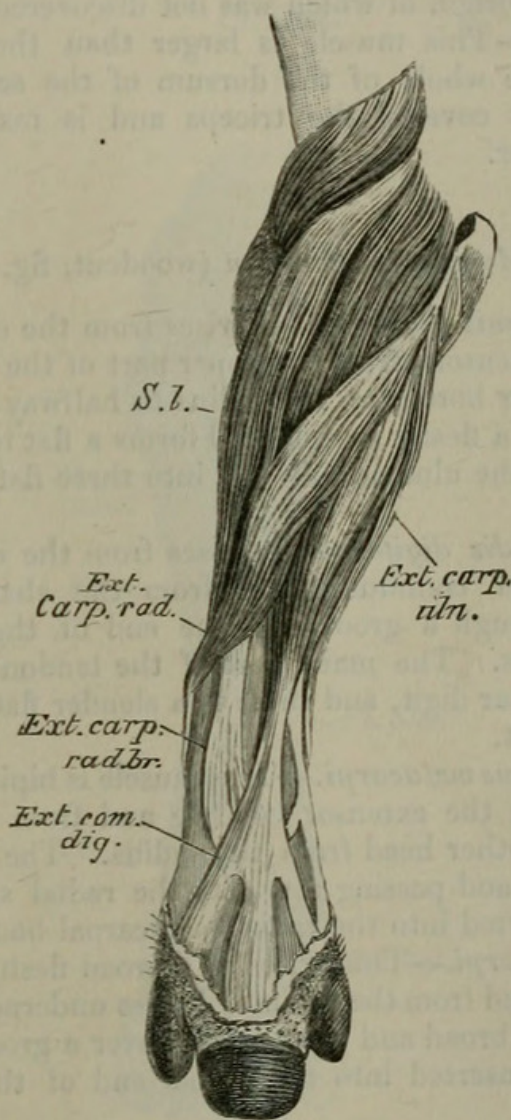
*Bi.*, biceps; *Brach.*, brachialis anticus; *Ext. carp. rad.*, extensor carpi radialis; *Fl. carp. rad.*, flexor carpi radialis; *Fl. carp. uln.*, flexor carpi ulnaris; *Fl. pr.*, flexor profundus digitorum; *Fl. subl.*, flexor sublimis; *Int.*, interosseus; *S.sc.*, subscapularis; *T.m.*, teres major; *Tri.*, triceps; *Tri.I.*, second head of triceps.



doing covered the muscles of the elbow-joint. The rest joined a large muscle from the chest.

The muscle lay to its outer side and covered the whole humeral

Fig. 4.



Fore limb (anterior surface) of *Rhinoceros sumatrensis*.

*Ext. carp. rad. br.*, extensor carpi radialis brevior; *S.l.*, supinator longus; *Ext. carp. uln.*, extensor carpi ulnaris; *Ext. com. dig.*, extensor communis digitorum; *Ext. carp. rad.*, extensor carpi radialis.

region, not unlike the human deltoid. Its upper part was inserted into the external supra-condyloid ridge of the humerus, lying between the biceps and brachialis anticus.

*Biceps*.—A fusiform muscle of large size. Arose by single tendon from coracoid process. The tendon passed underneath the supraspinatus, beneath the muscle from the chest, and was inserted into



the radius at its neck, and joined also the deep fascia of the forearm. Biceps tendon of origin two inches wide and one inch thick.

*Supraspinatus*.—A huge fleshy muscle, occupying superior border of scapula; covered biceps tendon; inserted on to external tuberosity; it arose from the whole of the supraspinous fossa; it was covered by a dense aponeurosis, and into this a slender muscle from the neck was inserted, the origin of which was not discovered.

*Infraspinatus*.—This muscle is larger than the supraspinatus; it arises from the whole of the dorsum of the scapula below the supraspinatus; it covered the triceps and is inserted on to the external trochanter.

*Extensor Muscles of Forearm* (woodcut, fig. 4, p. 13).

*Extensor communis digitorum*.—Arises from the extensor condyle with the other extensors, from the upper part of the ulna and radius, and from the ulnar border of the radius to halfway down that bone. It passes down as a fleshy muscle, and forms a flat tendon just above the distal end of the ulna and divides into three flat expansions, one for each digit.

*Extensor lateralis digitorum*.—Arises from the extensor condyle below the extensor communis, and from the shaft of the ulna. Passes down through a groove on the end of the ulna, where it becomes tendinous. The main part of the tendon goes to the first phalanx of the ulnar digit, and there is a slender flattened expansion to the middle digit.

*Extensor obliquus metacarpi*.—This muscle is bipinnate. It arises by one head from the extensor condyle and from the shaft of the radius, and by another head from the radius. The heads join just above the carpus, and passing round to the radial side of the wrist, the muscle is inserted into the radial metacarpal bone.

*Extensor metacarpi*.—This arises as a broad fleshy mass from the extensor condyle and from the radius. Passes underneath the extensor obliquus as a very broad and thick tendon over a groove in distal end of radius, to be inserted into the carpal end of the middle metacarpal bone.

*Supinator longus*.—Rises in common with the other muscles, being the most superior (proximal) one of them, from the extensor condyle. Passes down as a slender muscle to be inserted into the distal end of the radius.

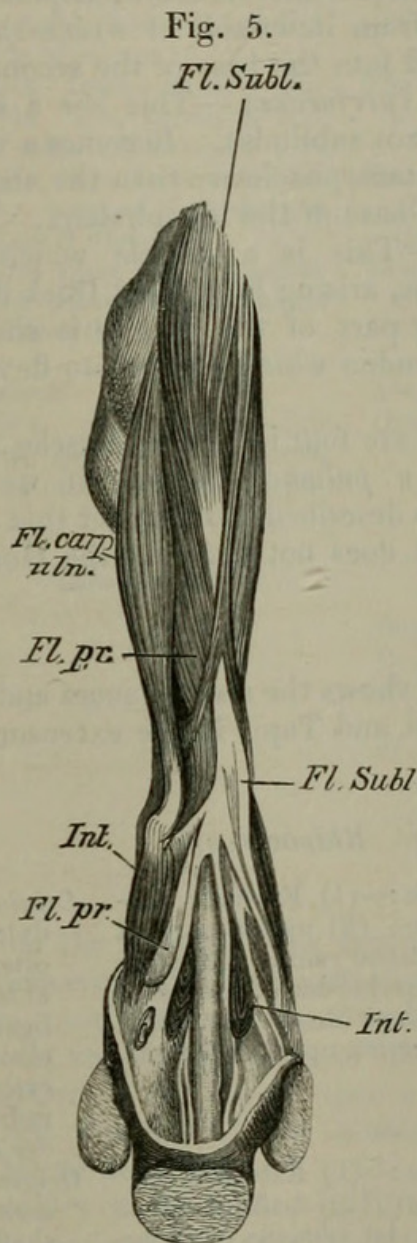
*Flexor Muscles of Forearm* (woodcut, fig. 5, p. 15).

*Flexor externus metacarpi*.—Rises from the extensor condyle and from the olecranon. It is a very big and fleshy muscle; it is inserted by a small tendon into the pisiform bone.

*Flexor obliquus metacarpi*.—This muscle arises by two heads: (1) by a tendon, in common with the flexor internus metacarpi, from the



flexor condyle, and (2) by a fleshy head partly from the olecranon and partly from the humerus. Its flat fleshy belly passes down, the main tendon passing over, and being connected with, a large sesamoid (?) bone over the distal end of the ulna to be inserted into the pisi-



Fore limb (posterior surface) of *Rhinoceros sumatrensis*.

*Fl. subl.*, flexor sublimis; *Fl. carp. uln.*, flexor carpi ulnaris; *Fl. pr.*, flexor profundus digitorum; *Int.*, interosseus.

form bone; a few fleshy fibres, given off before the muscle becomes tendinous, are inserted into the radial side of the carpus.

*Flexor internus metacarpi*.—Arises from the flexor condyle (there is a bursa half an inch in diameter between the muscle and the condyle) as a big fleshy mass. Passes down in a groove on the



radius, and, becoming tendinous above the wrist, is inserted into the proximal end of the radial metacarpal bone.

*Flexor sublimis (perforatus)*.—Arises, in common with the flexor profundus, from the flexor condyle. Passes down as a large fleshy muscle; becomes tendinous at wrist, under annular ligament, and there divides into three small tendons, expanding into sheath at bases of phalanges, from inner side of which sheath expansions go forward to be inserted into the base of the second phalanx.

*Flexor profundus (perforans)*.—This has a similar origin to last described muscle (flexor sublimis). Becomes a very big tendon, and dividing over the metacarpus lower than the above, passes through a thick sheath to the base of the last phalanx.

*Palmaris longus*.—This is a muscle which is apparently not described in the Horse, arising by a short thick fleshy belly from the olecranon; the fleshy part of the muscle is short and is succeeded by a wide and thin tendon which passes into flexor profundus at the wrist.

*Interossei*.—There are four interossei muscles.

The presence of a *palmaris longus*, if we are right in thus identifying the muscle described above under that name, is interesting for the reason that it does not occur in the Horse, but does in the Tapir.

The following table shows the resemblances and differences between the Rhinoceros, Horse, and Tapir in the extensor and flexor muscles of the arm:—

|                             | <i>Rhinoceros.</i>   | <i>Horse.</i>   |
|-----------------------------|--|---|
| <i>Ext. comm. digit...</i>  | <i>Origin</i> :—(1) Extensor condyle; (2) upper part of ulna and radius; (3) from ulnar border of radius to halfway down that bone.<br><i>Insertion</i> upon all 3 digits. | <i>Origin</i> :—(1) Extensor condyle; (2) humerus below extensor condyle; (3) the anterior border of external ligament of articulation of elbow; (4) superior and external tuberosity of radius; (5) external border of radius. |
| <i>Ext. lat. digit.....</i> | <i>Origin</i> :—(1) Extensor condyle; (2) shaft of ulna.<br><i>Ins.</i> 1st phalanx of ulnar digit and (by a slight tendon) to middle digit.                               | <i>Origin.</i> From external tuberosity of radius and from shaft of radius and ulna, <i>not</i> from humerus.   |
| <i>Ext. obl. met. ....</i>  | <i>Origin</i> by one head from exterior condyle and shaft of radius; by 2nd head from radius. <i>Ins.</i> , radial metacarpal.   | <i>Origin.</i> Only one head from external side of radius.  |
| <i>Flexor ext. met. ...</i> | <i>Origin</i> from extensor condyle and olecranon. <i>Ins.</i> into pisiform.  | <i>Insertion</i> by 2 tendons: (1) on to pisiform; (2) outer metacarpal.  |



*Rhinoceros.**Horse.*

*Flex. obl. met.* ... *Origin* by one head from flexor condyle, by a 2nd head partly from olecranon and partly from humerus. *Ins.* (1) by a tendon upon pisiform; (2) by fleshy fibres upon radial side of carpus.

*Origin.* By two heads as in *Rhinoceros*. 2nd head arises only from olecranon. *Insertion* only on to pisiform.

*Flex. int. met.* ... *Origin* from flexor condyle. *Ins.* proximal end of radial metacarpal.

The same.

*Flex. perforatus*... *Origin* from flexor condyle. *Ins.* bases of 2nd phalanx of all 3 digits.

The same, allowing for absence of phalanges of 2nd and 4th digits.

*Flexor profundus.* *Origin* from flexor condyle. *Ins.* bases of last phalanx of each digit.

*Origin*:—(1) From flexor condyle; (2) olecranon; (3) posterior surface of radius.

*Palmaris longus* (?) Present.

Absent.

*Ext. met.* ..... *Origin.* Extensor condyle and radius. *Ins.* carpal end of middle metacarpal.

*Origin* only from humerus.

*Rhinoceros.**Tapir.*

*Extensor met.* .....

*Origin* only from humerus.

*Ext. comm. digit.*

*Origin*:—(1) Outer condyle; (2) head of radius; (3) from middle of ulna.

*Ext. lat. digit.* ...

*Origin* from extensor condyle and from ulna and radius. *Insertion*, outer digits 3 and 4.

It will be seen from the above tabular comparison of some of the muscles of the *Rhinoceros* with the corresponding muscles of the *Horse* that there are some differences, particularly in the extensors.

We shall now compare the myology of *Rhinoceros* with that of *Hyrae*; our comparison is not based upon a dissection of *Hyrae*, but upon the detailed account of the muscular anatomy of that animal by Messrs. Murie and Mivart<sup>1</sup>.

The extensor muscles of the manus in *Rhinoceros* are, as in the *Horse*, only four in number; the corresponding muscles in *Hyrae* appear to be as follows:—

*Rhinoceros, Horse.**Hyrae.*

*Extensor communis digitorum.*

*Extensor communis digitorum.*

*Extensor lateralis digitorum.*

*Extensor minimi digiti.*

*Extensor obliquus metacarpi.*

*Extensor ossis metacarpi pollicis.*

*Extensor metacarpi.*

{ *Extensor carpi longior.*  
*Extensor carpi brevior.*

<sup>1</sup> P. Z. S. 1865, p. 329.



*Hyrax* possesses in addition an *extensor carpi ulnaris*, which is wanting in the Ungulates.

In *Hyrax* the *extensores primi, secundi internodii*, and *indicis* are wanting, which is so far a resemblance to the Ungulate in that the last two of these muscles are present in the Rabbit<sup>1</sup> and apparently in *Hydromys*.

The *supinator longus*, which we have described in the Rhinoceros, is absent in the Horse, and according to Meckel, quoted by Messrs. Murie and Mivart, in many Rodents. Windle<sup>2</sup> asserts its absence in *Hydromys*, and Huxley in the Rabbit. Its presence in *Hyrax* is therefore of particular interest and also its presence in the Tapir.

### *Muscles of the Hind Limbs* (figs. 6, 7, 8, 9).

*Iliacus*.—This muscle is largely tendinous upon the inner side; its origin is from the whole of the iliac fossa.

*Psoas*.—A small muscle dividing into two tendons; both are inserted into lesser trochanter, curving round femur from before back.

*Psoas parvus*.—The upper part of the belly is muscular but soon becomes tendinous; it is continuous with the sartorius (see fig. 7).

*Gracilis*.—The gracilis is enormously wide and muscular throughout; it arises from pubic arch and is inserted by a large muscular and tendinous insertion into fascia above the inner side of the knee, which is continued on to patella and then on to inner side of tibia.

*Pectineus* is a fleshy, somewhat flat oblong-shaped muscle; it arises from pubis along pectineal line; it is inserted on to the femur as in the Horse.

*Adductor longus*.—Arises from ramus of pubis, where it is blended with adductor magnus; its insertion is the same as that of the gracilis, except that it also is attached to the lower end of the femur; it is partly covered by gracilis.

*Adductor magnus* is a large fleshy muscle with but little tendon; its origin is muscular and it is here fused with adductor longus as already stated; its insertion is to inner side of shaft and to inner condyle of femur; it forms a tendinous arch for artery at junction of middle and lower third.

The *Rectus* and two *Vasti* were fused into a single muscle, the elements of which were indicated by aponeuroses; the muscle is inserted on to patella.

*Semimembranosus*.—This muscle is united to form one muscle with the semitendinosus; it is inserted by a flat tendon parallel with and  $\frac{1}{4}$  inch behind the crest of tibia; this tendon is three inches long.

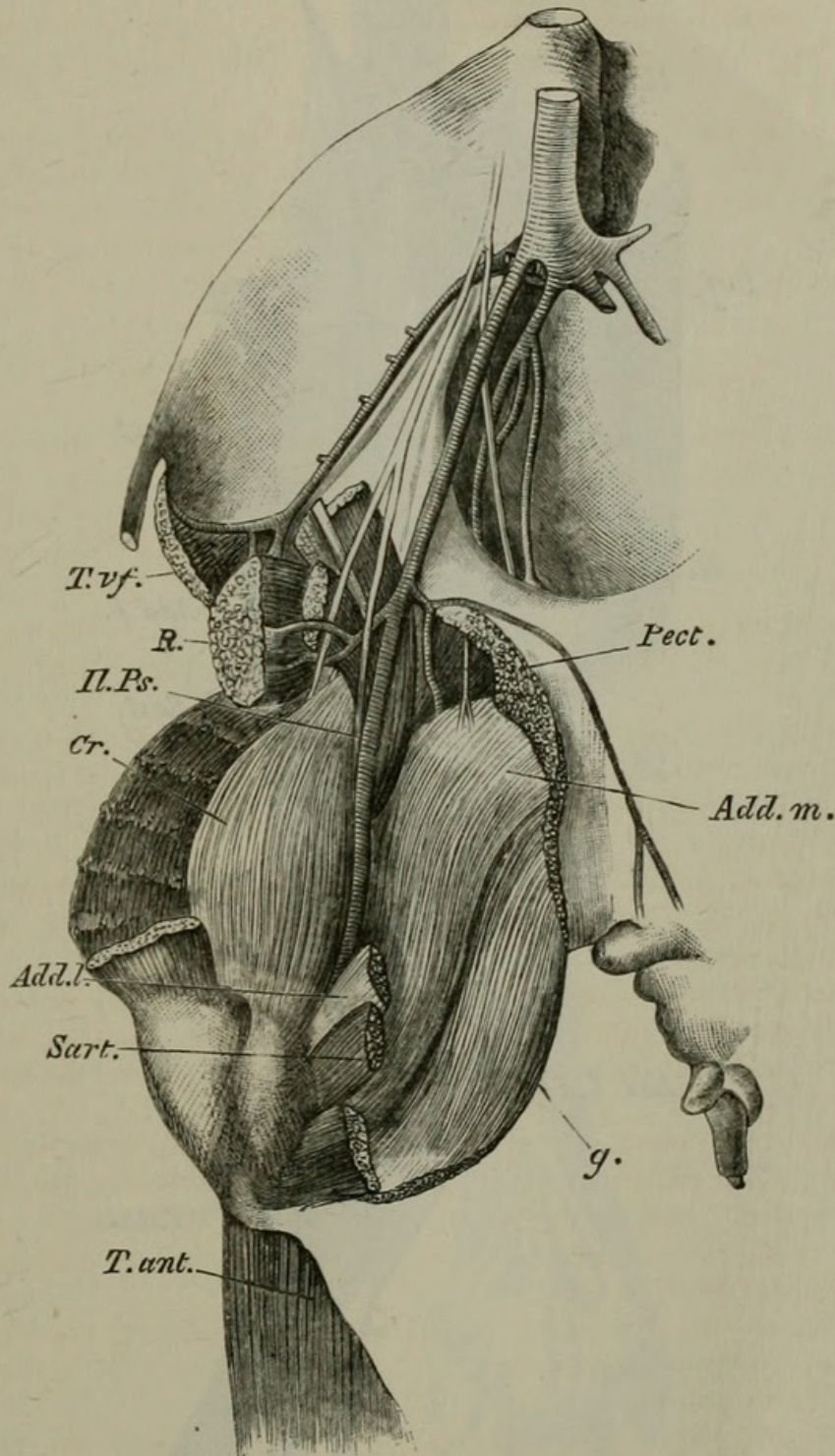
The *Peronei* muscles are four in number:—

(1) Originates from the outer side of the head of the fibula and

<sup>1</sup> Huxley, 'Anatomy of Vertebrates,' p. 439.  
P. Z. S. 1887, p. 56.



Fig. 6.

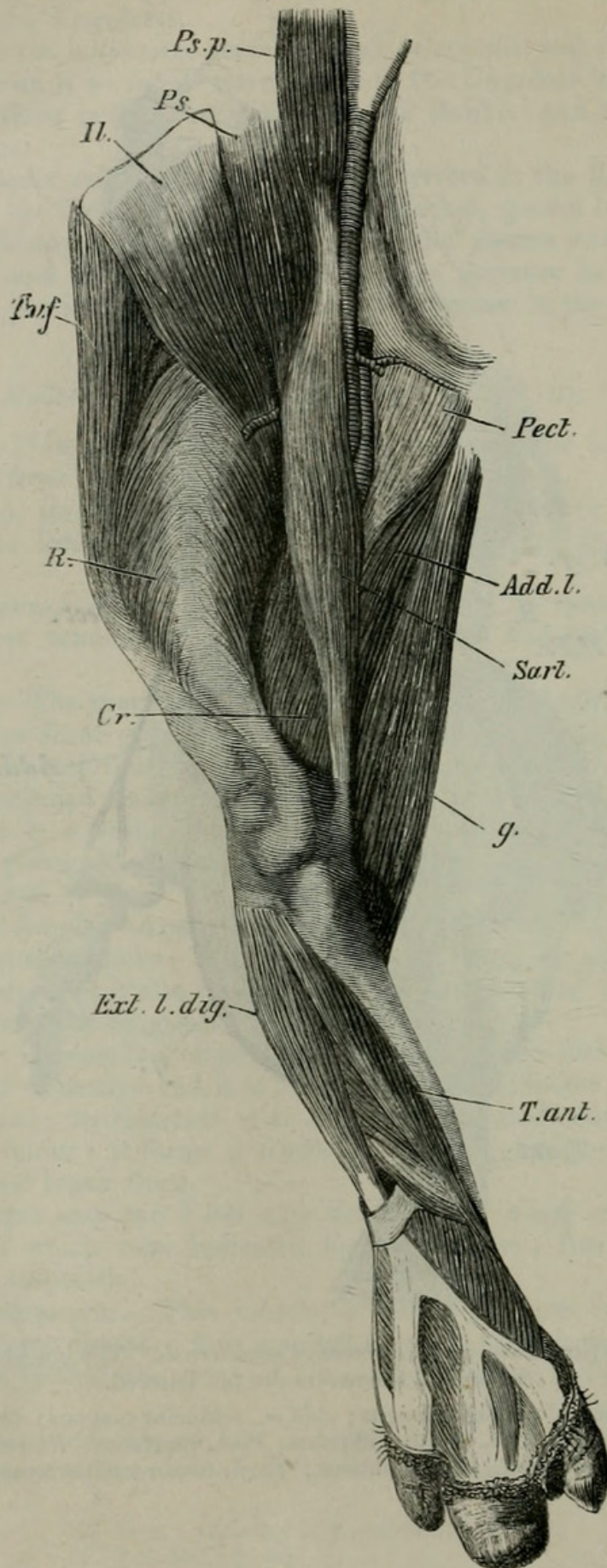


Hind limb (inner aspect) of *Rhinoceros sumatrensis*. The branches of the aorta and the nerves are not lettered.

*Add.l.*, insertion of adductor longus; *Add.m.*, adductor magnus; *Cr.*, cruræus; *g.*, gracilis; *Il.Ps.*, iliacus and psoas; *Pect.*, pectineus; *R.*, rectus; *Sart.*, sartorius; *T.ant.*, tibialis anticus; *T.v.f.*, tensor vaginae femoris.



Fig. 7.

Hind limb (front aspect) of *Rhinoceros sumatrensis*.

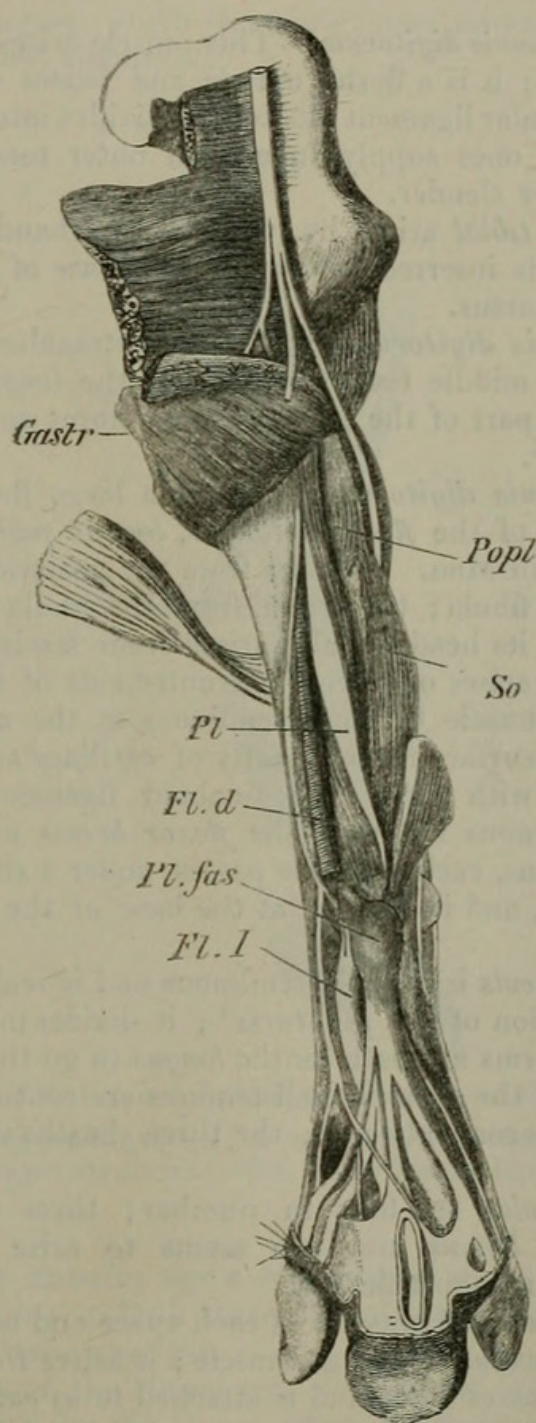
*Ext.l.dig.*, extensor longus digitorum; *Ps.p.*, psoas parvus (continuous with sartorius); *Ps.*, psoas; *Il.*, iliacus; *Pect.*, pectineus; *Cr.*, cruræus; *g.*, gracilis; *Add.l.*, adductor longus; *R.*, rectus; *Sart.*, sartorius; *T.ant.*, tibialis anticus; *T.v.f.*, tensor vaginæ femoris.



also from the shaft of that bone ; it passes down through a groove to be inserted into the head of outer metatarsal.

(2) The second peroneal has a common origin with the first

Fig. 8.



Hind limb (posterior aspect) of *Rhinoceros sumatrensis*.

*Fl.d.*, flexor longus digitorum ; *Gastr.*, gastrocnemius ; *Pl.*, plantaris ; *Pl.fas.*, plantaris fascia ; *Popl.*, popliteus ; *So.*, soleus ; *Fl.I.*, tendon of flexor longus.

from head of fibula ; it is separated below by a ridge of bone ; it is inserted into metatarsal bone of outer toe.



(3) Arises from the shaft of the fibula behind and below the other peroneal muscles ; it passes down beneath the tendon of second peroneal and is inserted on to the cuboid bone.

(4) The fourth peroneal is a small muscle arising from the lower part of the first peroneal ; it is inserted into the tendon of the third peroneal.

*Extensor communis digitorum*.—This muscle arises from the upper part of the tibia ; it is a fleshy muscle and passes down through a well-marked annular ligament ; its tendon divides into three branches ; two very strong ones supply inner and outer toes ; the tendon of middle toe is very slender.

The *anterior tibial* arises by two muscular bands from the shaft of the tibia ; it is inserted below into the base of the inner metatarsal bone and tarsus.

*Extensor brevis digitorum* arises from astragalus, and is inserted mainly into the middle toe together with the *longus*, but forming much the larger part of the tendon ; some fibres go to the inner toe, none to the outer.

*Flexor communis digitorum*.—This is a large fleshy muscle and takes the place of the *flexores longus*, *longus pollicis*, and of the *tibialis posticus* in Man. It arises from the posterior surface of the tibia and of the fibula ; the origin from the fibula extends as high up as a ridge on its head ; it also arises from fascia over popliteal ; from the tibia it arises only from the outer side of the lower part of the shaft ; the muscle becomes tendinous at the ankle and passes over a trochlear surface formed partly of cartilage and in connection, as it appeared, with the calcaneo-cuboid ligament ; it communicates by a tendinous slip with the *flexor brevis* and then divides into three tendons, each of these passes under a sheath formed by the *flexor brevis*, and is inserted at the base of the last phalanx of its digit.

The *Flexor brevis* is entirely tendinous and is really nothing more than a continuation of the *plantaris*<sup>1</sup> ; it divides into three tendons, each of which forms a sheath for the *longus* to go through, and from the inner wall of the sheath small tendons are continued forwards to the base of the second phalanx ; the three sheaths seem to be joined at the side.

The *Lumbricales* are four in number ; three of these are in connection with *longus* and one seems to arise from the outer tendon of long and short flexors.

There are *Interossei* muscles in each space and on both sides.

The *Gastrocnemius* is a large muscle ; it arises from the femur by two heads ; it passes down and is attached to *os calcis*.

The *Plantaris* is a slender strong muscle ; it arises from the outer condyle of the femur ; it passes down under *gastrocnemius* to *os calcis*, where it spreads out and passes over a smooth cartilaginous surface upon the bone and forms the *flexor brevis digitorum*.

The *Popliteus* is a large muscle ; it arises from the external condyle of femur ; it passes obliquely downwards and inwards to be

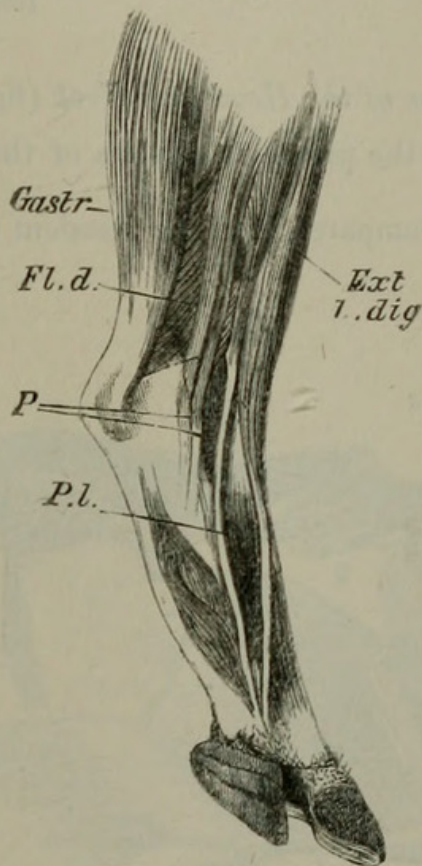
<sup>1</sup> As in most other Mammals.



inserted into tibia; the lower part (about half) was covered by *flexor communis digitorum*.

Great importance is attached by Dr. G. E. Dobson<sup>1</sup> to the presence or absence of a connection in the foot between the *flexor communis digitorum* and the *flexor brevis*; we have shown that this connection exists in *Rhinoceros*, which therefore forms no exception to the rule laid down by that anatomist.

Fig. 9.



Hind foot (inner surface) of *Rhinoceros sumatrensis*.

*P.l.*, peroneus longus; *P*, peronii; *Gastr.*, gastrocnemius; *Ext.l.dig.*, extensor longus digitorum; *Fl.d.*, flexor longus digitorum.

These flexor muscles agree very closely with those of the Horse and of the Tapir; in both these Ungulates and in *Hyrax* there is no separate *Tibialis posticus*.

The *Peronei* of the Rhinoceros are, on the other hand, far more complicated than in the Horse, where one only has been described. In *Hyrax* Murie and Mivart only describe two peroneal muscles. No reliable taxonomic conclusions can be drawn from the relations of these muscles, since in *Lepus* and *Hydromys* the peroneals are as complicated as in Rhinoceros.

<sup>1</sup> "On the Homologies of the long Flexor Muscles &c.," Journ. Anat. Phys. vol. xvii. p. 142.



The following is a tabular statement of the condition of certain muscles in the Rhinoceros and Horse.

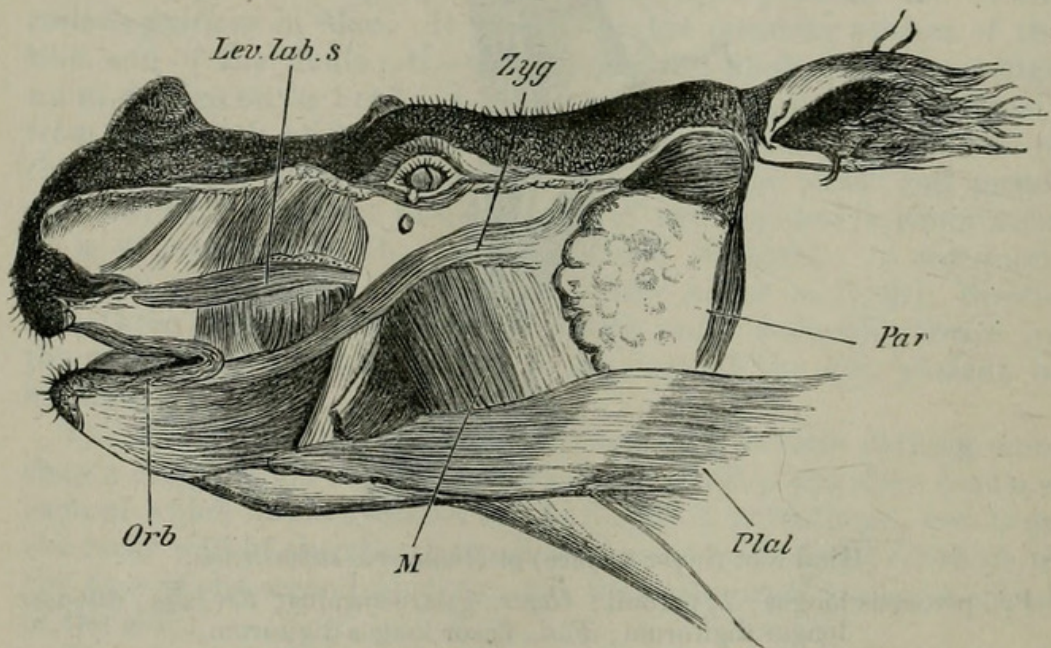
| <i>Rhinoceros.</i>   | <i>Horse.</i>  |
|--|--|
| <i>Ext. comm. dig.</i> ... Arises from tibia.  | Arises from between external condyle and trochea of femur.                                 |
| <i>Peronei</i> ..... Four separate muscles.  | Only one muscle.   |
| <i>Anterior tibial</i> ... Origin by two heads from tibia. <i>Ins.</i> radial metatarsal and tarsal. | Forms two separate muscles, one tendinous arising from femur, the other fleshy from tibia. |

*Muscles of the Head and Neck* (fig. 10).

Fig. 10 illustrates the principal muscles of the head as seen from the side.

Fig. 10 may be compared with the woodcut (fig. 97) illustrating

Fig. 10.



Dissection of side of face of *Rhinoceros sumatrensis*.

*Par.*, parotid gland; *Lev. lab. s.*, levator labii superioris alæque nasi; *M.*, masseter; *Orb.*, orbicularis; *Plat.*, platysma; *Zyg.*, zygomaticus.

the corresponding muscles in the Horse in Chauveau's book, and with plate viii. of Murie's memoir upon the Sumatran Tapir.

The *Zygomatic* arises from the zygoma just in front of the anterior edge of the parotid gland; it is inserted near to the margin of the lower lip at its hinder part close to the angle of the mouth. This muscle is much more important than in the Horse, where it is a small superficial slip arising from the surface of the masseter and inserted at a considerable distance away from the corner of the









Beddard, Frank E. and Treves, Frederick. 1889. "On the Anatomy of *Rhinoceros sumatrensis*." *Proceedings of the Zoological Society of London* 1889, 7-25. <https://doi.org/10.1111/j.1469-7998.1889.tb06740.x>.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/96894>

**DOI:** <https://doi.org/10.1111/j.1469-7998.1889.tb06740.x>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/72897>

**Holding Institution**

Natural History Museum Library, London

**Sponsored by**

Natural History Museum Library, London

**Copyright & Reuse**

Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.