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Stereoscopic Studies of ANATOMY

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Prepared under authority of the
University of Edinburgh

by

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Section I

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Stereoscopic Studies of Anatomy

Section I

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CRANIO-CEREBRAL TOPOGRAPHY—No. 1.

In localising different parts of the brain to the surface of the head certain definite bony points which can be recognised upon the surface constitute the primary landmarks, but as these points are few in number, they require to be supplemented by some arbitrary lines drawn between them, so as to fix certain points on the surface of the cranial vault.

The bony points which can be used are the following—

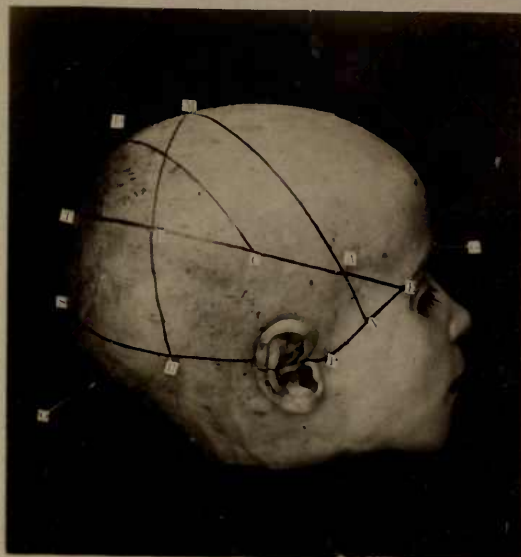
1. The **glabella**, a point midway between the superciliary ridges.
2. The **external occipital protuberance**, or **Inion**.
3. The **external angular process** of the frontal bone, which forms a protection at the outer and upper corner of the orbit.
4. The **root of the zygoma**. A point immediately above and in front of the external auditory meatus constitutes the **pre-auricular point**.
5. The **lambda**, the point of junction of the lambdoidal and sagittal sutures. It can usually be felt from the surface, and lies about $2\frac{1}{2}$ inches above the external occipital protuberance.
6. The region of the **parietal eminence** is often distinct upon the surface.

The accessory guiding lines have been variously worked out, but the lines drawn here are in accordance with the method introduced by Professor Chiene and employed by Stiles in Cunningham's Textbook of Anatomy. They are determined as follows:—

The head being shaved, find in the mesial line of the skull between the glabella and the external occipital protuberance, the midpoint M, the three-quarter point T, and the seven-eighths point S. Find also the external angular process E, and the pre-auricular point P, and join EP, PS, and ET. Bisect EP and PS at N and R. Join MN and MR. Bisect also AB at C, and draw CD parallel to AM.

The letters indicate—

- | | | | |
|----|--------------------------------------|----|----------------------------|
| G. | Glabella. | P. | Root of zygoma. |
| M. | Midpoint between G and O. | N. | Midpoint between E and P. |
| D. | Upper end of a line parallel to AM. | R. | Midpoint between P and O. |
| T. | Three-quarter point between G and O. | A. | Intersection of MN and ET. |
| S. | Seven-eighths point between G and O. | C. | Midpoint between A and B. |
| O. | External occipital protuberance. | B. | Intersection of MR and ET. |
| E. | External angular process. | | |



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CRANIO-CEREBRAL TOPOGRAPHY—No. 2.

THE SCALP HAS BEEN REMOVED FROM THE SURFACE OF THE CRANIUM OVER THE AREA PREVIOUSLY MARKED OUT AND THE SUTURES ARE SHOWN.

These sutures are, mostly, of limited value as landmarks for parts of the brain, but their position must be borne in mind in order that the line of a suture may not be mistaken for a fissured fracture of the skull in cases of injury to the head.

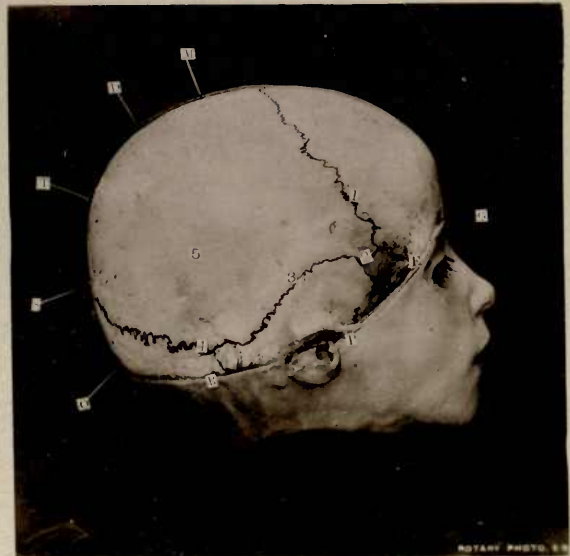
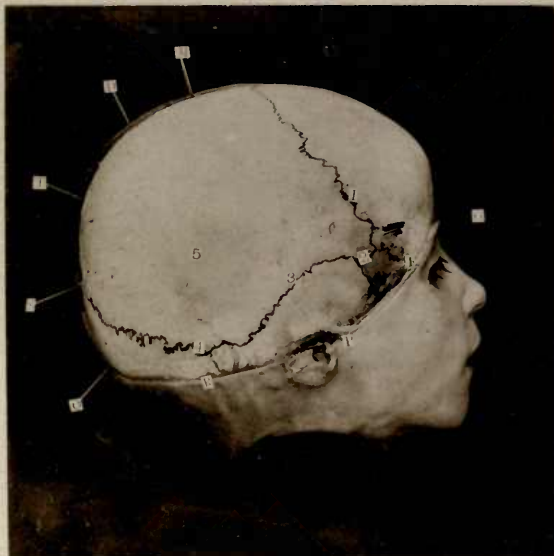
The principal sutures are:—

1. The **coronal**, between the frontal and parietal bones, which passes transversely across the head, but is in front of the midpoint M.
2. The **lambdoidal** suture, between the occipital and parietal bones.
3. The **spheno-parietal** suture, between the anterior inferior angle of the parietal and the great wing of the sphenoid. It is known as the **pterion**, and it overlies the point of division of the Sylvian fissure into its three limbs, and the bifurcation of the middle meningeal artery, or its anterior division.
4. The **squamous** suture, between the parietal bone and the squamous part of the temporal, beginning at the pterion and arching back to the asterion, or junction of the parietal, temporal, and occipital bones. The highest part of this suture reaches up to the lower end of the fissure of Rolando.

The letters and figures indicate—

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Coronal suture. 2. Pterion. 3. Squamous suture. 4. Asterion. 5. Parietal eminence. G. Glabella. M. Midpoint between G and O. | <ol style="list-style-type: none"> T. Three-quarters point between G and O. S. Seven-eighths point between G and O. O. External occipital protuberance. R. Midpoint between O and P. P. Root of zygoma. E. External angular process |
|---|---|

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CRANIO CEREBRAL TOPOGRAPHY. No. 2.

SECTION I.

NOTARY PHOTO. 11

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CRANIO-CEREBRAL TOPOGRAPHY.—No. 3.

THE SKULL-CAP HAS BEEN REMOVED AND THE OUTER SURFACE OF THE DURA MATER EXPOSED.

The outer surface of the dura mater is rough and is adherent to the bone, especially along the lines of the cranial sutures.

The meningeal arteries ramify between the membrane and the bone, and supply both of them with blood.

The largest of the meningeal vessels is the **middle meningeal**, a branch of the internal maxillary artery, which enters the skull through the foramen spinosum in the great wing of the sphenoid, and extends outwards and slightly forwards on the great wing of the sphenoid. As a rule, while still in contact with the base of the skull, the artery divides into two main branches. The anterior division, which is the larger, ascends in a deep groove on the inner aspect of the parietal bone near the anterior inferior angle. This part of the groove is very deep, and is occasionally converted into a canal, by being completely bridged over by bone. This division of the artery then passes upwards and backwards.

The posterior division of the vessel passes backwards under cover of the squamous portion of the temporal bone.

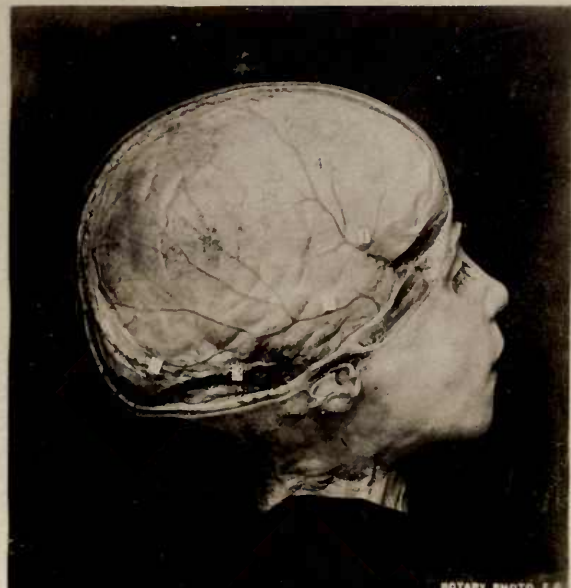
The **lateral sinus** may be divided into two parts, of which the first is seen here, passing from the region of the external occipital protuberance, to a point about three quarters of an inch below and behind the centre of the external auditory meatus, describing a curve with the convexity directed upwards.

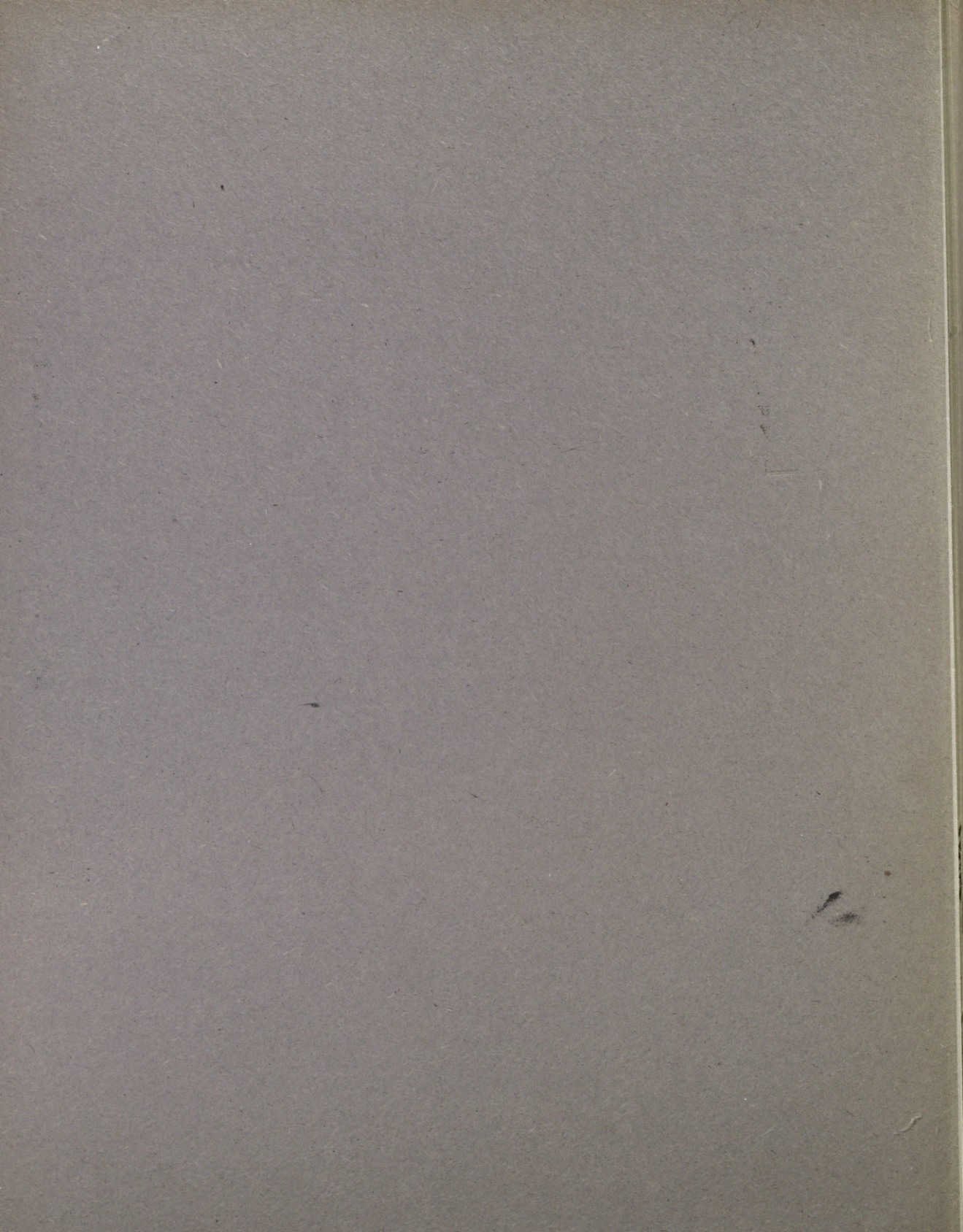
The second part of the vessel occupies a deep groove on the mastoid portion of the temporal bone and on the jugular process of the occipital bone.

The figures indicate:—

- | | |
|---|--|
| 1. Anterior division of middle meningeal artery. | 4. Thickening of dura mater along coronal suture. |
| 2. Posterior division of middle meningeal artery. | 5. Thickening of dura mater along lambdoid suture. |
| 3. Lateral sinus. | |

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CRANIO-CEREBRAL TOPOGRAPHY—No. 4.

▲ COMBINED VIEW HAS BEEN TAKEN TO SHOW THE RELATION OF THE SURFACE MARKINGS, THE SUTURES, AND THE BLOOD VESSELS OF THE MENINGES TO ONE ANOTHER.

1. **Sutures.** The point A on the surface overlies the pterion, or, as in the child, may lie rather above it, and the same point overlies the anterior division of the middle meningeal artery. The line MN lies entirely behind the coronal suture but is nearly parallel to it.

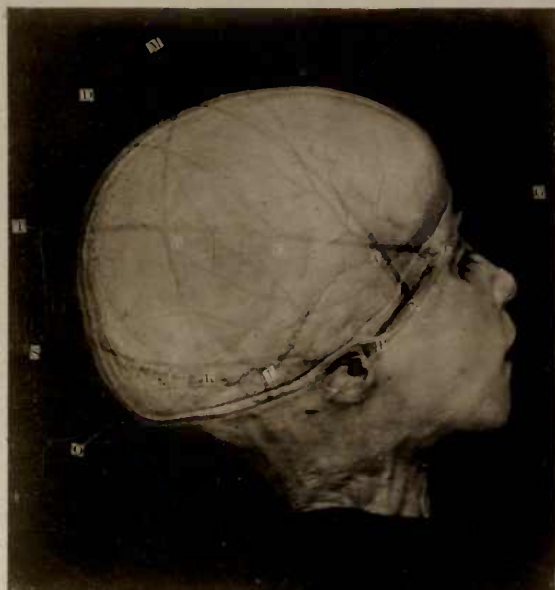
The posterior division of the middle meningeal artery crosses the squamous suture at a point above the external auditory meatus.

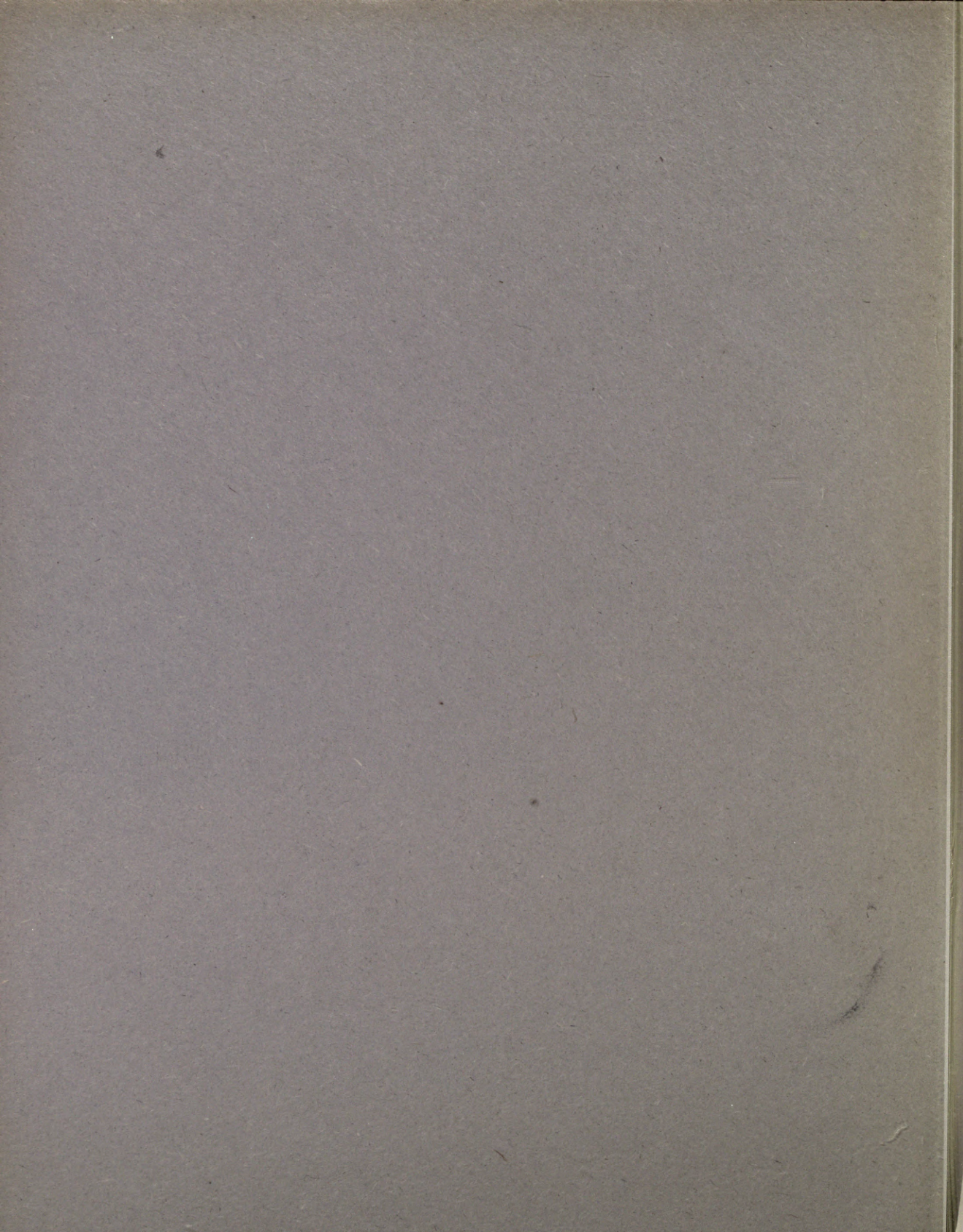
The point T overlies the lambda, and the line TR corresponds with considerable accuracy to the lambdoidal suture.

The point B corresponds to the position of the parietal eminence.

The letters indicate the same points as in No. 1, viz. —

- | | |
|--|-------------------------------|
| M. Midpoint between glabella and external occipital protuberance. | E. External angular process. |
| T. Three-quarter point between glabella and external occipital protuberance. | P. Preauricular point. |
| S. Seven-eighths point between glabella and external occipital protuberance. | N. Midpoint between E and P. |
| O. External occipital protuberance. | A. Intersection of MN and TE. |
| G. Glabella. | C. Midpoint of AB. |
| | R. Midpoint of PS. |
| | B. Intersection of MR and TE. |
| | L. Lateral sinus. |





CRANIO-CEREBRAL TOPOGRAPHY—No. 5.

THE DURA MATER HAS BEEN REMOVED AND THE FINE MEMBRANES STRIPPED FROM THE SURFACE OF THE BRAIN, EXPOSING THE OUTER ASPECT OF THE HEMISPHERE, AND THE POSITION OF SOME OF THE PRINCIPAL MOTOR AND SENSORY CENTRES HAS BEEN MARKED UPON IT.

The fissures and convolutions of the brain are at this age—5 years—very fully developed.

1. Motor centres. The great motor area of the outer surface of the hemisphere lies in front of the fissure of Rolando, and occupies mainly the ascending frontal convolution, extending into the depth of the fissure, and occupying the anterior wall and in some places the floor. It also extends into the adjacent portions of the frontal convolutions. The upper part forms the area for the lower limb, and below it is the area for the body. Near the centre of the fissure of Rolando, the precentral convolution grows backwards, deflecting the course of the fissure, and the area of the cortex which occupies the indentation so formed represents the centre for the upper limb of the opposite side. The centre for the shoulder lies highest, and lower down are the centres for the elbow, wrist, fingers, index, and thumb. The area for the face is continuous with the above, and the area for the tongue occupies the lowest part of the precentral convolution. The centres for the head and eyes occupy portions of the middle and inferior frontal convolutions in front of the centres for the limbs.

2. Sensory centres. The centre for vision is situated at the tip of the occipital lobe, while the centre for word-seeing is found in the angular gyrus.

The area for hearing is found in the superior temporal convolution.

The letters and figures indicate—

- | | |
|---------------------------------|---------------------------------|
| 1. Fissure of Rolando. | L. Centre for lower limb. |
| 2. Division of Sylvian fissure. | F. Centre for face. |
| 3. Parallel fissure. | B. Broca's convolution. |
| 4. Supra-marginal convolution. | S. Angular gyrus (word-seeing). |
| A. Arm centre. | V. Visual region (sensory). |



CRANIO-CEREBRAL TOPOGRAPHY—No. 6.

A COMPOSITE VIEW HAS BEEN TAKEN TO SHOW THE RELATION OF THE SURFACE LINES AND OF THE SUTURES TO THE PRINCIPAL FISSURES AND CONVOLUTIONS.

In viewing the relationships in this subject, aged 5 years, it should be borne in mind that the fissures of the brain of the child do not in all cases bear the same relationship to the cranial sutures as do those of the adult. Important differences exist, especially in the fissure of Sylvius, associated mainly with differences in the proportionate sizes of different lobes of the brain.

This view should therefore be compared with the relations shown in the corresponding view of the adult head (No. 10).

At birth the Sylvian fissure lies above the squamo-parietal suture, but the fissure and the suture approach one another rapidly up to the fifth year, and at that age the fissure lies about 14 millimetres above the suture. In the adult, the fissure may lie above, below, or subjacent to the suture. Chiene's surface lines drawn upon the head of the child also place the Sylvian point above the suture, but the fissure lies at a slightly higher level even than this point.

The fissure of Rolando maintains, after birth, a very constant position in relation to the surface, both at its upper and its lower ends.

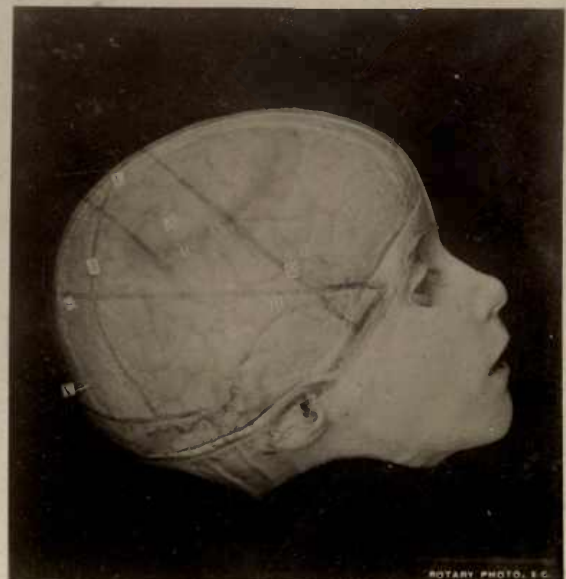
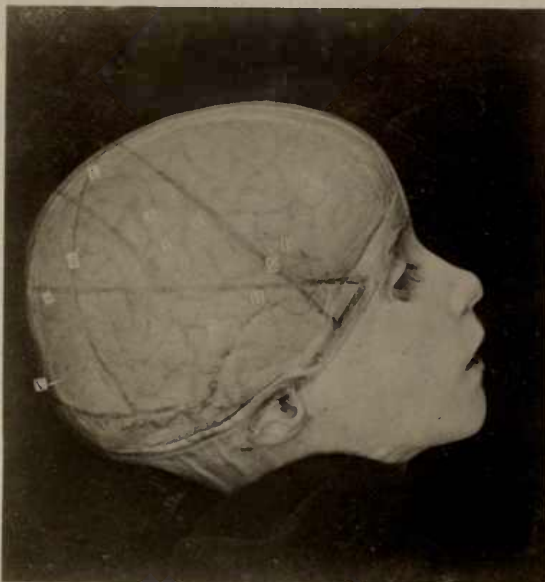
Comparing the lettering in No. 1, it will be seen that the Rolandic area lies inside a quadrilateral figure, ACDM, but it must be noted that the true motor area is confined to the precentral area, and does not extend behind the fissure of Rolando. The letters L, A, F, indicate, in a general way, the parts which contain the motor centres for the lower limb, arm and face respectively in the ascending frontal convolution.

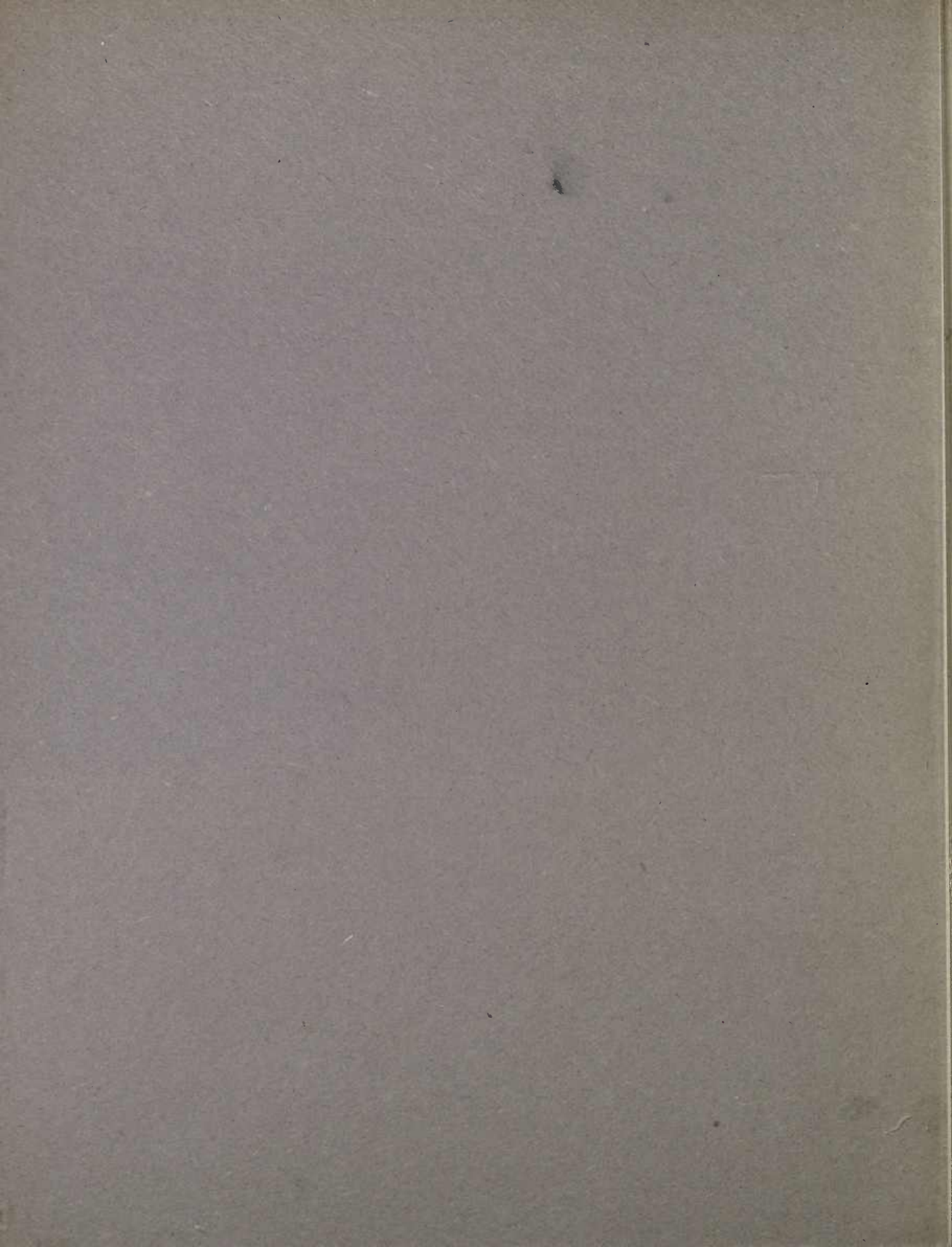
The figure 2 is placed on the division of the Sylvian fissure, and, as has been pointed out, in the child this division lies at a slightly higher level than the surface mark which would indicate its position in the head of the adult. The line AC however overlies the posterior horizontal limb of the Sylvian fissure, and a finger's breadth below that line lies the parallel fissure, 3, the hinder end of which is continued upwards into the parietal lobe to the region marked 8, subjacent to the point B in the surface lines, where lies the angular gyrus or centre for word vision. The letter B overlies the area which in the left hemisphere is the motor speech centre or Broca's convolution. The coronal suture can be seen to lie in front of the line AM and therefore is well in front of the fissure of Rolando.

The letters and figures indicate:—

- | | |
|--------------------------------------|-------------------------------------|
| L. Centre for opposite lower limb. | H. First temporal convolution. |
| A. Centre for opposite upper limb. | 1. Fissure of Rolando. |
| F. Centre for opposite side of face. | 2. Division of Sylvian fissure. |
| S. Supra-marginal convolution. | 3. Parallel (1st temporal) fissure. |
| V. Visual centre (sensory). | 4. Angular gyrus. |
| B. Broca's convolution. | |

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CRANIO-CEREBRAL TOPOGRAPHY—No. 7.

THE RIGHT CEREBRAL HEMISPHERE HAS BEEN REMOVED, IN ORDER TO SHOW THE MEMBRANES WHICH SUB-DIVIDE THE CRANIAL CAVITY AND A PART OF THE MESIAL SURFACE OF THE HEMISPHERE OF THE OPPOSITE SIDE.

The **falx cerebri** is a sickle-shaped fold of dura mater, attached in front to the crista galli of the ethmoid and to the frontal bones, and attached behind to the upper surface of the tentorium cerebelli. It has an upper and a lower margin, the upper being convex and the lower concave.

The convex margin is attached along the mesial plane, and contains the superior longitudinal sinus, while the lower concave margin is free and overlies the corpus callosum. This edge contains the inferior longitudinal sinus.

The **tentorium cerebelli** is a sloping horizontal shelf which roofs over the cerebellum. It is crescentic in shape, and is attached behind and at the convex margin while the concave free margin limits, behind and at the sides, an oval aperture which transmits the mid-brain.

It is attached in front to the clinoid processes of the sphenoid bone, and externally to the upper border of the petrous temporal bone. The lateral sinus is contained along the line where the tentorium joins the general investing dura mater at the back and sides, over the mastoid portion of the temporal and along the occipital bone.

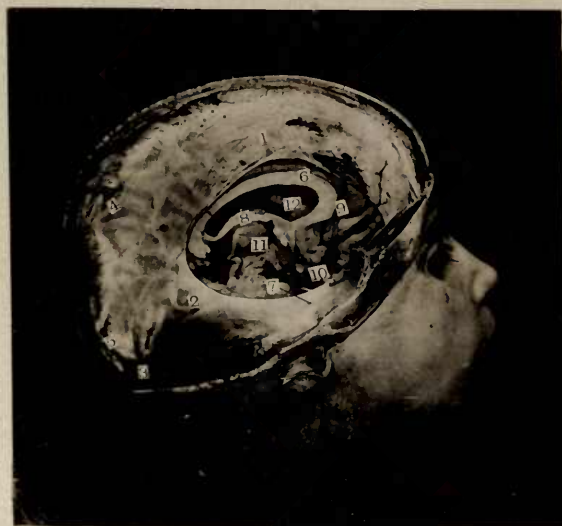
The section through the brain shows the third ventricle, and also the lateral ventricle of the opposite side, which has been exposed by the removal of the **septum lucidum**.

The figures indicate—

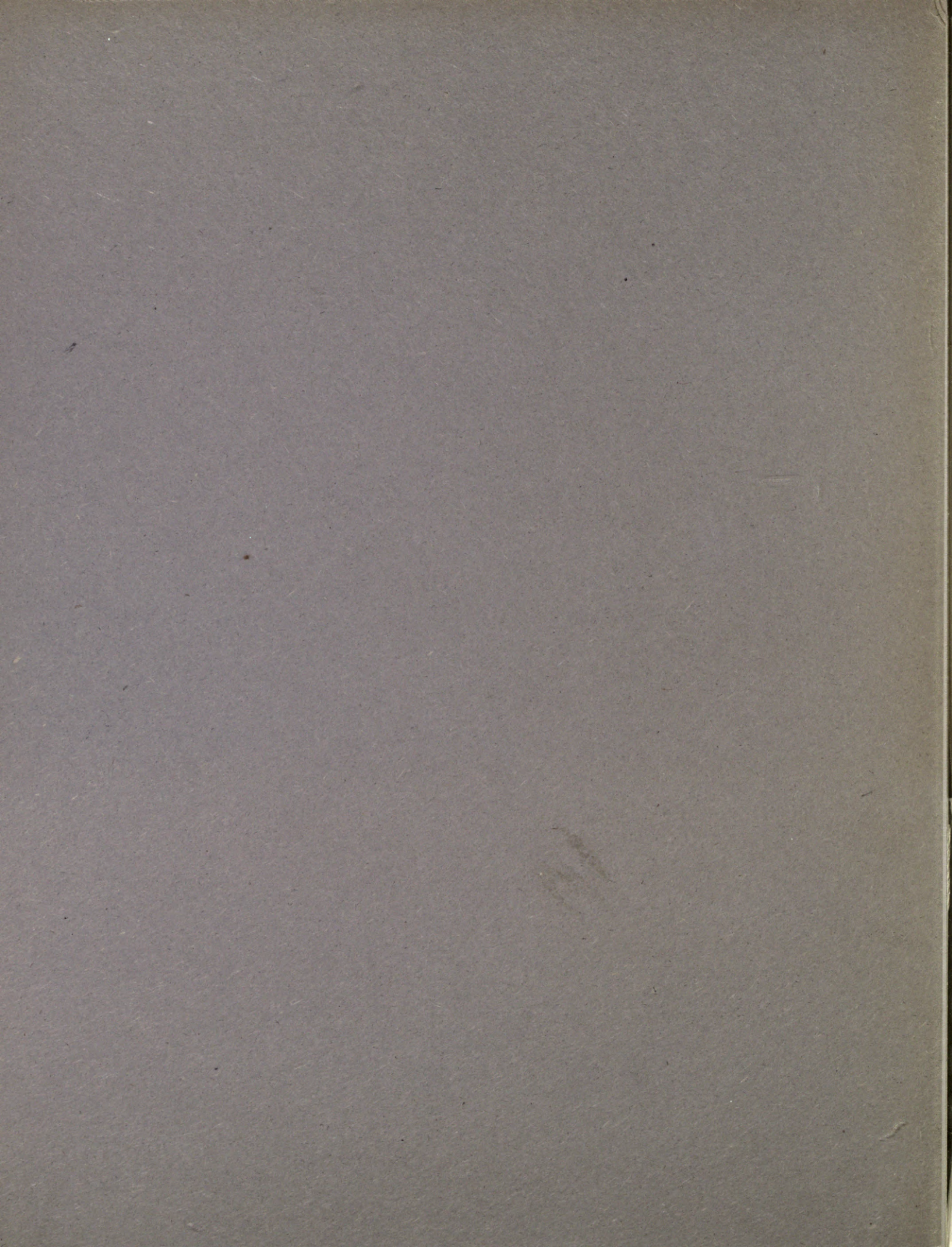
- | | |
|---|--|
| 1. Falx cerebri. | 7. Apex of petrous temporal bone. |
| 2. Tentorium cerebelli. | 8. Fornix. |
| 3. Lateral sinus and cerebral vein. | 9. Anterior cerebral artery. |
| 4. Cerebral veins passing into superior longitudinal sinus. | 10. Optic nerve, and middle cerebral artery. |
| 5. Superior longitudinal sinus. | 11. Third ventricle. |
| 6. Corpus callosum. | 12. Caudate nucleus of left side. |

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CRANIO-CEREBRAL TOPOGRAPHY—No. 8.

A COMPOSITE VIEW HAS BEEN TAKEN TO SHOW THE RELATION OF THE STRUCTURES SHOWN IN THE FORMER VIEW TO THE SURFACE MARKINGS.

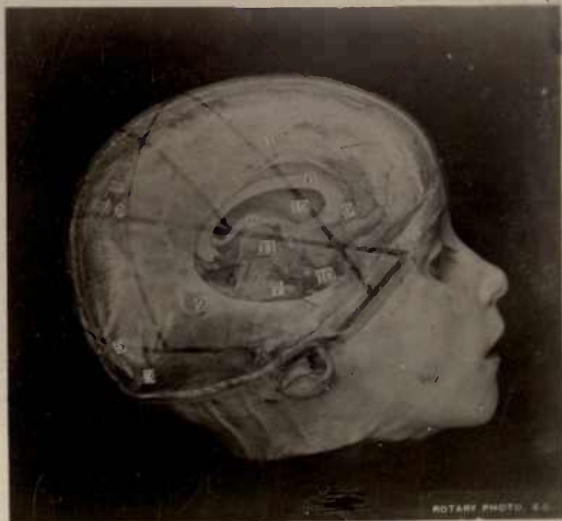
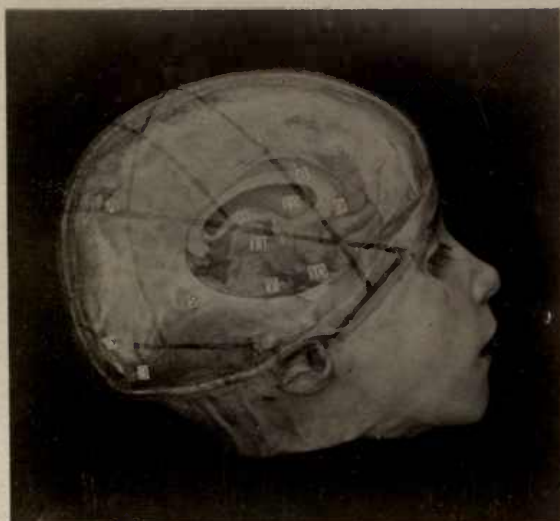
While the parts shown here are largely inaccessible to surgical interference, the view shows the parts which may be injured, for instance, by a penetrating wound, or by a bullet entering the head at any particular point upon the surface. Among the relations shown, it may be mentioned that the corpus callosum, for example, extends both in front of and behind the area marked upon the surface as the Rolandic area, and that the upper margin of the third ventricle extends as far up as to the oblique line which indicated upon the surface the posterior horizontal limb of the Sylvian fissure.

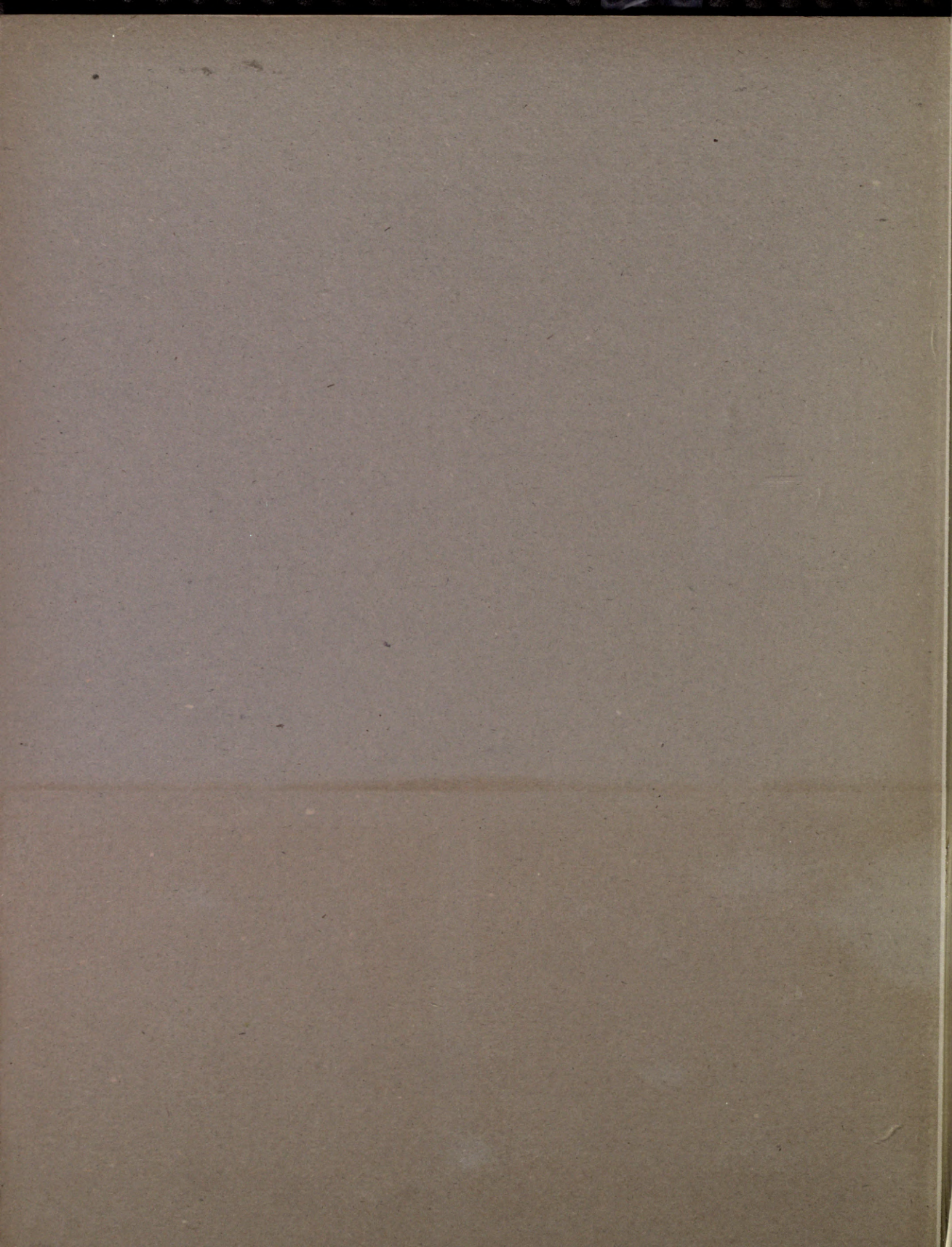
The Gasserian ganglion lies under the dura mater immediately in front of the point marked and slightly to its outer side, and this view shows the depth at which that point lies from the surface of the head.

The figures indicate—

- | | |
|--|---|
| 1. Falx cerebri. | 7. Apex of the petrous temporal bone. |
| 2. Tentorium cerebelli. | 8. Fornix. |
| 3. Lateral sinus. | 9. Anterior cerebral artery. |
| 4. Cerebral veins joining the superior longitudinal sinus. | 10. Optic chiasma. |
| 5. Superior longitudinal sinus. | 11. Third ventricle. |
| 6. The corpus callosum. | 12. Caudate nucleus in the floor of the lateral ventricle of the opposite side. |

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CRANIO-CEREBRAL TOPOGRAPHY—No. 9.

THE GREATER PART OF THE OUTER SURFACE OF THE LEFT CEREBRAL HEMISPHERE OF AN ADULT MALE HAS BEEN EXPOSED IN SITU, AND SOME OF THE IMPORTANT FISSURES ARE MARKED.

This view should be compared with that of the brain of a child, and the notes made in relation to it on the localisation of function should be referred to.

Individual variations exist in the surface anatomy of the cerebral hemispheres, but it will be seen that in the present instance the fissure of Rolando pursues a very characteristic course, and that the arm-centre is well developed and causes a marked deflection in the course of the fissure.

The upturned end of the posterior horizontal limb of the fissure of Sylvius is bounded by a well-marked gyrus, the supramarginal. The first temporal, or parallel fissure, is not continuous, but is intersected by bridging convolutions which subdivide it into small parts. There is, however, an upturned end similar to that of the fissure of Sylvius, which cuts into the parietal lobe and is bounded by the angular gyrus.

The localisation of these parts to the surface lines is shown in the next view.

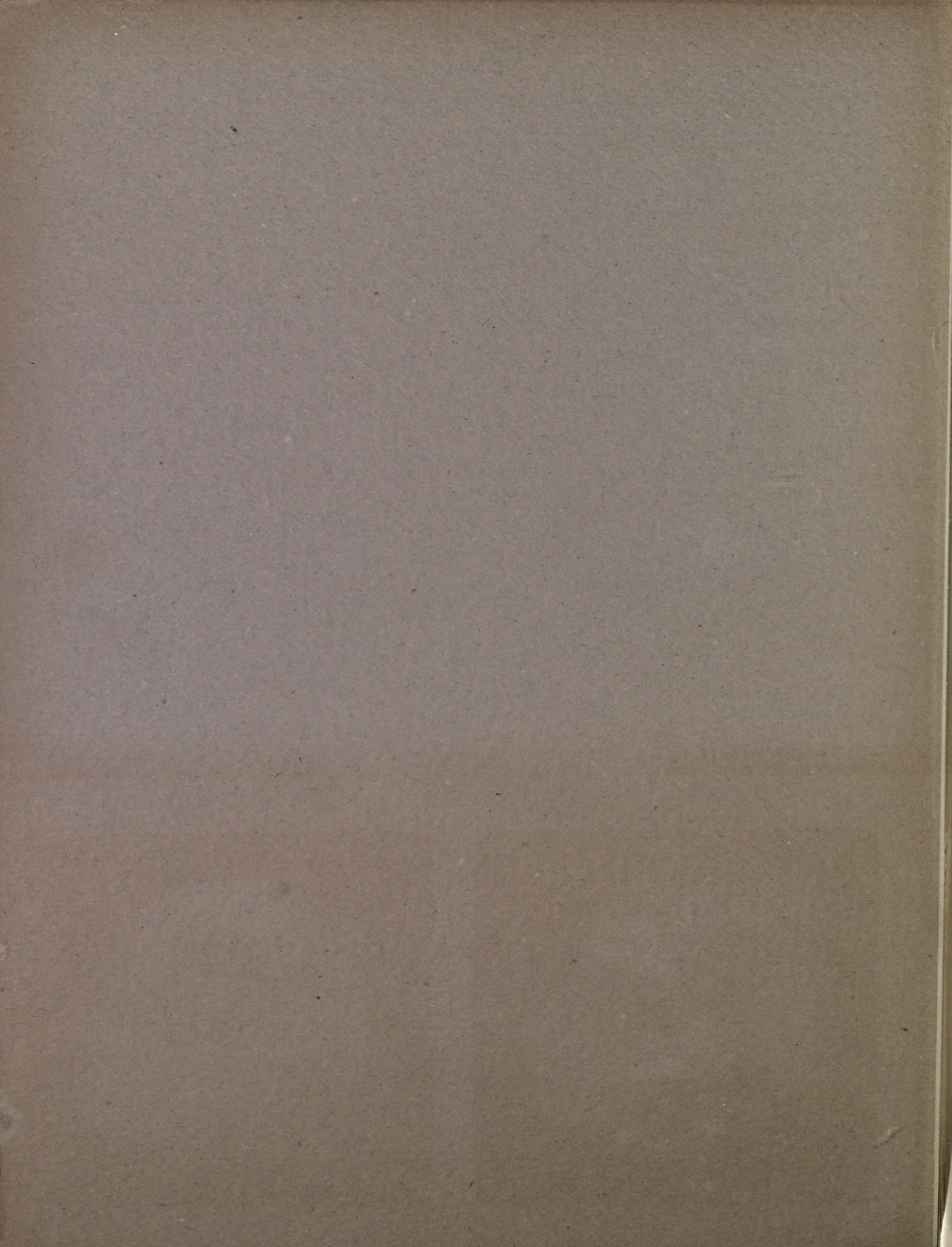
The figures indicate—

1. Division of the Sylvian fissure.
2. Lower end of the fissure of Rolando.
3. Arm-centre deflecting the fissure of Rolando backwards.
4. Supramarginal convolution.
5. Lower part of the precentral sulcus.
6. Postcentral sulcus (vertical part of the intraparietal sulcus).
7. Parallel sulcus.

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SECTION I.



CRANIO-CEREBRAL TOPOGRAPHY—No. 10.

THE PARTS SEEN IN THE FORMER VIEW ARE SHOWN IN RELATION TO THE SURFACE LINES ON THE SCALP.

Sylvian fissure. The point A lies at a higher level than the division of the Sylvian fissure, and the line AC also lies at a rather higher level than the posterior horizontal limb. This is one of the instances in which, as previously noticed, the fissure may lie at a lower level than the pterion, the opposite of the condition in the brain of the child.

Motor area.—The motor area lies inside the quadrilateral ACDM, the line MA following the line of the precentral sulcus in its upper and lower portions. The lower part of the line CD lies a little behind the lower part of the postcentral sulcus, and the upper part of that line corresponds to the upper part of the sulcus.

The triangle TRO corresponds to the outer surface of the occipital lobe, and the point R lies a little above the attachment of the tentorium cerebelli and the highest part of the lateral sinus.

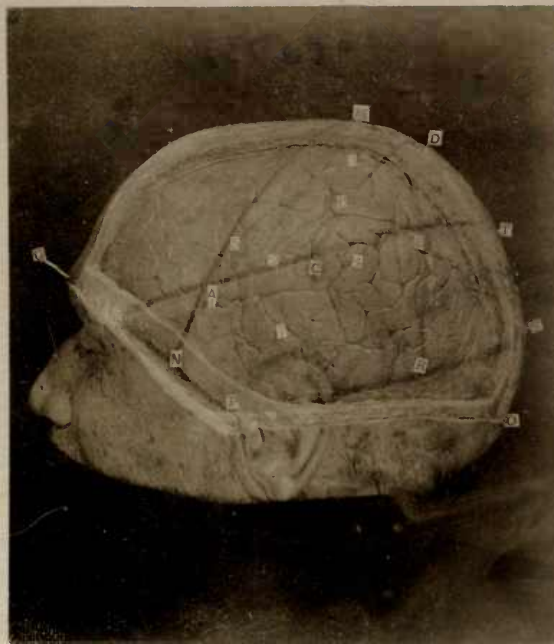
The point B overlies the angular gyrus or word-seeing area.

The pentagonal figure BRPNA includes the whole of the outer surface of the temporal lobe, in which lies the parallel fissure (7) a finger's-breadth below the posterior limb of the Sylvian fissure. Taste and smell are localised to the anterior end of the temporal lobe.

The figures indicate—

- | | |
|---|------------------------------------|
| 1. Division of the Sylvian fissure. | 5. Precentral sulcus, lower part. |
| 2. Lower end of the fissure of Rolando. | 6. Postcentral sulcus, lower part. |
| 3. Arm centre. | 7. Parallel fissure. |
| 4. Supramarginal convolution. | |

The letters indicate the points as previously determined upon the surface of the scalp by Chiene's method (See No. 1.).



CENTRAL NERVOUS SYSTEM.

BRAIN—No. 1.

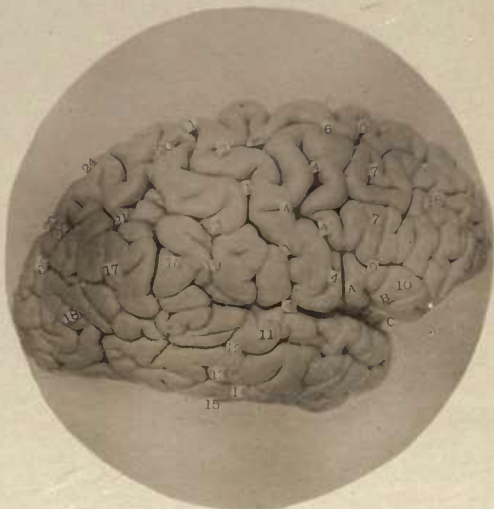
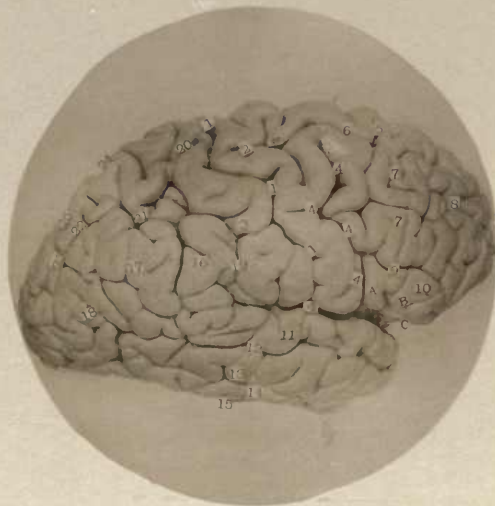
OUTER SURFACE OF THE RIGHT CEREBRAL HEMISPHERE

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Fissure of Rolando. The upper two labels are placed at the two genua. 2. Ascending frontal or anterior central gyrus. The label is placed on the arm-centre. 3. Ascending parietal or posterior central gyrus. 4. The sulcus præcentralis inferior. 4a. The sulcus præcentralis superior. 5. Superior frontal gyrus. 6. Superior frontal sulcus. 7. Middle frontal gyrus. The two labels are on the upper and lower portions of the gyrus. 8. Middle frontal sulcus. 9. Inferior frontal sulcus. 10. Inferior frontal gyrus. <ul style="list-style-type: none"> A. Basilar part. B. Triangular part. C. Orbital part. | <ol style="list-style-type: none"> S. Fissure of Sylvius (posterior horizontal limb). 11. Superior temporal gyrus. 12. Parallel or superior temporal sulcus. 13. Middle temporal gyrus. 14. Inferior temporal sulcus. 15. Inferior temporal gyrus. 16. Supramarginal gyrus. 17. Angular gyrus. 18. Postparietal gyrus. 19. Sulcus postcentralis inferior. 20. Sulcus postcentralis superior. 21. Ramus horizontalis. 22. Ramus occipitalis. 23. Sulcus occipitalis transversus. 24. Superior parietal lobule. 25. Arcus parieto-occipitalis. |
|--|--|

Intraparietal sulcus (of Turner).

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CENTRAL NERVOUS SYSTEM BRAIN. No. 1.
 SECTION I.



CENTRAL NERVOUS SYSTEM.

BRAIN—No. 2.

BASAL ASPECT OF THE BRAIN.

The Cerebellum, the Pons Varolii, and the Medulla have been removed by cutting through the Mesencephalon. The cut surface of the latter is seen in the middle of the specimen.

GYRI AND SULCI.

1. Calcarine fissure.
2. Isthmus of great limbic convolution.
3. Gyrus lingualis.
4. Collateral sulcus.
5. Hippocampal convolution (note the dentate fissure to its inner side).
6. Uncus (note the groove formed by the edge of the tentorium cerebelli close to the label).
7. Occipito-temporal gyrus.
8. Occipito-temporal sulcus.
9. Inferior temporal gyrus.
10. Groove for the right lateral blood-sinus on the occipital pole.
11. Olfactory sulcus, with gyrus rectus immediately to its inner side.
12. Internal orbital gyrus.
13. Anterior orbital gyrus.
14. Posterior orbital gyrus.
15. External orbital gyrus.

N.B.—Note the H-shaped orbital sulcus which separates these orbital gyri from each other.

OTHER STRUCTURES.

16. Splenium of corpus callosum.
17. Pineal body.
18. In front of label is seen the under surface of the posterior commissure.
19. Crusta of crus cerebri.
20. Substantia nigra.
21. Red nucleus in tegmentum of crus cerebri.
22. Tegmentum of crus cerebri.
23. Under surface of pulvinar of optic thalamus.
24. In front of label is seen the locus perforatus posticus.
25. Corpora albicantia or mammillaria.
26. Tuber cinereum.
27. Optic tract
28. Optic chiasma, immediately behind which is the infundibulum.
29. Locus perforatus anticus.
30. Olfactory tract and olfactory bulb.

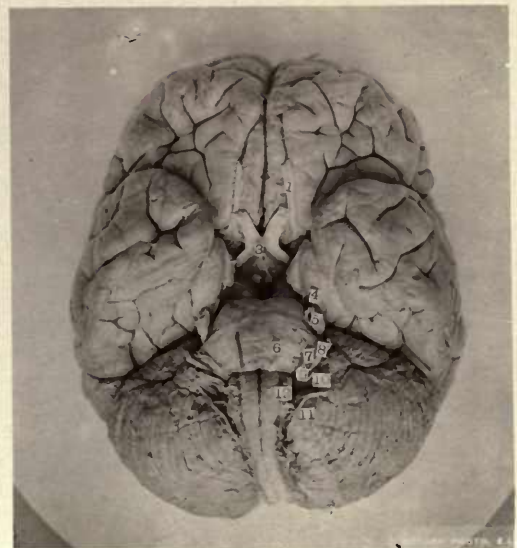


CENTRAL NERVOUS SYSTEM.**BRAIN—No. 3.****THE BASE OF THE BRAIN WITH THE SUPERFICIAL ORIGINS OF THE CRANIAL NERVES.**

The membranes and vessels have been removed from the base.

The figures indicate—

1. Olfactory peduncle with its roots and the commencement of the olfactory bulb (imperfect).
2. Optic nerve, springing from the optic chiasma and optic tract.
3. Oculomotor nerve, arising from the crus cerebri. The corpora albicantia are distinct in front, in the interpeduncular space.
4. Trochlear nerve, winding round the outer side of the crus.
5. Trigeminal nerve, springing by two roots, one large, sensory, the other small, motor, from the pons Varolii.
6. Abducens nerve, arising in the interval between the pons and medulla.
7. Facial nerve.
8. Auditory nerve, rising close to the facial, at the posterior border of the pons.
9. and 10. Glosso-pharyngeal and vagus nerves issuing from the side of the medulla, in the interval between the olive and the restiform body.
11. Spinal accessory nerve, arising by a series of rootlets from the side of the medulla and the upper cervical segments of the spinal cord.
12. Hypoglossal nerve, arising by numerous radicles from the front of the medulla oblongata, between the pyramid and the olive.



CENTRAL NERVOUS SYSTEM.

BRAIN—No. 4.

SAGGITAL SECTION THROUGH THE ENTIRE BRAIN SLIGHTLY TO THE LEFT SIDE OF THE MESIAL PLANE.

The Convolutions and Fissures on the mesial surface of the cerebrum are seen; also the Third and Fourth Ventricles of the brain and the parts in relation to them.

1. Marginal gyrus.
2. Calloso-marginal sulcus.
3. Callosal gyrus.
4. Paracentral lobule.
5. Upper end of fissure of Rolando.
6. Callosal fissure.
7. Pre-cuneus.
8. Internal parieto-occipital fissure.
9. Cuneus.
10. Calcarine fissure.

N.B.—The posterior cuneo-lingual gyrus is on the surface, breaking up the calcarine fissure into two parts.

11. Lingual gyrus.
12. Genu of the corpus callosum.

N.B.—The narrow part extending backwards from this is the rostrum.

13. Body of corpus callosum.
14. Splenium of corpus callosum.
15. Septum lucidum.
16. Body of fornix.

N.B.—The divided anterior pil-

Glass Rods.—Anterior rod in the foramen of Monro; posterior rod in the aqueduct of Sylvius.

lar of the fornix is seen immediately in front of the upright rod.

17. Velum interpositum.
18. Anterior commissure—transversely divided.
19. Lamina cinerea (lamina terminalis).

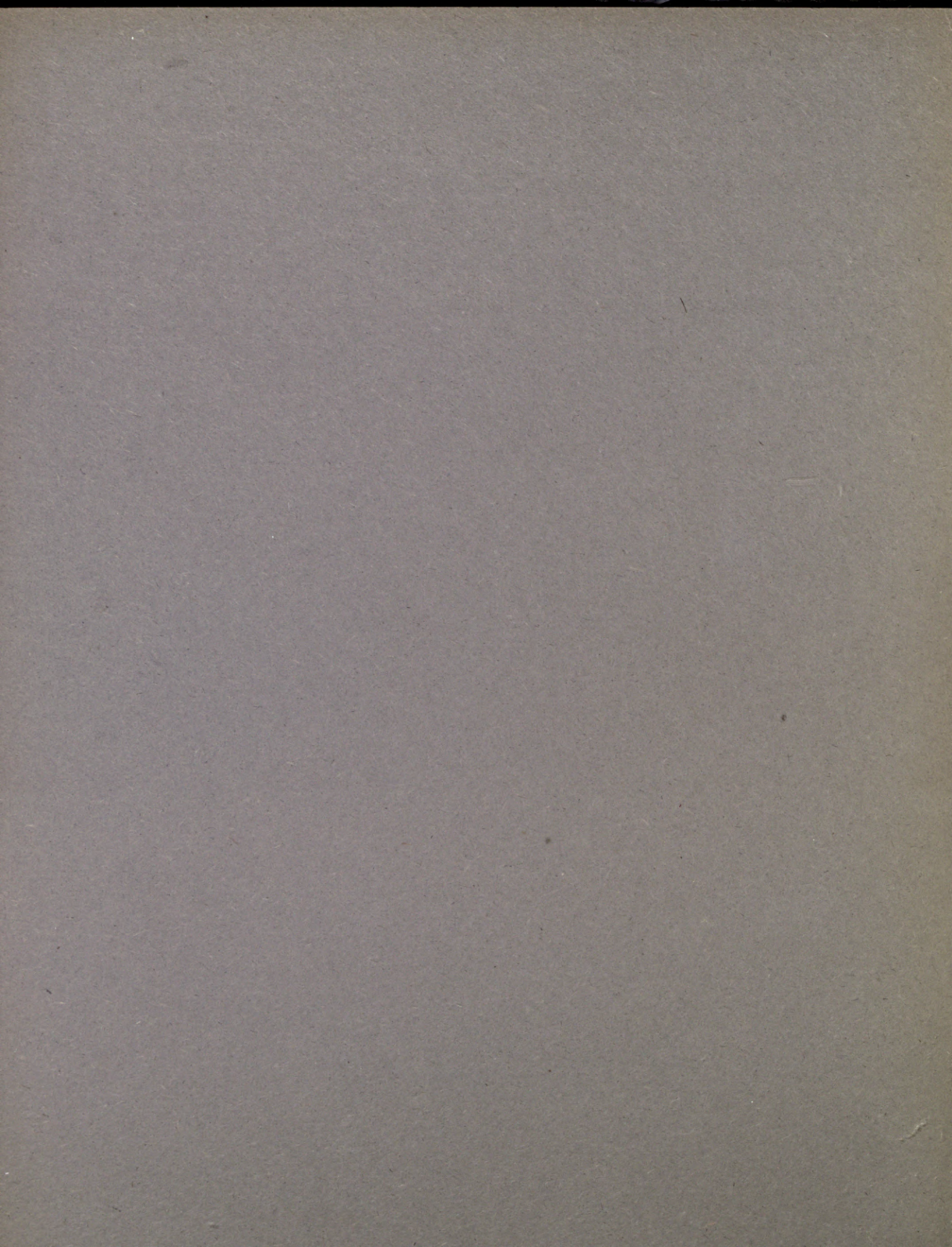
N.B.—Immediately below this number is the optic recess of the third ventricle, and below that again the optic chiasma transversely divided.

20. Optic nerve.
21. Cavity of third ventricle.
22. Middle commissure (below which is seen the sulcus of Monro on the lateral wall of the ventricle).
23. Mesial surface of optic thalamus (note the tænia thalami running along the upper edge of this surface).
24. Pineal body (note the pineal recess of the third ventricle

carried back in a fissure-like manner into the stalk of the pineal body).

25. Infundibulum of pituitary body.
26. Tuber cinereum; immediately behind are the corpora mammillaria. One of these bodies is divided; note the central nucleus of grey matter and the surrounding capsule of white matter.
27. Third or oculo-motor nerve.
28. Crus cerebri (number immediately below the red nucleus).
29. Corpora quadrigemina.
30. Substantia ferruginea (number in front of superior medullary velum).
31. Pons Varolii (note pyramidal fibres passing down through it).
32. Bulb or medulla (pin transfixes the inferior olivary nucleus).
33. Fourth ventricle of the brain.
34. Olfactory bulb.





CENTRAL NERVOUS SYSTEM.**BRAIN—No. 5.**

DISSECTION TO SHOW THE CORPORA GENICULATA, THE CONNECTIONS OF THE OPTIC TRACT, AND THE MIDDLE PEDUNCLE OF THE CEREBELLUM.

The posterior part of the hemisphere has been removed.

1. Orbital operculum.
2. Frontal operculum.
3. The frontal-parietal operculum.
4. The island of Reil.
5. The anterior perforated spot.

N.B.—The lateral root of the olfactory tract immediately in front.

6. Optic nerve.
7. Third or oculo-motor nerve.
8. Optic tract.
9. Mesial root of optic tract.
10. Lateral root of optic tract.
11. Corpus geniculatum externum.
12. Section through pulvinar.
13. Corpus geniculatum internum.
14. Inferior brachium.

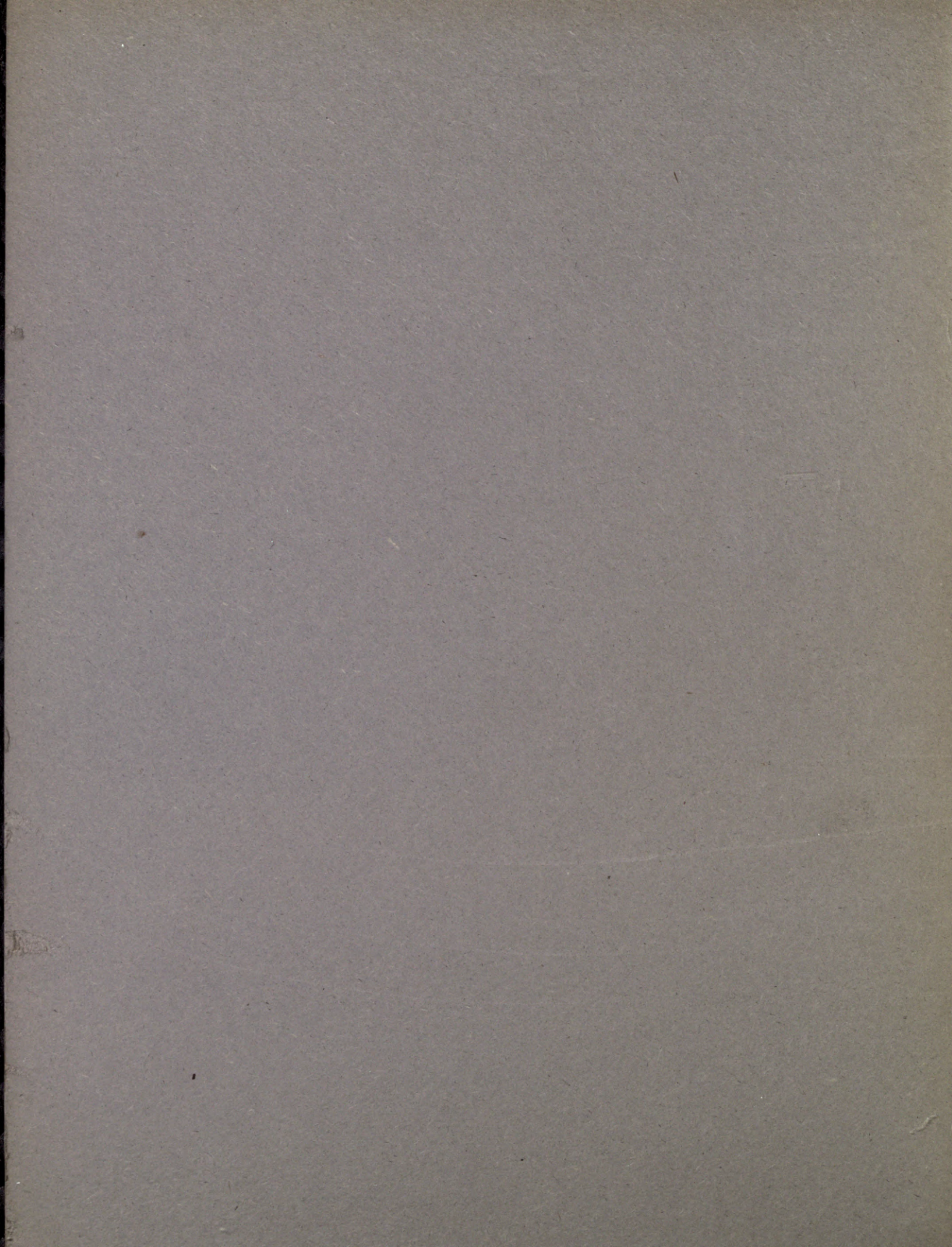
15. Inferior quadrigeminal body.

N.B.—The superior quadrigeminal body and its brachium immediately above 14 and 15.

16. Superior peduncle of the cerebellum.
17. Crus cerebri.
18. Fourth or trochlear nerve.
19. Pons Varolii.
20. Middle peduncle of the cerebellum.
21. Trigeminal nerve.
22. Auditory nerve.
23. Facial nerve.
24. Flocculus.
25. Vago-glossopharyngeal nerve.
26. Olfactory bulb.

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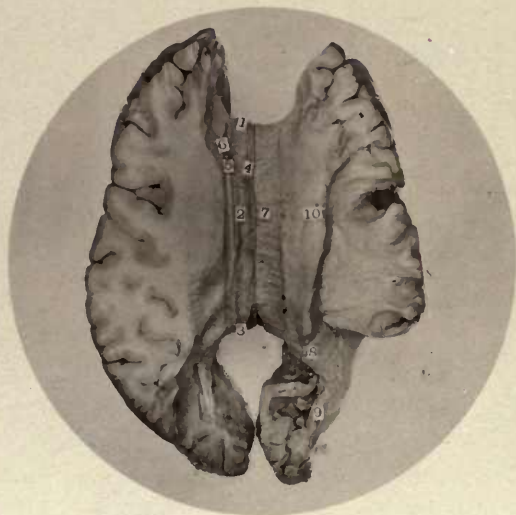
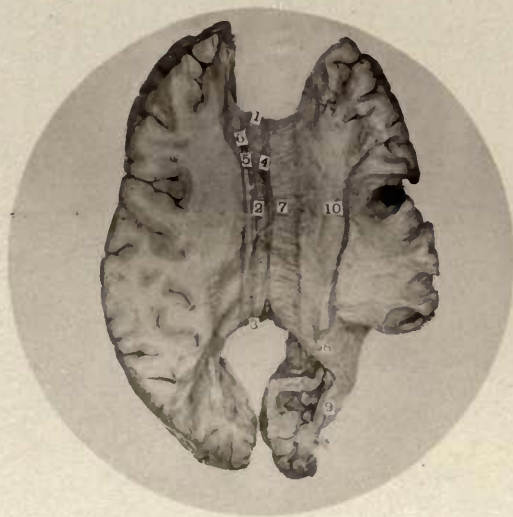




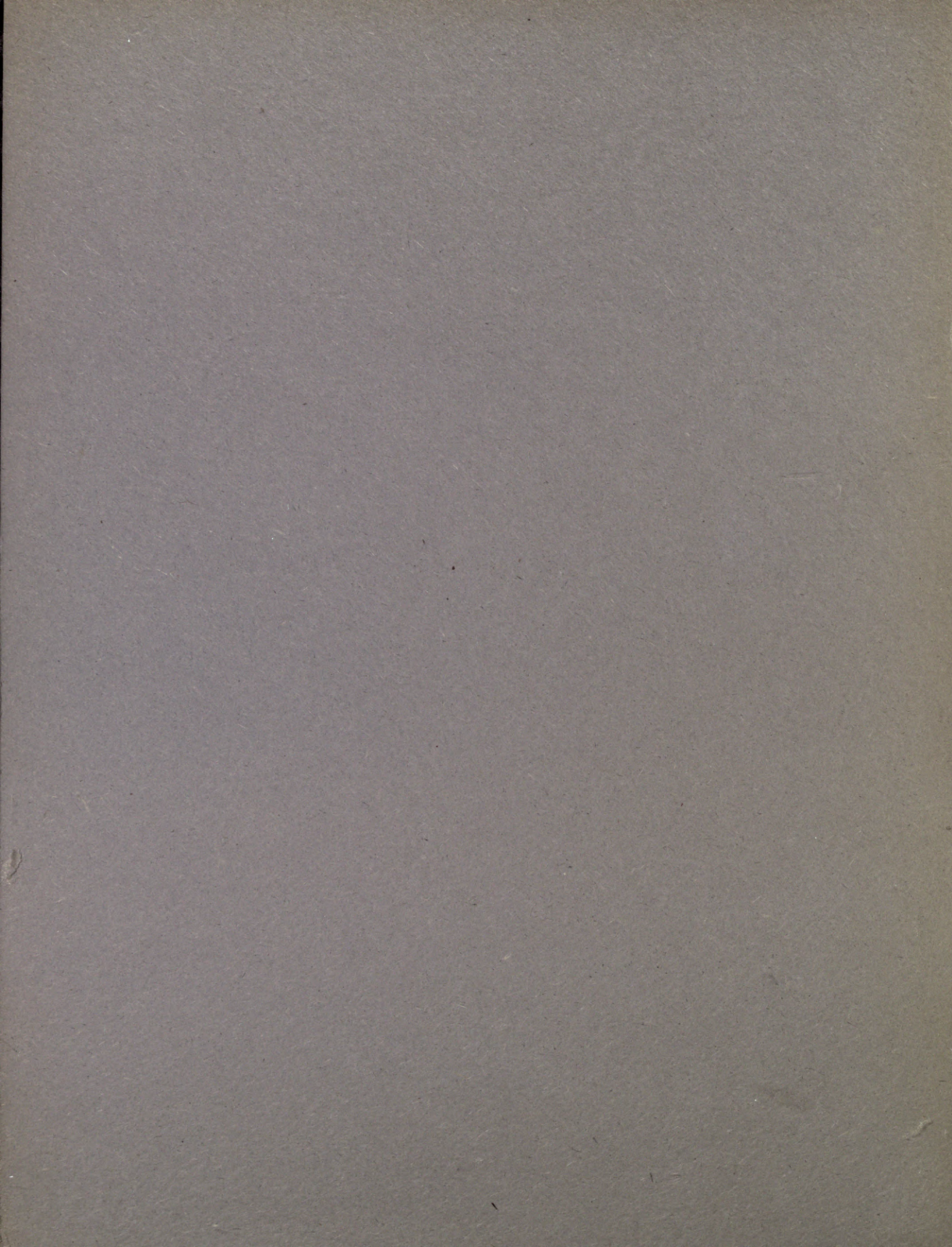
CENTRAL NERVOUS SYSTEM.**BRAIN—No. 6.****DISSECTION OF THE CORPUS CALLOSUM.**

The upper parts of the hemispheres have been removed down to the level of the corpus callosum, and the fibres of the corpus callosum traced outwards in different directions.

1. Genu of corpus callosum.
2. Body of corpus callosum.
3. Splenium of corpus callosum.
4. Stria longitudinalis mesialis.
5. Stria longitudinalis lateralis.
6. The bed or groove in which the cingulum lies.
7. Surface layer of the corpus callosum removed to show the transverse course pursued by the bundles of fibres of the corpus callosum.
8. Tapetum.
9. Forceps major.
10. The place where the callosal and corona radiata systems of fibres intersect.



SECTION-1.



CENTRAL NERVOUS SYSTEM.**BRAIN—No. 7.**

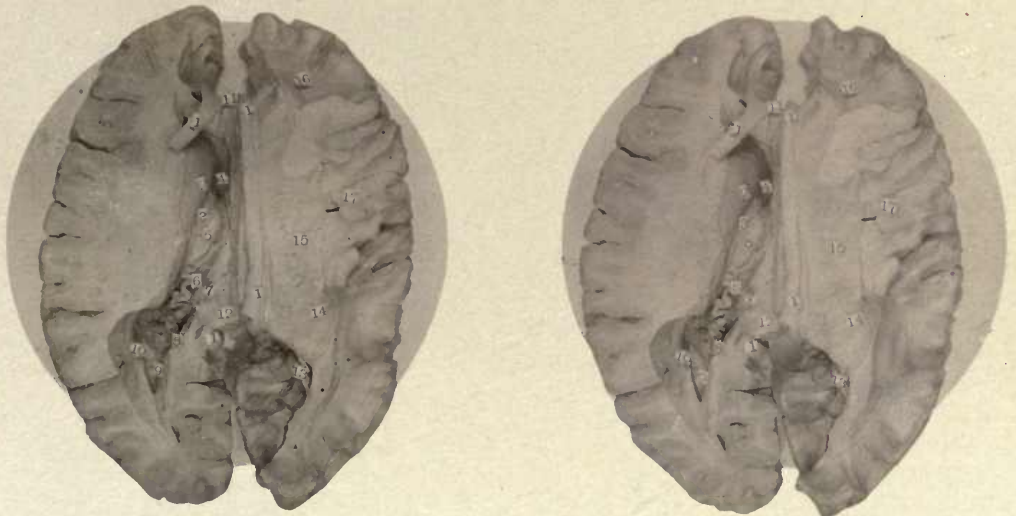
DISSECTION TO SHOW THE CINGULUM AND THE DISTRIBUTION OF THE FIBRES OF THE CORPUS CALLOSUM

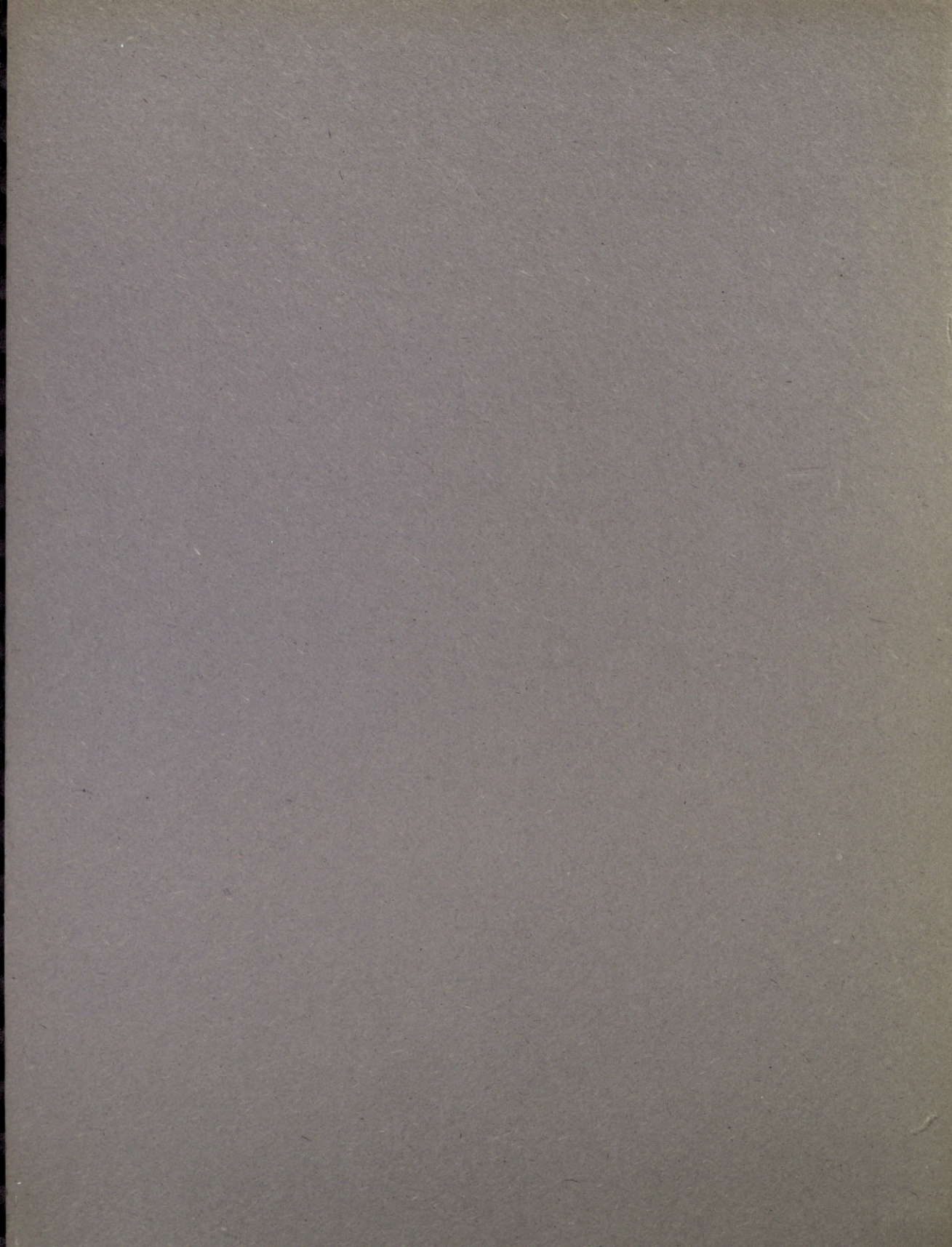
On the left side the lateral ventricle has been opened by the removal of a portion of the corpus callosum.

Rod IN FORAMEN OF MONRO.

- | | |
|--|--|
| 1. Cingulum : on left side central portion removed ;
on right side see the large contribution of fibres
which it sends back into the occipital lobe. This
is divided. | 9. Hippocampus minor. |
| 2. Caudate nucleus. | 10. Eminentia collateralis posterior. |
| 3. Tænia semicircularis. | 11. Genu of corpus callosum. |
| 4. Septum lucidum. | 12. Splenium of corpus callosum. |
| 5. Optic thalamus. | 13. Forceps major. |
| 6. Choroid plexus. | 14. Tapetum. |
| 7. Fornix. | 15. Transverse fibres issuing from body of fornix. |
| 8. Bulb of posterior horn formed by forceps major
which comes from the splenium (12) of the
corpus callosum. | 16. Intersection between callosal and corona radiata
systems of fibres. |
| | 17. Portion of the fasciculus longitudinalis superior. |

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CENTRAL NERVOUS SYSTEM.

BRAIN—No. 8.

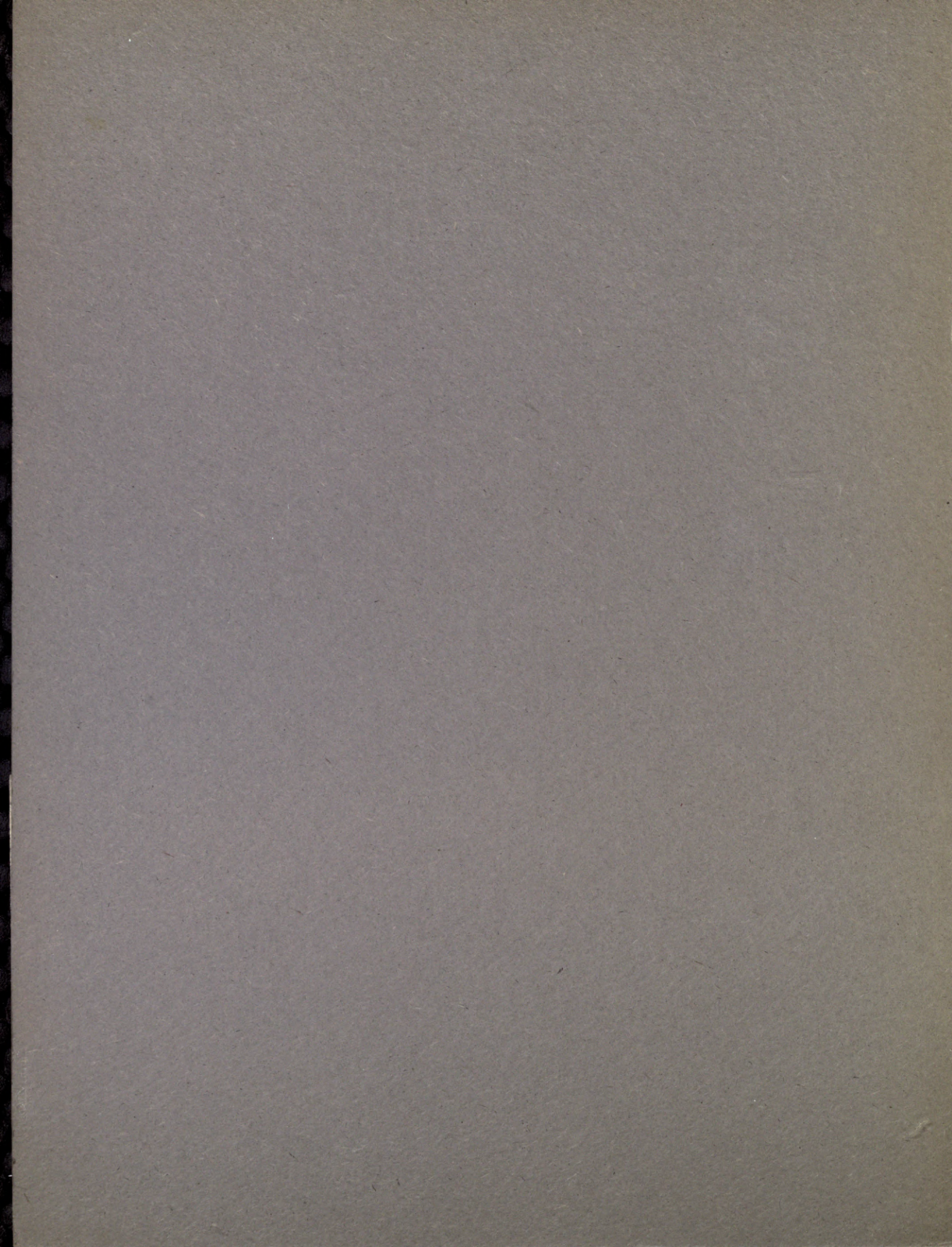
DISSECTION TO SHOW THE BODY OF THE FORNIX AND THE LATERAL VENTRICLES.

The body of the corpus callosum has been removed, and the descending horn of the lateral ventricle opened up on the right side by removal of part of the right hemisphere.

- | | |
|--|--|
| 1. Genu of corpus callosum. | 13. Posterior pillar of fornix passing on to the hippocampus major. |
| 2. Body of the corpus callosum turned over to the left, so as to open up the lateral ventricles. | 14. Bulb of posterior cornu. |
| 3. Splenium of the corpus callosum. | 15. Calcar avis or hippocampus minor. |
| 4. Septum lucidum and fifth ventricle ; note the two layers of the septum lucidum. | 16. Eminentia collateralis posterior. |
| 5. Caudate nucleus. | 17. Pes hippocampi. |
| 6. Vein of the corpus striatum joining the vein of Galen in the velum interpositum. | 18. Choroid plexus in descending horn of lateral ventricle. |
| 7. Optic thalamus. | 19. Inferior longitudinal fasciculus. |
| 8. Choroid plexus. | 20. Optic radiation. |
| 9. Body of fornix. | 21. The foot or base of corona radiata, <i>i.e.</i> fibres of the internal capsule passing up to spread out in corona radiata. |
| 10. Where fornix is attached to under surface of the corpus callosum. | 22. Intersection of callosal and corona radiata systems of fibres. |
| 11. Fimbria of fornix. | 23. Lenticular nucleus. |
| 12. Anterior tubercle of optic thalamus. | |

Small Rods in the foramina of Monro which lead from the third ventricle into the lateral ventricles.





CENTRAL NERVOUS SYSTEM.

BRAIN—No. 9.

DISSECTION TO SHOW THE VELUM INTERPOSITUM AND THE CHOROID PLEXUSES OF THE LATERAL VENTRICLES.

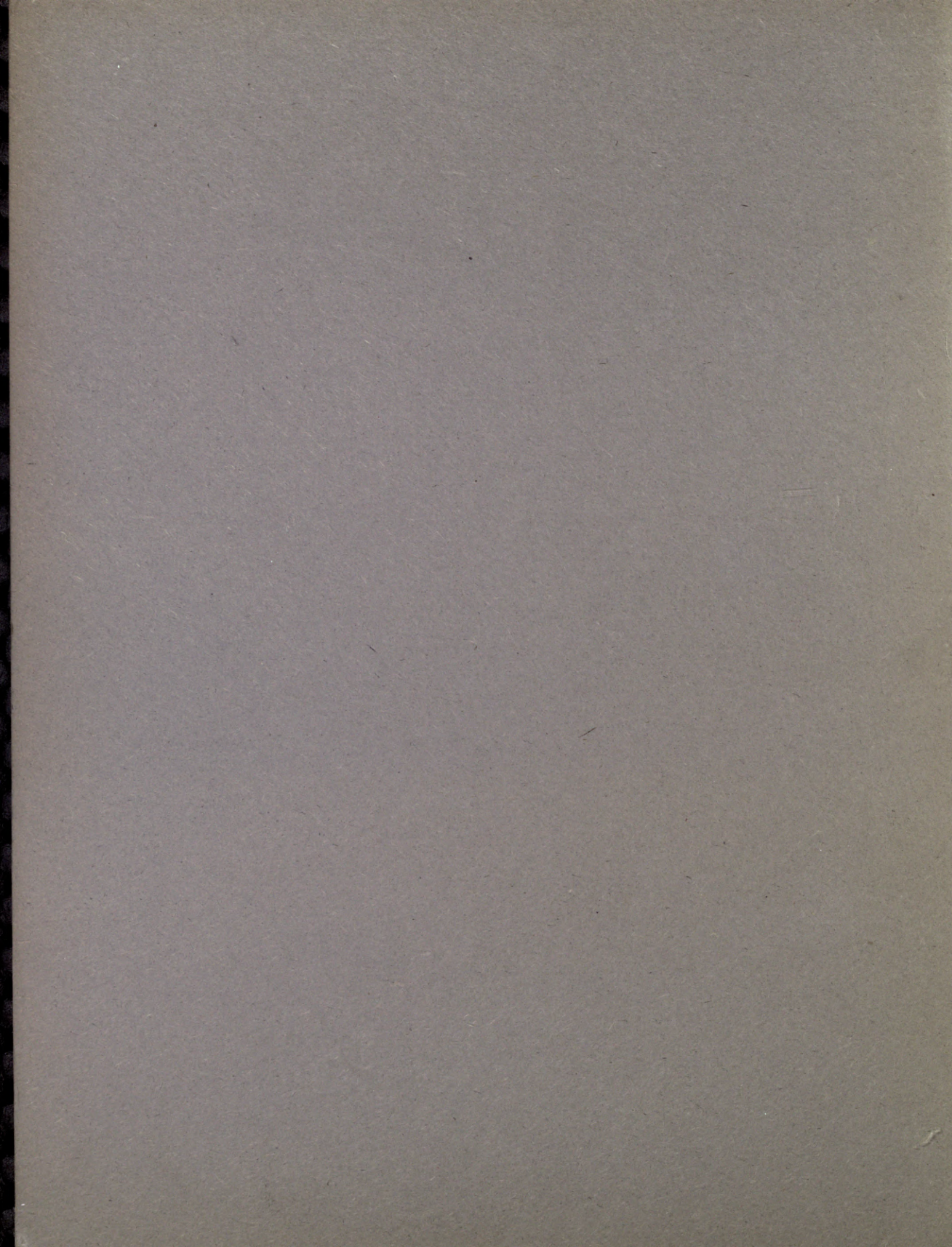
The greater part of the corpus callosum and the body of the fornix have been removed. On the right side the descending horn of the lateral ventricle is opened into; on the left side the fronto-parietal operculum has been removed, so as to display the island of Reil.

1. Genu of corpus callosum.
2. The label is placed over the fifth ventricle—the fissure-like space between the two laminae which form the septum lucidum, both of which are seen.
3. Anterior end of the body of the fornix.
4. Velum interpositum.
5. Vena magna Galeni.
6. Choroid plexuses.
7. Caudate nucleus.
8. Tænia semicircularis.
9. Splenium of corpus callosum.
10. Inferior longitudinal fasciculus.
11. Upper surface of temporal lobe.
12. Island of Reil.
13. Pes hippocampi.
14. Posterior horn of lateral ventricle.
15. Enlargement of choroid plexus in trigonum ventriculi.

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CENTRAL NERVOUS SYSTEM.

BRAIN—No. 10.

TWO CORONAL SECTIONS THROUGH THE BRAIN.

A. In a plane corresponding to the anterior end of the caudate nucleus.

B. In a plane corresponding to the anterior part of the locus perforatus anticus.

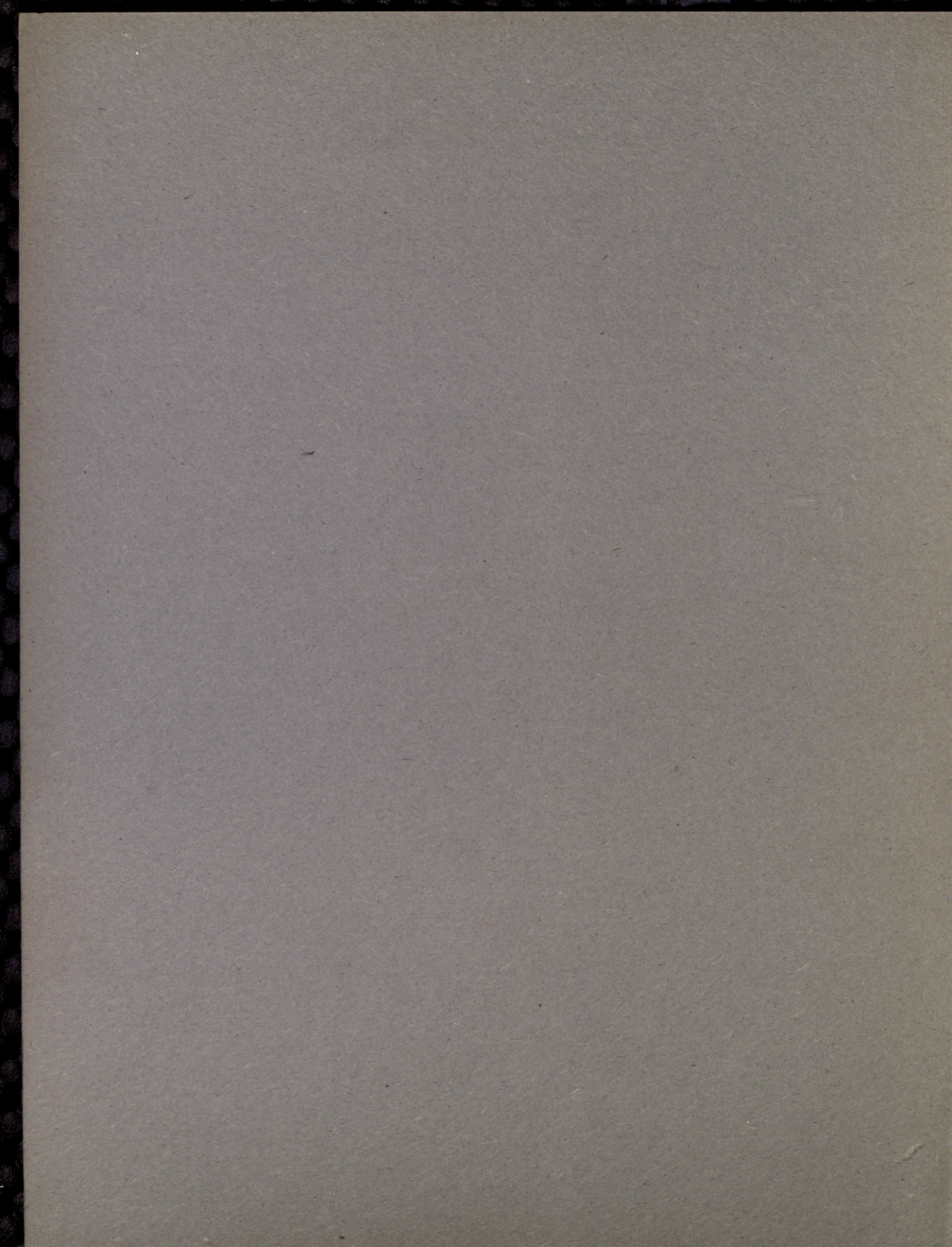
Lettering common to both specimens.

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- | | |
|--|---|
| 1. Corpus callosum. | 5. Septum lucidum. |
| 2. Rostrum of corpus callosum. | 6. Anterior end of the internal capsule. |
| 3. Anterior horn of lateral ventricle. In A, note how the genu of corpus callosum forms the anterior boundary of this ventricle. | 7. Putamen of the lenticular nucleus. |
| 4. Caudate nucleus. | 8. External capsule, and immediately to the outer side of this the thin lamina of gray matter termed the claustrum. |

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SECTION I





CENTRAL NERVOUS SYSTEM.

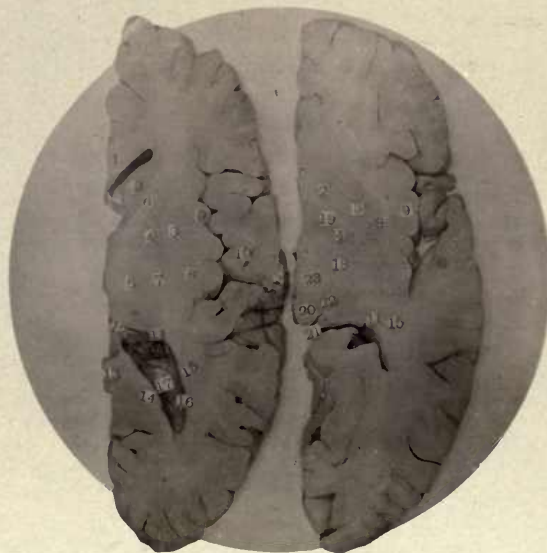
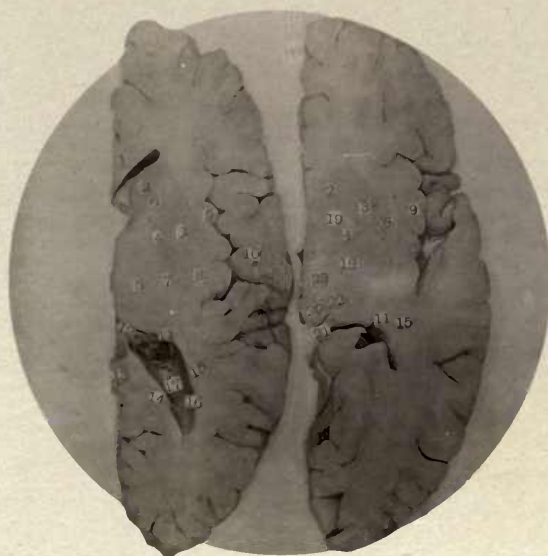
BRAIN—No. 11.

TWO TRANSVERSE SECTIONS THROUGH THE LEFT CEREBRUM; THE LOWER SURFACES OF THE SECTIONS ARE DISPLAYED.

N.B.—The section on the right is taken at a lower plane than that on the left.

- | | |
|---|--|
| 1. Corpus callosum. | 11. Tail of caudate nucleus. |
| 2. Head of caudate nucleus. | 12. Fornix. |
| 3. Putamen of lenticular nucleus. | 13. Splenium of corpus callosum. |
| 4. Globus pallidus of lenticular nucleus. | 14. Forceps major. |
| 5. Optic thalamus. | 15. Optic radiation. |
| 6. Anterior limb of internal capsule. | 16. Tapetum. |
| <i>N.B.</i> —Genu of intern. l. capsule between the head of the caudate nucleus and the optic thalamus. | |
| 7. Posterior limb of internal capsule. | 17. Roof of posterior horn of lateral ventricle. |
| 8. Claustrum (the thin white lamina between it and the lenticular nucleus is the external capsule). | 18. Internal capsule. |
| 9. Island of Reil. | 19. Anterior commissure. |
| 10. Temporal operculum. | 20. Superior quadrigeminal body. |
| | 21. Inferior quadrigeminal body. |
| | 22. Section through corpus geniculatum internum. |
| | 23. Sub-thalamic region. |

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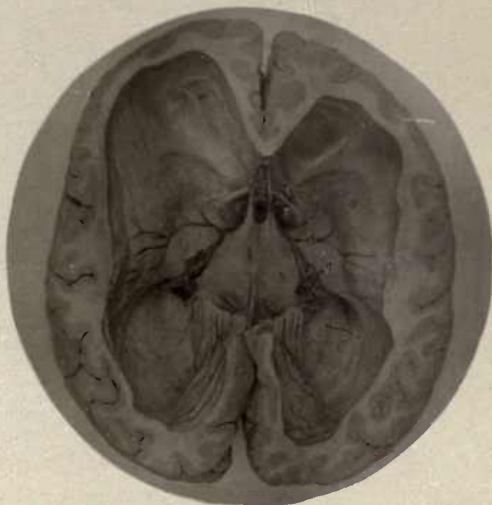
CENTRAL NERVOUS SYSTEM.

BRAIN—No. 12.

PATHOLOGICAL SPECIMEN—HYDROCEPHALUS.

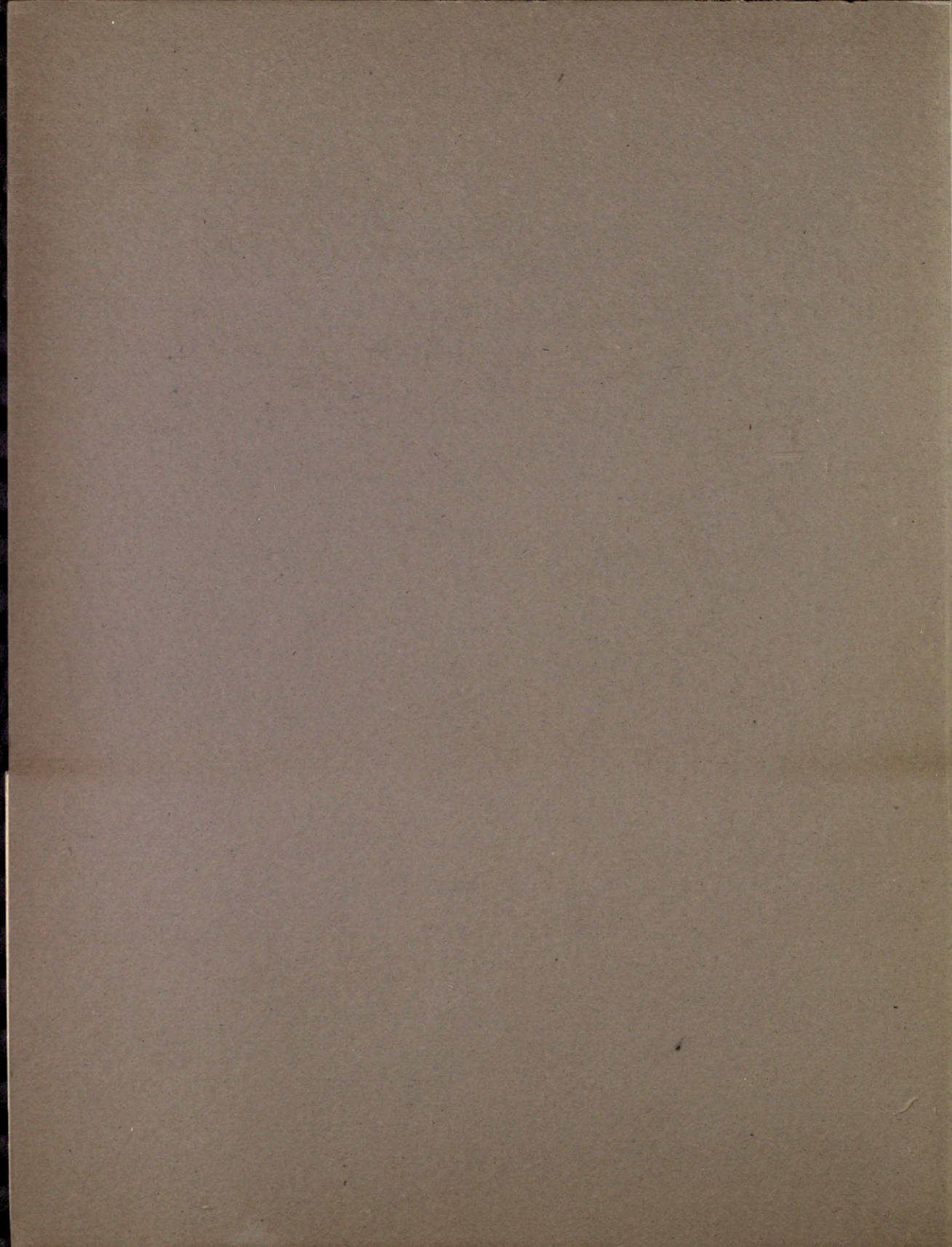
Ventricles of the brain greatly distended by fluid. Foramina of Monro much expanded and fornix stretched. The septum lucidum has in great part disappeared, so that the fifth ventricle is thrown into the ventricular system, and the lateral ventricles are brought into direct communication with each other. Looking down into the third ventricle, the infundibular recess in the floor is seen.

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- | | |
|-------------------------------|----------------------------|
| 1. Anterior pillar of fornix. | 6. Choroid Plexus. |
| 2. Foramen of Monro. | 7. Optic thalamus. |
| 3. Caudate nucleus. | 8. Eminentia collateralis. |
| 4. Vein of corpus striatum. | 9. Calcar avis. |
| 5. Fornix (body). | |



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CENTRAL NERVOUS SYSTEM.

BRAIN—No. 13.

DISSECTION OF THE BRAIN FROM ABOVE AND FROM BEHIND TO SHOW THE BRAIN-STEM AND THE SYSTEM OF VENTRICULAR CAVITIES.

FROM ABOVE, the cerebral hemispheres have been sliced away down to the level of the corpus callosum, the body of the corpus callosum has been turned over to the right, and the fornix and the velum interpositum have been removed.

FROM BEHIND, the cerebellum and the posterior portions of the cerebral hemispheres have been removed, and the inferior cornua of the lateral ventricles exposed from below.

A minute Rod is passed from the fourth ventricle into the central canal of the cord; another Rod traverses the aqueduct of Sylvius and passes from the fourth ventricle into the third ventricle.

The four rounded eminences, termed the corpora quadrigemina, on the dorsal aspect of the mesencephalon are not lettered; nor is the pineal body which lies between the upper pair of corpora quadrigemina.

The areas on the floor of the fourth ventricle, and the clava, cuneate tubercle, and Rolandic tubercle on the back of the medulla oblongata are well seen, but are not lettered.

Note on the medulla the thin lamina, termed the ligula, which is attached to the outer surface of the restiform body.

- | | | |
|---|---|---|
| 1. Corpus callosum. | 7. Pulvinar. | 17. Valve of Vieussens. |
| 2. Septum lucidum. | 8. External geniculate body. | 18. Superior cerebellar peduncle |
| 3. Fornix (divided). | 9. Tænia thalami. | 19. Middle cerebellar peduncle |
| 4. Intraventricular part of upper surface of optic thalamus. | 10. Trigonum habenulæ. | 20. Inferior cerebellar peduncle (restiform body) |
| 5. Groove on the upper surface of the thalamus which corresponds to the edge of the fornix. | 12. Inferior brachium passing from inferior quadrigeminal body. | 21. Crus cerebri. |
| 6. Extraventricular part of upper surface of thalamus. | 13. Internal geniculate body. | 22. Eminentia teres. |
| | 14. Fourth or trochlear nerve. | 23. Striæ acusticæ. |
| | 15. Caudate nucleus. | 24. Vago-glossopharyngeal fascicles. |
| | 16. Position of tænia semicircularis. | |

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divided.

SECTION I.





CENTRAL NERVOUS SYSTEM.

BRAIN—No. 14.

THE CEREBELLUM.

A. Lower Surface.

B. Upper Surface.

In both specimens the great horizontal fissure is indicated by the small glass rods.

LOWER SURFACE.

A.

On the right side the tonsil or amygdala has been removed to show the inferior medullary velum, which is rendered distinct through the introduction beneath it of some cotton-wadding.

SMALL ROD in posterior part of the fourth ventricle of the brain.

1. Lobulus centralis.
2. Ala.
3. Superior medullary velum or valve of Vieussens.
4. Superior cerebellar peduncles.
5. Middle cerebellar peduncles.
6. Flocculus.
7. Inferior medullary velum; note its connection with the flocculus.
8. Nodule.
9. Uvula.
10. Pyramid.
11. Tuber valvulæ.

Inferior vermis.

12. Tonsil.
13. Biventral lobule.
14. Slender lobule (lobulus gracilis).
15. Postero-inferior lobule.

UPPER SURFACE.

B.

16. Lobulus centralis.
17. Culmen monticuli.
18. Clivus monticuli.
19. Folium cacuminis.
- 20 (right side) and 21 (left side). Ala.
- 21 (right side) and 22 (left side). Anterior semilunar lobule.
- 22 (right side). Posterior semilunar lobule.
23. Postero-superior lobule.

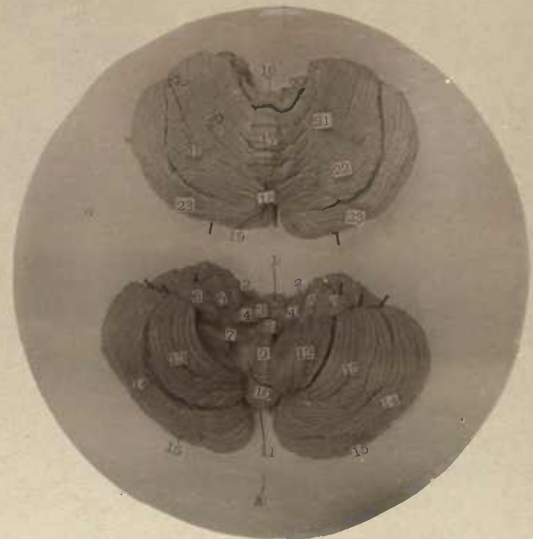
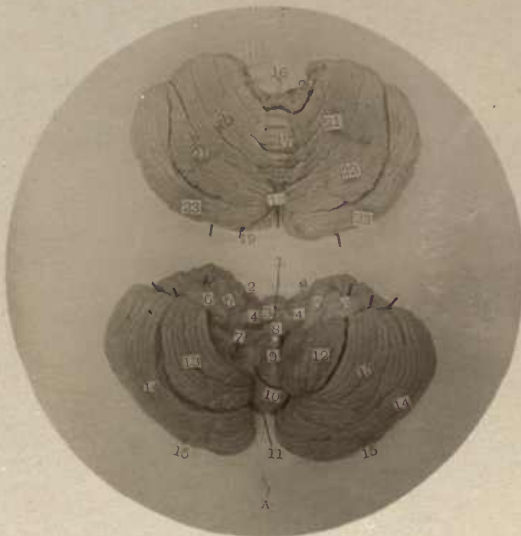
Superior vermis.

Quadrangular lobule.

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CENTRAL NERVOUS SYSTEM BRAIN. No. 14.

SECTION I.



CENTRAL NERVOUS SYSTEM.

BRAIN—No. 15.

ISLAND OF REIL, OR INSULA.

The parts of the frontal, parietal, and temporal lobes covering the insula of the left hemisphere have been removed by a cone-like section.

The insula, or island of Reil, is a portion of the cortex concealed from view in the adult brain by the growth over it of the adjacent portions of the cortex. These portions are termed the opercula, and belong to the frontal, parietal, and temporal lobes.

The insula is surrounded by a slit-like groove, the *sulcus limitans insulæ*, which marks off the surface of the insula from the cortex, and which entirely surrounds it except at the lower and front part, where the insula is continuous with the back part of the orbital surface of the frontal lobe.

Like the rest of the cortex, the insula is divided by fissures into convolutions.

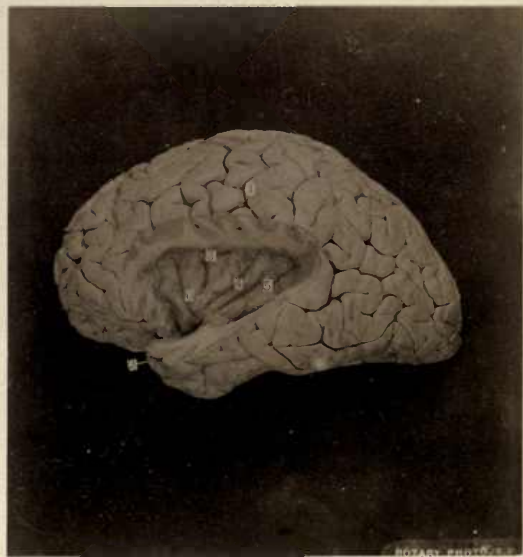
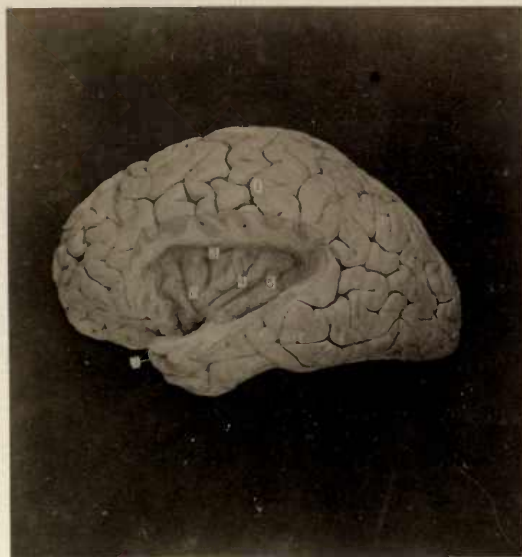
The principal fissure runs obliquely downwards and forwards, and is called the *sulcus centralis insulæ*. It runs very much in the same direction as the fissure of Rolando, and divides the insula into an anterior and a posterior part.

The posterior part shows one or more convolutions called *gyri longi insulæ*, while the anterior part is subdivided by radiating fissures into several *gyri breves insulæ*.

The upper part of the insula overlies the claustrum and the external capsule of the basal ganglia.

The figures indicate:—

- | | |
|----------------------------|-----------------------------|
| 1. Fissure of Rolando. | 4. Sulcus centralis insulæ. |
| 2. Temporal pole. | 5. Gyri longi insulæ. |
| 3. Sulcus limitans insulæ. | 6. Gyri breves insulæ. |



CENTRAL NERVOUS SYSTEM.

BRAIN—No. 16.

DISSECTION FROM THE OUTER SIDE OF THE LEFT CEREBRAL HEMISPHERE TO SHOW CERTAIN TRACTS OF LONG ASSOCIATION FIBRES.

The grey matter of the cortex with the short association fibres has been removed.

Association fibres connect different regions of the cortex of the same hemisphere. **Short association fibres** unite contiguous convolutions, and such as are removed only a short distance from one another.

Long association fibres are gathered together into fasciculi which lie in the white substance of the hemisphere, and connect areas of the cortex separated by considerable intervals.

The **superior longitudinal fasciculus** lies on the outer side of the corona radiata in the base of the fronto-parietal operculum. From the frontal lobe it extends backwards above the island of Reil and the lenticular nucleus to the posterior end of the fissure of Sylvius. Here many fibres radiate backwards into the occipital lobe, while the majority arch round the fissure of Sylvius, downwards and forwards into the temporal lobe.

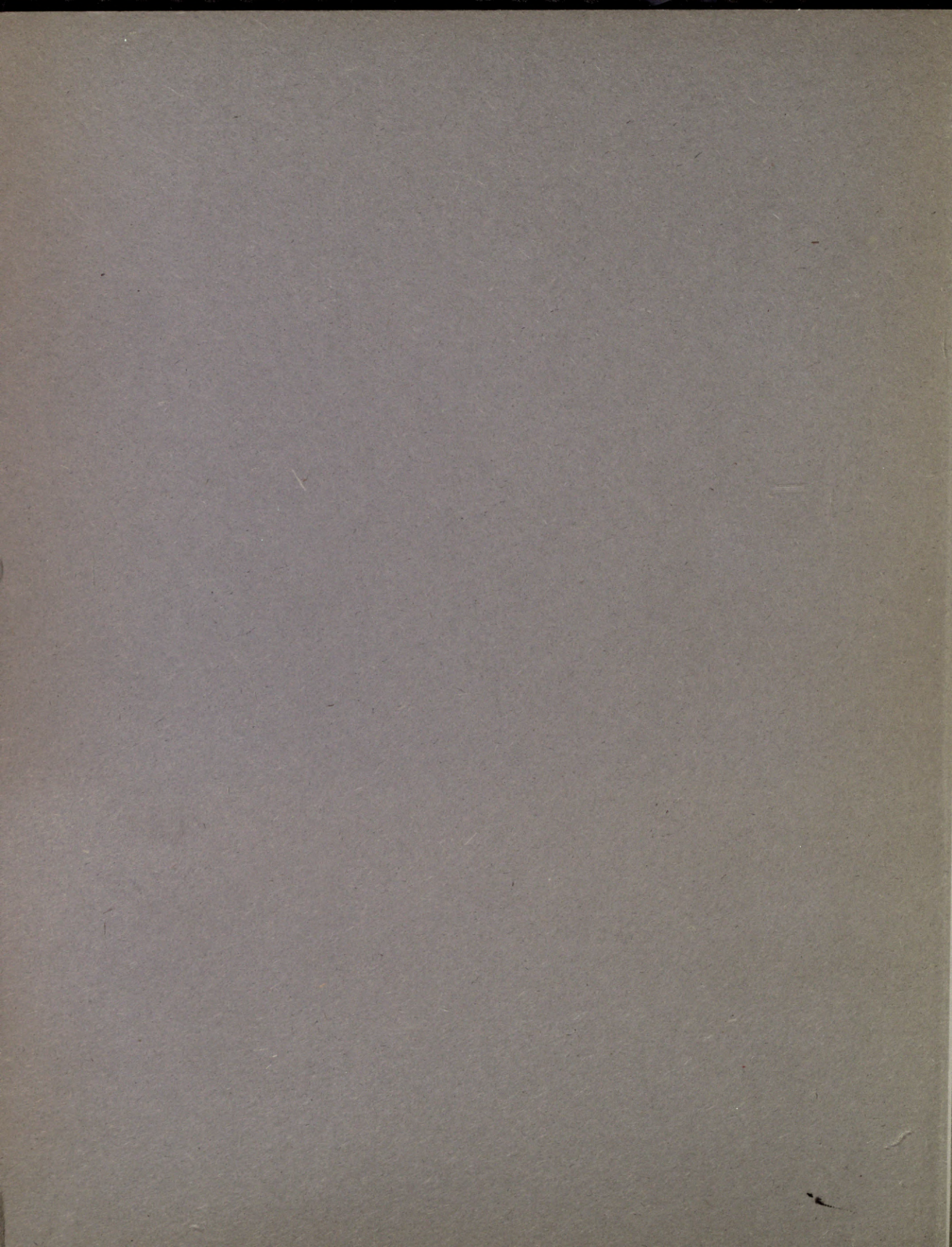
The **inferior longitudinal fasciculus** lies on the outer side of the optic radiation. It extends from the posterior end of the occipital lobe to the anterior end of the temporal lobe.

The **fasciculus uncinatus** arches round the stem of the fissure of Sylvius, and connects the frontal pole and the orbital convolutions with the anterior part of the temporal lobe.

The figures indicate—

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Superior longitudinal fasciculus. 2. Some of its occipital fibres. 3. Its temporal fibres. 4. Inferior longitudinal fasciculus. Some of it has been removed along with underlying fibres of the optic radiation, to show the Tapetum forming the outer wall of the posterior horn of the lateral ventricle. | <ol style="list-style-type: none"> 5. Fasciculus uncinatus. 6. Fibres of the optic radiation above the roof of the descending horn of the lateral ventricle. 7. Outer wall of posterior horn. 8. White matter of the island of Reil with grey matter of claustrum showing through. 9. Temporal pole. 10. Internal orbital gyrus. |
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CENTRAL NERVOUS SYSTEM.

BRAIN—No. 17.

DISSECTION FROM THE OUTER SIDE OF THE LEFT CEREBRAL HEMISPHERE TO SHOW THE OUTER SURFACE OF THE LENTICULAR NUCLEUS, THE CORONA RADIATA, AND THE ANTERIOR WHITE COMMISSURE.

The opercula, the island of Reil, the claustrum, the external capsule, the anterior part of the hippocampal gyrus, and the uncus have been removed.

The **lenticular nucleus** together with the caudate nucleus forms the corpus striatum. It is placed upon the outer aspect of the internal capsule which separates it from the caudate nucleus and the optic thalamus. Laminae of grey matter pass between the two nuclei through the internal capsule. Externally it is covered by the external capsule, the claustrum, and the island of Reil. The lower part of its anterior end is directly continuous with the caudate nucleus internally, and with grey matter of the anterior perforated spot below. Posteriorly its lower surface rests upon the anterior commissure and fibres passing between the internal capsule and the temporal lobe.

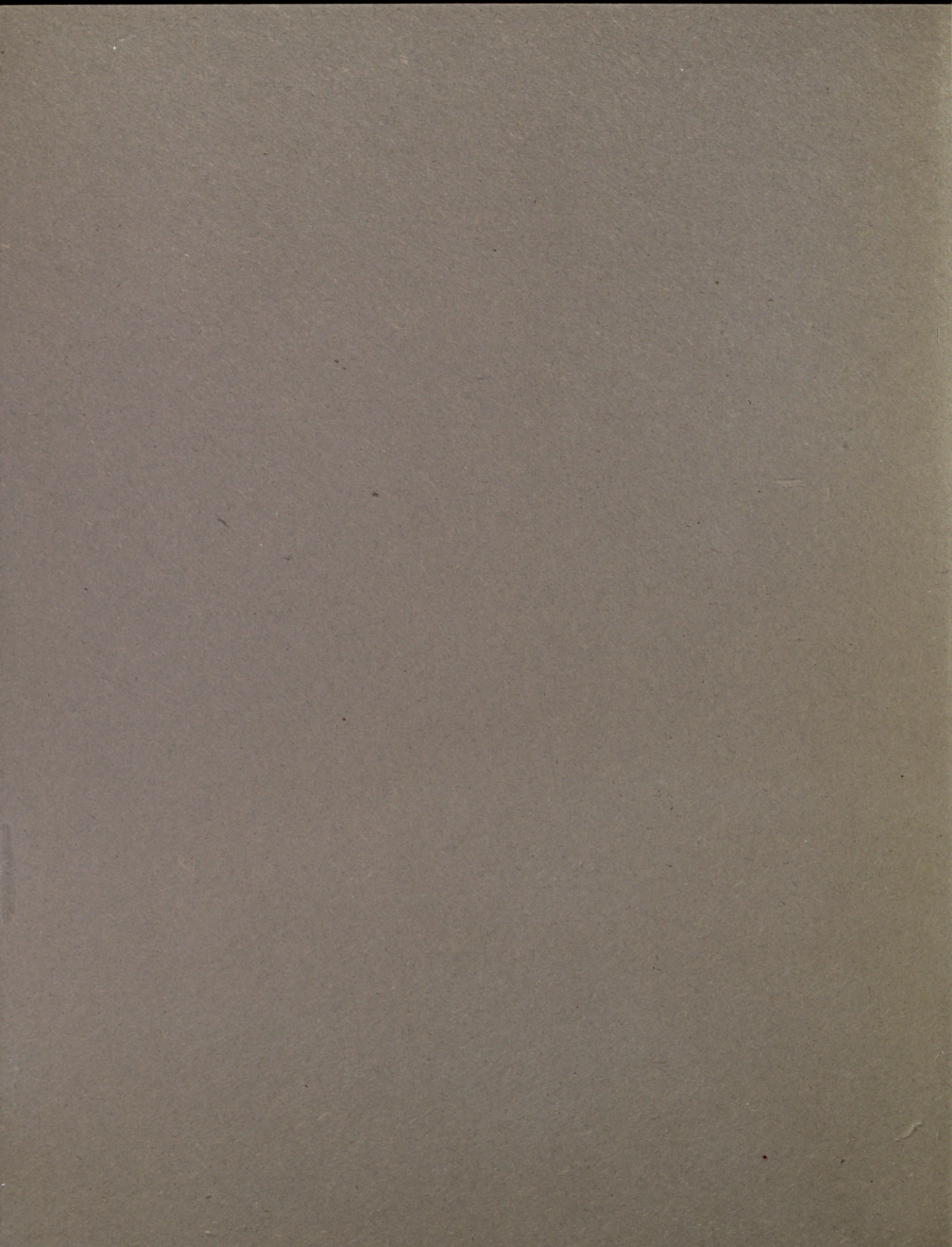
The **lenticulo-striate** and **lenticulo-optic** branches of the middle cerebral artery pass through the anterior perforated spot and ascend for a certain distance between the lenticular nucleus and the external capsule (the grooves for these are faintly indicated). They then pass inwards through the lenticular nucleus and through the internal capsule to end—the lenticulo-optic arteries in the optic thalamus, the lenticulo-striate in the caudate nucleus. The largest of the latter group is Charcot's 'Artery of cerebral hæmorrhage.'

The **anterior commissure** connects the olfactory lobes and the temporal lobes. In the middle line it is free, in front of the anterior pillars of the fornix in the anterior wall of the third ventricle. It extends outwards on either side, below the caudate nucleus and below the internal capsule, where it sends forwards a small contribution to the olfactory tract. Thence it proceeds outwards and backwards, below the lenticular nucleus and over the amygdaloid nucleus, to lose itself in the white centre of the temporal lobe.

The figures indicate—

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|---|---|
| <ol style="list-style-type: none"> 1. Lenticular nucleus. 2. Corona radiata. 3. Optic radiation. 4. Superior longitudinal fasciculus. 5. Anterior white commissure. Between the commissure and the optic radiation are | <ol style="list-style-type: none"> temporo-pontine fibres and fibres of the auditory radiation. 6. Crusta of the mid-brain (crus cerebri). 7. External geniculate body. 8. Olfactory peduncle. Between the figure 5 and the optic tract is the anterior perforated spot |
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CENTRAL NERVOUS SYSTEM.

BRAIN—No. 18.

DISSECTION FROM THE UPPER AND OUTER ASPECTS OF THE LEFT CEREBRAL HEMISPHERE TO SHOW THE CORONA RADIATA AND ITS RELATIONS TO THE BASAL GANGLIA.

The brain substance has been removed, exposing the lenticular nucleus and the corona radiata from the outer side. From above the hemisphere has been sliced down to a short distance above the corpus callosum. The corpus callosum and the callosal convolution have been removed.

The corona radiata is composed of the great majority of 'projection' fibres, which connect the cortex cerebri with the optic thalamus, mid-brain, pons, medulla, and spinal cord. Traced downwards its fibres converge towards the basal ganglia, intersecting the fibres of the corpus callosum, and form the internal capsule, which is situated between the optic thalamus and the caudate nucleus, on its inner side, and the lenticular nucleus on its outer side. It contains the motor pyramidal tract, the fronto-pontine and temporo-pontine tracts, the auditory and optic radiations, thalamo-cortical fibres, and some fibres of the superior cerebellar peduncle and of the mesial fillet.

The fibres of the auditory radiation arise in the internal geniculate body, enter the internal capsule, pass outwards under the lenticular nucleus, proceed into the temporal lobe to end in the 'auditory area'—i.e. the middle of the upper temporal gyrus and the gyri on the insular surface of the temporal operculum.

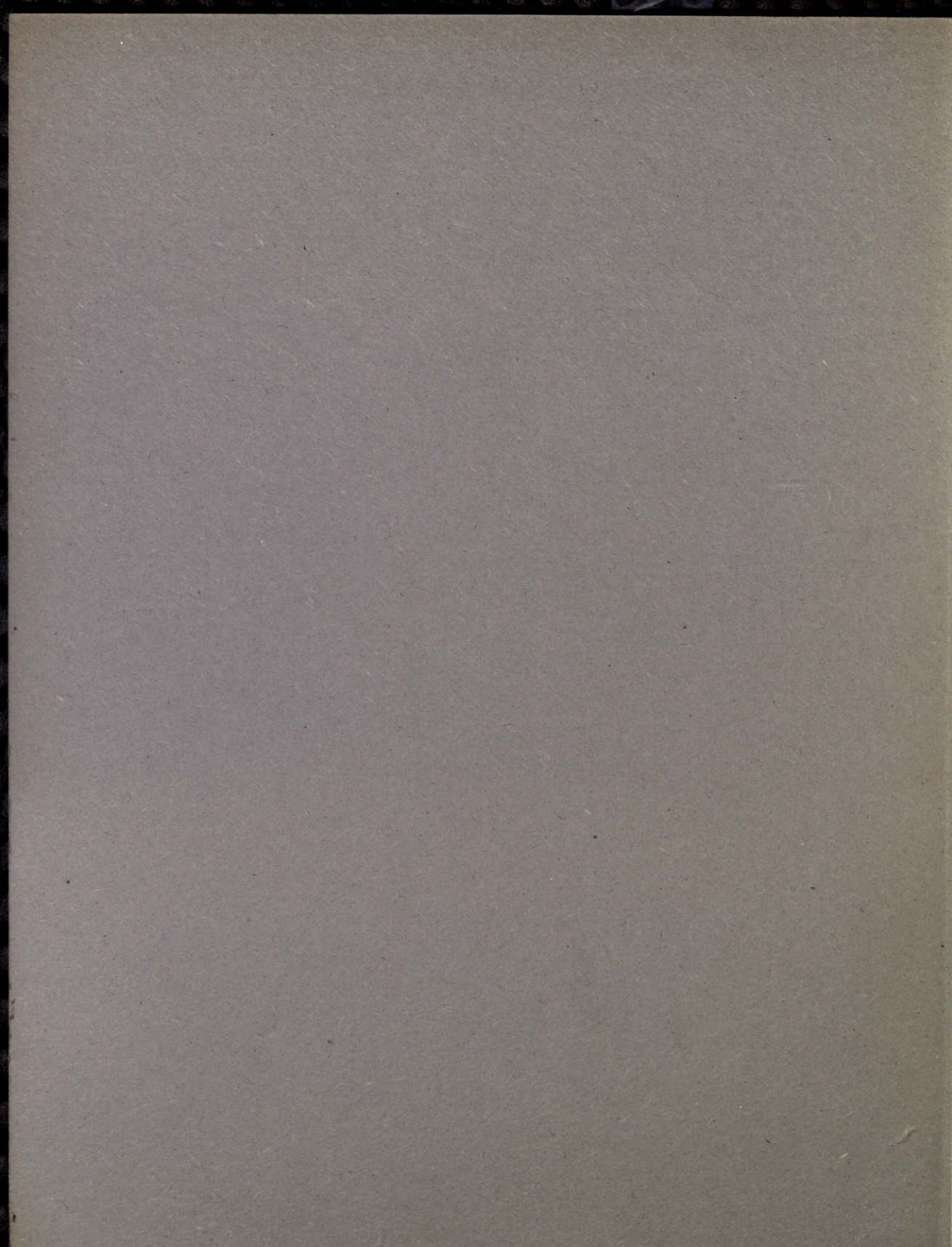
The fibres of the optic radiation establish connection between the occipital cortex and the lower visual centres, in which retinal fibres of the optic tract end, viz: corpus quadrigeminum superius, pulvinar, corpus geniculatum externum. Traced from below they enter the internal capsule, and thence radiate backwards into the occipital lobe.

Thalamo-cortical fibres arise in the optic thalamus, enter the internal capsule and, through the corona radiata, are distributed to all parts of the cortex. They include fibres of the optic radiation.

The figures indicate—

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| 1. Corona radiata. | 8. Tænia semicircularis. |
| 2. Optic radiation. | 9. Deep fibres of fasciculus uncinatus. |
| 3. Auditory radiation and temporo-pontine fibres. | 10. Temporal pole. |
| 4. Anterior white commissure. | 11. Posterior orbital gyrus. (Between 10 and 11
the stem of the fissure of Sylvius.) |
| 5. Lenticular nucleus (exposed from the outer side). | 12. Calcarine fissure. |
| 6. Caudate nucleus. | |
| 7. Optic thalamus. | |





CENTRAL NERVOUS SYSTEM.

BRAIN—No. 19.

DISSECTION OF THE LEFT HALF OF THE BRAIN FROM THE OUTER SIDE, TO SHOW THE CONTINUITY OF THE CORONA RADIATA, INTERNAL CAPSULE, CRUSTA OF THE MID-BRAIN, PYRAMIDAL FIBRES OF THE PONS, AND PYRAMID OF THE MEDULLA.

The gyri of the outer surface of the cerebrum, the island of Reil, the claustrum, the external capsule and the lenticular nucleus have been removed. Part of the cerebellar hemisphere has been sliced off. The transverse fibres of the pons and the nucleus pontis, *i.e.* the grey matter in the ventral part of the pons—have been dissected away.

The corona radiata and the internal capsule contain, *inter alia*—(see Brain No. 28)—the motor pyramidal tract, fronto-pontine, and temporo-pontine fibres.

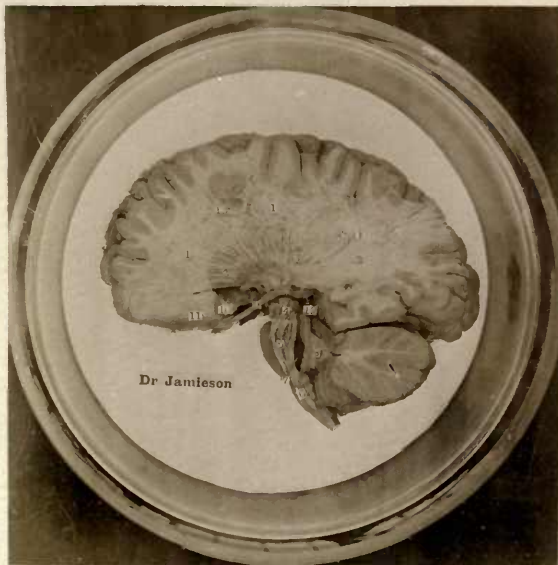
Pyramidal fibres arise in the Rolandic area of the cortex, descend through the corona radiata, internal capsule, crusta, and ventral part of the pons to the medulla, where they form the pyramid. 70-90 per cent. decussate in the medulla and pass down the opposite half of the cord as the crossed pyramidal tract. The rest pass down the same side, forming the direct pyramidal tract, and cross at different levels in the cord (a few pass down with the crossed tract). All the fibres end round cells of the posterior horn of the cord, whence new fibres proceed to the cells of origin of the motor roots of spinal nerves in the anterior horn. In the mid-brain, pons and medulla fibres are given off to the nuclei of motor cranial nerves of the opposite side.

Fronto-pontine fibres arise in the frontal cortex, descend through the corona radiata, internal capsule, and crusta, to end in the nucleus pontis.

Temporo-pontine fibres arise in the upper two temporal gyri, pass inwards below the lenticular nucleus to the internal capsule, and thence through the crusta to end in nucleus pontis.

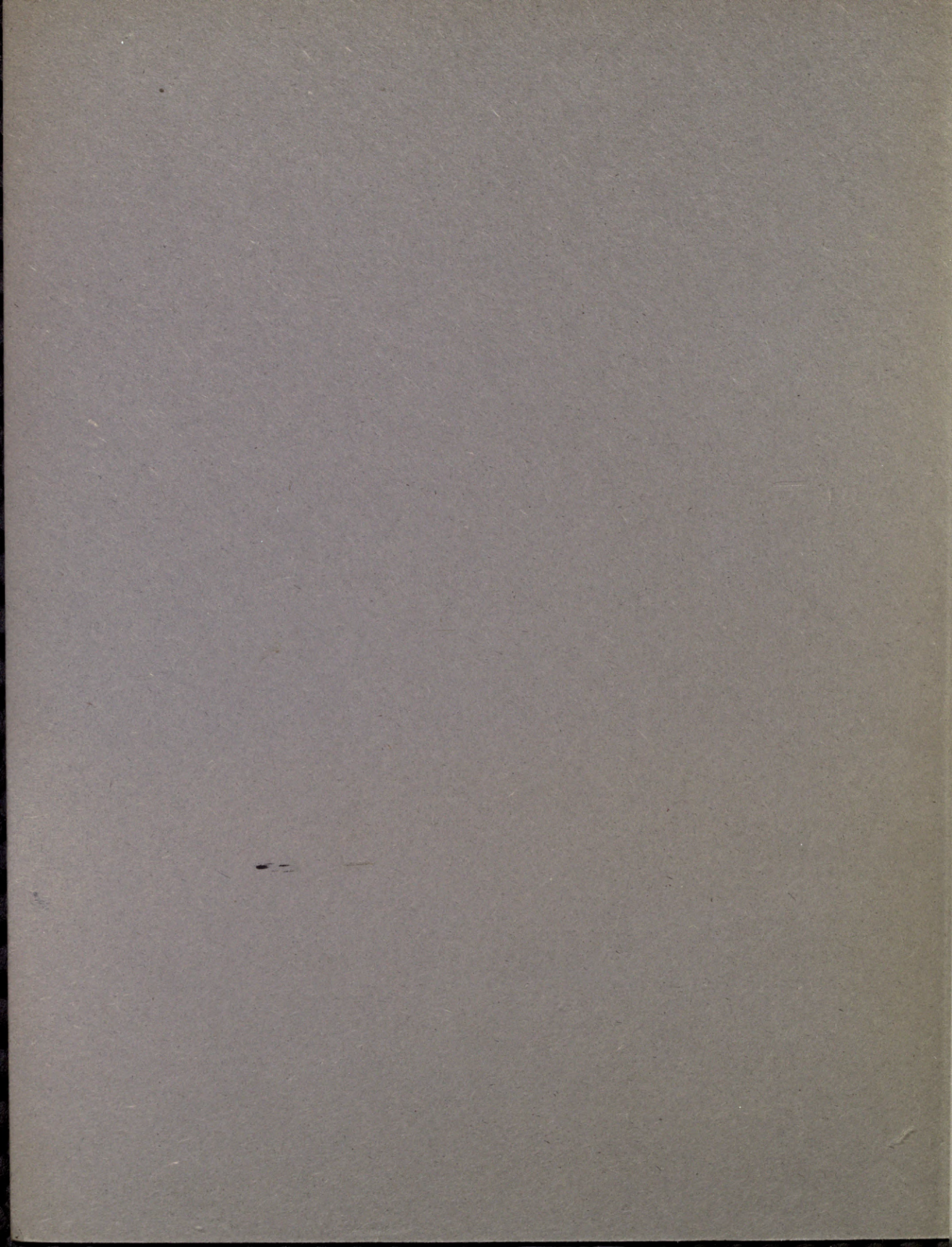
The figures indicate—

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| <ul style="list-style-type: none"> 1. Corona radiata. 2. Optic radiation. Temporo-pontine fibres lie in front of the figure. 3. Internal capsule. (Note the grey matter between the bundles of white matter.) 4. Crusta of the mid-brain. 5. Pyramidal fibres of the pons. 6. Pyramid of the medulla. | <ul style="list-style-type: none"> 7. Mesial fillet. 8. Cut surface of middle cerebellar peduncle. 9. Optic tract. 10. Anterior white commissure. 11. Internal orbital gyrus. 12. Corpus geniculatum externum. 13. A band of short association fibres. |
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CENTRAL NERVOUS SYSTEM BRAIN NO. 19
 SECTION I



CENTRAL NERVOUS SYSTEM.

BRAIN—No. 20.

THE BASAL GANGLIA AND THE OPTIC THALAMUS OF THE RIGHT SIDE.

The neighbouring brain matter, including the claustrum and the anterior part of the amygdaloid nucleus, has been removed. The anterior commissure, the anterior perforated spot, and part of the mid-brain have been retained. The upper specimen is viewed from above, the lower from the outer side.

The basal ganglia are the caudate and the lenticular nuclei, which together form the corpus striatum; the claustrum and the amygdaloid nucleus. To the former two the optic thalamus is closely related.

Lenticular nucleus:—Note the grooves on its outer surface for the lenticulo-striate and -optic arteries (see Brain—No. 27). The caudate nucleus is pyriform and highly arched. Its deep surface is separated from the lenticular nucleus by the internal capsule which is intersected by laminae of grey matter connecting the two nuclei. The lower part of the head is directly continuous with the lenticular nucleus and the anterior perforated spot. The tail ends in the amygdaloid nucleus.

The amygdaloid nucleus lies below the lenticular nucleus and the anterior commissure. It is continuous with the anterior perforated spot and the lenticular nucleus. The tail of the caudate nucleus and the tænia semicircularis end in it.

The claustrum is a thin sheet of grey matter between the white matter of the island of Reil and the external capsule. It is continuous with the anterior perforated spot below.

The optic thalamus is separated from the caudate and lenticular nuclei by the tænia semicircularis and internal capsule respectively. It is continuous below with the tegmentum of the mid-brain through the 'subthalamc region.' Its anterior end bounds the foramen of Monro. Its posterior projecting end is the pulvinar. On the outer part of the inferior aspect of the posterior end is the external geniculate body, internal to which at the upper end of the lateral sulcus of the mid-brain, is the internal geniculate body.

The figures indicate:—

View from above:—

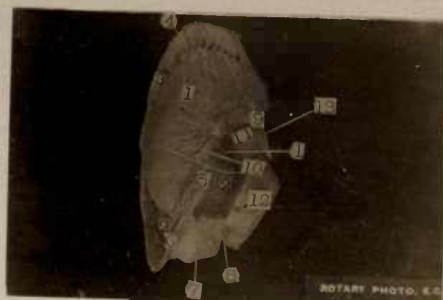
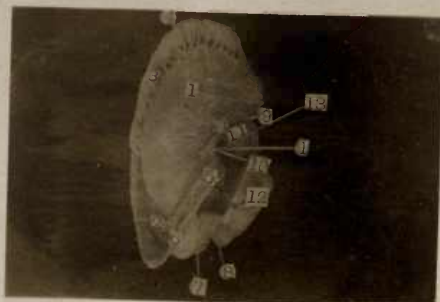
1. Optic thalamus.
2. Caudate nucleus.
3. Lenticular nucleus.
4. Laminae connecting caudate and lenticular nuclei.
5. Tænia semicircularis.
6. Anterior pillar of fornix.

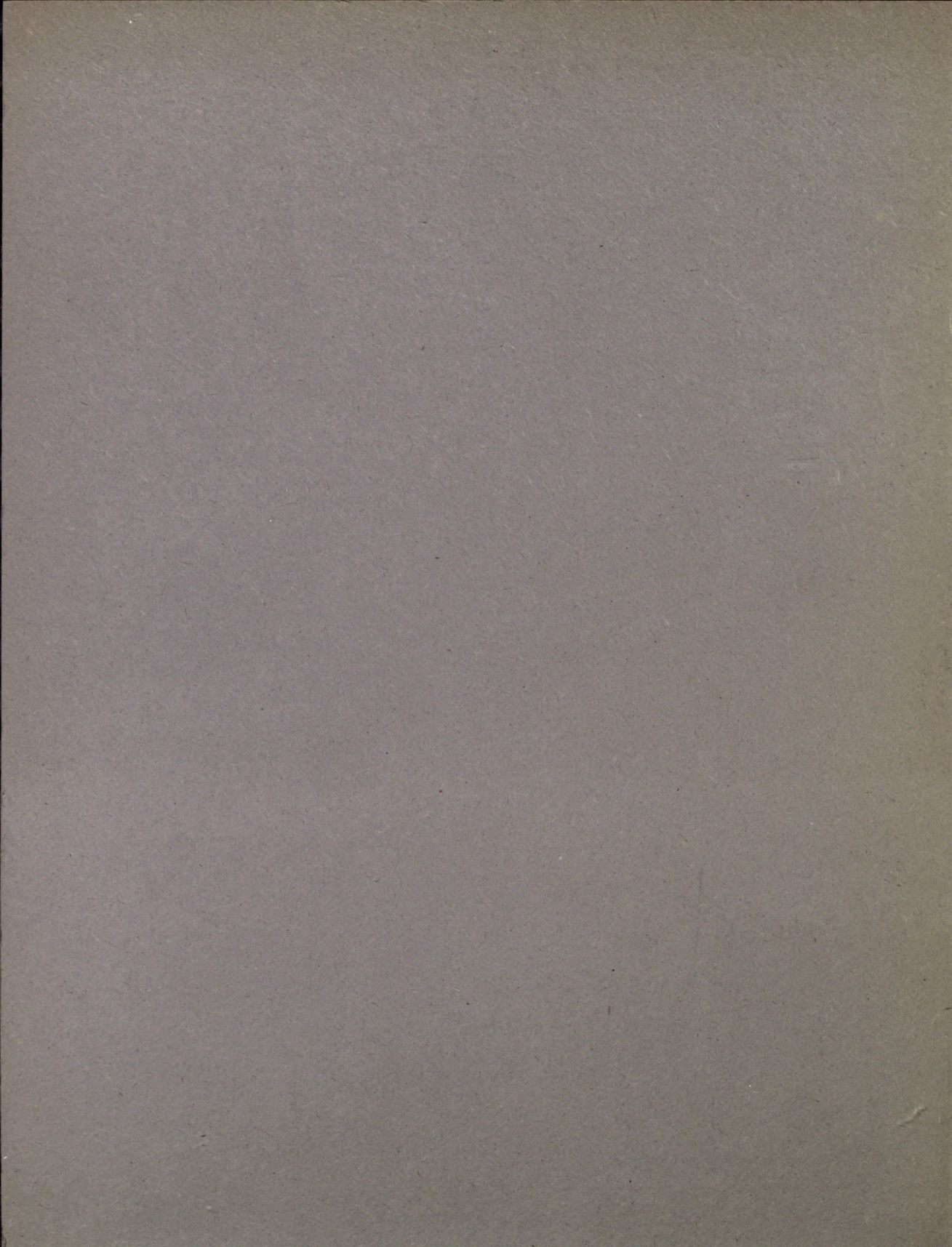
7. Posterior part of amygdaloid nucleus.
8. Tail of caudate nucleus.
9. Deep surface of external geniculate body.
10. Pineal body.
11. Pincal body.
12. Outer surface of optic thalamus.
13. Caudate nucleus.
14. Laminae connecting caudate and lenticular nuclei.
15. Posterior part of amygdaloid nucleus.

View from outer side:—

1. Lenticular nucleus.

8. Internal geniculate body.
9. Outer part of anterior perforated spot.
10. Anterior commissure.
11. Anterior fibres of crura passing up to internal capsule.
12. Crusta of mid-brain.
13. Anterior pillar of fornix.





CENTRAL NERVOUS SYSTEM.

BRAIN.—No. 21.

MESIAL AND TENTORIAL SURFACES OF THE LEFT CEREBRAL HEMISPHERE WITH THE WHOLE EXTENT OF THE CINGULUM AND THE FORNIX EXPOSED.

Most of the callosal and hippocampal gyri, the isthmus, the dentate gyrus, part of hippocampus major, and the grey matter covering the anterior pillar of fornix have been removed, and the bundle of Vicq d'Azyr has been traced through the optic thalamus to its termination in the anterior nucleus.

The **cingulum** is a 'long association' tract lying in the limbic lobe. It begins at the anterior perforated spot, arches round the genu, and runs backwards on the corpus callosum lying in the callosal gyrus. Bending round the splenium, it is carried in the isthmus to the hippocampal gyrus, in which it extends forwards to the uncus, and from there to the temporal pole.

The **fornix** is an arched bilateral structure composed mainly of longitudinal fibres. It is united in its middle part to form the body of the fornix. The **body** lies below the corpus callosum, to which it is adherent posteriorly and united anteriorly by the septum lucidum. Its anterior end or apex divides into two anterior pillars, its base into two posterior pillars. The **anterior pillars** descend in front of the foramina of Monro, behind the anterior commissure, sink into the side walls of the third ventricle, and end in the **corpora mammillaria** in its floor. From each of these the **bundle of Vicq d'Azyr** ascends, through the optic thalamus, to end in its anterior nucleus. The **posterior pillars** diverge. Each turns round the optic thalamus, enters the descending horn of the lateral ventricle and becomes continuous with the fimbria and alveus. The **alveus** consists of fibres spread out in a thin sheet over the hippocampus major. The **fimbria**, composed of the rest of the fibres, is attached along the inner side of the hippocampus, and extends forward to the recurved end of the uncus. Where the pillars diverge some fibres pass across from one to the other, forming a thin sheet called the **lyra**.

The figures indicate—

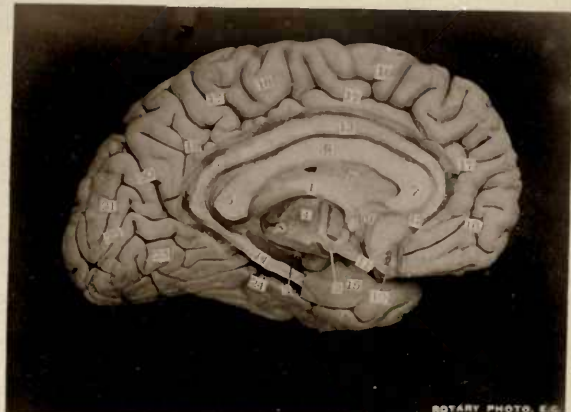
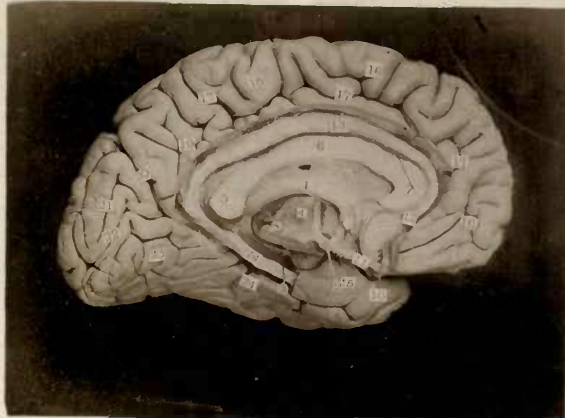
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| 1. Body of fornix. | 9. Subcallosal gyrus. Behind it is the cut anterior commissure. | 17. Calloso-marginal fissure. |
| 2. Corpus mammillare. The anterior pillar, and bundle of Vicq d'Azyr are seen above it. | 10. Olfactory peduncle. Note connection between its inner root and subcallosal gyrus. | 18. Paracallosal lobule. |
| 3. Fimbria. | 11. Optic chiasma. | 19. Post-limbic sulcus. Above it is the quadrate lobule. |
| 4. Optic thalamus. Below it is the tegmentum of mid-brain. | 12, 13, 14. Anterior end, middle, posterior end of cingulum. | 20. Internal parieto-occipital fissure. |
| 5, 6, 7. Splenium, body and genu of corpus callosum. | 15. Uncus. | 21. Cuneus. |
| 8. Left lamina of septum lucidum. | 16. Marginal gyrus. | 22. Posterior calcarine fissure. |
| | | 23. Lingual gyrus. |
| | | 24. Occipito-temporal gyrus. |

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CENTRAL NERVOUS SYSTEM—BRAIN No. 21

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