

the same connections, and probably a distinct function to play in the mechanism of the foot.

The *plantar layer* constitutes a very constant part of the intrinsic muscle apparatus of the Mammalian foot. In the feet of forty-six different species possessed of three or more toes, it was absent entirely in three cases only. In the monodactylous and didactylous feet of Solipeds and Ruminants not a trace of adducting muscles is to be found. The original number of these muscles is five, one for each toe, but they exhibit a distinct tendency to disappear from the centre of the foot towards the margins, and this disappearance takes place in a more marked degree outwards towards the minimus than in an inward direction towards the hallux. The central adductor (*i.e.*, adductor medii) was only found in three specimens. The sudden disappearance of this adductor is probably due to the tendency which these muscles have to arrange themselves so as to act with reference to the middle toe.

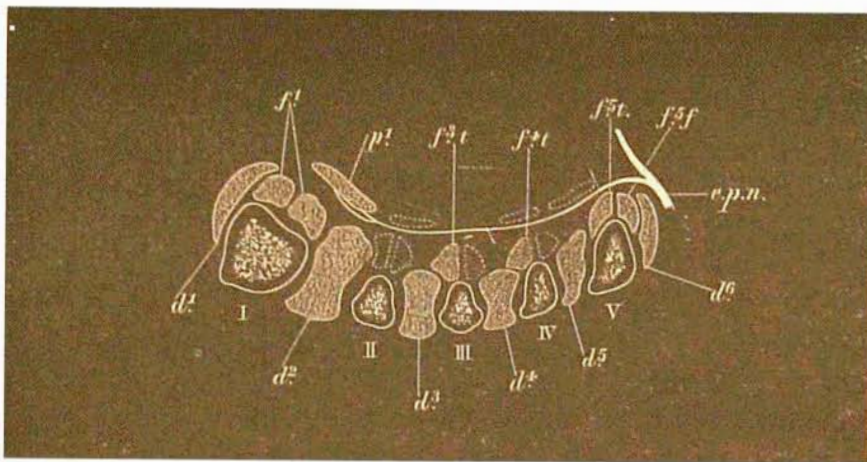


FIG. 172.—Schematic view of a transverse section through the metatarsus showing the intrinsic muscles of the left human foot.

I. V. Metatarsals;  $f^1$ , flexor brevis hallucis;  $f^{2t}$ , tibial head of flexor brevis medii (1st plantar interosseous);  $f^{3t}$ , tibial head of flexor brevis annularis (2nd plantar interosseous);  $f^{5t}$ , tibial head of flexor brevis minimi digiti (3rd plantar interosseous);  $f^{5f}$ , fibular head of flexor brevis minimi digiti;  $p^1$ , adductor obliquus hallucis;  $d^1$ , abductor hallucis;  $d^6$ , abductor minimi digiti;  $d^2-d^5$ , dorsal interossei; *e.p.n.*, external plantar nerve.

The *intermediate group* of flexores breves is the most constant layer, and is closely associated with the *dorsal layer*, which is the least constant and most variable. It is quite possible that the latter (*i.e.*, dorsal interossei, abductor hallucis, and the abductor of the minimus) may have originally been derived from the former. Ruge's<sup>1</sup> investigations into the development of the muscles of the human foot favour this view.

If the human foot be studied in the light of these results, it will be seen that the *dorsal layer* is the most fully represented. It consists of (1) the abductor hallucis, (2) the abductor minimi digiti, and (3) the four dorsal interossei.

The *plantar layer* is represented by the adductor hallucis and the transversalis pedis,

<sup>1</sup> Zur vergleichenden Anatomie der tiefen Muskeln in der Fusssohle, *Morphol. Jahrb.*, Bd. iv. pp. 644-660, 1878.