tarsal of the hallux; this has not been described by other authors, nor indeed is there any trustworthy evidence of the existence of such a muscle in any of the Mammalia."

Macalister (Proceedings of the Royal Irish Academy, vol. i., 2nd series, page 506) describes an opponens hallucis in the Gorilla. Bischoff, however, was unable to find such a muscle in the specimen which he dissected (Beiträge zur Anatomie des Gorilla, p. 31, *loc. cit.*).

An opponens minimi digiti is very common, and often very strongly marked. It may be regarded as belonging in some instances to the adducting or plantar layer, and in others to the intermediate or flexor layer. Thus Ruge has conclusively shown that in the human foot (when present) it is a special development of the flexor brevis minimi digiti. He says:[1] "in the earliest periods in the development of the human foot every trace of an opponens of the little toe is awanting. First by the aberration of fibres of insertion of the flexor brevis on to the head, and outer surface of the fifth metatarsal the beginning of an opponens becomes gradually noticeable; in older subjects this becomes further developed, and more turned in direction until, finally, the whole outer surface of the fifth metatarsal serves for the insertion of the muscle. In preparations from later embryonic periods, the flexor and opponens fibres appear separate in their distal portions, so that the opponens reaches a greater and greater degree of independence the further the process of separation goes on. At the same time the opponens, now distinct, comes to lie under cover of the flexor. This condition remains throughout life, but still the muscle in the adult shows a decrease in its circumference, and may even have disappeared altogether. These conditions occur so very frequently that I may say they are the rule."

In the Lemur and in the phalanging marsupials the opponens minimi digiti has apparently the same origin as in man.

On the other hand many of the digitigrade Carnivora afford a beautiful example of its association with the plantar layer. We have already seen it in the Dog, Cat, Puma, Leopard, Lion, Otter, and Pole-Cat, arising in common with the adductor minimi digiti.

III. The last point that we have to consider is one of great interest, viz., that the relation of the intrinsic muscles of the foot to the metatarsus in many animals corresponds to transitory conditions in the foot of the human embryo.

Ruge in his memoir upon the Development of the Muscles of the Human Foot shows that the interossei muscles in the foot of the early embryo are plantar in position, and that the upward growth of the dorsal interossei and the formation of the interosseous spaces take place as a subsequent and gradual step. In three of the diagrams which illustrate the text he gives representations of sections through the metatarsus at three

[1] The Development of the Muscles of the Human Foot (*loc. cit.*), p. 131.