

of the continuation of these tracts in the tegumentum of the crus cerebri, and thence into the posterior part of the internal capsule, whence they radiate outward, according to Fletchsig, and distribute themselves to the cortex in the region lying between the fissure of Rolando and the occipital lobe.

That the sensory tracts lie distinct from the motor in the posterior division (or rather posterior third of the posterior segment) of the internal capsule, has been amply proved by experiments and by researches on cerebral hemianæsthesia occurring in man. The sensory tracts being admittedly distinct from the motor in the internal capsule, the question then arises whether these, which up to this point have maintained their separate position, fuse in the cortex with the motor, as some believe, or are distributed to a special region.

In Ferrier's earlier researches, facts pointed to the hippocampal region as being the centre of common sensibility, and, therefore, experiments were devised to reach and destroy this region by itself.

Tactile sensibility was in every case impaired or abolished, in proportion to the destruction of the hippocampal and inferior temporal region. But it was established that a very extensive lesion might be made in one or both hippocampal regions without producing permanent anæsthesia.

The gradual diminution of the anæsthesia, at first induced by extensive, if not complete, removal of the hippocampal region, led Ferrier to suggest similar experiments on the gyrus fornicatus, or the ground that the tactile centre might extend into the rest of the falciform lobe, of which the hippocampal region was only apart. This originated the experiments of Horsley and Schafer on the gyrus fornicatus, which proved the accuracy of Broca's anatomical views as to the unity of the falciform lobe, and demonstrated that lesions of the gyrus fornicatus caused similar symptoms to those produced by destruction of the hippocampal region, of perhaps even greater intensity and longer duration.

It is not unlikely that, besides representing sensibility of the opposite side of the body generally, certain parts of the falciform lobe may represent more particularly the sensibility of special regions. But evidence is, so far, not conclusive of the ex-

istence of any altogether-specialized centres in this general area.

It has not yet been found possible to produce total persistent loss of all forms of tactile and common sensation on the opposite side of the destructive lesions of the falciform lobe, but this may be due to the fact that this lobe has never been absolutely destroyed throughout its whole extent. It is probable, however, that common sensibility may, to some extent at least, be bilaterally represented, so that a certain amount of compensation may be effected by the falciform lobe of the other hemisphere.

No scheme of the cortical distribution of the sensory tracts can be admitted as correct which does not connect them with the cortex of the callosal and hippocampal convolutions.

OLFACTORY AND GUSTATORY CENTRES.

The position of the olfactory centre, or at least its principal portion, may, with great probability, be inferred from the cortical connections of the olfactory tract, altogether apart from physiological experiment. The connection of the olfactory tract, by means of its inner and outer root, with the anterior and posterior extremities of the falciform lobe, have been compared by Broca to a tennis racquet, of which the circumference is formed by the falciform lobe and the handle by the olfactory tract and bulb.

Broca divides all animals into two classes. First, the "osmatics," a class which includes the great majority of mammals; and secondly, "anosmatics," in which the sense of smell is relatively feebly developed. In osmatics, the olfactory tract and bulb are large, and the hippocampal lobule in particular attains extraordinary proportions, and in some animals constitutes the greater part of the cerebral hemisphere.

In anosmatics, the hippocampal lobule is relatively small in those such as man and monkey, in which the sense of smell, though good, is subordinate to other sensory faculties; while in the balænidæ, it is greatly reduced, and in the delphinidæ is almost entirely wanting. The posterior boundary of the hippocampal lobule is clearly indicated in the osmatics by an annectant gyrus, which interrupts the continuity of the limbic fissure and unites the lobule with the parieto-temporal part of the hemisphere.