

that stimulation of the area marked (16) on the lower end of the anterior limb of the Sylvian convolution in Dr. Ferrier's figures of the brain of the Dog and Cat is occasionally associated with movements of the lips, whilst similar movements are produced by irritation inside the fissure of Sylvius in the Monkey,<sup>1</sup> doubtless due therefore to irritation of the areas (9) and (10) which lie in proximity to the fissure.

To harmonize the arrangement of the convolutions of the frontal, parietal, and occipital lobes of the human and Ape's brain with the tiers of convolutions which in the Carnivora surmount the fissure of Sylvius, is undoubtedly a task of some difficulty. Several anatomists have, however, attempted to do so. M. Broca, in his memoir already quoted, has argued with great emphasis, that in the brain of the Primates the character which dominates over all others in importance is the enormous development of the frontal lobe, from whence results the backward position and the oblique direction of the fissure of Rolando. The position which I took up many years ago<sup>2</sup> that the fissure of Rolando, or central fissure, should be regarded as forming the posterior limit of the frontal lobe and the plane of demarcation between it and the parietal lobe, is now generally accepted. It becomes therefore a matter of some moment to determine if possible the fissure in the carnivorous brain which corresponds to the fissure of Rolando in Man and Apes, the oblique and backward direction of which must be borne in mind.

Broca regarded the fissure of Rolando as represented in the Carnivora by the præ-sylvian fissure, so that he practically confined the frontal lobe in these animals to the region in front of and below that fissure, which has been named in this Report the supra-orbital area. Schwalbe is apparently inclined to attach some weight to this view; but owing to the divergence in development of the Carnivora and Ungulata on the one hand, and the Primates on the other, he does not consider it possible to make a strict comparison between the convolutions and furrows of these orders of Mammals. I believe that the limitation of the frontal lobe to the area in front of the præ-sylvian fissure would be too great a restriction of that lobe, which on developmental and other grounds may, I think, be shown to extend further back in the hemisphere.

At the first glance there might seem to be a strong likeness between the crucial fissure in the carnivorous brain and the fissure of Rolando. They are both directed more or less vertically and transversely downwards on the cranial surface of the hemisphere, and each is bounded in front and behind by a gyrus having a corresponding direction; in the Carnivora the gyri are the anterior and posterior limbs of the sigmoid gyrus; in Man and Apes they are the ascending frontal and parietal convolutions. These general resemblances have led more than one anatomist to regard them as homologous. But in discussing the homology of the crucial fissure it is important to attend to its relative period of appearance

<sup>1</sup> I am indebted to Dr. Ferrier for this information, which he wrote to me in reply to a request as to the area in the Monkey's brain which corresponds to (16) in the brain of the Dog.

<sup>2</sup> The Convolution of the Human Cerebrum topographically considered, Edinburgh, 1866, p. 11. Notes more especially on the Bridging Convolution in the Brain of the Chimpanzee, *Proc. Roy. Soc. Edin.*, 19th Feb. 1866, vol. v. p. 578.