the lower ends from the *inside* by the breadth of the hook. If now the distances between the fibres top and bottom are nearly the same, no sensible error will be made by taking the product of these distances as equal to the product of the breadth of the hook and the width of the metal aperture. (2.) To render the controlling couple produced by the deflected bifilars independent of temperature, it is proposed to select metals with appropriate coefficients of expansion for regulating the dimensions of the bifilars top and bottom, and to alter the length of the silk fibres by an appropriate arrangement, so that a pointer attached to the hook at the lower end shall always come to a fiducial point upon a strip of brass attached to the metal framework which forms the upper suspension. The neatest way of doing this seems to be to cement the plane and silvered side of a short-focus plano-convex lens to the strip of brass, and to arrange its position with reference to the pointer so that the tip of the latter is exactly in the focus of the lens. In this position the tip and its reflected image will appear just in coincidence, and if necessary a lens may be provided in the side of the instrument for observing the relative positions of the pointer and its image and adjusting them to coincidence.]

VIII. "On the course of the Fibres of the Cingulum and the Posterior Parts of the Corpus Callosum and of the Fornix in the Marmoset Monkey." By Charles E. Beevor, M.D., F.R.C.P. Communicated by Professor Ferrier, F.R.S.

Received June 12, 1890.

(Abstract.)

This paper has for its scope the investigation by the microscope of the course of certain fibre-tracts in the brain which have not hitherto been minutely examined.

After an introduction showing the difficulties of tracing these fibres by dissection and by other means, the *method of investigation* is given. This consisted in cutting serial sections of the brain of the Marmoset Monkey (*Hapale jactans* and *penicillata*) after hardening in bichromate of potash; the sections were stained by Weigert's and also by Pal's hæmatoxylin methods, whereby the fibres are differentiated. In this way, a complete series of sections was made in the sagittal and horizontal planes, and almost a complete series in the frontal direction, and by combining the appearances found in the three planes, a mental picture of the whole could thus be obtained.

In the description of this brain, emphasis is laid on its small size, which renders it very easy of manipulation, while, from its high position in the animal scale, its general arrangement is comparable

with the brain of man. Moreover, the slight amount of convolution on its median surface is a very great advantage in tracing fibres; this is especially the case with the calloso-marginal sulcus, the absence of which enables the fibres of the cingulum to be followed in a way not obtainable in the brains of other apes and of man.

The *cingulum*, or the fibres of the gyrus fornicatus, is described in three parts:—

1. Horizontal, above the corpus callosum;
2. Anterior, in front of this body;
3. Posterior, from behind the corpus callosum to the anterior end of the temporo-sphenoïdal lobe.

The horizontal part consists, not of fibres extending through its whole length, but of internuncial fibres coursing between the gyrus fornicatus and the centrum ovale; the anterior part connects the olfactory nerve with the frontal region; the posterior part contains internuncial fibres between the gyrus hippocampi and the inferior surface of the temporo-sphenoïdal lobe.

The cingulum is not connected with the hippocampal lobule and its contained nucleus amygdalæ, as was considered by Broca.

Reference is made to an operation in the monkey, performed for the author by Professor Horsley, in which the cingulum was divided, producing degeneration in it in a posterior direction.

From the relation of the gyrus fornicatus to sensation found by Professors Horsley and Schäfer, it is suggested that the cingulum joins this gyrus representing sensation with the part of the centrum ovale connected with the so-called motor cortex.

The *calcarine fibres* bounding the calcarine fissure are described as internuncial fibres analogous to the cingulum, and the *superficial fibres* of the gyrus fornicatus are considered to be a separate tract and not part of the cingulum.

The posterior part of the *corpus callosum* is described in three parts:—

1. *The body*, giving off the tapetum to supply the cortex bounding externally the posterior and descending cornua of the lateral ventricle.
2. The *splenium*, ending in the forceps major, sending fibres to the inner part of the occipital lobe below the calcarine fissure.
3. *An intermediate part* between the two former, forming with the tapetum the roof of the posterior cornu, and supplying the cortex of the upper lip of the calcarine fissure.

No connexion between these fibres and those of the internal capsule, as described by Professor Hamilton, can be found.

The *fornix* comprises the body and the posterior crura. The body can be separated, while in the septum lucidum, into (1) a

median and (2) a lateral part. The median part can be traced horizontally backwards into the septum between the body and the splenium of the corpus callosum, but not to join the cingulum as described by Meynert. The lateral fibres descend the lateral ventricle, becoming the tænia hippocampi or fimbria, and end in the cortex of the cornu Ammonis, while the alveus of this body receives fibres from its cortex, and then passes to its under surface to send fibres to the inferior surface of the temporo-sphenoïdal lobe. Besides these parts, there are the transverse fibres connecting the cornua Ammonis of opposite sides.

Particular attention is directed to the different degree of staining by Weigert's method of the corpus callosum, fornix, and tænia semicircularis, of which the last is scarcely coloured, suggesting that it is a degenerated or non-developed structure.

IX. "On the Changes produced in the Circulation and Respiration by Increase of the Intracranial Pressure or Tension." By WALTER SPENCER, M.S., Assistant Surgeon to Westminster Hospital, and VICTOR HORSLEY, B.S., F.R.S. Received June 12, 1890.

(Abstract.)

The authors have made for some time the effect of an increase in intracranial pressure or tension the subject of an experimental inquiry, and they have in this paper recorded the results obtained, in so far as the increase of intracranial pressure affects the circulation and respiration.

They conclude that the increase in intracranial pressure influences the circulation and respiration through the diminution in the physiological activity of the medulla which it causes, and show that the changes produced by the pressure assume a sequence according to the degree to which the activity of the medulla is impaired.

The authors first give an historical *résumé* of the work of previous observers, and then a short introduction on some anatomical and physiological details which relate to the part of the subject under consideration.

The method chiefly employed of increasing intracranial pressure was by inserting a small rubber bag through a trephine hole in the skull, and then distending the bag by means of a column of mercury, which served to show at once the pressure required to distend the bag, and the extent to which the bag was distended.

The capacity of the thin-walled rubber bag, when distended, was at