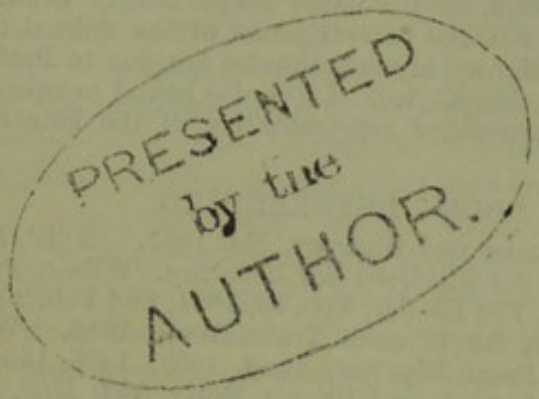
On the muscles and nerves of a chimpanzee (Troglodytes niger) and a Cynocephalus anubis / by Frank Champneys.



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ON THE MUSCLES AND NERVES OF A CHIMPANZEE (TROGLODYTES NIGER) AND A CYNOCEPHALUS ANUBIS.

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Professor Rolleston having kindly provided me with a young Cynocephalus Anubis, and subsequently with a female Chimpanzee, I have dissected the greater part of the muscles and nerves of those animals. I have substituted, on the advice of Prof. Rolleston, for the name Magot that of Inuus nemestrinus; for this, he informs me, was the correct name of the animal from which Dr Church drew his observations. My best thanks are due to Prof. Rolleston for assisting me with his valuable advice. I feel also bound to acknowledge, as his private property, the ligamentous representative of the long coracoid in the Chimp.

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Vertebral formula in Chimp. C_7, D_{13}, L_4, $SC._9$ (usually 5 sacral). Dr Embleton found 10 sacro-coccygeal vertebræ.

The terms "hand" and "foot" have been used as more convenient than "fore-hand" and "hind-hand."

The creature had been skinned, to the destruction of nearly all the cutaneous nerves.

The An. was quite young. Its body was covered with tawny hair, on the back it was 2½ or 3 inches long, and darker than the rest; on the pectoral region it was nearly or quite absent. On the face it was scattered, and there were dark bristles on the muzzle and chin. The length of the tail was equal to that of the trunk, the proximal half hairy, the distal half bare.

Muscles.

The *Platysma myoides* in the Chimp. was largely developed. It rose from the superficial fascia along a line extending along the external half of the external and superior edge of the trapezius. The fibres

ran straight and parallel to be inserted into the anterior part of the zygomatic arch, the angle of the mouth and the mental symphysis, becoming continuous with the muscles and fascia in those regions.

An inch from the symphysis the fibres of the left side overlapped those of the right. Quain says that when in man there is a decussation of fibres those of the right side overlap those of the left. In AN. it lay between the two layers of superficial fascia, and arose by thin, almost parallel, bands over the region of the Trapezius, Deltoid, and upper part of the great Pectoral; ran on each side upwards and mesiad, over the clavicle, and over the ramus of the jaw to the symphysis, over which the two sides decussated. A few fibres passed over the lower and inner part of the exterior wall of the cheek-pouch, and lost themselves in the superficial fascia covering it[1].

Dermo-humérien (Cuv.), absent in CHIMP., was in AN. in close connection with the skin of the sides and back from the pelvis to the axilla, and was coextensive with the Latissimus dorsi, which it covered. It was also continued, though with scanty fasciculi, over the outer side of the thigh as far as the knee. Its ventral edge was the most muscular, from which it gradually became less muscular and more tendinous as it stretched dorsa, losing all its muscular fibres opposite the middle line of the back. In the axillary region its muscular fibres were also few, and in some parts absent; it gave a few fibres to the Lat. d. after having previously received a few from it. It continued to ascend, and this with greatly increased muscularity, till it was again gathered up and terminated by a tendon, which was inserted, together with that of the great Pectoral, below the head of the Humerus.

The connection mentioned above seems to be represented occasionally (Henle and Wood) in man by a connection between Latissimus dorsi and Pectoralis major; and in the Pigeon by a slip described and figured by Rolleston (Pl. 2).

Orbicularis oris in CHIMP. was mutilated.

Levator labii superioris, *Levator anguli oris* present, but not well differentiated.

Depressor labii inferioris not distinguishable.

Zygomatici were represented by one muscle, half-inch wide, which rose from the anterior half of the zygomatic arch, and from the temporal fascia above it. Over its most anterior origin a second strip rose from the temporal fascia, but fused with the rest of the muscle half an inch below the zygoma.

Sterno-cleido-mastoid in CHIMP. had a double origin from the sternum[2]. The clavicular tendon, broader than the sternal though narrow, arose from the sternal end of the clavicle[3].

[1] Cuvier says: "Dans le magot et les cynocéphales, il enveloppe l'épaule et s'étend en haut ou en arrière du cou beaucoup plus que dans l'homme."

[2] This double sternal insertion is not found in Man, nor does Vrolik mention it in the Chimp., though he does (p. 25) remark it in the oran-outan. Cuvier says nothing about it.

[3] Macalister, Wilder, and Wyman, also found the sternal part larger than the clavicular part. Duvernoy, in the Gorilla, found the reverse proportion. The

Acromio-basilar (Vicq. d'Azyr.) or Acromio-trachélien (Cuvier) rose in the CHIMP. from the occipital bone on a line with the occipital condyles[1], and was inserted into the acromial or external half of the clavicle anteriorly to the insertion of the trapezius. In AN. it was inserted into the exterior third of the clavicle, and rose from the ant. side of the transv. pr. of the altas, and by a tendinous slip from the occipital.

Trapezius in CHIMP. was as in man.

Omo-hyoid in CHIMP. was as in man[2].

Sterno-hyoid in CHIMP. was as in man, and marked nearly in the middle with a tendinous portion, as Macalister found it.

Sterno-thyroid in CHIMP. was as in man[3].

Thyro-hyoid in CHIMP. was as in man, the anterior or internal fibres of the sterno-thyroid being continued into it.

Great Pectoral in CHIMP. rose from the anterior or internal half of the clavicle, from the whole length of the sternum, from the cartilages of 8 ribs and the upper of linea semilunaris. Two additional strips were differentiated, a superior from the 4th and 5th ribs and a fascia stretched vertically between them, an inferior from the 5th rib close to the cartilages; these fused with the rest of the muscle opposite the lower border of the axilla[4].

The clavicular portion was not separated by a depression from the sternal portion, which depression is mentioned in man in several works, *e.g.* by Vrolik and Ellis. Macalister found no such separation in his CHIMP. It was inserted as in man. In AN. it was as in man with two exceptions; 1st, the clavicular origin extended only one-eighth of the length of the clavicle from its sternal end; 2nd, it was not distinctly differentiated from the lesser pectoral, as will be described.

The *Lesser Pectoral* in CHIMP. was distinct from the greater Pectoral, rose from the ends of the 1st, 2nd, and 3rd ribs, the aponeurosis between them, and an aponeurosis from the end of the 4th rib, by which its origin extended mesiad as far as the costal cartilages. It ended in a round tendon, which was inserted into the capsule of the joint, together with the insertion of the supra-spinatus[5].

sternal part is smaller in Cercopithicus, still smaller in Macacus (rhesus, sinicus, nemestrinus, and cynomolgus) and Inuus silvanus. Vrolik did not find it in Innus. It was the smaller in my An.

[1] It is found in all mammals below Man. Macalister (*Pr. I. Ac.* x. p. 124) says it occurs in one out of sixty human subjects. It seems to be correlated with a quadrupedal gait. It usually rises from the transverse process of the atlas, and sometimes the two following vertebræ; and is inserted into the acromion. It sometimes moreover (as in the rabbit) rises from the basi-occipital.

[2] The intermediate tendon, Vrolik says, "manque chez le macaque, le magot, et le babouin." Macalister (p. 343) found it as I did, but feeble. He also found it in Inuus and Macacus cynomolgus, and in Cynocephalus porcarius and hamadryas. Vrolik, he says, did not find it in Inuus and Cynocephalus.

[3] Macalister found it marked with a tendinous inscription, which was not present in mine.

[4] Wood (*Pr. R. S.* 1866) describes in a human subject a separate slip rising from the sixth rib, and compares it with "the so-called chondro-epitrochlear muscle of apes and monkeys."

[5] Wood found it giving a tendinous slip in several human subjects to the

In AN. the lesser Pectoral was not a separate muscle, but was represented by the deep portion of the great Pectoral. Its coracoid insertion was also feeble, and only gained by the intermediation of fascia. (These fibres are described in man by Henle as running vertically over the bicipital groove.) It also had an extended insertion along the external edge of the bicipital groove.

In CHIMP. a distinct fibrous band ran from the coracoid to the sternum between the articulation of the clavicle and the first rib. This is said by Rolleston and others to be the representative of the *Long Coracoid* of birds, monotremes, and reptiles. It partially fused at its anterior end with the sheath of the subclavius muscle (part of the costo-coracoid membrane), but eventually crossed it, and was inserted more anteriorly than the origin of the subclavius. It has been found by Gegenbaur to contain cartilage cells, but there were none in my CHIMP., though their absence may perhaps be accounted for by its adult age. A similar elastic band has been found in a Drill by Pagenstecher.

Subclavius was in both as in man.

Scalenus anticus in CHIMP. from the transverse processes of the 4th to 7th cervical vertebræ instead of from the 3rd to 6th as in man. It was inserted, as in man, into the "tubercle" of the 1st rib.

Scalenus posticus did not extend below the 1st rib, as is does in nearly all the lower monkeys. In Macalister's CHIMP. it did not extend below the 2nd rib. In AN. the division called posticus (proper) was inserted into ribs 3, 4, and 5.

The supra-pleural fascia (Quain, II. 894) was well developed in CHIMP.

Rectus Thoracis[1] absent in CHIMP., as also in Macalister's[2], rose in AN. from the inferior edge of the 1st rib opposite the insertion of the Scalenus anticus and the manubrium sterni, by a short, flat tendon, as far as the 3rd rib, where it again became tendinous, and was subsequently succeeded by the upper fibres of the Rectus abdominis[3].

Deltoid in CHIMP. arose as in man, and was inserted into the deltoid impression on the exterior side of the humerus, the upper

greater tuberosity of the humerus. Humphry (this *Journal*, I. 266) found its insertion extending across to the great tuberosity of the humerus in his Chimp.; Wilder found it inserted into the coracoid on the left, and into the humerus on the right side of his.

[1] *Camb. Journ. of Anat. and Phys.* May, 1868, p. 393, 4. Henle, p. 95.

[2] P. 346.

[3] From a simple case like that before us we should call the above muscle a prolongation of the rectus abdominis; but on viewing it as it appears in other animals (*e. g.* the crocodile), it seems on the whole to be a divaricated superior portion of the external oblique. It is however also said by Prof. Turner (*P. R. S. Ed.* 1866—7, p. 65) to be closely allied to the Panniculus carnosus; and he calls it "musculus sternalis," S. "sternalis brutorum." It should be mentioned that the inner layer of the greater Pectoral abutted at the upper end of its sternal attachment on the tendinous origin of the "Rectus thoracis," as it expanded to reach the manubrium, and below was continuous by means of an aponeurosis with the upper prolongation of the Rectus abdominis mentioned above.

end of its insertion being just continuous with the lower and external part of the insertion of the Pectoralis major (*i.e.* the part rising from the clavicle)[1]. In AN. it arose from nearly the whole of the clavicle.

Latissimus dorsi in CHIMP. arose from the spines of the 9th to the 13th dorsal, and all the lumbar vertebræ (4) from the supra-spinous ligament of that extent, from more than the outer half of the iliac crest, from the 10th to the 13th ribs, was connected with the tendons of the dorsal muscles, and with the External Oblique. It was inserted into the inner border of the bicipital groove, just internal to and alongside of the insertion of the Teres major, a few of the tendinous fibres being common to both insertions.

In AN. it differed from that in man in not interdigitating with the External Oblique, but having a long straight aponeurotic origin on its ventral aspect about midway between the angles and cartilages of the ribs (the interdigitations seem to be replaced by the muscle mentioned under Serratus magnus), by failing to reach the iliac crest by nearly two inches, arising instead from an aponeurosis joining some of the lower fibres of the External Oblique, and lower down from a lumbar aponeurosis, which extended down to the iliac crest[2]. Half-way down it sent a tendon upwards, which joined the lower end of the inner division of the Coraco-brachialis[3].

[1] In Humphry's, but not Macalister's, Chimp., it was continuous with the Triceps and Brachialis anticus.

[2] *Dorso epitrochlien* in Chimp. rose from the internal side of the tendon of the Latissimus dorsi, about two inches before its insertion, and was inserted in the internal condyle of the Humerus. Macalister (p. 344) found it ending in a fascia at the middle third of the arm, shorter than in most Quadrumana. Bergman and Halbertsma describe its anomalous occurrence in man. In mine, the muscular fibres extended down the upper two-thirds of the arm. With regard to the claims of the Dorso-epitrochlien to be considered a separate muscle, and not a part of the Latissimus dorsi, the strongest arguments are derived from the innervation. The Dorso-epitrochlien was supplied by a branch which was given off by the Musculo-spiral nerve soon after its origin; from the same branch a factor was given off which joined the Ulnar nerve just before this sent twigs to the inner head of the Triceps. The Latissimus dorsi, on the contrary, was supplied separately by a branch of the long Subscapular nerve, which arose higher, being given off simultaneously with the Musculo-spiral, but not from it.

[3] Vrolik describes the above-mentioned slip as being muscular, and as starting from the Coraco-brachialis, but wrongly says: "Il va se confondre avec la portion interne du triceps." A glance at his figure (IV. e.) shows that he has mistaken the Dorso-epitrochlien (f.) for the inner head of the Triceps.

The Dorso-epitrochlien is represented (Henle) in man by a constant tendinous band connecting the long head of the Triceps with the Latissimus dorsi, and crossing over the Teres major. This band represents its upper or proximal portion, and presents an instance of histological substitution. Its distal, or lower portion, is represented, as it seems to me, in man by the intermuscular septum above the internal condyle of the Humerus from which fibres of the Pronator radii teres often arise; these same fibres taking origin in our Chimp. (as will be hereafter shown) from the lower part of the tendon of the Dorso-epitrochlien. Prof. Rolleston has kindly pointed out to me an account, in a book of notes kept in the Biological department of the Oxford Museum, from which I quote the following extract: "In a child dissected, March, 1862, a distinct tendinous band passed down from the broad tendon of the Latissimus dorsi to the anterior surface of the long head of the Triceps, which it left at

This muscle was well developed in AN.

Levator anguli scapulæ in CHIMP. arose as in man from the posterior transverse processes of the first and second cervical vertebræ, but differed from that in man in not having a fascicle from the third. The superior fascicle split, just before its insertion into the superior inch of the posterior border of the Scapula, into several small factors. The second fascicle was inserted with the most inferior portion of the first fascicle.

Rhomboideus minor in CHIMP. was separate from the Rhomboideus major[1], and was as in man. In AN. the Rhomboidei were feebly separated, and the Rhomboideus minor extended up the ligamentum nuchæ to the occiput.

Rhomboideus major in CHIMP. rose and was inserted as in man, its tendon of origin fused with the overlying Rhomboideus minor. A curious and complicated fascicle, which must be considered as part of the Rhomboideus major, rose, *first*, from the spines of the 4th and 5th dorsal vertebræ, that from the 4th being fused with the most posterior part of the origin of the Rhomboideus major, joining it on its deep surface: *secondly*, from the spine of the 8th dorsal vertebræ. From the first origin a muscular slip, 1½ in. long, stretched backwards and outwards; from the second origin a flat tendon, ½ in. long, ran forward and outwards, and these met at a right angle opposite the 7th dorsal vertebra. From their junction a muscular band ran directly outwards like the stem of a Y, the two origins forming the two branches. This portion was 3 in. long, and was inserted into the most posterior or inferior angle of the Scapula with the most inferior part of the Rhomboideus major. At an inch from its insertion a few muscular fibres ran directly forward to fuse with the posterior part of the Rhomboideus major. An inch farther from the insertion the muscle took a third origin from the subjacent fascia, but not from the subjacent ribs.

No special nervous slip supplied any of the above.

In AN. no such muscle was found, and the Rhomboideus major presented no points of note.

Serratus magnus in CHIMP. was stronger than that in man. It was formed of three portions. The *first*, or lowest, arose from the 1st to the 10th ribs, instead of, as in man, from the 4th to the 8th or 9th[2]. It was inserted into the posterior or inferior angle of the Scapula. The *second*, or middle portion, radiated from its costal origin, and its digitations were only slightly marked. It rose from the 1st and 2nd ribs and intermediate fascia, instead of, as in man,

right angles. The muscular slip which represents this in the monkey was quite distinct from the long head of the Triceps in the Cercopithecus cynosurus, and in the Hapale penicillata."

[1] Vrolik (p. 18) says the Rhomboids are not differentiated, but his was a young specimen. Macalister (p. 343) says the same, and states that this often occurs in man.

[2] Macalister found it rising from ribs five to twelve inclusive. Wilder, from ribs five to eleven, and from the fascia covering the Intercostal muscles, by slips, of which the lower seven interdigitated with corresponding slips of the External oblique.

from the 2nd and 3rd ribs. It was inserted into the whole of the base of the Scapula, with the exception of the inch or so occupied by the insertion of portion 1. It was therefore commensurate with the insertion of the Rhomboideus minor and Levator anguli scapulæ. The *third* portion, which also arose from the 1st rib, and, by fusion of its tendon of origin with that of portion 2, also from the 2nd rib, was overlapped by portion 2, and was inserted into the anterior or superior inch of the posterior or dorsal border (base) of the Scapula opposite the insertions of the Levator anguli scapulæ. A small fascicle, rising from between the insertions of the Ilio-costalis, Longissimus dorsi, and Splenius colli, opposite the 5th cervical vertebra, was inserted into portion 3 just an inch from its origin from the 1st rib. It seems to come under the category noted by Professor Wood, under the head of "occipito-scapular."

In AN. it differed from that in man in having 3 costal attachments instead of 9. Of these the 1st was inserted into the 1st rib in nearly its whole length, the 2nd into the 2nd rib and fibrous tissue between the 2nd and 3rd, the 3rd into the 3rd rib. Of these the upper may be said to be again subdivided almost equally by an aponeurosis. It thus extended only as far down as the 3rd instead of the 8th rib, as in man. This latter difference, however, was not at first sight conspicuous; for a second muscle, seen on examination to belong to a deeper layer, extended down to the interspace between the 8th and 9th ribs[1].

Supraspinatus and *Infraspinatus* in both were as in man.

Teres minor in CHIMP. differed from that in man, by rising from the middle third instead of the anterior two-thirds of the ventral edge and adjacent part of the infraspinous fossa of the Scapula. In AN. it was as in man.

Teres major in CHIMP., larger than in man, rose from the posterior or dorsal $2\frac{1}{2}$ inches of the posterior edge of the Scapula and the adjacent part of the infraspinous and subscapular fossæ, abutting on, and partially overlapped by, not separated by an inch from the long head of the Triceps. It was inserted as in man. There was no such connection with the internal head of the Triceps as is described by Duvernoy. In AN. it arose from the posterior half of the Scapula.

Triceps and *Biceps* in both were as in man.

Coraco-brachialis in CHIMP. was divided into 2 parts, by a cellular interval, $1\frac{1}{2}$ in. long, through which the Musculo-cutaneous nerve

[1] This remarkable slip is not found in man, nor was it present in my Chimp. It was seen to rise from the angles of the first to the seventh ribs beneath the Serratus magnus in a line between the origins of the Longissimus dorsi and Sacro-lumbalis, and was attached to ribs four to nine. It seemed to be a specialisation of the external intercostals.

In an adult An., examined with a view to ascertain the constancy of some of the peculiarities noticed in this young animal, the Serratus magnus was found to extend to the tenth rib, but the additional slip noticed above was absent.

Henle mentions a deep layer to the Serratus magnus rising from the first or second rib, but fusing with the deep surface of the muscle. A somewhat similar arrangement was found in the Pectoralis major of my Chimp.

passed. The inner of the 2 divisions thus formed was fused with the coracoid head of the Biceps[1]. In AN. it was soon divided into two portions, of which one was inserted into the neck of the Humerus on the inner side of the inner edge of the bicipital groove, and corresponded with the 3rd human variety of Wood. The other portion was inserted into the middle fifth of the inner side of the Humerus, just anteriorly to the origin of the inner head of the Triceps, and in a line between that and the Brachialis anticus. It seemed to correspond with Wood's 1st variety. It was divided from the Biceps by the Musculo-cutaneous nerve, which did not pierce the muscle as normally in man, or as it did in CHIMP.

Brachialis anticus in both as in man[2].

Subanconeus in CHIMP. as in man.

Anconeus in both as in man.

Supinator radii longus in both as in man.

Extensor carpi radialis longior in both as in man, except that in AN. the muscular belly was not differentiated from Ext. c. r. br. In CHIMP. the remainder of the superficial extensors had, as in man, a common origin, and were not differentiated till they had passed one-third down the forearm. It will be best to follow the description of the arrangement in the human subject, and to note the differences[3].

Extensor carpi radialis brevior as in man.

Extensor communis digitorum in CHIMP. as in man, except that the little finger of the *right* hand received only a slip from the tendon going to the ring-finger, just opposite the metacarpo-phalangeal articulation[4].

Extensor minimi digiti in CHIMP. was as in man[5]. In AN. it

[1] This arrangement has been noticed in man by Wood (*Camb. Journ. of Anat. and Phys.* 1867, p. 46), and called by him Variety 2. There was no third Variety of Wood (also known as Coraco-brachialis brevis vel superior, and Rotator humeri). Macalister found a rudiment of it in his Chimp., and he says he has found it represented in all Quadrumana. A slip which I have mentioned under "Dorso-epitrochlien," found by me to be tendinous, by Vrolik to be muscular, joined the inner division of the Coraco-brachialis with the Dorso-epitrochlien. This is described by Wood in Variety 2.

[2] Rolleston found in both arms of a Chimp. a muscular slip parting from the upper and outer part of this muscle, and losing itself in the fascia of the forearm. This is not noticed by Vrolik or Duvernoy, nor did I find it in my specimen.

[3] Vrolik, while professing to do this ("de même que chez l'homme), has described a superficial Extensor Indicis. Now, while it is true that this fascicle was as distinct as that of the Extensor carpi radialis brevior, it is also the fact that careful dissection will distinguish an Extensor medii digiti, the muscular fascicle of which was however covered by the fascicle supplying the Index on one side, and by that supplying the little finger (Extensor minimi digiti) on the other.

[4] Macalister, Vrolik, and Moore found no tendon to the little finger. Macalister and Wilder found the tendons not readily divisible: they were readily divisible in mine. This slip, as well as one between the ring and middle fingers (less well marked in the CHIMP. than in man), is present in man in addition to the proper tendon to the little finger.

[5] This muscle was found by Rolleston in the CHIMP. Wood has found in the human subject cases of two tendons, two muscles, and an additional tendon to the ring finger. Vesalius (I. 258) describes a tendon of this muscle going to

differed considerably from that in man. Rising in common with the Extensor communis digitorum from the external condyle of the Humerus, but also from the fascia covering the upper end of the Radius, it passed down through its proper ring in the annular ligament, to be inserted into the outer side of the base of the 1st phalanx of the little finger, and by a second tendon into the outer side of the base of the 1st phalanx of the ring-finger. This arrangement has been noticed in the human subject by Wood and Vesalius (see note 5 in preceding page).

Extensor carpi ulnaris in CHIMP. as in man[1]. In AN. it had no origin from the ulna.

Supinator radii brevis in both as in man.

Extensor ossis metacarpi pollicis consisted of two quite separate bellies (as its homologue, the Tibialis anticus, did in the leg), having the same 2 insertions as the single muscle in man. Of these bellies that into the Trapezium, and the prolongation by a tendinous slip into the Abductor pollicis (noticed under that muscle), had the more superficial origin[2]. In AN. it was not double, but had a double insertion into the Trapezoid bone and the base of the metacarpal bone of the thumb, its tendon containing a sesamoid cartilage (replaced in man by a bursa mucosa) in relation with the quadrupedal habits of the animal.

Extensor primi internodii pollicis was absent in both[3]. In AN. its absence was more easily detected on account of the singleness of the Ext. met. poll.

Extensor secundi internodii pollicis in CHIMP., as often in man, gave a slip to the first phalanx also. It rose from the 2 in. or $2\frac{1}{2}$ in. in the middle portion of the Ulna, instead of from its lower half. In AN. it was as in man.

join the tendon of the Extensor communis to the ring finger in man. Macalister found it in the CHIMP., sending a single tendon to the little finger only.

[1] Macalister found a tendon which he calls "Ulnaris quinti" prolonged to the first phalanx of the little finger; as in the case of the Peroneus brevis (the homologue in the leg of the Extensor carpi ulnaris) in my CHIMP. This is also mentioned in man by Theile and Wood.

[2] The muscle is described by Vrolik (p. 20) as two muscles which he calls "petit Extenseur" and "grand Abducteur." He also found an additional tendon inserted into a sesamoid bone between the Scaphoid and Trapezium, the two others being inserted into the base of the metacarpal bone and the Trapezium respectively. Humphry found one tendon inserted into the Scaphoid and metacarpal (which in mine and Macalister's ended in the Trapezium), the second attached to the metacarpal. He says, Vrolik, Wilder, and Wyman found the same arrangement as Humphry. The muscle has been found in man double, and also sending a slip on to the Abductor pollicis, by Wood. (*Pr. R. S.* 1866.)

[3] Henle says that this muscle sometimes increases its size at the expense of the Extensor ossis metacarpi pollicis, which would represent exactly the reverse state to that which obtains in the CHIMP. The two cases show, however, the interdependence of these muscles. Rolleston found the muscle present in a CHIMP. In my CHIMP. two apparently separate muscles which crossed the tendons of the radial extensors of the carpus, and seemed to be from their position the Extensores ossis metacarpi and primi intermodii pollicis, respectively, were really the two separate divisions of the Extensor ossis metacarpi pollicis, as was shewn by their insertion.

Extensor Indicis as in man in CHIMP.[1]. In AN. it gave a tendon to the middle finger, as well as to the Index.

Flexor carpi ulnaris as in man in CHIMP. In AN. it rose from the internal lateral ligament, as well as from the condyle; the second rose from the Olecranon and the upper end only of the inner and anterior border of the Ulna.

Palmaris longus in both as in man; it was partly inserted into the anterior annular ligament, as in a CHIMP. dissected by Rolleston.

Flexor carpi radialis in CHIMP. as in man, except that its tendon was not free from muscular fibres till it reached the annular ligament. In AN. it was as in man, but relatively smaller.

Pronator radii teres in CHIMP. was inserted lower down the Radius than in man, and some of its fibres rose from the tendon of the Dorso-epitrochlien[2]. In AN. the second head of origin from the coronoid process of the Ulna was absent.

Flexor sublimis digitorum in CHIMP. as in man, with the following exceptions, which were the same in both hands. The fascicles to the different digits were more differentiated proximally than in man, and the tendons were much longer. The fascicle to the middle finger alone, instead of those to the middle and ring fingers, took an additional origin from the Radius[3]. In AN. it had no origin from

[1] It was found by Rolleston and Duvernoy, but not by Vrolik; Macalister and Humphry found a second tendon to the middle finger. Wilder found it as I did. See Wood for human varieties. The old dictum that "no ape can point" is therefore abundantly disproved.

[2] This latter difference, however, was only apparent, for these additional fibres rise in man (when they are present) from an intermuscular septum above the internal condyle of the Humerus, having the same position as the tendon of the Dorso-epitrochlien in the CHIMP., and seem to me to furnish the means of identifying the above-mentioned intermuscular septum in man as the homologue of the tendon of the Dorso-epitrochlien. (For further particulars see under the Dorso-epitrochlien. We shall find a parallel instance in the tendon of the Glutæus maximus, which furnishes origin to some fibres of the Vastus externus.) The two heads of origin in the CHIMP. were divided and innervated by the Median nerve, as in man.

[3] Macalister found no radial origin. In Rolleston's CHIMP., the only fascicle with a radial origin was that to the *Index*. I can find no other instance of this in man or monkeys: it throws much light on the way in which a muscle may, so to say, transfer its origin; as, for instance, the Flexor hallucis does, the homologue of which in the hand rises from the Radius, while it rises from the Fibula, the homologue of the Ulna. In my AN., as will be seen on referring to the description of the Flexor longus hallucis, the latter muscle is seen in the process of transference, having half its fibres of origin from the Tibia. By the time that man was evolved, the origin of this muscle had, however, quite established itself on the Fibula alone, for Henle remarks that it is very invariable. The case plainly put is this: In the same muscular stratum a fascicle rising from one or other side is, as a rule, differentiated to a definite digit or insertion; this fascicle, however, by not constantly arriving at the same destination, reminds us that the muscular stratum to which it belongs was originally undifferentiated, and was capable of a variety of differentiations. The fascicle to the little finger arose from the internal condyle of the Humerus, not in common with the rest of the Flexor sublimus digitorum (except by a small tendinous band), but in common with the Flexor carpi ulnaris. Macalister says Mr Moore found two tendons to the ring finger, none to the little finger, but

the coronoid process of the Ulna and the oblique line of the Radius. Traced upwards from under the annular ligament the tendons developed muscular bellies; at middle of the forearm the muscle split into two portions; the radial side subdivided. One subdivision fused with the Fl. c. r., and ran with it and the Pronator radii teres to the internal condyle. The other subdivision fused a little further on with a slip (which was a proximally extended representative of a common arrangement found in man, and called "Fasciculus exilis" by Henle[1], extending from this muscle to the Flexor longus pollicis or Flexor profundus digitorum), which ran from the internal lateral ligament and internal condyle to fuse with the Flexor prof. digit. with which it had a common origin. The other primary portion fused first with the Fl. c. u. and then with the Palmaris longus, with both of which it rose from the internal condyle and internal lateral ligament.

Flexor profundus digitorum in CHIMP. rose (as was also the case with the other flexor muscles) from the superior two-thirds instead of three-fourths of the Ulna. Its insertion also differed in not including a tendon to the Index, which was supplied with one by the Fl. l. p.; as in all the flexors its tendons were longer and the fascicles more differentiated than in man. In both hands the muscular bellies and tendons to the middle and ring fingers were more or less closely connected with each other, and with those of Fl. l. p.[2] In AN. it differed from that it man in rising from the upper two-thirds of the Radius as well as of the Ulna, and in giving a tendon to the thumb (that is, the origin and insertion of the Flexor longus pollicis were merged in this muscle). A muscular slip was differentiated to the little finger, though it was also attached by connecting fascia to the main tendon moving the other fingers.

Flexor longus pollicis rose in CHIMP. as in man, but had two tendons, one to the Index, which was large, while that to the thumb was small[3]. The tendon to the Index pierced the sublimis tendon

Wilder and Macalister found four tendons as usual. In both man and CHIMP., however, the fascicle to the Index is most deeply placed, then that to the middle finger, then that to the ring finger. In each case the fascicle to the middle finger rising more radially than that to the Index, their tendons cross, that to the Index lying the more deeply. In each case the tendons pass under the annular ligament in pairs, those to the two middle digits lying superficially. In the CHIMP. the fascicle to the Index was somewhat peculiar; rising by two distinct heads from the same origin, viz. that which was common to all the superficial flexor muscles: it developed a tendinous marking on the anterior surface of the more internal of these two heads, which only extended for half an inch, and gave this portion the appearance of being digastric. Careful inspection, however, showed that this tendinous portion took an oblique direction through the fascicle, and appeared again on its deeper or posterior surface. Here it soon again disappeared, but an inch above the point of its disappearance a similar tendinous marking appeared on the superficial or anterior surface of the fascicle, which was continued into the proper tendon. The tendons were inserted into the phalanges as in man.

[1] P. 197.

[2] Macalister found the muscle not distinct from the Flexor longus pollicis. Wilder found them separate in a CHIMP., Duvernoy in a Gorilla.

[3] This want of differentiation is sometimes partly retained in man, as

as if part of the Flexor profundus digitorum, as indeed the whole muscle really is. The muscle was so far differentiated into two that the muscular fibres, which ended in the tendon going to the thumb, extended much farther distally along the common tendon than did those which ended in the tendon going to the Index, and these (so to speak) would soon become separate in their whole course. The origin of the Fl. l. p. from the Radius, of the Fl. l. h. from the Fibula (the homologue of the Ulna), has been noticed under the Fl. s. d.[1]. In AN. it was absent, or rather undifferentiated from the Fl. pr. d.

Pronator quadratus in both as in man.

Lumbricales in CHIMP. as in man, except that the 4th arose not at all from the tendon of the Fl. pr. d. going to the little finger, but from the ulnar side of the tendon going to the ring finger, stretching over the tendon and blending at its origin with that of the Lumbricalis of the ring finger. The 2nd, as often in man, rose partly from the ulnar side of the tendon of the Fl. pr. d. going to the Index. In AN. they were, on the whole, as in man.

Palmaris brevis in CHIMP. (as far as could be seen from the shred of it which alone was left, the animal having been previously skinned) was as in man.

Abductor pollicis in CHIMP. as in man. It was not split into slips. Macalister seems to have found it the same. In AN. it rose by 4 heads, the origin from the annular ligament being subdivided into 3 divisions. We shall find several other instances of reduplication in the muscles of this animal, *e. g.* in the Iliacus, Psoas, Flexor brevis minimi digiti (hand), Extensor brevis digitorum (foot), Abductor hallucis, &c.

Opponeus pollicis in both as in man[2].

Flexor brevis pollicis in CHIMP. as in man[3]. It was supplied, as in man, by the Median nerve.

Under this muscle we must notice the "*Interosseus volaris primus*" of Henle. It rose in CHIMP. from the radial corner of the Os magnum, and from the ligaments covering it, not from the meta-

observed by Henle, Wood, and Turner, a muscular slip from the Flexor longus pollicis sending a tendon to join the tendon of the Flexor profundus digitorum to the Index.

[1] The tendon to the pollex crossed the other tendons of the Fl. p. d. in Humphry's but not Macalister's specimen. Vrolik found no tendon to the thumb; Humphry found the tendon to the thumb rising as a slender tendon from the palmar fascia and going to the last phalanx of the thumb in one specimen, and in another as a long thin tendon from the ulnar side of the Flexor profundus. Wyman found it as Macalister, Wilder found it conjoined with the Flexor profundus indicis. In both hands of my specimen there was a good deal of tendinous connection at the origin of the tendons with those of the Flexor profundus digitorum going to the middle and ring fingers.

[2] Duvernoy describes it in the CHIMP. as divided into two portions, one rising higher than the other on the annular ligament, and the longer fascicle inserted more externally than the shorter: but this was not the case in my specimen. Dr Embleton found it absent in a young CHIMP.

[3] Macalister found it as I did, but Humphry found the outer portion extending beyond the first phalanx.

carpal directly as in man[1]. In AN. the Fl. br. p. seemed to be as in man.

Adductor pollicis and *Abductor minimi digiti* in both.

Flexor brevis minimi digiti in CHIMP. arose as in man, but was inserted not together with the Abductor minimi digiti but distally to it in the same line, by two tendons, of which the external or radial was more distally inserted than internal or ulnar. It also gave two tendinous slips to the Abductor minimi digiti, with which in man it is often fused. In AN. it was not marked off from the Abductor minimi digiti by the deep branch of the ulnar nerve. The head, rising from the annular ligament, was split into three, placed in axial series (thus furnishing another instance of reduplication of muscles, such as we have noticed), and the ulnar nerve passed between these and the fourth head, which, as part of the muscle in man, rose from the tip of the hooked process of the unciform bone. All of these heads, except the most radially, which was also the most distally placed, of those rising from the annular ligament, were more or less fused during some part of their course with each other and with the Abductor minimi digiti, and were inserted together into the base of the first phalanx of the little finger; the most radially placed (before mentioned) having a similar but separate insertion.

Opponens minimi digiti was in both as in man.

Dorsal interossei in CHIMP. were 4. Abductors from the axis of the middle finger; the "Abductor indicis" was more largely developed than in man. It had a double origin from the index metacarpal, one from the base, the other from about two-thirds of its length. The radial artery, as in man, separated the origin of the metacarpal of the thumb from that of the metacarpal of the Index. It was inserted as in man. The other dorsal Interossei were as in man[2].

Palmar interossei six in number in CHIMP.[3], each rose from the whole of the metacarpal of the digit into which it was inserted, and

[1] Rolleston found it in his CHIMP. Wood mentions its presence in man.

[2] Macalister found them all as in man. In Ateles fuliginosus, in which the thumb is represented by a rudimentary metacarpal, he found them thus: "Of palmar Interossei there are, 1st, a normal first palmar from the 2nd metacarpal to the Index; 2nd, a thin superficial palmar rising from the front of the 3rd and 4th metacarpals, and inserted into the ulnar side of the first phalanx of the Index; this muscle looks like an Adductor pollicis with a displaced insertion; the other two palmar Interossei are normal. To the metacarpal of the pollex two small muscles are attached, one to the ulnar, one to the radial side, both springing from the second row of the carpus; the inner of these may be an Interosseus primus volaris, or a flexor; the outer is evidently the adductor."

[3] According to Duvernoy they are three in number (*i. e.* he reckons four, including the Adductor pollicis), and all "adduct" to the axis of the middle finger; they rise from the metacarpal bone of the digit into which they are inserted, in its whole length, and partly from the adjacent side of the adjacent metacarpal. It is plain that he only considers those as palmar Interossei which are inserted into digits which have no other slip of insertion from the dorsal Interossei on the same side, viz. the Index, ring, and little fingers. As, however, several other slips, placed on the palmar aspect of the dorsal Interossei, and concealed by them from the dorsal aspect, are provided with distinct

from the base of the adjacent one, and was inserted partly into the base of the first phalanx, partly into the extensor tendon, more distally than the insertion of the dorsal Interossei. No. 1, chiefly from met. II., partly from met. III., inserted into the Index which it adducted. No. 2, principally from met. III., partly from met. II., inserted into the middle finger, which it abducted radiad. No. 3 rose principally from met. III., partly from met. IV., and from an intermuscular septum, described below, inserted into the middle finger, which it abducted ulnad. No. 4, principally from met. IV., partly from met. III., and from an intermuscular septum at the origin of the Adductor pollicis, inserted into the ring finger, which it adducted. No. 5, principally met. IV., partly from met. V., and from an intermuscular septum, described below, inserted into the ring finger, which it abducted. No. 6, principally from met. V., partly from met. IV., and from an intermuscular septum, inserted into the little finger, which it abducted[1].

Dorsal interossei in AN. (which strictly ought not to be called dorsal, as none had a dorsal origin) rose from the distal part of the palmar ligament, and also from the bases of the metacarpal bones into which they were inserted; the 1st ("Abductor indicis") having also an origin from the base of the metacarpal of the thumb. This muscle had also a raphe, which united it to the other indical (2nd) dorsal Interosseus. They were 7 in number (as Church found the palmar set in the Cebus and Inuus nemestrinus); all the fingers had two, inserted on each side, and alternately abducting and adducting, except the little finger, which had one only.

Palmar rose from the distal part of the deep palmar ligament in common with the dorsal set. They had a common origin, were flat, and concealed the subjacent ones from view. They adducted the little and ring fingers (inwards). According to Church's description[2] of the Cebus and Inuus nemestrinus they resembled the same muscles in those monkeys generally, but differed in number; all were much like those of the Carnivora.

Some general remarks on the Interossei will be found under the description of those in the foot.

tendons separately inserted, it is better, I think, to describe the palmar Interossei as six in number. Church found seven in the Orang.

[1] The intermuscular septa mentioned above, from which Nos. 3 to 6 partly rose, were those between adjacent palmar Interossei. Since the palmar Interossei in man are all adductors, sc. of the Index, ring, and little fingers, these were represented by the 1st, 4th, and 6th in the CHIMP.; the abductors, sc. two of the middl and one of the ring finger, were palmarly divaricated portions of the 2nd, 3rd, and 4th dorsal Interossei of man. They were, however, in my CHIMP. quite separate and palmarly placed. Rolleston describes them thus in the CHIMP.: "The dorsal Interossei have their two heads from the opposed faces of the metacarpals less intimately connected than in man, and the head from the metacarpal of the digit into which this muscle is inserted, sends its tendon into the fibrous extensor expansion on the dorsum of the digit, whilst the other head has its insertion into the basal phalanx, and having its origin placed dorsally, and connected with both metacarpals at their carpal end, has its insertion palmarly to that of the other head."

[2] P. 9.

Diaphragm was carefully examined in CHIMP., and was found strikingly anthropomorphic; the 4 weak places (2 on each side), in which in man diaphragmatic or phrenic hernia sometimes occurs, viz. on each side of the ensiform cartilage, and also between the origin of the greater muscle from the last rib, and that from the Ligamentum arcuatum externum, were as well marked in the CHIMP. as in man.

LOWER LIMB.

Femur possessed a Ligamentum teres, in both CHIMP. and AN., as in all Quadrumana except the Orang.

Psoas parvus in CHIMP. rose from the last (13th) dorsal and first lumbar vertebræ, was attached to the bodies of the succeeding vertebræ by a fascia which overlaid the Psoas magnus, and received from it and transmitted to Ps. p. a few fibres. It overlaid the Ps. m., and ended in a flat tendon which was inserted into the lower part of the Ilium at the ilio-pectineal line, just where the femoral vessels emerged. In AN. it was well developed, rose from the intervertebral space between the 1st and 2nd lumbar, and from the fascia iliaca and transversalis as far down as the 6th lumbar, where its tendon, which was very strong, began. It was continuous with Poupart's ligament, and was inserted into the whole length of the upper border of the Pubes and lowest part of the Ilium, crossing the Psoas magnus as it left the pelvis. In man this muscle is very variable and inconstant, but generally rises from the last dorsal and first lumbar vertebræ.

Psoas magnus in CHIMP. rose from the last dorsal v., from the inferior surface of the interior inch of the last rib; from the body and transverse process of all the (4) lumbar v. and the tendinous arches passing across the hollow formed by the constricted portions of their bodies, becoming continuous with the Iliacus below this origin. It was inserted with the Iliacus as in man. In AN. it differed from that in man in rising not higher than the intervertebral space between the 1st and 2nd lumbar v. instead of from the last dorsal v. It was in two distinct parts; an external and superior, rising from the intervertebral spaces between the 1st and 2nd lumbar v. and down as far as between the 5th and 6th lumbar v. supplied by the Anterior crural nerve; and an internal and inferior, rising from the intervertebral space between the 3rd and 4th lumbar v. and as far down as the 7th lumbar v. (this increased number of lumbar vertebræ accounts for many differences both of muscles and nerves), supplied by the 3rd lumbar nerve. In man the whole muscle is supplied by the 2nd lumbar nerve. The two divisions were separated by the course of the lumbar nerves. This furnishes another instance of reduplication, and this set of muscles (the two Psoas and Iliacus) was much split up in this animal.

Iliacus rose in CHIMP. as in man, and soon fused with the Psoas magnus, the fibres running obliquely on each side into the Psoas magnus and its tendon, and gradually enveloping it from each side. In AN. it was on the whole the same. Near it were two remarkable slips;

one, which was probably the same as that mentioned by Owen[1] in the Orang (where, however, he does not mention any second origin from the Psoas magnus) was present on the right side, but not on the left in my young AN., and altogether wanting in an adult AN. which I examined specially. It rose by two heads, one from the external factor of the Psoas magnus opposite the 5th lumbar v., the other from the exterior border of the Iliacus, just as it left the pelvic cavity. These formed a round tendon which was attached to the lesser Trochanter on the outer border of the rest of the Ilio-psoas. It resembled those described by Henle and Luschka as "Iliacus internus minor" except in having a psoas origin. It thus formed a *Second Ilio-psoas*, and so far justified Henle in using the term Ilio-psoas in man instead of Iliacus and Psoas. It offers another interesting instance of reduplication. The second muscle rose from the Ilium at the under surface of the origin of the tendon of the Rectus, and from a line drawn from thence across the capsular ligament of the Femur. It was inserted into the line which runs from the upper part of the linea aspera, spirally inwards and forwards, limiting the neck of the Femur, between the insertions of the Pectineus and Ilio-psoas. It was better developed on the left than on the right side. On the right side it was inserted beneath the "second Ilio-psoas," and at the same spot (that muscle being absent, as above stated, on the left side). It was a reduplication of the Iliacus, and, together with the iliac head of the "second Ilio-psoas," represents, or rather is represented, by the "Iliacus internus minor" of Henle and Luschka in man. The Ilio-psoad set of muscles was thus much split up (as were the Glutæi in the CHIMP.); the Psoas magnus consisting of two distinct muscles, and there being a second Ilio-psoas, and a second Iliacus.

Tensor vaginæ femoris in CHIMP. differed from that in man in extending farther down the exterior border of the Ilium at its origin, in relation with the greater length of the Ilium. Its lowest point of origin was marked however as in man by the origin of the Sartorius. It only reached the anterior superior spinous process of the Ilium after fusing, or rising in common with the glutæus medius and minimus externally. Its origin was also common to the Sartorius internally and below, and the Transversalis internally and above. In AN. it rose half way down the anterior edge of the Ilium.

Glutæus maximus in CHIMP. was smaller relatively than in man, but larger than in AN., in correspondence with the more erect gait. It rose from a fascia covering and giving partial origin to the Glutæus medius, and rising from the exterior part of the whole of the crest of the Ilium, and posteriorly continuous with the fascia covering the dorsal muscles; from the Sacrum, sacrosciatic ligament, Coccyx, and ischial tuberosity by an origin shared by the long head of the Biceps. (This ischial origin is described by Duvernoy as a separate muscle which he calls "Ischii-fémorien.") Though it had this extensive origin, its muscular fibres did not reach higher than the

[1] *Proc. Zool. Soc.* Part I. (1830—31) p. 69; see also Church, p. 16.

sacro-sciatic notch; above this point what is muscular fibre in man was fibrous tissue in the CHIMP. It was separate from the Tensor vaginæ femoris. It was inserted into the whole length of the linea aspera along the origin of the Vastus externus (Henle mentions that in man some of the most external fibres are inserted alongside of the Vastus externus), and also by a distinct tendon into the fascia lata just below the great Trochanter. Its texture was coarse, especially in its lower part. Part of its tendon gave origin to some fibres of the Vastus externus and short head of the Biceps, which in man rise from an intermuscular septum occupying the same position, and which I think serve to identify that septum as the homologue of the tendon of the Glutæus maximus of the higher monkeys. A similar instance I have recorded under the Dorso-epitrochlien and Pronator radii teres. In AN. it was covered by a dense fascia containing much hard yellow fat and clinging very close to the muscle. It rose not higher than the lowest part of the Sacrum and the root of the tail. Its fibres became fused with those of the Tensor vaginæ femoris opposite the great Trochanter (at which point some fibres were given off to terminate in the linea aspera), while the remainder terminated with those of the Tensor vaginæ femoris in the fascia lata. The muscle was weak, especially at its origin.

Glutæus medius in CHIMP. was the largest of the three Glutæi, and relatively larger than in man. It rose from the fossa Ilii below the crest in its whole length, and as far down as half the length of the Ilium. Also, opposite the upper fourth of the Ilium, from the fascia above-mentioned, overlying it. It was inserted into the posterior edge of the great Trochanter in its whole length. A small fascicle a quarter of an inch broad separated from its anterior or exterior border, and was inserted into the anterior and distal part of the great Trochanter, on the opposite side of the Vastus externus from rest of the glut. med. In AN. it was largely developed as usual in Quadrumana, and with difficulty separable from the Pyriformis.

Glutæus minimus, the smallest of the three in the CHIMP. (Macalister found it twice as large as the Glutæus medius), rose from a line drawn from one inch below the ant. sup. spinous of the Ilium, to its posterior and inferior extremity, opposite the acetabulum. The fibres from the anterior or superior portion rose from a wider origin than the rest, the line of origin decreasing in breadth as it ran backwards. It had no origin from the coccyx, it could be separated with some difficulty into two nearly equal portions, an interior and deeper, and a posterior and superficial, overlapping the hinder part of the first. From the former of these the Scansorius was differentiated. The tendons, which occupied equal lengths of insertion along the proximal or upper 1½ in. of the anterior surface of the great Trochanter, were distinguishable but not separate. These two divisions are mentioned in man by Henle. Beneath the Glutæus minimus a small muscle a quarter of an inch broad, and two inches long, quite separate from it, rose from the exterior edge of the Ilium on a level with the uppermost part of the ischiadic attachment of the sacro-sciatic ligament, and was inserted into the anterior edge of the great

Trochanter just opposite the insertion of the second part of the Glutæus medius with which it agreed in breadth. In AN. it showed no signs of fission or reduplication; it rose from the exterior of the Ilium within two lines, the upper starting from a point one-third down the anterior edge of the Ilium, and running backwards and downwards to the upper extremity of the sacro-sciatic notch; the lower running from a point two-thirds of the distance down the anterior edge of the Ilium backwards and downwards to a point just opposite the acetabulum. It was inserted as in man.

The *Scansorius* in CHIMP. was very imperfectly separated from the Glutæus minimus, the anterior half of which overlapped it. It formed about a quarter of that muscle, being differentiated from the anterior and deep portion, and was inserted together with its most anterior portion into the anterior and distal part of the great Trochanter. It was supplied by the superior Gluteal nerve in common with the rest of the Glutæus minimus[1]. In AN. it was undifferentiated[2].

Pyriformis in CHIMP. was really, but not obviously, separate from the Glutæus medius. It rose from the lower part of the 2nd, 3rd, and 4th, and upper part of the 5th sacral vertebræ, from the adjacent part of the deep surface of the Ilium, but not from the sacro-sciatic ligament. It was inserted into the proximal end of the great Trochanter, being at its extremity slightly united with the tendon of the Glut. med., with which it shared a bursa mucosa. In AN. it was nearly fused with the Glut. med.

Obturator internus in both had an origin somewhat more extended, and elongated by the increased length of the iliac bones than in man; viz. from the whole of that part of the brim of the pelvis which was formed by the Ilium and Pubis, except opposite the obturator foramen, where the fibres rose from the tendinous arch which ran below the obturator vessels and nerve, across and below that foramen; from the internal aspect of the long symphysis Pubis, and adjacent part of the lower border of the Ischium as far as the tuberosity; also from the obturator membrane, and from all the internal surface of the Pubis and Ischium mesiad of a line drawn perpendicularly through the obturator foramen. Its tendon was overlapped by the Gemelli and fused with them, and they were inserted together into the digital fossa on the internal and posterior side of the great Trochanter, as in man.

Gemellus superior in both rose from a point just above the troch-

[1] Vrolik could not find it. Macalister found it one-fifth of the size of the Glutæus medius. Its presence in man is recorded by Wood.

[2] In CHIMP. we see a remarkable tendency in the Gluteal set of muscles towards fission or reduplication, such as we found to obtain in many other muscles, which we have noticed as they have been described, but in AN. especially in the Ilio-psoad set:—the Glutæus maximus in CHIMP. was so far separated into two as to have been described by Duvernoy as two muscles; the Glutæus medius was bifid and had its two parts differently inserted; the Glutæus minimus not only showed the two divisions described in man by Henle, but in addition threw off a Scansorius, and a still more distinct muscle mentioned above, from its deep surface, thus being split into four divisions.

lear surface of the Ischium, where there was a small rudiment of the ischial spine.

Gemellus inferior in both as usually in man, much the smaller of the two Gemelli. It rose from an origin 2 in. in length, commencing at the most dorsal, posterior, or superior part of the internal ridge of the ischial tuberosity, and ending at the ventral, inferior, or mesial one-third of the same edge.

Quadratus femoris in both arose as in man. It was inserted not into the linea quadrati as in man, but into a horizontal line, extending from the lesser Trochanter outwards, and a little downwards for about three-fourths of an inch. There was, however, about half way along this line a small vertical insertion extending along the posterior edge of the great Trochanter, in a line feebly representing the linea quadrati of man. The upper part of the insertion of the Adductor brevis overlapped the exterior part of the insertion of this muscle.

Coccygeus in CHIMP. was as in man, except that it was readily divisible into two portions. Its insertion was fused with the coccygeal part of the origin of the Glutæus maximus. The perineal muscles had been destroyed in removing the abdominal viscera.

Biceps femoris in CHIMP. was as in man in general. The short head was well developed; the long head rose, as in man, from the most external part of the external edge of the tuber Ischii, its origin being common also to the Semitendinosus, but also, unlike man, to the Semimembranosus which the Semitendinosus overlapped; to the most posterior part of the Gracilis, which the Semimembranosus overlapped and which was much larger relatively than in man, also to the lowest part of the origin of the Glut. max., which in man has no origin from the tuber Ischii. Its tendon ran for one inch before receiving the fibres of the short head. The fusion between the tendons of the two heads was not complete, but the tendon of the long head crossed over that of the short head and was inserted into the outer and anterior tuberosities of the Tibia, as well as into the fascia of the leg, which was continuous at the knee-joint with the fascia lata of the thigh. The tendon of the short head crossed under that of the long head and was inserted into the prominence at the exterior side of the head of the Fibula, and into the fascia of the leg, distally to the tendon of the long head[1]. In AN. the Biceps was very

[1] The proper tendon of each of the heads was ½ in. broad. In the Gorilla and in the Orang the Biceps consists of two distinct muscles, no fusion taking place as in CHIMP. and still more in man. In CHIMP. compared with most other Quadrumana the insertion was very high, and the muscle itself small, an anthropomorphic point. In man there is but one conjoined tendon from the two heads. The original separateness of the two heads was even in CHIMP. plainly indicated by the difference in the mode of their innervation; they were both supplied by the great Sciatic nerve as in man but in a different way. In man this nerve gives off separate branches to the Adductor magnus, Semitendinosus, Semimembranosus, and Biceps. In CHIMP. a separate trunk was formed as the great Sciatic issued from the sacro-sciatic foramen, and after a course of 4 in. gave off (1) a branch which supplied the origin of the Semitend. by several twigs, (2) a branch which bifurcated and supplied the upper one-third

large. Its short head was wanting, as sometimes in man (Henle and Theile) and the lower monkeys. Its insertion was very long, occupying nearly half of the Fibula. It was inserted chiefly into the fascia of the leg, a strong band being given off to the covering the knee-joint, and a less strongly marked one to the outer tuberosity of the Tibia, but there appeared to be no special insertion into the head of the Fibula[1].

Semitendinosus in CHIMP. rose from the tuber Ischii in common with and below the long head of the Biceps as in man, with which it was fused for its first three inches, and also in common with and superficially to the Semimembranosus, unlike that in man. It differed from that in man in being larger instead of smaller than the long head of the Biceps, and not having a tendinous inscription (which, however, was found by Macalister in his CHIMP.), also in its insertion, which was comparatively much lower down than in man. Vrolik found it inserted as in man. Its tendon proper was inserted into the anterior tubercle of the Tibia, two inches from the top of that bone, and was well marked, flat (it is round in man), and one-third of an inch broad; but about three inches before it reached its insertion it suddenly gave off a wide-spreading expansion (represented in man as observed by Ellis, p. 705) downwards, which was three-fourths of an inch wide at one inch distant from its origin, and the most posterior fibres of which became quite perpendicular. This expansion became continuous with the fascia of the leg. The insertion was overlapped by that of the Gracilis, with the aponeurotic expansion of which it fused. The tendon was not so long as in man, as Vrolik also found[2]. In AN. this muscle rose in common with the long head of the Biceps, and was inserted very low down the leg, much lower than in CHIMP. Two principal tendons were given off, one exactly opposite the upper

of the long head of the Biceps, (3) it split into branches which supplied the proximal part of the Add. ma., the mesial part of the Semitend. and Semimembr. and the separate external or distal division of the Add. ma. The short head was supplied by two twigs separately rising from the main trunk of the great Sciatic nearly opposite the middle of the thigh. The bearing of this arrangement on the general question of progress as indicated by Integration will be found noticed under the great Sciatic nerve.

[1] The distinctness throughout of the two heads and their tendons in the Gorilla and Orang, as well as their different mode of innervation in CHIMP. and the absence of the short head in the Cebus and Inuus nemestrinus, in AN. and many other Quadrumana, and also occasionally in man, all point to the essential distinctness of the two as separate muscles. The progress from the absence of the short head in the Cebus, Inuus nemestrinus, AN, &c., and the complete distinctness of the heads and their tendons in the Gorilla and Orang, through the partial fusion of the tendons in CHIMP., to the complete fusion in man, is remarkable, and would, as far as it goes, serve as an argument for placing CHIMP. at the head of the Quadrumana.

[2] Cuvier has remarked that in all Mammals below man this muscle and the Semimembranosus possess this aponeurotic expansion at their insertion, and that their insertion is also much lower down the leg than in man, which keeps their knee necessarily bent and is incompatible with an erect gait. The approach to an erect gait is therefore indicated by the removal upwards of their insertions. Professor Rolleston informs me that this comparatively low insertion of the hamstring muscles is still to be seen in young children—a most significant fact.

part of the insertion of the Gracilis, and inserted into the lower part of the anterior tubercle of the Tibia, the lower fusing with the lower end of the Gracilis, and ending with it in the fascia of the leg at a point more than half way down the leg. There was no tendinous intersection.

Semimembranosus in CHIMP. rose as in man. It was overlaid at its origin by the conjoined origin of the Biceps and Semitendinosus, and was fused with that part of this conjoined origin which was continued into the Semitendinosus for one inch, and after that, partly (by several small and separate tendinous slips) for another 1½ inch. Its tendon of origin was flat and long, as in man, being 3 inches in length. The muscle was of the same size as the long head of the Biceps, *i.e.* smaller than the Semitendinosus; in man it is larger than either. Its insertion differs from that in man (Macalister, in p. 349), in not possessing a slip expanding into the aponeurosis overlying the popliteus muscle. Between its tendon and the internal lateral ligament of the knee-joint was a bursa. It sent no fibres to this ligament as it does in man. Its tendon of insertion was rounded and small, and reached the Tibia one inch more proximally than the upper part of the insertion of any of the other three hamstring muscles[1]. In AN. it resembled that in man, except that it had no membranous origin and only one insertion, viz. that into the posterior part of the internal tuberosity of the Tibia.

Gracilis in CHIMP. rose from the whole length of the Symphysis Pubis, and the interior inch of the upper edge of the pubic ramus, by a flat membranous tendon half an inch long, which overlapped diagonally and fused with the part of the Add. l. which was adjacent to the most exterior part of its origin. It was inserted just superficially to the insertion of the Semitendinosus and agreed with the latter in the breadth of its tendon proper (half-inch), but differed in having its tendon a little the shorter; it also agreed with the Semitendinosus exactly, in the insertion of its tendon proper into the lower part of the anterior tibial tubercle, 2 in. from the top of that bone, and of a rapidly spreading tendinous expansion into the fascia of the leg. It differed quantitatively in an enormous degree from that in man in every particular, being much larger, as is the case in the orang (Church, p. 10), but agreed qualitatively. Its insertion, like that of all the hamstring muscles except the Semimembranosus, was much lower than in man. It was the largest of the hamstring muscles, and was broad and flat. In AN. it had a wide origin and was not inserted into the inner tuberosity of the tibia, but into the fascia of the leg and anterior ridge of the middle third of the Tibia, straightening of the limb.

Sartorius in CHIMP. was large, and rose from the *lower* part of the anterior edge of the Ilium, and was fused with a few of the fibres of the external part of the Iliacus, with Poupart's ligament, with the Tensor vaginæ femoris, the Gl. min. and the Rectus femoris[2], inserted

[1] Vrolik says it is inserted lower down than in man, but this was not the case in this specimen, nor did Owen find it so.

[2] No such slip from the origin of the Pectineus, passing under the femoral

superficially to the Gracilis, but without a bursa between them. In AN. it rose as in man, but was inserted into the upper half of the anterior ridge of the Tibia and the fascia of the leg.

Rectus femoris in CHIMP. resembled that in man, but rose by one and not two separate tendons as in man[1], inserted as in man, but was more separate from the Crureus than in man. In AN. there were also not two separate heads of origin; the fibres had no penniform arrangement.

Vastus externus in CHIMP. agreed with that in man in every respect, except in its relations to Glut. max. (which see above).

In AN. it was, as in man, except that the short head of the Biceps being absent, it had no origin from an intermuscular septum between the short head of the Biceps and itself.

Vastus internus in CHIMP. rose higher, as far up as the neck of the femur.

Crureus in CHIMP. differed in being more closely connected with the Vastus ext. than with the Vastus int.

Subcrureus in both was absent.

Pectineus in both as in man.

It was not bilaminar in either, but it was found by Macalister to be so in CHIMP.

Adductor longus in CHIMP. was generally as in man. In AN. it arose as in man, but differed slightly in fusing with the tendon of the Adductor magnus.

Adductor brevis in both was in general as in man but relatively larger. It was multi-fasciculate, but in CHIMP. was inserted into the oblique line leading not from the small but the great Trochanter, to the linea aspera. The Obturator nerve pierced it and divided it into two portions, at the same time supplying it as in man.

Adductor magnus in CHIMP. consisted of two distinct divisions, the deeper and larger rose from the whole of the anterior surface of the pubic bone along the Symphysis, and the adjoining part of the Ischium as far as the tuberosity. It was inserted into the linea aspera along the lower half of the thigh, fusing with that of the Add. l. It was multi-fasciculate, and supplied by the Obturator nerve. The superficial and smaller division, more compact, overlapped the preceding below, and arose from the Tuber Ischii by a flat thin ten-

vessels, as is described by Owen, could be found, but with regard to this connection when it exists, Cuvier's remark on the "castor" (beaver) is not a little interesting: "Le couturier est tout-à-fait confondu dans le castor avec les pectinés."

[1] Vrolik asserts that there are two origins;—in my CHIMP. the tendon of origin arched round the upper edge of the acetabulum (as does the 2nd origin in man), but this portion was not separate. In man, however, the two origins are united by membrane, and in CHIMP. they admitted of being readily separated. It rose from the anterior inferior spinous process of the Ilium (as in man) and from two lines diverging from it on each side like the legs of the letter A, and capping the acetabulum, also from an aponeurosis giving origin in order from above downwards to the Tensor vaginæ femoris, Glutæus minimus, Sartorius and Rectus, and, externally to the origin of the Rectus, to the small muscle mentioned as underlying the Glutæus minimus; by which aponeurosis the origins of all the above-mentioned muscles were connected.

don, and was inserted separately into quarter of an inch on the internal side of the internal condyle of the Femur[1]. In AN. it was multifasciculate, but not in two separate divisions.

Obturator externus in CHIMP. had its origin, in general, as in man.

Gastrocnemius in CHIMP. was as in man and was large, but the muscular fibres were continued as far as the insertion into the calcaneum; see also foot-note[2].

Solæus was large. It rose from the head and upper three-quarters of an inch of the Fibula instead of from its upper one-third. There was no origin from the Tibia[3].

Plantaris in CHIMP. as in man. It was absent in the right leg[4].

In AN. it was fused with the outer head of the Gastrocnemius for half an inch from its origin, and was partly united with it by ten-

[1] Cuvier in his plates draws in a figure of a Magot, an Adductor having a similar but not so distinct insertion (l^2), which he calls "long adducteur," but as he also calls it "Ischii-fémorien" it cannot be homologous with the Add. l. of man (Church has, wrongly I think, translated it "Adductor longus," p. 13), which rises from the Pubis. This fascicle is apparently the same as that here described in CHIMP. Ellis describes two more or less distinct parts of this muscle in man, which differ in the same way in texture and insertion, but are not really separate. In CHIMP. the superficial part of the Femoral artery *divided the two portions* before reaching the popliteal space; and since it *pierces* the Adductor magnus at the same portion of its course in man it furnishes another reason why the distinct second portion in CHIMP. may be identified as part of the Add. magnus, specialised. Moreover, the Obturator nerve supplied the principal portion, the great Sciatic nerve the superficial and smaller division, both of these nerves in man supplying the Adductor magnus. Henle describes a slip somewhat similar to the second portion which I have described.

Burdach describes the 3 Adductors as one muscle in 5 divisions; the Add. m. furnishing two, the Add. l. the 3rd, and Add. br. the 4th and 5th. He also says that Meckel includes the Pectineus as a 6th (could he do so consistently if he had found it bilaminar?).

[2] Church says that in the Orang it is small and often separate from Solæus; in Inuus nemestrinus it was more separate than in the cases in which it was found to be fused in the Orang. The only points in the CHIMP. worth remark are that the inner head was fused with the insertion of the second portion of the Add., this head neither being separate nor extending so low as in man. A bursa underlaid this head and communicated with the knee-joint as in man. No sesamoid bone or fibro-cartilage could be found in the external head. The tendon slightly differed from that in man, in that the muscular fibres were continued as far as the insertion into the Calcaneum (Macalister's CHIMP. differed in this respect from mine, while Wilder's agreed with it), running on each side into the tendon which lay in the middle.

[3] The tibial head was absent in a CHIMP. dissected by Macalister (the fibular origin being very large). It is absent in AN.; in the Orang and Cebus (Church, p. 14), and the Gorilla (Duvernoy, p. 93). In the Inuus nemestrinus it rose from the fibula and external condyle of the Femur. Vrolik mentions in CHIMP. a tibial but no fibular origin. The tibial head was found by Humphry in a CHIMP. The fibular origin was found a mere slip in CHIMP. by Humphry and Huxley, and by Church in the Orang.

[4] Macalister found it very small, present in the left leg, absent in the right, the opposite arrangement was found by Wilder. Vrolik found it as well as Huxley and Humphry; it was absent in Traill's specimen. In the Orang (Church, p. 14) it was absent, also in the Cebus; it was large in the Inuus nemestrinus and arose as in the CHIMP. Duvernoy says it is absent in the Gorilla and Orang. It is often absent in man. It was absent in a young CHIMP. dissected by Dr Embleton.

dinous slips for one inch further, at this point being connected with the outer head of the Gastrocnemius by a broad fibrous band. Its muscular belly was longer than either of those of the Gastrocnemius, and its greatest breadth was half that of the Solæus[1].

Popliteus in CHIMP. as in man.

In AN. a small slip of muscle, not found in an adult AN. specially examined, but present in a Wanderoo (Simia ferox), ran from the upper (external) head of the Popliteus to the internal head of the Gastrocnemius.

Flexor longus digitorum in CHIMP. arose as in man. Its tendon was more fused with that of the Fl. l. h. It could be seen, that, but for the fusion above mentioned, this muscle would furnish tendons only to the 2nd (index) and 5th toes[2].

In AN. it was the sole mover of the index and little toes, but moved the others by its intimate connection with the Flexor longus hallucis. It also sent a distinct slip to the tendon of the Flexor longus hallucis going to the hallux.

Lumbricales. Most of these muscles in CHIMP. took origin both from the tendons proper of the Fl. l. d., and those of the Fl. l. h. That one, however, which went to the 2nd toe rose only from that of the Fl. l. d. It was the largest. That one which went to the 3rd toe rose by two heads, one from the tendon of the Fl. l. d. going to the 2nd, principally from the fibular, but partly also from the deep and tibial aspects; the other from the tendon of the Fl. l. h. going to the 3rd toe, from the internal, and internal half of the superficial surface. That one which went to the 4th toe rose from the tendons of the Fl. l. h. going to the 3rd and 4th toes, from the adjacent halves of their superficial aspects, and the adjacent sides. That one which went to the 5th toe rose from the tendon of the Fl. l. h. going to the 4th toe, from its superficial aspect, and fibular side, and by another small belly, from the adjacent half of the superficial surface and tibial side of the tendon of the Fl. l. d. going to the 5th toe. Most of these reached proximally as far as the division into separate tendons,

[1] In contrasting the muscles of the tendo Achillis in CHIMP. and AN., we find the general arrangement very anthropomorphic in the former, very much the reverse in the latter, but there are some exceptions. For while AN. has a smaller Gastrocnemius, the heads of which are separate far down, on the other hand its tendon is longer; the muscular fibres quite ceasing half way down the leg, though AN. was a young one. In both the Solæus has only a fibular origin. The Plantaris is large and partly fused with both the Solæus and both heads of the Gastrocnemius in AN., but is small and separate except at its origin in CHIMP. as in man. In AN., however, the tendons of all three muscles remain separate till just before their insertion, when they simultaneously fuse; in CHIMP. as in man the Solæus is fused during nearly its whole extent with the Gastrocnemius, the Plantaris being separate at least in its muscular portion; its tendon also not fusing completely till just before insertion.

[2] Duvernoy describes in the Gorilla the Flexor longus digitorum sending tendons to all the digits. Church found it in the Orang sending tendons to the 2nd, 4th and little toes, and sending no slip to the tendon of the Flexor longus hallucis. In my CHIMP. it was inserted as in man, and in the same way as the Flexor profundus in the hand.

and extended distally for three quarters of an inch, but the small belly of the Lumbricalis of the little toe had only a minute origin which was attached about three quarters of an inch from the division of the tendon of the Fl. l. d. going to the little toe.

They were inserted as in man, and were quite as well developed as those of the hand, in which point they differed from those in man, which in general they resembled. The chief differences were those of origin, which were due to the continuance of tendons from the Fl. l. h. to all the digits except the index and little toes[1].

Flexor accessorius in CHIMP. in both feet rose from the Calcaneum, a little anterior to the internal tubercle (by one head, not two as in man) and stretching inwards and forwards was inserted into the external edge of the tendon of the Fl. l. d. just before the fusion with the tendon of the Fl. l. h. The tendon was much longer, and smaller than in man[2]. In AN. it was well-developed, and was present also in an adult AN. specially examined, and rose from the fibular side of the middle part of the plantar surface of the Calcaneum by a fleshy head, and from the adjacent corner of the Cuboid by a tendinous head; and was inserted into the outer side of the point of intercommunication of the common tendons of the Fl. l. d. and l. h., thus running diagonally across the Calcaneum.

Flexor brevis digitorum in CHIMP., a very complicated muscle. The principal portion rose from the inner side of the os-calcis as far as the tuberosity, and from the deep surface of the plantar fascia, by which it was connected with the origin of the Abductor pollicis. Two minute tendons were sent from that going to the third to fuse with the tendon of the flexor brevis going to the second (index) toe, just mentioned, which they did opposite the metacarpo-phalangeal articulation, one of them developing about half-way a very small muscular belly. A small muscular belly was also detached from the main portion, and ended in a tendon which fused with the tendon to the 4th toe. This last rose from the surface of the tendon of the Fl. l. d., as far as the internal malleolus, and was chiefly

[1] Duvernoy says, that only the Lumbricalis of the 2nd toe arises from the corresponding tendon of the Flex. long. dig., the others rising from the tendon of the Flex. long. hal. Dr Embleton mentions "a small muscle accessory to the Lumbricales arising from the long Flexor tendon before its division." He gives no further account of it. Could it possibly be that part of the Fl. br. d. which sent a tendon to the 4th toe in mine?

[2] This muscle was absent in Rolleston's and Embleton's specimens. Humphry found it small in both feet of one CHIMP. In another CHIMP. it did not reach the flexor tendon in one foot, and was absent in the other foot. Church found it in the Orang, sending a tendon to the tendon of Flexor longus to the little toe, and another, which accompanied that tendon, and, after being perforated by it, was inserted into the second phalanx of the little toe. Humphry could not find it in Orang, but found it large in Ateles. In AN., Cebus, and Inuus nemestrinus, it fused with the tendon of the Flexor longus digitorum, as in man.

The coexistence of this muscle with the irregular slips described under Fl. br. d., which have been stated (as by Vrolik, and apparently by Church, as above) to partly represent the Accessorius, tends to establish their nature as that of scattered portions of Fl. br. d., as hereafter described, and at any rate in CHIMP. disproves their homology with the Moles carnea.

inserted into the 4th toe. A portion of it joined the tendon before described going to the 3rd toe. A small slip also rose from the tendon of the Fl. l. d. to the little toe, and was inserted indistinctly, being much fused by fibrous tissue, with the tendon of the Fl. l. d. going to the little toe. The fascicle to the little toe is most irregular in its arrangement in the Quadrumana and in man.

In AN. the Fl. br. d. was very different from that in man. It consisted of the following parts: (1) a long head rising from the lower surface of the Calcaneum, in common with the Abd. p. and Abd. 5ti as well as to fascicle 2. It was inserted into the 2nd toe. In the left foot but not in the right, it received two minute slips from the next. (2) A compound fascicle from the conjoined tendon of Fl. l. h. and Fl. l. d., and consisting of one proximal and distinct belly, and three other distally placed and less distinct bellies; they ended in a tendon inserted into the 3rd toe. In the right foot, but not in the left, the first and second bellies of portion 2 each gave a small tendon to the conjoined tendon of Fl. l. h. and Fl. l. d. (3) from a similar and parallel origin inserted into the 4th toe. The last two received slips from the plantar fascia. (4) A small fascicle in the left foot, from a belly common also to portion 3 (in the right foot rising separately), inserted into the 5th toe.

Tibialis posticus in CHIM. rose as in man. Its tendon split more definitely than in man into two, one of which was inserted into the Scaphoid, the other into the Ecto-cuneiform bone. No sesamoid body could be found in its tendon, as is usual in man. In AN. as in man, except that its tibial origin did not extend so far down as that of the Fl. l. d.

Flexor longus hallucis in CHIMP. rose as in man, except that the origin of the Solæus not extending down the Fibula for more than one inch, all below this was occupied by it. Its tendon, besides furnishing a tendon to the Hallux, furnished one to the 3rd and 4th toes[1]. In AN. this muscle rose equally from Tibia and Fibula, from the latter of which in man it is separated by the Tib. post. This tibial origin, which was paler, explains the fact that the Fl. l. p. rises in man from the radius, the Fl. l. h. from the Fibula; we here, as it were, see the muscle transferring its origin[2]. The tendon was intimately fused with that of the Fl. l. d., so that the action of either muscle bent all the toes. As usual in Quadrumana it supplied the middle and fourth toes as well as the Hallux. The tendon to the Hallux, which passed through a ligamentous ring giving partial origin to the inner head of the Flexor brevis hallucis, received a slip from the tendon of the Fl. l. d. Theile mentions a similar slip in man.

Peroneus longus in CHIMP. as in man, but strong, and the fleshy fibres extended to the malleolus. In AN. it was as in man, except that it rose from the upper half of the Fibula, instead of from the upper third.

[1] The descriptions by various authors shew that these two muscles in Quadrumana vary greatly in their relations to one another and in the toes they respectively supply. See Vol. I. of this *Journ.* p. 266.

[2] In man this muscle is very invariable. Henle, p. 292.

Peroneus brev. in CHIMP. resembled that in man in its origin, but was stronger, and had a second tendon running along the 5th metatarsal connected by fibrous tissue with that bone, and fusing with tendon of Ext. l. d. and lumbricalis. This second insertion is not uncommon. In AN. as in man, but rose from the middle 1-3rd instead of the lower half of the Fibula.

Peroneus tertius absent in CHIMP.[1] In AN. it differed considerably from that in man. On both sides it rose from nearly the middle one-third of the Fibula enclosed in the P. br. Its tendon passed through the annular astragalo-calcaneal ligament with that of the P. br. (the Per. longus being in a separate channel). Its tendon fused with the extensor tendon of the little toe. This will be seen to be really a Peroneus quinti.

Extensor longus digitorum in both as in man[2].

Extensor proprius hallucis in CHIMP. as in man, but more powerfully adapted for abduction by passing under another ligament, besides the annular ligament, which extended from the tuberosity of the Scaphoid to the base of the inner metatarsal bones, and which gave passage also to the two tendons of the Tib. ant.[3] In AN. it rose from the upper two-thirds of the Fibula and interosseous membrane, but otherwise as in man.

Tibialis anticus in CHIMP. was, as is often the case, double, and the internal and larger tendon inserted into the Ento-cuneiform bone was separate throughout from the external and smaller tendon, which was inserted into the base of the metatarsal bone of the Hallux. In AN. it rose only from the upper half of the Tibia. It showed a tendency to become split, and we must remember that this was a young animal.

[1] Macalister says it is never present in Quadrumana, "the so-called Peroneus tertius of Wyman, in the Howling monkey, being a Peroneus quinti;" Rolleston, however, found it in a CHIMP. Church mentions it in the Inuus nemestrinus and Cebus, and I found it in AN. on both sides; but in all the three latter at least it did not pass together with the tendon of the Ex. l. d., but with that of the P. br. Again, it was not inserted into the base of the fifth Metatarsal, but fused with the tendon of the Ext. l. d. opposite the Metatarso-phalangeal articulation, just as did the accessory tendon which I found to the Peroneus brevis (see above). In the Cebus it perforated the tendon of the Peroneus brevis opposite the Cuboid bone. Does not this perforation in the Cebus of the P. br. tendon, together with the second tendon which I found to the Peroneus brevis in CHIMP., go to show that the so-called P. tertius of Quadrumana is really a divarication of the P. br.? Wood mentions a "Peroneus quinti" as a human anomaly.

[2] The tendon, after passing under the anterior annular ligament, passed through a separate sheath springing from the base of the Calcaneum, and again inserted close to its origin, running upwards and inwards; from the superficial end of this sheath a small slip ran inwards to join the annular ligament over the internal malleolus. I can find no description of this ligament in any of the books, but I found it in AN. and CH. By its means the tendon was held just distally to the external malleolus. It is not found in man.

[3] This ligament is mentioned by Duvernoy in the Gorilla, but he says that the tendon follows the line of the metatarsal and first phalanx of the thumb, which was not the case in my CHIMP. It is not mentioned by Vrolik, Macalister, or Church, nor can I find any mention of it in CHIMP. It was present in AN.—Henle mentions that in man this muscle is occasionally double.

Extensor brevis digitorum in CHIMP. was as in man, except that it rose partly from the special sheath from the Calcaneum, transmitting the tendons of the Extensor l. d. The hallucal division was not separate, as has frequently been found by others to be the case. In AN. it was as in man, except that the tendon to the Hallux and next toe were given off by a common muscular belly, and the inner side of the muscular belly for the middle toe was attached by fascia to the inner side of the metatarsal of that toe, besides its insertion into the tendon of the common Extensor. A small muscle rose from the Calcaneum at its neck, and was inserted into the inner side of the base of the metatarsal bone of the great toe, together with one of the tendons of the Tib. ant. It exhibited a variability, which we found to obtain in the muscles of the hand, being absent in an adult AN., specially examined. It would seem to be a reduplication of the Ext. br. d., such as we have noticed in other muscles, *e. g.* Abd. p., Fl. br. 5ti (in the hand), and Iliacus and Psoas in the lower limb.

Abductor hallucis in CHIMP. as in man. Duvernoy found it so in the Gorilla[1]. In AN. it was different from that in man, and different on the two feet. On the left foot the proximal head rose with part of the Fl. br. d. and Abd. 5ti from the under surface of the Calcaneum, and joined the distal part of the second head (as was the case in the second head of the Fl. br. d.). The second head rose by two fascicles, one from the internal, one from the external side of the Scaphoid bone; these joined the tendon of the first head, and the common tendon was inserted into the external side of the base of the first phalanx of the great toe. In the right foot the second head rose not from the Scaphoid bone, but from the deep fascia opposite it, and a third head was added, also from the deep fascia opposite the tarso-metatarsal articulation.

Flexor brevis hallucis in CHIMP. was very different from that in man. Its *inner head* rose from several origins, principally from the Ecto-cuneiform bone, just where the second tendon of the Tib. p. was inserted. From this origin the internal portion (α) ran and fused with the lowest $\frac{3}{4}$ in. of the tendon of the Abductor. This fusion is found in man and in the Gorilla and Orang. The next portion (β) was inserted into the internal sesamoid bone. An underlying portion (γ) rose from the Ento-cuneiform, and was inserted with the last portion (β). Rolleston found the inner head prolonged by a tendinous expansion to the distal phalanx. The *outer head*, being that portion eventually inserted on the outer side of the tendon of the Flexor longus hallucis, was thus arranged: the most internal portion (α) rose together with portions α and β of the inner head from the Ecto-cuneiform bone, and, crossing under the tendon of the

[1] In the Cebus and Inuus nemestrinus it had two distinct heads, one from the Calcaneum, the other from the plantar fascia. In the Orang it was inserted into the metatarsal as well as into the first phalanx. Vrolik describes two origins in CHIMP., one from the Ento-cuneiform, but also says it is as in man; this second origin is probably part of the Flexor brevis, the fibres of which as in man fuse with the tendon of the Abductor hallucis.

Fl. l. h., was inserted into the external sesamoid bone, as is the case in man. The next portion (β), having a similar origin and course, but larger, was inserted into the outer edge of the external sesamoid bone, fusing at its insertion with some of the adjacent fibres of the Abd. h., which fusion is also seen in man. The deepest portion (γ), consisting of 3 fascicles, rose from the Ento-cuneiform with portion γ of the inner head, and from the external side of the metatarsal of the Hallux in its whole length, and was inserted principally into the middle of the external sesamoid bone between the insertions of portions α and β; part however fused with portion β, and was inserted with it, and part fused directly with some adjacent fibres of the Adductor, and was inserted into the external edge of the external sesamoid bone[1]. In AN. it rose by two distinct heads: the inner from the internal Cuneiform bone, with one of the palmar Interossei, was inserted into the internal sesamoid bone, and into the base of the first phalanx of the Hallux; the outer rose along the line of the middle metatarsal bone, from the deep plantar ligament and sheath of the tendon of the Flexor longus hallucis going to the Hallux, and from a tendinous band of origin of the Interossei in that region. It was inserted into the external sesamoid bone, and the base of the first phalanx of the Hallux in common with the insertion of the Add. h. The identity of this muscle was proved by (1) its insertion, (2) its action, (3) its relation to the tendon of the Fl. l. h., which separated its two halves.

Adductor hallucis in CHIMP. was much larger than in man. Its principal origin was from the middle metatarsal in its whole length, and from an intermuscular septum between that and the fourth metatarsal. Its anterior and most transverse fascicle also rose from the distal end of the second as well as middle metatarsal, and its posterior or interior fascicle rose largely from the sheath of the Per. l., and the superficial and internal aspects of the base of the second metatarsal. It was easily separable into many fascicles, and might have been described as several muscles. Its general appearance was much more that of an Add. p. than of an Add. h., and it was stronger than the Add. p. It was inserted into the external side of the distal end of the metatarsal of the Hallux, some of its fibres fusing as in

[1] This last portion is called by Henle "*Interosseus volaris primus.*" All the deep portions in the CHIMP. also took origin from the sheath of the Per. l. All the superficial factors of both heads also had origin from the sheath of the tendon of the Flexor longus hallucis. Vrolik describes the muscle as rising from the Ento-cuneiform, and forming a thin muscular fascicle. In the Gorilla and Orang Duvernoy describes the whole muscle as rising from the Scaphoid and Ento-cuneiform. In the Orang Church found it rising from the Ento-cuneiform and plantar fascia, the external portion being inserted into the first phalanx, the internal into the metatarsal. In the Inuus nemestrinus the interior belly rose from the Ecto-cuneiform, and was inserted into the external sesamoid bone.

The whole muscle was supplied by the internal plantar division of the posterior tibial nerve. I could find no twig given from the deep branch of the external plantar to the external head, as sometimes in man (and as the analogy of the deep branch of the ulnar nerve in the hand would lead one to expect); that branch seeming to lie at a deeper level also than this muscle.

man with the adjacent part of the external head of the Fl. br.[1] In AN. it rose from the fascia and intermuscular septum between the metatarsals of the second and middle toes along rather more than their distal half; from a fascia, giving origin also to the plantar Interossei (thus showing its nature as an Interosseus), and to the external head of the Flexor brevis hallucis; also from the whole of the plantar surface of the base of the first phalanx of the second toe. It was inserted with the adjacent outer head of the Fl. br. h. into the outer side of the base of the first phalanx of the great toe. Its origin thus differed widely from that in man.

Abductor minimi digiti in CHIMP. was large, rising from the whole of the anterior and plantar edge of the tuber Calcis, and from the plantar fascia. Its external portion was inserted into the base of the 5th metatarsal. The next portion was inserted by a very delicate tendon into the external side of the base of the proximal phalanx of the little finger. The internal and main portion, which exhibited a penniform arrangement (a tendon which diminished from the origin of the muscle downwards, and disappeared before the insertion, lying on the middle of its plantar surface), developed one larger and two smaller tendons opposite the metatarso-phalangeal articulation, while other fibres were continued to the very insertion. These middle and internal portions were inserted just internally to the first[2]. In AN. it was as in man, and by its extensive connection with plantar fascia would give it tension and also flex the three exterior toes, owing to the fusion of the plantar fascia with the tendons of the Fl. br. d. of those toes. In an adult AN. there was also another muscle rising externally to it, and inserted into the base of the metatarsal of the little toe.

Flexor brevis minimi digiti in CHIMP., absent in Rolleston's CHIMP., rose as in man. Its origin was complicated, by being shared by the palmar Interosseus of the little toe, and also by a muscle which certainly fulfilled the requirements of an Opponens. In AN.

[1] Duvernoy, in the Gorilla, describes it as two muscles, "adducteur oblique" and "adducteur transverse," according to the direction of the fibres. But no interval, such as that drawn by Duvernoy (Pl. x.) in the Gorilla, could be seen in my CHIMP., though its most transverse fascicle could be divided from the rest, as could several other fascicles. Vrolik does the same, and says that the oblique portion comes from the Cuboid, the transverse from the fifth metatarsal. I could find neither origin. He says also that it consists in man of the same portions. Church, in the Orang, found a fascicle rising from a ligament "stretched from the head of the third digit to be inserted into the distal end of the metatarsal and proximal end of the first phalanx of the second," and inserted into nearly the whole length of the metatarsal of the Hallux. Cuvier also calls this portion "adducteur transverse."

[2] It is curious that the insertion into the base of the 5th metatarsal (that of the external portion) is correlated with the absence of the so-called Peroneus tertius in CHIMP. and Cebus (Church, p. 17); but in the Inuus nemestrinus this insertion coexists with the Peroneus tertius. In CHIMP. it is weak, however, perhaps owing to the additional Extensor tendon given by the Per. br., and fusing with the Extensor tendon of the little toe. Vrolik found this muscle inserted into the second phalanx by a very fine tendon. Henle (p. 300, and Fig. 150, p. 296 a b q') describes an insertion into the tuberosity of the metatarsal as normal in man.

it rose from the base of the 5th metatarsal bone, and was inserted into the outer sesamoid bone and fibular side of the base of the first phalanx of the little toe. It was obviously an Interosseus.

Opponens minimi digiti in CHIMP. rose in common with the preceding, and with the palmar Interosseus of the little toe, and was inserted into the external and plantar surfaces of the 5th metatarsal in its whole length[1].

Transversalis pedis was wanting in CHIMP. as a separate muscle, as in the Orang, Cebus and Inuus nemestrinus, and occasionally in man; but was represented by the transverse portion of the Adductor hallucis.

Interossei in CHIMP. were of the same number as in man, but abducted and adducted relatively to the middle digit as in the *hand* of man and CHIMP., not relatively to the 2nd (index) digit as in the *foot* of man[2]. The first *dorsal* was much the largest, and had a broad origin from the base of met. I. as well from the side of met. I. like the Abd. indicis in hand.

In AN. the *Dorsal Interossei* were seven, and were inserted in the same manner as the plantar Interossei, and as in man. The internal (first and second) arose from the base of the metatarsal of the second toe, and were inserted one on each side of the second (index) toe. The third rose from the base of the metatarsal of the second (index) and middle toes, and was inserted into the internal (tibial) side of the middle toe. The fourth rose from the bases of the third and fourth metatarsals and was inserted into the external (fibular) side of the middle toe. The fifth rose with the fourth, but principally from the fourth metatarsal, and was inserted into the internal (tibial) side of the fourth toe. The sixth rose from the bases of the fourth and fifth metatarsals, and was inserted into the external (fibular) side of the fourth toe. The seventh rose from the base of the fifth metatarsal with the Flexor brevis minimi digiti, and was inserted into the internal (tibial) side of the fifth (little) toe. The dorsal Interossei alternately adducted and abducted from the middle toe.

[1] I can find no description of this muscle in any of the anthropoid apes, but Henle and Huxley describe it as normal in man. It was found in a CHIMP. by Rolleston. This muscle is described and figured by Dr Halford in the Macaque. He also describes a similar muscle in the Hallux, and says that "Professor Huxley has not shown that Table IV. does not apply to the foot of the Gorilla, CHIMP., etc." Now, so far as CHIMP. is concerned, I can answer that no muscle was *inserted* into the length of the metatarsal of its Hallux, though I can confirm Dr Halford's conjecture as to the presence of a similar muscle in the fifth metatarsal, as described by Huxley and Henle in man. Part of the Flexor brevis hallucis *rose* from the whole length of the *outer* side of the first metatarsal, as I have described.

[2] Duvernoy, who makes this comparison *à propos* of the Gorilla, refers it to the prepotence of the middle digit in the hand and foot of apes, and the second digit of the foot of man, as indicated by the superior length. This was also the case in the Macaque. The differences entailed by the point of abduction and adduction being the middle toe in the Anthropoid apes, the second in man, are as follows:—the middle toe in the Anthropoid apes, the Index in man has two dorsal (abductors), no plantar Interossei (adductors). The adaptation of the same general plan, the dorsal being abductors, the plantar adductors, is highly interesting.

Table of *Dorsal* Interossei in AN.

Adductors which were also partial flexors.
2nd adducted 2nd (index) toe.
5th adducted 4th toe.
7th adducted 5th (little) toe.

Abductors.
1st abducted 2nd (index) toe.
3rd abducted 3rd (middle) toe towards Tibia.
4th abducted 3rd (middle) toe towards Fibula.
6th abducted 4th toe.

The 4th and 6th were also partial flexors.

In AN. the *Plantar* Interossei were three adducting to middle toe. They all rose from a common origin, viz. from the base of the middle met., and from a ligament stretched across the plantar space[1].

The external Plantar Interosseus ran to the base of the first phalanx and extensor tendon of the 5th toe, both on the tibial side. The second and first arose by a common muscular slip, and afterwards divided and were inserted each by a similar double insertion, the third on the tibial side of the fourth toe, the second on the fibular side of the second toe. They thus all adducted their toes towards the middle toe.

In both feet a small slip of muscle ran from the interior (tibial) side of the first (internal) Plantar Interosseus (rising from the intermuscular septum between the dorsal and Plantar Interossei), and was inserted into the distal part of met. III. This extra muscle points to the prepotence of the middle toe, as indicated also by its length. We find the same prepotence in CHIMP., where the adduction and abduction are to and from this toe instead of the second, as in man[2].

[1] This is mentioned by Church in the Inuus nemestrinus and Cebus, and he does not seem to consider these muscles as Interossei. It is, however, at least significant that they all adducted towards the middle toe which, as we have seen, is the prepotent digit in the foot of apes. He found the same arrangement in the hand.

[2] Though these two layers were distinct, and one lay more dorsally than the other, still, as Church remarks of the Inuus nemestrinus, there were no dorsal Interossei, as none had a dorsal origin, and also, but for the set which I have called plantar (as being more plantar than the other, and lying superficially to it), and which Church does not seem to consider Interossei, his account of them in the Inuus nemestrinus would tally with mine in AN. Moreover, the real nature of the Fl. br. 5^1 appears, for it is evidently an Interosseus.

Duvernoy remarks that in the Gorilla, as I also found in CHIMP., the dorsal Interossei are not so dorsally placed as in man. Moreover, this fact was plainly set forth in the hand of my CHIMP., in which parts of the dorsal Interossei were so far divaricated palmarly, as to be positively palmarly, and not at all dorsally, placed. In the lower monkeys, as Cebus, Inuus nemestrinus and in AN., there are really no true dorsal Interossei, but two layers of Plantar, the more dorsally lying of which we may take, if we please, to represent the dorsal Interossei. The more plantarly placed resemble the Interossei of the Carnivora, as Church remarks. We therefore have an ascending series, from that case where the dorsal Interossei are plantarly placed (represented by the Cebus and AN., the more plantarly placed resembling those of the Carnivora), to

Abdominal Muscles.

Rectus abdominis in CHIMP. powerful, had two origins, as in man. The posterior wall of the sheath was founded by the aponeurosis of Transversalis only, the anterior by those of the external and internal oblique, thus differing from the arrangement in man. It was marked by four "inscriptiones tendineæ" (as in Vrolik's) which went quite through the muscle to the sheath.

In AN. it became continuous with a fascia interposed between it and the inner layer of the Pectoral opposite the fifth rib, and was attached, as in man, to the cartilages of the fifth, sixth and seventh ribs.

Pyramidalis in both was absent as in Vrolik's specimen.

External Oblique in CHIMP. rose by seven digitations from ribs 5 to 11 inclusive, the two lowest interdigitating with Lat. d., the rest with Ser. m. It was inserted into the ant. sup. iliac spine for half an inch only, into Poupart's ligament and the linea semilunaris. Its fibres ended below at the level of one inch below the anterior superior iliac spine, and mesially opposite the line of the Rectus. In AN. its first upper digitations were received not between those of the Ser. m., which failed to reach it, but of that special development of the Intercostals which has been already noticed.

Internal Oblique in CHIMP. resembled that in man. In AN. it did not reach the last rib.

Transversalis in both nearly as in man. The Fascia transversalis in CHIMP. was better developed than in man, in correlation with the increased strain on the abdominal muscles.

Nerves.

The factors given according to Quain, and Flower's Plates.

The innervation of the muscles closely resembled that in man, and did not call for remark except in the following particulars.

Anterior Thoracic in CHIMP., which supplied both Pectorals, seemed to receive supply from all the factors of the Brachial flexus, not only from C. V., C. VI., and C. VII.

Nerve to the Subclavius in CHIMP. had no communication with the Phrenic.

In CHIMP. the *Scalenus anticus* was supplied by C. VIII., instead of C. IV.

Phrenic nerve was formed in CHIMP. by C. IV. and V.; in AN. by C. IV. No connection could be found with the sympathetic in either.

Middle cervical Ganglion was fused with the 3rd in both.

Third cervical Ganglion in both was placed as in man at the root of the neck in an angle enclosed by the subclavian and vertebral arteries, which it more or less surrounded with plexuses. It sent

the anthropoid apes, where these are more dorsal, and thus to man, where they are more dorsal still. This dorsa migration of Interossei is very interesting.

twigs in company with the vertebral artery into the vertebral canal in the 7th cervical vertebra, another to join the 8th cervical nerve, another to join the recurrent Laryngeal nerve.

Circumflex nerve in both was formed of C. V, VI, VII, instead of by C. V, VI, VII, and VIII.

Posterior Thoracic nerve (external respiratory of Bell), was formed in CHIMP. by C. V. and VI. as in man. In AN. by C. VI., and VII.; but the 5th cervical nerve, which supplied the Rhomboideus major, gave twigs to the serratus magnus, which thus received its supply from C. V. and VI (also as stated above from C. VII) though in a different manner from that in man.

Intercosto-humeral in AN., unlike its representative in man and CHIMP., pierced the lower part of the Scalenus post., which was inserted in the 3rd and 4th ribs and not into the 2nd.

Nerve to the Levator anguli Scapulæ in CHIMP. was C. IV, not C. III.

Nerve to Rhomboideus minor was C. III. in AN., C. V. in CHIMP. as in man.

Supra-scapular in CHIMP., formed by C. V. alone instead of C. V. and C. VI.; nerve to *Teres major* in CHIMP., was from the Subscapular, but from the circumflex in AN.; and this latter arrangement has been noticed as an abnormality in the human subject by Prof. Turner[1].

Median in both passed under instead of superficial to the Brachial artery in the upper arm[2]. It communicated by its main branch with the ulnar nerve in CHIMP.[3] but not in AN. at about one-third of the distance down the forearm, and supplied the fingers simultaneously, and not from 2 main divisions. There was no supra-condyloid foramen.

Ulnar nerve in CHIMP. was small till it had received its factor from the median, when it doubled its size. It received a factor from the branch of the musculo-spiral nerve that supplied the Dorso-Epitrochlien, after which it gave some twigs to the inner head of the Triceps as it passed it, which possibly are derived from the branch of the musculo-spiral joint membrane.

Musculo-cutaneus in CHIMP. passed through a cellular interval in the coraco-brachialis, much more pronounced than in man. In AN. it did not pierce the Coraco-brachialis but passed quite beneath it (dividing it from the Biceps), and not superficial to it, as Wood[4] says is always the case in the 1st human variety, with which this arrangement otherwise corresponded.

Gangliform enlargements over the back of the carpus, at the end of the posterior Interosseous nerve, and on the branch of the

[1] *Nat. Hist. Rev.* Oct. 1864, p. 615.

[2] Professor Turner has noticed a similar arrangement several times in the human subject; and Prof. Humphry informs me that its occurrence is almost always associated with some abnormal disposition of one or other of the main arterial trunks of the limb, which is a point of some practical as well as morphological importance.

[3] I have just met with an example of this in a human subject.

[4] *Camb. Journ. of Anat. and Phys.* 1867, p. 45.

Circumflex going to the Teres minor were present in CHIMP. as in man. In AN. they could not be distinguished.

Flexor profundus digitorum in CHIMP. was supplied by the anterior interosseous as well as by the main trunk of median and the ulnar.

Flexor longus pollicis in CHIMP. was supplied from the main trunk of the Median as well as from its anterior interosseous branch.

The general arrangement of the nerves of the lower limb and Lumbar and sacral plexuses was in CHIMP. very similar to that in man, but very different in composition, which was perhaps due to the fact that there were 13 instead of 12 dorsal vertebræ. The differences in composition will be more readily seen by the following Table.

MAN	CHIMP.
Ilio-Hypogastric, and Ilio-Inguinal, L. I.	D. XIII.
Genito[1]-crural, L. I. II.	D. XIII.
External cutaneous, L. II. III.	D. XIII. L. I.
Obturator, L. III. IV.	D. XIII. L. I. II.
Anterior crural, L. II. III. IV.	D. XIII. L. I. II. III.
Superior gluteal, L. IV. V.; S. I.	L. III. IV.; S. I.
Sacral plexus, L. IV. V.; S. I. II. III. IV.	L. I. II. III. IV.; S. I. II.
Small sciatic, L. IV. V.; S. I. II. III. IV.	L. III. IV.; S. I.
Great sciatic, see Sacral plexus.	

Psoas parvus in CHIMP. was supplied by D. XIII. instead of L. II. In AN. by L. II. *Psoas magnus* by D. XIII., and anterior crural in CHIMP. instead of by L. II. In AN. the superior part (see description) by the ant. crural, the inferior by L. III.

Pyriformis, in AN. but not CHIMP. by the Superior gluteal, not as in man from the 2nd Sacral n. *Obturator int.* in CHIMP. supplied as in man from the sacral plexus, but the arrangement was different; for while in man one twig rising separately from the plexus supplies it; a second, subsequently and separately arising, supplying the Gemellus superior; and a third, subsequently and separately rising, supplying the Gemellus inferior and Quadratus femoris; in CHIMP. one nerve was given off from the sacral plexus, which bifurcated and sent one division to the Ob. int; the other division then gave off a twig to the superior edge of the Gemellus sup., then dived below the conjoined tendon of the Ob. int. and Gemelli, supplying the Gemellus inf. and ended in the Quadratus femoris. (The two Obturator muscles are *never* supplied by the same nerve.) In AN. the same nerve supplied both Ob. int. and Gemel. inf.[2]

[1] It also differed from that in man in lying externally instead of internally to the Psoas magnus.

[2] It will be observed in the arrangement of the nerves of the lower limb, as compared with that in man, that in many cases in which adjacent parts are supplied in man by nerves which are given off separately from a primary nerve-trunk, the same parts in these animals are supplied by nerves given off from a

Coccygeus in CHIMP. by the 3rd, and not the 4th and 5th sacral nerves. The *great Sciatic* nerve in CHIMP. did not divide till the Popliteal space, but in AN. almost as soon as it issued from the Pelvis. The point of bifurcation varies widely in man[1]. In both its distribution varied somewhat from that in man. In AN. the proximal end of the long head of the Biceps (the short head being absent) was supplied by the int. pop. n. the distal part by the ext. pop. The Semitendinosus and Semimembranosus were supplied together by a common branch of the great sciatic, instead of by separate branches, another instance of lowness of Integration. In CHIMP. a separate trunk from the great Sciatic high up after a course of 4 in. gave off (1) a branch to the origin of the Semitendinosus; (2) a branch which supplied the upper third of the long head of the Biceps; (3) the remainder split into branches which supplied the proximal part of the Add. m., the mesial part of the Semitend. and Semimemb., and the separate external division of the Add. m. (noticed under that muscle). The short head of the Biceps was supplied by two twigs separately rising from the main trunk of the great Sciatic nerve, nearly opposite the middle of the thigh. Another instance of want of Integration; but it is curious that the anthropoid CHIMP. furnishes a better instance of it than the low AN.

Sartorius supplied in CHIMP. by the main branch, and also (unlike that in man) in its lower part by the Internal Saphenous. *Pectineus* in CHIMP. supplied by a somewhat large branch from the Ant. cr. n., and by a very small branch from the ob. In AN. by Ant. cr. n. only. (In man the twig from the obturator is inconstant.)

secondary branch together; that is to say, in man the primary nerve-trunk has absorbed the secondary trunks into itself. This is a good instance of the advance in "Integration" in man, as compared with animals less highly organised.

[1] Quain, Vol. II. p. 675, Turner (*Nat. Hist. Rev.* Oct. 1864, p. 616) says that such early duplicity, when it occurs in man, almost always coexists with duplicity of the Pyriformis.