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THE NEOCORTEX OF THE CAT

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The brain of the cat is a favorite object of different physiological experiments, but there are only few papers dealing with the structure of the cat cortex and its division into areas. The aim of this paper is to fill the gap and give an architectonic review of the cat cortex.

The review is based on five continuous series from cat brains, cut in the three cardinal planes and stained by the methods of Weigert, Klüver, Nissl, and Schulze. Emphasis has been laid on their myeloarchitectonics, as providing more information about the cortex than the very easy Nissl method.

In this study I use my own myeloarchitectonic scheme, different from that of Vogt. I do not consider the lamination of the cortex but analyse its

1. radial fibers, their length, number, density, caliber and arrangement, giving special attention to their proximal course in the white matter,

2. tangential fibers, their density, number, caliber, distribution and connections with neighbouring areas, and

3. superficial plexus, the density, caliber and direction of its fibers. For further detalis see my previous papers (Kreiner 1961, 1966).

This scheme proved very useful in my papers on the myeloarchitectonics of the dog. As in those papers, I complement it with short traditional cytoarchitectonic descriptions.

An analysis of the cat brain based on this scheme allows, as in the dog, the distinction of three types of myeloarchitectonics, referred to as the gyral, the fissural and the paragyral cortex.

The gyral cortex is characterized by its well-developed radial fibers, which in most areas run deep into the white matter. They cross the tangential fibers, which are usually fairly abundant and they often form loose bundles extending to the neighbouring areas. The superficial plexus is commonly fairly dense. The pyramidal cells lie in two layers (III and V). In general, this scheme corresponds with the text-book scheme of cortical structures. The areas of this type occur, as often as not, in the top portions of the gyri, sometimes also on smooth unfurrowed surfaces of the hemisphere, where they are cryptogyral areas.

The fissural areas are, as a rule, situated at the bottom of fissures, sometimes on smooth surfaces of the cortex, where they form cryptofissures, seen with the naked eye in Weigert sections. The radial fibers of the fissural areas are poorly developed and extend at most halfway through the cortex. Proximally such fibers disappear on the surface of the white matter, more rarely they sink into it. The unusually well-developed tangential fibers go across the bottom of the fissure to its other side and connect the fissural area with the adjoining gyral ones. The superficial plexus is for the most part well developed. In Nissl sections the thickness of layer I stands out in relief against the remaining, reduced, layers, which is also observed in the architectonics of the cryptogyral areas on smooth surfaces of the hemisphere.

The stratification of the fissural cortex is blurred. Often, however, the pyramidal cells appear in only one, rather deep situated, layer (? V). Big cells with large dendrites, having two or more branches, are frequently found among the pyramidal cells in Schulze silver sections. Their branches reach up to layer I.

The paragyral areas occur in the walls of fissures as fields showing an intermediate structure. The radial fibers, which are moderately well developed, run proximally to the neighbouring areas; the tangential fibers are well developed and the superficial plexus again moderately well.

By the term "area" I mean a fragment of cortex of similar architectonics and the same connections, regardless of whether it is situated on a gyrus or in a fissure. A central subarea (subarea a), which shows the most typical architectonics, and some subareas showing a weaker development of the same type can be distinguished within an area. The arrangement of the subareas may be various: the central subarea may lie in the middle of the area or in its periphery. At the boundary between two areas there are zones, about 100–250 μ wide, which have an intermediate architectonics.

Generally speaking, the architectonic areas adjoin each other and form a mosaic, which reveals a constant arrangement. The morphological macroscopic pattern of fissures and gyri develops against the background of this arrangement of areas. The pattern of fissures in the cat is similar in outline to that of the dog only that in the cat the number of fissures is smaller, which is connected with the smaller average body size of this animal.

GYRAL AND FISSURAL PATTERN

It is most convenient to begin the identification and description of the gyral and fissural pattern at the sylvian fissure. This fissure may be found on the lateral aspect of the hemisphere as a medium-sized groove, which cuts into the cortex, not perpendicularly, but slanting somewhat to the rear. In the cat this fissure is often accompanied by small horizontal branches.

The sylvian fissure joins two fissures, the anterior and the posterior rhinal, which extend along the boundary between the neocortex and allocortex. The anterior rhinal fissure runs to the front as far as the place where the olfactory peduncle branches off. On its way it gives off a large branch to the front, erroneously regarded as the presylvian fissure, which is missing in the cat. This fissure, here called the *pseudopresylvian* fissure (Kreiner 1970), runs to the front *ventral* to the orbital gyrus, in which it differs fundamentally from the presylvian fissure of the dog, situated *dorsally* to the orbital gyrus. No homologue of the pseudopresylvian fissure was found in the dog.

The gyrus orbitalis of the cat is large and is bordered ventrally by the anterior rhinal fissure and further by the pseudopresylvian fissure. On the dorsal side it is bounded by small variable sulci, which usually join the fissures of the perisylvian system. In the cat the gyrus compositus anterior is absent.

The posterior rhinal fissure runs from the sylvian fissure to the rear and terminates without joining the retrosplenial fissure. In its posterior portion it sends off the short pararecurrent fissure.

Laterally and dorsally the sylvian fissure is surrounded by a system of arcuate fissures, the ectosylvian and the suprasylvian.

The ectosylvian fissure of the cat divides into two parts, an anterior and a posterior, separated by a gyral portion of the cortex, known as the gyrus felinus. Occasionally there is a small sulcus in the middle of this gyrus. The upper part of the fissura ectosylvia posterior is, as can be seen from the arrangement of the areas, homologous with the ramification of the fissura ectosylvia of the dog. Some small variable sulci often occur ventral to the gyrus ectosylvius.

The fairly large gyrus sylvius, in the cat known as the auditory area, is situated between the sylvian and the ectosylvian fissures. The gyrus ectosylvius can be seen external to the ectosylvian fissure and is limited by the suprasylvian fissure on the opposite side.

The suprasylvian fissure of the cat forms a wide arch dorsal and caudal to the ectosylvian fissure. In the front, in the neighbourhood of the upper end of the anterior ectosylvian fissure the regular course of the suprasylvian fissure is disturbed; it develops very small variable branches. The extension of this fissure, its oralmost portion, can be found rather low on the surface of the hemisphere in the form of a furrow which runs parallel to the anterior ectosylvian fissure. It extends up to the fissure that bounds the gyrus orbitalis. In the cat the gyrus compositus anterior is lacking.

Another morphological system of the cat consists of the lateral, ansate, coronal and ectolateral fissures. The lateral fissure, which runs parallel to the suprasylvian over a large portion of the hemisphere, forms the main bulk of this system. Its course is, however, frequently disturbed, especially where its middle part passes into the posterior one. Some cats show connections with the ectolateral fissure here (Otsuka and Hassler 1962).

Orally the lateral fissure forks to form the ansate and coronal fissures, the last of which runs laterally. The coronal fissure usually divides into two parts. The upper part goes off latterally directly from the lateral fissure, the lower one can be seen as its prolongation, separated from it by rather a large gap, where it is marked only by the boundaries of architectonic areas. The lower part often reaches the fissure which limits the gyrus orbitalis dorsally. Sometimes there are some small loosely scattered sulci oral to the ansate-coronal fork, but it is questionable whether they are homologous with the sulcus centralis.

The lateral fissure borders laterally on the gyrus suprasylvius, which orally passes into the gyrus coronalis. Medially, this fissure neighbours on the long gyrus marginalis, which forms the margin of the hemisphere. On the medial aspect of the hemisphere this gyrus is limited by the suprasplenial fissure. In Winkler and Potter's atlas (1914) it bears two names; its lateral slope is called the gyrus lateralis and the medial slope the gyrus suprasplenialis.

The large gyrus suprasplenialis (mihi) stretches inferior to the suprasplenial fissure on the medial aspect of the hemisphere. Ventrally it is limited by the splenial fissure, which separates it from the gyrus cinguli, situated along the callosal commissure, or — in so far as the caudalmost portion of the splenial fissure is concerned — from the small gyrus retrosplenialis. This gyrus occurs on the medial surface of the hemisphere, near the caudal pole, between the pararecurrent fissure, which is a branch of the posterior rhinal fissure, and the posterior part of the splenial fissure.

Two parallel fissures, the ectolateral and the entolateral, join the system of the lateral fissure. In the cat they are usually present in the form of areas of the fissural type (cryptosulci) or as boundaries between architectonic areas. There are, however, occasional brains in which the ectolateral fissure develops into a normal fissure and it may possibly join the lateral fissure.

The cruciate, splenial and suprasplenial fissures, which in the dog form a typical system, occur as three separate sulci in the cat. The first of them, the cruciato-splenial fissure, can be seen on the dorsal aspect of the hemisphere as the cruciate fissure; it extends on to the medial aspect of the hemisphere, where it can be traced running to the rear for about one-third of the length of the hemisphere. Another fissure of this system, the splenial, arises somewhat dorsally to the posterior end of the previous fissure and runs backward past the splenium corporis callosi. There it passes on to the lateral surface of the hemisphere as the posterior splenial (= pararecurrent) fissure. The retrosplenial fissure does not occur in the cat and therefore there are no connections with the posterior rhinal fissure.

The suprasplenial fissure appears in some cats as a normal fissure, in others as a cryptosulcus or a boundary between architectonic areas.

In general, the gyral and fissural pattern of the cat shows great individual variation.

ARCHITECTONICS

Proceeding to analyse the architectonics of the cat cortex, I divided it into eight regions, the perisylvian, the parietal, the occipital, the dorsofrontal, the orbitofrontal, the mediofrontal, the prorean and subprorean, and the cingular. This division is conventional and introduced only to facilitate the survey of the whole of the cortex.

Perisylvian cortex

By the perisylvian cortex I mean the region surrounding the sylvian fissure, limited externally by the suprasylvian fissure or its extension. It includes the gyrus sylvius, gyrus ectosylvius and gyrus compositus posterior.

Gyrus sylvius

In the cat the gyrus sylvius is limited orally and caudally by two portions of the ectosylvian fissure; dorsally it passes without a clear-cut boundary (gyrus felinus) into the gyrus ectosylvius and ventrally into the gyrus compositus posterior. The sylvian fissure runs in the middle of this gyrus. The gyrus sylvius has been subdivided into 11 architectonic areas.

The *area sylvia* (S) lies in the middle portion of the gyrus sylvius, above the upper end the sylvian fissure. Orally it rests against the ectosylvian fissure, dorsally it borders upon area EM I without any demercating sulci (occasionally a small dimple may occur here). Similarly, without any externally visible boundaries area S neighbours on areas SP and SA. Caudally it extends to the ectosylvian fissure only for a very short portion. Area S is separated from the ectosylvian fissure by a narrow strip of area EM I, which runs along the posterior ectosylvian fissure.

The area sylvia is a well-myelinated gyral field and corresponds to the area labeled by Rose (1949) as Aud II.

The radial fibers are medium-sized and thin and grouped in loose bundles. The medium-sized fibers extend about four-sevenths and the thin ones about five-sevenths of the way through the cortex. In the middle of the cortex they are accompanied by some pararadial fibers, parallel to the radial fibers proper only for the middle portion of their course. As a result, there arises a band, white and not very distinct, but visible even from a perfunctory examination of the sections of the cortex. Proximally, the radial fibers of this area run medioorally in front of the bundles which come out of area EM I.

The tangential fibers are medium-sized and thin. The thin fibers, which appear chiefly above the tops of the radial fascicles, generally end within the area. The medium-sized fibers, which are densest in the middle part of the cortex, go to the adjacent areas.

The superficial plexus consists of thin and very thin fibers and forms a layer, about 60 μ thick. It is moderately well developed and its fibers run in all directions, many of them being directed orocaudally. A few thin radial fibers join the plexus and some other very thin fibers are visible under it.

In Nissl sections layer I is about 280 μ thick. Layers II and III are composed of small diversiform cells with a small number of pyramids among them. These make the distinction of layer III possible. Layer IV contains closely packed small cells. Layer V has rather large cells (45 μ), rich in Nissl bodies, but not resembling pyramids. Layer VI, fairly thick, contains small cells similar to those in the other layers.

The *area sylvia anterior* (SA) stretches for the whole width of the gyrus sylvius anterior, ventral to the area sylvia (S). Dorsally, it borders on area S, ventrally on the area sylvia insularis (SJ). It is a strongly mylinated gyral area.

The radial fibers are medium-sized and thin and run in indistinct and anastomosing fascicles three-quarters of the way through the cortex. Proximally they extend orodorsomedially, passing in front of the radiation of area SJ.

The abundant tangential fibers run in all directions, sometimes diagonally. They are of medium caliber in the deep cortical leyers and thin near the ends of the radial fibers. They form connections with area S (thin fibers tending chiefly to the superficial layers) and area SJ (medium-sized fibers from the deeper layers).

The superficial plexus is moderately abundant and composed of thin and very thin fibers, which go in all directions, frequently parasagittally.

In Nissl sections layer I is about 275 μ thick, layers II–IV being poorly differentiated and composed of small cells. Layer V is hardly distinguishable by the presence of somewhat larger, sparse elongate cells.

On the ventral side area SA is accompanied by a cryptosulcus (SA d). Here the radial fibers run singly or in very loose fascicles halfway through the cortex. The tangential fibers pass through the lower layers of this region and the superficial plexus is similar to that in area SA. In Nissl sections layer I is 450 μ in thickness, layer II is composed of closely packed small cells, and similar but somewhat looser cells make up layer III. Layer IV consists of somewhat paler cells arranged in columns. Layer V is distinct and shows large cells, rich in tigroid, and of the type often observed in the fissural cortex. Layer VI is less well developed.

The *area sylvia insularis* (SJ) occupies the lower portion of the gyrus sylvius anterior, along the anterior rhinal fissure. It is a well-myelinated gyral area neighbouring dorsally on area SA and medially on area SJM.

Its medium-sized and thin radial fibers show a weak tendency to form bundles and run straight for five-sixths of the way through the cortex. Proximally they form a bundle which extends a long way dorsally, with a slight medial deviation. They run close to the claustrum, some of them piercing through it.

The tangential fibers are numerous in all the layers except for the region above the tops of the radial fascicles. Many of them, oblique to the radial fibers, come from the extreme capsule, whose fibers go in a fan-like manner to all deeper layers. Two bundles can be distinguished here. The deeper of them, composed of medium-sized fibers, runs to the deeper layers, the more superficial one tends to the middle layers of area SJ. Both penetrate to the other side of area SJ and enter area SA. There are also some fibers with a sagittal course.

The superficial plexus, poorly developed, consists of a small number of very thin fibers.

In Nissl sections layer I is about 160 μ thick, and layers II–IV are made up of small triangular or polygonal cells arranged in irregular figures. Layer II is distinguishable for its increased density of cells and layer V for the presence of somewhat larger cells containing a large amount of tigroid.

The *area sylvia insularis medialis* (SJM) is a small paragyral area hidden in the lateral wall of the anterior rhinal fissure along area SJ.

The radial fibers are very thin, thin and medium-sized and few in number. They run singly somewhat deeper than the fibers in area SJ, which is especially true of those in the medial portion. Proximally they penetrate through the marginal portion of the claustrum and on its other side disappear in the extreme capsule; they may also terminate in the claustrum itself.

The tangential fibers are those of the extreme capsule and divide into two groups, a deeper group composed of thicker fibers which go to the deep layers of area SJ and a superficial one of thinner fibers running to the middle layers of this area. Not very numerous fine fibers connecting the upper layers of area SJM with area SJ are also visible.

The superficial plexus is abundant and composed of thin and very thin fibers, which run parallel in a plane approximating to the frontal plane.

In Nissl sections layer I measures 180 μ. Layers II–IV consist of irregularly arranged small cells. In layer V these cells are somewhat larger and better stained. Layer VI has small cells which pass into the system of the claustral cells.

The *area fissurae rhinalis anterioris* (FRhA) occupies a narrow strip of cortex in the dorsal wall and bottom of the anterior rhinal fissure, squeezed in between area SJM and the allocortex. Orally this area forms a narrow wedge pressed into the olfactory sulcus, more or less up to the end of the claustrum. The area is typically fissural in character.

Its very thin and occasional thin radial fibers run singly, far apart from each other, about halfway through the cortex. Proximally they disappear in the extreme capsule.

The tangential fibers, very thin and few in number, extend from this region to the allocortex and area SJM.

The superficial plexus is rather tightly packed with thin, medium-sized and single fairly thick fibers. The fibers run in various directions, a large number of them being grouped in a bundle, which goes orolaterally. The fibers are particularly tightly packed in the bottom of the fissure.

In Nissl sections layer I is 450–600 μ thick and contains single cells. The other layers are composed of small cells, which are irregularly arranged.

The *area fissurae sylviae I* (FS I) occurs as a well-myelinated fissural field in the wall of the sylvian fissure.

Its radial fibers are thin with a small admixture of medium-sized ones and they run halfway through the cortex. Some thin fibers reach as far as the superficial plexus. Proximally they have an oromedial direction.

The tangential fibers, thin and medium-sized and moderately numerous, run in all directions, many of them orocaudally. The occurrence of connections with areas SA and SJ is probable.

The superficial plexus is dense and is comprised of thin and very thin fibers, which run in all directions, the fibers directed dorsolaterally and dorsocaudally being prevalent. There are numerous fine fibers under the plexus.

The cytoarchitectonic is well-developed. In Nissl sections layer I is 450 μ thick, the remaining portion of the cortex is divided into two layers, a deep layer composed of cells which are darker in color and more loosely arranged and a middle one built of small cells, pale in color and irregulary arranged.

The *area fissurae sylviae II* (FS II) lies on the lateral side in the depth of the sylvian fissure. It is a poorly myelinated fissural area.

The radial fibers, very thin and few in number, run singly for about a quarter of the way through the cortex. Proximally they turn to the front and disappear in the white matter.

The tangential fibers are not very numerous and extend in all directions, but mostly orocaudally to area SP.

The superficial plexus is rich in fibers and similar to that of area FS I. The very thin fibers extend in all directions, the medium-sized ones are parallel to the bottom of the fissure.

In Nissl sections layer I measures 370 μ. The other portion of the cortex is composed of small cells and shows no stratification, perhaps with the exception of layer II, which is marked by a denser arrangement of cells.

The *area sylvia posterior* (SP) is situated on the gyrus sylvius posterior. This strongly myelinated gyral area adjoins the sylvian fissure, but does not extend to the posterior ectosylvian fissure, from which it is separated by areas EM I and EP II.

The medium-sized and thin radial fibers run in well-defined and tightly disposed bundles for about two-thirds of the thickness of the cortex. In the deepest layers they are joined by thick fibers. Proximally they go medially to turn to the front at a sharp angle.

The tangential fibers, thin and very thin, are abundant in all the layers and form many connections with the adjacent areas. Deep in the cortex they often run obliquely.

The superficial plexus is fairly compact and composed of thin and very thin fibers, which extend in all directions, often parasagittally.

In Nissl sections layer I is of normal thickness and contains many perikarya. Layers II–VI contain round and polygonal small cells and show the greatest density in the zone of layer II. Layer V is distinguishable for the presence of somewhat larger cells with a high tigroid content.

The *area ectosylvia posterior II* (EP II) is not very extensive and lies in the lower portion of the gyrus sylvius posterior. Dorsally it passes imperceptibly into area SP, orally borders on the sylvian fissure and caudally on the posterior ectosylvian.

The radial fibers are medium-sized, thin, very thin and, occasionally, single ones of them are thick. The thin fibers extend two-thirds and the thicker ones one-third of the way through the cortex. The fibers are gathered in fascicles. Proximally they can be traced far in a mediooral direction.

The tangential fibers are abundant, very thin in the upper layers, thin in the lower ones, and also medium-sized and thick at the margin of the white matter. They form rather indistinct connections with areas SP and FS dorsally and with area CPL ventrally.

In Nissl sections layer I, about 120 μ thick, contains single cells. Layers II–IV are of small diversiform cells, and layer V is distinguished by a looser arrangement of its slightly larger cells. Layer VI consists of small cells, a large number of which are scattered also in the white matter.

The *area fissurae ectosylviae anterioris* (FEA) appears as a moderately well myelinated fissural area in the bottom of the named fissure.

The radial fibers are thin and not very numerous. They occur singly and are rather sparse. They run for about a third of the way through the cortex and, proximally, disperse in the white matter or turn into tangential fibers.

The tangential fibers, medium-sized andthin, are numerous in the lower half of the cortex and less abundant in the superficial portion. They go in all directions, many of them diagonally. There are connections with the neighbouring areas.

The superficial plexus is rich in thin and very thin fibers, of which some turn to the depth of the cortex as pseudoradial fibers. The fibers of the plexus, parallel to each other, run oromedially.

In Nissl sections layer I is about 420 μ in thickness; the other layers show no orderly arrangement, being more diffuse in the depth of the cortex. Some large and intensely stained cells, lying loosely halfway through the cortex (? layer V), stand out in relief against this background.

The *area fissurae ectosylviae posterioris* (FEP) is a moderately well-myelinated fissural area which stretches in the bottom of the named fissure.

Its thin radial fibers, scattered singly, run halfway through the cortex. Proximally they disappear at the edge of the white matter.

The tangential fibers are numerous, medium-sized and thin, and extend in all directions. Many of them go to the neighbouring areas EP I and S.

The superficial plexus is well developed and consists of thin and medium-sized fibers. They run parallel to each other in an orocaudal direction and are joined by numerous pseudoradii of a very small caliber.

In Nissl sections layer I measures about 300 μ. The other layers, composed of small cells, differ only slightly from each other.

Gyrus ectosylvius

The gyrus ectosylvius surrounds the gyrus sylvius on the outer side. Its boundary is marked by the suprasylvian fissure or its extension on the outer side, and the anterior and posterior ectosylvian fissures or their extension on the inner side. There are ten areas on the gyrus ectosylvius.

The *area ectosylvia media I* (EM I) occupies the middle portion of the ectosylvian gyrus, which in cats is also called the gyrus felinus. It corresponds to Rose's (1949) auditory area I. Area EM I borders ventrally on area S, caudally on area EP I, and dorsally on areas EM II and ED, without reaching the suprasylvian fissure. Area EM shows a strong myelination.

Its radial fibers vary in size and are grouped in fascicles, which become thinner towards the top. The thick and medium-sized fibers go for six-sevenths and the thin ones for four-fifths of the way through the cortex. In the middle of the cortical layer they are joined by numerous thin pararadial fibers, whose presence causes the formation of a white band, which can be seen eçen with the naked eye. Proximally the radial fibers run ventromedially and caudally and lie in the white matter behind the fibers from area S.

The tangential fibers are numerous in all the layers, vary in caliber, and go in all directions. They area most abundant in the middle layer of the cortex, where they contribute to the make-up of the above-mentioned white band. They also accumulate at the border of the white matter. Only a small number of thin fibers occur in the layer above the tops of the radial fascicles. Some strong connections with area S and remarkably weaker ones with area EM are visible.

The superficial plexus is compact and distinct and composed of medium-sized, thick and thin fibers going in all directions. It receives very thin fibers from the underlying layer.

In Nissl sections layer I is about 200 μ in thickness, the stratification of the remaining portion being indistinct. Small cells are arranged in columns and larger cells, unassociated with any special layers, are visible in places. Many small cells are dispersed in the white matter.

The *area ectosylvia media II* (EM II) occupies the lateral edge of the suprasylvian fissure. It is a well-myelinated gyral area.

The radial fibers, thin and medium-sized, run in compact bundles for four-fifths of the thickness of the cortex. Pararadial fibers join them in the middle layer and, together with the increasing density of the tangential fibers, produce the impression of a white band. Proximally they form an arch in a medio-ventral and slightly caudal direction.

The tangential fibers are thin and medium-sized and abundant in all the layers as far as the tops of the radial fascicles. They run in all directions, but form two distinct bundles, which tend to the area of the sylvian fissure: the upper band extends right under the tops of the radial fibers, the lower one at one-third of their height. There are also some weaker connections with area EM I.

The superficial plexus is well developed but markedly weaker than it is in area EM I. It consists of thin and very thin fibers with an admixture of medium-sized ones. They run in all directions.

The cytoarchitectonic stratification is much more pronounced than in area EM I.

In Nissl sections layer I measures 180 μ in thickness, layer II is well seen and composed of small cells, tightly packed. There are small pyramidal cells in layer III and granula in layer IV, whereas layers V and VI, built up of small cells, do not differ from each other. A large number of cells are scattered in the white matter.

The *area ectosylvia dorsalis* (ED) is of the paragyral type and lies in the lateral wall of the suprasylvian fissure.

Its radial fibers are thin and very thin and at the base of the fascicles also medium-sized. They extend in loose anastomosing fascicles for three-quarters of the way through the cortex in the case of thin fibers and only for one-third of it in the case of thick ones. Proximally they swing medially at a sharp angle and run right at the border of the white matter.

The tangential fibers are abundant. Some of them constitute a continuation of the systems of EM II, the others run in all directions. In the lower layers there are many medium-sized fibers, the thin fibers being prevalent in the upper layers.

The superficial plexus is moderately dense and consists of thin, very thin and medium-sized fibers, which run partly in a plane approximating the frontal plane, and partly orocaudally.

In Nissl sections layer I is 210 μ thick. Layer II is made up of tightly packed granular cells. The cells of layer III are more loosely arranged, somewhat larger and more intensely stained. Layer IV contains granules and layer V is distinguished by the presence of large cells rich in Nissl bodies. Layer VI has small cells, partly scattered in the white matter.

The *area ectosylvia posterior I* (EP I) is a large, heavily myelinated area of the gyral type, covering a great part of the gyrus ectosylvius posterior.

The thin and very thin radial fibers are grouped in fascicles, which are not very thick and reach as far as two-thirds of the way through the cortex. Proximally they go in a medial direction into the white matter.

The tangential fibers, which are numerous and very thin, run in all directions, often diagonally. They form strong connections with area EDP.

The rather poorly developed superficial plexus comprises thin fibers of a varying course. It is connected with thin pseudoradii.

In Nissl sections layer I is 230 μ thick. Layer II can be distinguished by an increased density of its cells, which in layer III are somewhat larger, rich in tigroid, and have large nuclei. Layer IV is composed of small cells and in layers V and VI the cells are arranged somewhat more loosely.

The *area ectosylvia posterior dorsalis* (EPD) is situated in the dorsal part of the gyrus ectosylvius, close to the bend of the suprasylvian fissure. This area is strongly myelinated.

Its radial fibers are medium-sized, thin and very thin, and they are grouped in thin fascicles. The thin fibers reach farther than three-quarters of the thickness of the cortex and are associated with a system of very fine "grundfasern". Proximally they arch ventromedially and disappear in the white matter.

The tangential fibers, very numerous and, for the most part, thin and very thin, run in all directions, having strong connections with area PSS and the dorsal part of EP I.

The superficial plexus is composed of thin fibers, which are dark in coloration and rather loosely arranged.

In Nissl sections layer I is 200 μ thick. The other layers are built up of small cells, which form indistinct columns, against the background of which some more intensely stained cells, similar to pyramids, stand out in layer III as do a small number of large cells in layer V.

The *area ectosylvia anterior* (EA) is a well-myelinated large region oral to the anterior ectosylvian fissure. Ventrally it borders upon the ventral ectosylvian area (EV) and orally upon the area composita ectosylviae I (CE I). The border-line between these two areas is an extension of the anterior suprasylvian fissure.

The radial fibers, thin and medium-sized, occur in densely arranged anastomosing fascicles, extending for more than four-fifths of the way through the cortex. Proximally they go medially ventral to the fibers from the area ectosylvia anterior dorsalis (EAD).

The tangential fibers are thin and medium-sized and run in all directions. They form connections with the area ectosylvia ventralis (EV) and the area ectosylvia anterior dorsalis (EAD).

The superficial plexus is scanty and composed of a small number of thin and very thin fibers which run in a plane approximating the frontal plane.

In Nissl sections layer I is 240 μ thick. The other layers consist of small and medium-sized cells arranged in columns. In places there occur larger cells and, in layer II, the cells are packed more densely.

The *area ectosylvia anterior dorsalis* (EAD) occupies the lower lip of the suprasylvian fissure dorsal to area EA. It is a strongly myelinated gyral area.

The radial fibers are thin and very thin, with an admixture of medium-sized ones. They run in closely arrranged compact fascicles as far as five-sixths of the cortex thickness. Proximally they extend medially dorsal to the fibers from the anterior ectosylvian area (EA).

The tangential fibers, thin and very thin and going in all directions, occur in abundance in all the layers except that above the tops of the radial fascicles. A strong connection with the area fissurae suprasylviae (FSS) and a weaker one with the anterior ectosylvian area (EA) are visible.

The superficial plexus is well developed unlike that in the anterior ectosylvian area. It has thin and very thin well-stained fibers, which run parallel in a frontal plane.

In Nissl sections layer I measures 200 μ, layer II is clearly visible, and layer

III has fairly numerous well-stained pyramidal cells. The other layers contain small cells varying in shape.

The well-myelinated *area ectosylvia ventralis* (EV) is situated ventrally to the anterior ectosylvian area (EA).

The radial fibers are thin and medium-sized and grouped in indistinct fascicles, which reach into as far as four-fifths of the cortex thickness. Proximally they turn medially and orally. In Weigert sections there are gaps filled with large cells among the fascicles.

The numerous tangential fibers, thin and medium-sized, extend in various directions and from connections with the adjacent areas; the most distinct are those with upper layers of areas EA and EAD.

The superficial plexus is poorly developed and represented by a small number of thin and very thin fibers having various courses.

In Nissl sections the layer pattern diverges from the standard one. Layer I is 200 μ thick and layer II is well seen. Layer III contains small pale cells scattered irregularly. Against this background there appear intensely stained large cells, whose presence continues into area FEA. Small cells without clear stratification occur deeper in the cortex.

The *area fissurae suprasylviae* (FSS) fills the bottom of the named fissure and also the bottom of its fragment which is situated orally to the fissure ectosylvia anterior. It is a well-myelinated gyral area.

The radial fibers, twisted and varying in caliber, run singly. The thicker of them extend for a third and the thinner ones for two-thirds of the cortex thickness. They are often seen to bend and turn into tangential fibers. Proximally some fibers sink into the white matter. Most of them, however, disappear at its border or change into deep tangential fibers.

The abundant tangential fibers are medium-sized and thin and there are only a few very thin ones. They run parallel to each other in a frontal plane and produce strong connections with area FSS in the dorsal ectosylvian and suprasylvian areas (ED and SS). The thin and medium-sized fibers are grouped in deep layers and the very thin fibers, which join the superficial plexus, are rather in the upper layers.

The superficial plexus is well developed, wide and composed of very thin, thin and single medium-sized fibers, in association with the underlying fibers.

In Nissl sections layer I is 270 μ thick. The remainder of the cortex can be divided into three layers. The first of these (? II–IV) consists of fairly densely packed small cells. In the second layer (? V) the small cells lie more loosely and form the background for the well-stained medium-sized cells. The deepest layer has tightly arranged small cells.

The *area suprasylvia accessoria* (SSAc) covers a small gyrus hidden at the bottom of the suprasylvian fissure, somewhat anterior to the plane which passes through the splenium corporis callosi. It is noted here for its frequent occurrence both in the cat and in the dog. It is a poorly myelinated gyral area.

The radial fibers are gathered in indistinct fascicles which extend three-quarters of the way through the cortex and proximally penetrate fairly far into the white matter.

The tangential fibers are numerous, thin or very thin, and they go in different directions, having connections with the adjacent regions of the area fissurae suprasylviae (FSS).

The superficial plexus is strong, well-stained and similar to that of the neighbouring area FSS.

In Nissl sections layer I measures 230 μ. Layer II is composed of tightly packed small elements. In layers III–V the cells are arranged loosely with large ones, rich in tigroid, among them. Layer VI is poorly seen.

Gyrus compositus posterior

The gyrus compositus posterior of the cat lies along the posterior rhinal fissure on the lower margin of the hemisphere, from the sylvian to the pararecurrent fissure (this name is given to the laterally bending branch of the posterior rhinal fissure following the example of that described in the dog). The gyrus compositus posterior may be divided into eight architectonic areas.

The moderately well-myelinated fissural *area fissurae rhinalis posterioris* (FRhP) occupies the bottom of the named fissure.

Its thin or very thin fibers are not numerous and they run singly through a third of the thickness of the cortex. Proximally they run dorsoorally and join the fibers from areas CPM I or CPM II.

The numerous tangential fibers are grouped into two systems. The more superficial system, approximately in the middle of the cortex, consists of very thin fibers, which connect area FRhP with the adjacent allocortex. The deeper system, composed of somewhat thicker fibers, constitutes a part of the extreme capsule. These fibers are stretched between the allocortex and the white matter of the gyrus compositus posterioris, within which they turn orodorsally.

The superficial plexus is moderately dense and is comprised of very thin fibers.

In Nissl sections layer I is 450 μ thick. The distinct second layer is composed of closely packed well-stained small cells. In layer III the cells are arranged more loosely and the deeper layers show no differentiation.

The *area composita posterior medialis I* (CPM I), which is a moderately well-myelinated gyral area, occupies the lateral edge of the oral portion of the posterior rhinal fissure.

The radial fibers, which are thin with only a small number of medium-sized fibers, run in indistinct fascicles somewhat farther than halfway through the cortex. Proximally they tend to go dorsally and somewhat to the rear.

The tangential fibers, which occur in the form of very thin "grundfasern" and a few medium-sized fibers, are not numerous. They form a connection, made up of very thin fibers, with area CPL I and a very weak connection with the area fissurae rhinalis posterioris (FRhP).

The superficial plexus is poorly developed and of very thin fibers.

In Nissl sections the cortex is poorly developed. Layer I measures 250 μ, and the remaining portion of the cortex, composed of well-stained small cells, does not divide into clear-cut layers.

The *area composita posterior lateralis I* (CPL I) accompanies the area composita posterior medialis I on its lateral side as a moderately well-myelinated gyral area.

Its radial fibers are thin, very thin and medium-sized and gathered in loose fascicles. The medium-sized fibers go for a third and the thin fibers for five-sevenths of the way through the cortex. Proximally they extend medioorally.

The moderately abundant, thin and very thin tangential fibers are accumulated mostly in the deep layer, and are somewhat less numerous in the middle layer. In the layer above the tops of the radial fascicles there are only a few "grundfasern". The tangential fibers of the deep layer gather together in a strong bundle, which runs to the area ectosylvia posterior II (EP II). The connection with area CPM I is maintained by a not too strong bundle coming from the middle layer.

The superficial plexus is scanty and composed of loosely arranged, very thin fibers, which run in different directions.

In Nissl sections layer I is about 300 μ across, the remaining portion of the cortex being unstratified and built of small cells.

Area CPL I is accompanied dorsally by a vestigial shallow sulcus or cryptosulcus, occupied by a subarea, which is half-gyral in character.

The well-myelinated gyral *area composita posterior medialis II* (CPM II), being an extension of the area composita posterior medialis I (CPM I), is situated on the lateral edge of the posterior rhinal fissure.

Its thin, very thin and medium-sized radial fibers form fascicles, which go as far as halfway through the cortex. Proximally they can be traced mediodorsally and somewhat to the front.

The tangential fibers are not very numerous. They are thin and medium-sized and for the most part accumulated in the deepest layers. They run in various directions, generally without going out of this area. The interareal connections are not very numerous except for those with the area composita posterior lateralis II (CPL II).

The superficial plexus is scanty and composed of very thin fibers, more or less parallel to each other.

In Nissl sections layer I measures 250 μ. The zone corresponding to layers II–IV is composed of tightly packed, well-stained, granular small cells. In layer V (?) the cells are more loosely arranged and often triangular in shape. Layer VI (?) is wide and built of longitudinal cells, which are also scattered in abundance in the white matter.

The *area composita posterior lateralis II* (CPL II) accompanies area CPM II on its lateral side.

The radial fibers, thin, medium-sized and, a few of them, very thin, are grouped in fascicles. The thin fibers go up to three-quarters of the way through the cortex, the medium-sized ones only halfway through it. Proximally they run in a dorsomedial direction, lateral to the fibers which leave the area composita posterior medialis II.

The tangential fibers, mostly very thin, are nearly all grouped in the lower half of the cortex and run to the area ectosylvia posterior II and to the area composita posterior medialis II (CPM II).

The superficial plexus consists of very thin, loosely arranged fibers.

In Nissl sections layer I is 250 μ in thickness. Layer II is distinct and wide and layers III–IV are composed of closely packed well-stained small cells. Layer V

(?) contains somewhat more loosely arranged triangular cells, and the cells are dense again in layer VI.

The *area fissurae pararecurrentis* (FRe) occupies the bottom of the fissure of the same name, which is a branch of the posterior rhinal fissure.

The radial fibers occur in small number, are very thin and reach a fifth of the way through the cortex. Proximally they disappear at the edge of the white matter.

The tangential fibers are numerous in the lower layers of the cortex and produce connections with the area retrosplenialis ventralis (RV) and area composita posterior medialis II (CPM II).

The superficial plexus is very poorly developed and made up of very thin fibers which run in different directions.

In Nissl sections layer I is 250 μ thick. Layers II–IV consist of closely arranged pale cells. Layer V, very narrow, is marked by the presence of a small number of somewhat larger calls rich in tigroid. In layer VI small cells are densely arranged.

The *area pararecurrens medialis* (ZM) lies on the ventrocaudal margin of the hemisphere, up to the pararcurrent fissure (a branch of the posterior rhinal fissure).

The radial fibers are thin and very thin and they extend in groups of small fascicles halfway through the cortex. Proximally they swing at a sharp angle to the front.

The tangential fibers are moderately dense, very thin and run freely. There are connections with area FRc and some weaker ones with area ZL.

The superficial plexus is very scanty, composed of a small number of very thin fibers.

In Nissl sections layer I measures 150 μ. Layers II–VI are made up of very small cells and it is hard to distinguish them from each other. The zone corresponding to layers II–IV (?) has small, pale cells with an underlying layer of somewhat larger and better-stained ones (?) layer V or III and, finally a layer of granular cells, which can also be seen in the white matter.

The *area pararecurrens lateralis* (ZL) is the counterpart of ZM on the lateral side of the hemisphere.

The radial fibers are thin, medium-sized and very thin, arranged in fascicles which extend farther than halfway through the cortex. Proximally they turn abruptly to the front.

The tangential fibers are few in number and very thin with an admixture of single medium-sized ones.

The superficial plexus is very poorly developed and has very few, very thin fibers.

In Nissl sections layer I is 300 μ thick. The remaining portion of the cortex is built of small cells, there being no typical distinguishable layers.

Parietal cortex

The parietal cortex of the cat is not very large and it includes six architectonic areas situated between the ansate fissure and the fissura cruciato-splenialis in the anterior portion of the gyrus marginalis.

The *area entolateralis anterior* (BA) is a well-myelinated area situated along the ansate fissure on the lateral slope of the gyrus marginalis.

The radial fibers are thin and very thin, with only a small number of medium-sized ones. The medium-sized fibers extend for two-thirds and the thin ones for three-quarters of the thickness of the cortex and form anastomosing fascicles. At the base the fibers are short and in the middle of the cortex there is a white band made up of thin intracortical radial fibers.

The moderately closely arranged tangential fibers are mostly very thin in the upper layers and thin and medium-sized in the lower ones. They run in all directions, many of them obliquely, suplying strong connections with area FA and somewhat weaker ones with area MA I.

The superficial plexus is not very dense. It is thin and made up of thin fibers running in all directions.

In Nissl sections layer I is about 180 μ thick. Layers II–IV are composed of small cells, which in layer V are fairly closely compacted, with well-stained larger cells among them. Layer VI is composed of small cells.

The *area marginalis anterior I* (MA I) lies on the margin of the gyrus marginalis and extends on to the medial aspect of the hemisphere.

The radial fibers are very thin and thin with an admixture of medium-sized ones and they run in fascicles, distinct at the base and more diffuse above. They reach two-thirds of the way through the cortex. Proximally their course can be seen ventral through the album gyri, straight at the margin of the gyrus and arching on its slope.

The tangential fibers, mostly thin and very thin, are distributed in moderately large numbers in the deep and middle layers. The connections with the adjacent areas are not very numerous.

The superficial plexus is scanty and consists of very thin fibers which go in all directions.

In Nissl sections layer I, about 150 μ thick, contains single cells. Layers II–III have small cells similar to pyramids. The cells of layer IV are small and diversiform, while those of layer V are pyramidal cells or cells resembling pyramids, medium-sized and loosely arranged. Layer VI is made up of small diversiform cells.

The *area marginalis anterior II* (MA II) lies ventral to the previous area on the medial surface of the hemisphere and is well-myelinated. It is divided into the better myelinated dorsal subarea "a" and the less well myelinated ventral subarea "b".

The radial fibers are very thin and medium-sized and show a constant tendency to group together in anastomosing fascicles, which go for four-fifths (very thin fibers) or two-thirds (medium-sized fibers) of the way through the cortex. Proximally the fascicles sink into the white matter and can be traced far downwards.

The tangential fibers provide abundant connections between area ND and the splenial fissure. These fibers are thin and very thin and are most numerously accumulated within layer V. They run in all directions but there are not many parasagittal fibers. Many of the fibers extend on a slant.

The superficial plexus is poorly developed. The thin and very thin fibers run in all directions.

In Nissl sections layer I, 210 μ in thickness, is not very sharply demarcated from layer II. Layers II–III consist of small cells, with somewhat larger diversiform cells among them in layer III. Layer IV contains pale granules and layer V larger diversiform cells with a big nucleus. Layer VI is composed of small cells which vary in shape and penetrate also into the white matter.

The *area marginalis anterior III* (MA III), situated orally to the previous one, is a small area of the paragyral type.

Its radial fibers are thin and very thin and extend for two-thirds of the cortex thickness while in the deeper layers the number of thin fibers is smaller. Proximally they are lost at the edge of the white matter.

The tangential fibers are abundant. In layer IV there are very fine "grundfasern", and in the deeper layers very thin and medium-sized cells, running in different directions, often on a slant.

The superficial plexus, narrow but fairly compact, is composed of thin and very thin fibers, which have various courses, inclusive of the parasagittal one.

In Nissl sections layer I is about 180 μ thick. Layers II–IV comprise small cells and layer V has singly scattered large cells rich in tigroid.

The *area presplenialis dorsalis* (ND) is well myelinated, fairly large and lies on the upper margin of the posterior cruciate fissure. At its base, in the white matter, there is a characteristic orocaudal bundle.

The thin, very thin and medium-sized radial fibers are loosely arranged and reach three-quarter (thin fibers) or two-thirds (thick ones) of the way through the cortex. In the deep layers the medium-sized fibers increase in number. Proximally they arch lateroventrally and join the radial fibers from areas MA I and II or are lost in the parasagittal bundle at the edge of the white substance.

The tangential fibers are rather few in number, thin or very thin, and chaotic in course. Many of them are slant. There are connections with area MA II and the splenial fissure.

The poorly developed superficial plexus is composed of very thin fibers which extend on a frontal plane.

In Nissl sections layer I measures 160 μ and layers II–IV are composed of small cells with a small amount of tigroid. In layer V there is a row of large cells rich in tigroid and in layer VI the cells are small, often granular and scattered far into the white matter.

The *area presplenialis ventralis* (NV) is a small paragyral area in the dorsal wall of the posterior cruciate fissure.

The radial fibers are thin and medium-sized and, forming indistinct fascicles, they reach, respectively, five-eighths and a half of the way through the cortex. Proximally they run in a medial direction in the white matter.

The tangential fibers are not very numerous. They are very thin, thin, and some of them are medium-sized and distributed fairly uniformly in all the layers.

The superficial plexus is narrow and sparse, made up of thin fibers running in all directions.

In Nissl sections layer I is 180 μ thick. Layers II–III are composed of small cells, tightly packed in layer II and loosely arranged in layer II. There are also some granular cells in layer IV. The cells of layer V are larger, moderately rich in tigroid and diversiform, while those in layer VI are small and angular.

Occipital cortex

In the occipital cortex of the cat I have arbitrarily included the cortex between the medial and posterior suprasylvian fissures and the splenial fissure. This embraces the gyrus suprasylvius between the suprasylvian and lateral fissures, the gyrus marginalis on the margin of the hemisphere between the lateral and suprasplenial fissures and the gyrus splenialis between the suprasplenial and splenial fissures. The gyrus retrosplenialis (mihi), ventral to the posterior end of the splenial fissure and hard to distinguish, is also numbered in the occipital cortex.

Gyrus suprasylvius

The gyrus suprasylvius spreads along the suprasylvian fissure, on its medial side. Orally it passes into the gyrus coronalis and caudally merges with the gyrus marginalis in the vicinity of the posterior end of the lateral fissure, extending here as far as the posterior splenial fissure. Four large architectonic areas, which stretch orocaudally for a long distance, can be distinguished on the gyrus suprasylvius.

The well-myelinated *area suprasylvia* (SS) is adjacent to the suprasylvian fissure on its medial side.

Its radial fibers, medium-sized and thin, are grouped in loose fascicles and reach two-thirds of the way through the cortex. Proximally they arch ventromedially through the album gyri. Starting from one-quarter of the thickness of the cortex, they are joined by such numbers of very thin fibers that they cause the division of the cortex into a less well-myelinated layer at the base and a better-myelinated one in the middle.

The tangential fibers are abundant. In the lower layer they are thin and run in different directions, in the middle layer thin and very thin, many of them with a slanting course, while in the upper layer the number of these fibers is small. At the edge of the white matter there are many medium-sized and thick parasagittal fibers.

The oral portion of the superficial plexus is thin, not very well developed, and its caudal portion forms a thin layer of numerous, closely packed, thin fibers.

In Nissl sections layer I measures from 280 μ in the front to 180 μ at the back. Layers II–IV are composed of small, partly granular cells. Layer V contains loosely arranged small cells with singly scatered large ones among them. The cells are small in layer VI.

The *area suprasylvio-ectolateralis* (SSQ) adjoins the middle part of area SS on its medial side and holds a position in which the ectolateral fissure occurs in the dog.

The radial fibers are medium-sized and thin and go through a third and two-thirds of the cortex thickness, respectively. Proximally most of the medium-sized fibers sink deep into the white matter and the thin and remaining medium-sized ones are lost in its superficial layers.

The medium-sized tangential fibers are grouped mostly in the lower half of the cortex with the thin ones in the upper half. The fibers are fewer in the lower half of the cortex, which brings about the formation of a grey band seen with the naked eye, and they are most numerous in the middle part. There are connections, chiefly with area QP, and much weaker with area SS. Many fibers run parasagittally.

The superficial plexus is about 50 μ thick and consists of pale thin fibers running in all directions.

In Nissl sections layer I measures about 180 μ. The remaining layers are composed of small cells, which are denser in layer II, and with an admixture of larger cells with a large amount of tigroid in layers III and V. Small cells of layer VI can be seen deep in the white matter.

The *area ectolateralis posterior* (QP) is situated on the ventral edge of the lateral fissure and it differs from area SSQ in, among other things, the presence of large cells. It is homologous with the gyrus ectolateralis of the dog.

The radial fibers are thin, medium-sized and, in the upper layers, also very thin. They run in fascicles, avoiding large cells, for about three-quarters of the way through the cortex. Proximally they tend downwards through the album gyri without mingling with the radiation of area SS.

The tangential fibers, which are abundant, medium-sized and thin, extend in all directions in the middle and deep layers. Many of them run on a slant. They produce very strong connections between all the layers and area FL, and weak connections with area SS.

The superficial plexus is narrow but compact, and it is especially so at the margin of the lateral fissure.

In Nissl sections layer I is 225–270 μ in thickness. Layers II and III are made up of small cells with an admixture of medium-sized pyramidal cells in layer III. Layer IV is hard to distinguish, while in layer V there are single medium-sized pyramidal cells abounding in tigroid, and layer VI contains small cells resembling the granular ones.

The *area fissurae lateralis* (FL) lies in the bottom of the lateral fissure. It is a fissural area, strongly myelinated in the deeper layers.

The radial fibers are dense, as for a fissural area. They are thin and very thin, have an undulate course and go singly as far as halway through the cortex. Proximally they disappear in the lower layers of the cortex without reaching the white substance; probably, they bend and turn into tangential fibers.

In the deepest layers there are compact bundles of parallel tangential fibers, thin and very thin, coming from area BP and QP and terminating here. The fibers of the two bundles overlap. In the middle layers the fibers have a similar course, but are paler and looser and, in addition, more chaotically arranged. A loose parasagittal bundle runs along the fissure. Other parasagittal fibers, thin and medium-sized, run in the white matter under the fissure.

The superficial plexus is fairly dense, composed of parasagittal and frontal thin fibers. Under it there is a subplexus of the type of "grundfasern" fibers.

In Nissl sections layer I is 230 μ thick. Layer II has small cells, including those of the granular type. Among these cells there are somewhat larger cells with a high tigroid content in layer III (?). The deepest layer (VI or IV–VI) consists of small cells varying in shape and size.

Gyrus marginalis

This is a long gyrus extending on the margin of the hemisphere from the cruciate fissure in the front beyond the caudal pole of the hemisphere at the back. On its surface there are three architectonic areas in the form of narrow long strips of cortex.

The *area ectolateralis posterior* (BP) stretches along the lateral fissure, on its medial side. The area is well myelinated, with a characteristic white band in the middle layers of the cortex.

In the deep layer the radial fibers, varying in caliber, run singly. In the middle layers they are joined by fascicles of very thin fibers, which reach three-quarters of the way through the cortex (the medium-sized fibers extend only for two-thirds of the thickness of the cortex). Proximally the thin fibers do not reach the white matter but disappear close above it, which gives the picture of a white band. The medium-sized fibers penetrate deep into the white matter.

The tangential fibers are numerous, medium-size, thin and, in the highest layers, very thin. They run in all directions, also on a slant.

The dense superficial plexus is about 160 μ in thickness. The thin fibers extend singly in parasagittal planes, and the very thin ones in a frontal plane.

In Nissl sections layer one is 160 μ thick, and in the anterior part of the area it comes up to 300 μ. Layers II–IV contain diversiform small cells. In addition to these, single medium-sized cells with a high tigroid content are scattered in layer V. Layer VI again has small cells, also scattered in the white matter.

The *area fissurae entolateralis* (FB) takes the place of the entolateral fissure in the dog; however, the fissural character of this cortex in the cat is poorly marked. A white stripe as wide as half the thickness of the cortex occurs in the middle layers in the section.

In the lower layers the radial fibers are medium-sized. They go two-thirds of the way through the cortex and proximally sink ventrally deep into the white matter. In the upper layer the fibers are numerous and very thin and they form indistinct fascicles, without entering the white matter.

The tangential fibers, varying in caliber, are for the most part grouped in the zone of the white stripe and run in various directions (the medium-sized ones often on a slant). At the border of the white mater there are bundles of thin and medium-sized fibers with an orocaudal course.

The moderately dense and flat superficial plexus is composed of very thin fibers having a frontal course.

In Nissl sections layer I measures 160 μ. The remaining layers are made up of small cells, which closer to the surface resemble small pyramidal or polygonal cells and respond well to staining. Deep in the cortex they pass into palely stained granular cells.

The well-myelinated *area marginalis posterior* (MP) occurs on the margin of the hemisphere. Hassler (1962) considers it to be area "17".

The radial fibers are thin and, a few of them, middle-sized, arranged in anastomosing fascicles (about 8 μ in diameter and 20 μ apart). The thin fibers run five-sixths of the way through the cortex. Proximally the fibers form fascicles and go deep through the album gyri.

The moderately dense tangential fibers form a denser layer of thin and medium-sized fibers in the middle of the cortex. The medium-sized fibers run parasagittally. In the upper layers the thin tangential fibers go in all directions.

The superficial plexus consists of thin and single medium-sized fibers and forms a layer which is not very thick (70 μ) and compact. Its fibers run in all directions, but the medium-sized ones are chiefly arranged in a frontal plane.

In Nissl sections layer I is extremely thin, about 100 μ. Layer II consists of well-stained polygonal small cells. Small pyramidal cells occur in layer III and loosely scattered granular ones occur in layer IV. Layer V is hard to mark out and its place is indicated only by single larger cells. The small cells of layer VI vary in shape.

Gyrus splenialis

This is a large gyrus on the medial surface of the hemisphere between the splenial fissure and the suprasplenial one. Caudally it merges in the gyrus marginalis. It contains six architectonic areas.

The well-myelinated fissural *area fissurae suprasplenialis* (FO) occupies the bottom of the fissure of this name.

Its radial fibers, thin and medium-sized, are gathered in indistinct fascicles and extend for five-sixths of the way through the cortex, but, with a few exceptions, do not reach, the white matter. As a result, the deep layer of the cortex is almost completely devoid of radial fibers, which occur in its middle layer, but are again missing in the superficial layer. The radial fibers probably turn into tanqential fibers.

The medium-sized and thin tangential fibers form an entanglement void of radial fibers in the deepest layer. A stria of tangential fibers arises also at the border of the zone with radial fibers. Further upowards the tangential system becomes looser and its fibers run in all directions, mostly parasagittally.

The superficial plexus is composed of abundant thin and very thin fibers, which are closely packed and run parallel to the bottom of the fissure. There are many very thin pseudoradial fibers.

In Nissl sections layer I is about 150 μ thick. The remaining layers are made up of small granular cells. The boundaries between the layers are very poorly marked. Layer VI is characterized by the density of its cells.

The *area fissurae splenialis* (Sp) is a fissural area situated at the bottom of the fissure of this name.

The radial fibers, very few in number, are very thin and go through a third of the thickness of the cortex. Proximally they are lost at the edge of the white matter.

The tangential fibers are very thin and prevail in the lower layers. They connect the area under discussion with both the adjacent areas.

The superficial plexus is loose and composed of very thin fibers going in different directions. It passes into a "grundfasern" system.

The cytological picture is hardly typical. Layer I measures 400 μ. Layers II–V are made up of small cells which are tightly packed. Somewhat larger cells with a higher tigroid content are scattered among them. Layer VI has small well-stained cells.

The *area splenialis* (O) is large, well-meylinated and situated along the splenial fissure.

Its radial fibers are thin and medium-sized and reach as far as three-sevenths of the thickness of the cortex. Above them there are bundles of very thin fibers extending up to four-fifths of the way through the cortex. Consequently, a white band rises in the middle layers. Proximally the radial fibers arch lateroventrally up to the corpus callosum and, probably, to the centrum semi-ovale and the marginal portion of the cingulum.

The thin and very thin tangential fibers are not numerous. They run in all directions, many of them on a slant. The connections with the neighbouring areas are poor.

The superficial plexus is narrow but dense and well stained. It consists of thin fibers and a small number of medium-sized ones.

In Nissl sections layer I is 60–70 μ thick. Layer II is clearly visible because of its densely arranged small cells. Layers III–IV are made up of somewhat looser granular cells and layer V is marked by thinly scattered single pyramidal cells. Layer VI contains closely packed well-stained small fibers.

The *area splenialis ventralis* (OV) is a paragyral area situated along the posterior portion of the area splenialis.

Its medium-sized, thin and very thin radial fibers run undulately in loose fascicles for five-sixths of the way through the cortex. Proximally they disappear in the plexus at the edge of the white matter.

The tangential fibers, thin, very thin and medium-sized, form an entanglement at the edge of the white matter and, partly, pass into radial fibers.

The superficial plexus is narrow, compact and composed of thin fibers and single medium-sized ones.

In Nissl sections layer I is 120 μ thick. Layers II–VI are of small diversiform cells. In the presumable position of layer III there occur medium-sized cells, few in number, with a large amount of tigroid. A group of large cells in tigroid appears deep in the cortex (? layer V). Layer VI is thin.

The *area splenialis accessoria* (OAc) is hidden in the wall of the splenial fissure.

The radial fibers are thin and very thin and have a wavy course. They run unaccompanied for three-sevenths of the way through the cortex. Proximally they turn towards the splenial fissure and extend on the surface of the white matter or, in the case of the thicker ones, bend to become parasagittally tangential fibers.

The tangential fibers are very thin and not very numerous. They produce weak connections with area OV and somewhat stronger ones with area FO.

The superficial plexus is very poorly developed; it is composed of very thin fibers running in all directions. Pseudoradial fibers are also formed.

In Nissl sections layer I measures 180 μ. The other layers are made up of small cells, inclusive of granular ones. There occur only single larger cells. The cells are closely packed in thin layer VI.

The poorly-myelinated *area fissurae splenialis posterior* (FOP) occupies the bottom of the caudal portion of the splenial fissure.

Very thin radial fibers occur in small numbers and they run singly or in loose fascicles. Proximally they disappear at the edge of the white matter.

The very abundant tangential fibers occupy the whole lower half of the cortex. They have connections with the area splenialis (O) and area retrosplenialis dorsalis (RD). The very thin fibers of the superficial plexus run in large numbers either parallel to the bottom of the fissure or in a frontal plan.

In Nissl sections layer I is 240 μ thick. The remaining layers consists of small cells, which are paler in the middle layer and better stained in the deep one (? VI).

Gyrus retrosplenialis

The gyrus retrosplenialis is situated on the medial aspect of the hemisphere, near its caudal pole. Dorsally it is bounded by the posterior splenial fissure and ventrally by the branch of the posterior rhinal fissure, hemologus with the pararecurrent fissure of the dog.

The *area retrosplenialis dorsalis* (RD) is not large and lies along the ventral margin of the pararecurrent fissure (posterior part of the splenial fissure).

The radial fibers, thin and very thin, run in rather indistinct fascicles halfway through the cortex. Proximally they tend latero-orally.

The tangential fibers are thin and show a tendency to form bundles. They run in the middle layer of the cortex and connect it with area FR. There are weaker connections with area RV.

The superficial plexus consists of thin fibers running in all directions.

In Nissl sections layer I is 180 μ thick. Layer II has closely packed small granular cells. The cells of layer III are small but somewhat larger and richer in tigroid, those of layer IV are granular. Layer V is indistinguishable and layer VI again contains small cells, widely scattered in the white matter.

The *area retrosplenialis ventralis* (RV) neighbours on the previous one on the ventral side.

The radial fibers, thin and very thin, are grouped in indistinct fascicles and extend for four-ninths of the cortex thickness. Proximally they are directed orally and dorsolaterally.

The tangential fibers are very thin, scanty, and "grundfasern".

The superficial plexus, not very dense, consists of very thin fibers, many of which run in a frontal plane.

In Nissl sections layer I is about 180 μ thick; the other layers contain small cells, so uniformly arranged that it is impossible to distinguish particular layers.

Dorsofrontal cortex

The dorsofrontal cortex occupies an area limited caudally by the anterior suprasylvian fissure or its extension, medially by the cruciatosplenial fissure and dorsally by the ansate fissure. Three gyri can be distinguished in this area: the gyrus coronalis and its extension, the gyrus sigmoideus and a small portion of the gyrus marginalis anterior.

Gyrus coronalis

In the cat the gyrus coronalis lies between the suprasylvian fissure or its extension and the coronal fissure (and its extension). Dorsally it passes into the gyrus suprasylvius, ventrally into the gyrus orbitalis. The gyrus coronalis can be divided into four architectonic areas.

The *area coronalis* (K) is large and heavily myelinated.

Its radial fibers, medium-sized and thin, run in a large number of tightly arranged fascicles, which go as far as four-sevenths of the cortex thickness. Proximally they turn deep medialwards. In the upper layers these fibers are joined by very thin pararadial fibers, which go three-quarters of the way through the cortex.

The tangential fibers, not too numerous and medium-sized, occur for the most part in the lower layers and often have a diagonal course. In the upper layers. below the tops of the radii, there occur thin fibers.

The superficial plexus is sparse and consists of thin, medium-sized and single thick fibers. They run in all directions, and many of them extend parasagittally.

In Nissl sections layer I is 150 μ in thickness and contains single cells. Layer II is clear-cut and composed of well-stained small cells. Layers III–IV have less closely packed cells with an admixture of small pyramidal ones. Layer V is marked out by pyramidal cells with a large amount of tigroid. Layer VI is wide and contains tightly packed diversiform small cells.

The *area composita ectosylvia I* (CE I) is a strongly myelinated area situated ventrally to the previous one.

The radial fibers of various thickness, not excluding thick ones, run four-sevenths of the way through the cortex. They run singly or in thin fascicles. Proximally they swing medially.

The tangential fibers are few in number, very thin in the upper layers, lower of various caliber, also thick, but in general thinner than in the area coronalis (K). A diagonal course is an exception here. The connection with area K is weak; instead, in all the layers, there are numerous connections with the area composita ectosylvia II (CE II).

The superficial plexus is sparse and composed of thin fibers with various courses.

In Nissl sections layer I measures 250 μ and contains single cells. Layer II is well-marked and layer III is characterized by well-stained medium-sized pyramidal cells. Layer IV is indistinct, layer V has large cells resembling pyramids, with a great quantity of Nissl bodies, and in layer VI the cells are small, round or elongate.

The *area composita ectosylvia II* (CE II) lies ventrally to CE I and is hardly demarcated from it.

The radial fibers are thin and medium-sized and arranged in slender fascicles, which extend for five-sevenths of the way through the cortex. Proximally they form a deep arch in a medial direction.

The tangential fibers, thin, very thin and occasionally medium-sized, run in large numbers in various directions in all the layers, many of them orocaudally. A large bundle of these fibers goes out as does that of "U" fibers to the area orbitalis II (ORB II) and a smaller one to area CE I.

The superficial plexus is poor and consists of thin and very thin fibers.

In Nissl sections layer I is 180 μ thick, layer II is clear-cut and layers III–IV are made up of small cells, some of which contain much tigroid and resemble pyramidal cells in outline. Layer V contains small pyramidal cells and layer VI small angular ones.

The *area fissurae coronalis* (FK) occupies the bottom of the deep coronal fissure and is fairly well myelinated.

The radial fibers are thin, undulate and run singly or in very loose fascicles halfway through the cortex. Proximally they are lost at the boundary of the white matter.

The tangential fibers are very numerous, chiefly in the lower half of the cortex. They are mostly medium-sized; the thin fibers are fewer. The fibers run in all directions, the parasagittal ones being prevalent. The connections with the adjacent areas are weak.

The superficial plexus is composed of thin and very thin fibers, which run parallel to each other along the bottom of the fissure, with only a few running in other directions.

In Nissl sections layer I measures 300 μ, the remaining layers are 600 μ altogether. These layers are made up of pale small cells with better stained medium-sized cells strewn among them and roughly marking out the position of layers V and III (?).

Gyrus sigmoideus

This is a large gyrus in the fork of the ansate and coronal fissures on the lateral and frontal surface of the hemisphere. Ventrally it passes into the gyrus orbitalis without a clear-cut morphological boundary. The cruciate fissure cuts into the space of the gyrus sigmoideus from in front. Nine architectonic areas can be distinguished on the surface of the gyrus sigmoideus.

The *area fissurae cruciatae* (FCr) occurs at the bottom of the anterior portion of the cruciate fissure and merges with area FCrP posteriorly.

The radial fibers, few in number, thin and medium-sized, are scattered singly and reach halfway through the cortex. Proximally they are lost at the border of the white matter.

The tangential fibers are very abundant and divided into a deep portion and a more superficial one, separated by a series of giant cells. In the upper portion the thin and medium-sized fibers form a longitudinal bundle tending laterodorsally to the area precentralis interna (PrCJ). On the medial side a markedly smaller bundle runs to the cortex of the area precruciata lateralis (VL). The tangential fibers of the lower portion are for the most part of medium caliber and run to areas PrCJ and XL.

The superficial plexus is fairly dense and composed of thin and medium-sized fibers, among which those running along the fissure bottom are predominant. Under it there is a subplexus of very thin fibers.

In Nissl sections layer I is 300 μ in thickness. Layers II–IV are composed of pale small cells, being somewhat denser at the border of layer I. Layer V is conspicuous and comprises medium-sized cells rich in tigroid. They are a continuation of the large cells of the area precentralis interna (PrCJ). Layer VI consists of small cells.

The *area fissurae cruciatae posterior* (FCrP) is an extension of the area described above and has a very similar texture of fibers.

The radial fibers are similar to those in area FCr.

The abundant tangential fibers, thin and medium-sized, form a bundle which runs from the cortex of area PrCJ in a mediooral direction towards the area precruciata lateralis (XL). These fibers are grouped in the lower layers, whereas in the more superficial layers single fibers run in various directions.

The superficial plexus as in area FCr.

The cytological picture here is similar to that of the area fissurae cruciatae except that the cells of layer V are somewhat smaller here.

The *area precentralis* (PrC) stretches on the surface of the hemisphere as a moderately well myelinated area posterior to the cruciate fissure. Farther to the rear it passes imperceptibly into the area postcentralis (PoC). There is no fissure corresponding to the sulcus centralis.

The radial fibers are medium-sized or very thin and show a weak tendency to gather together in fascicles. They extend for five-sevenths of the thickness of the cortex. The thin fibers often join the "grundfasern". Proximally the radial fibers may be traced far into the white matter, where they turn laterally with a caudodorsal deviation.

The tangential fibers, very abundant and varying in thickness, run in all directions up to the tops of the radii in the deeper layers. A diagonal course is often observed in these fibers.

The superficial plexus is dense and extends right under the surface of the cortex. It consists of thin, very thin and medium-sized fibers, most of which run oromedially.

In Nissl sections layer I is about 150 μ thick. Layers II–IV are made up of small pale cells, among which there are single better stained cells. In layer V the cells are small and pale, with sparsely scattered giant cells rich in tigroid among them. However, they do not have the shape of pyramidal cells. The cells of layer VI are similar to those in layers II–IV.

The *area precentralis interna* (PrCJ) is hidden in the dorsal wall of the cruciate fissure. It is a well-myelinated area with numerous giant cells.

Its radial fibers, medium-sized and thin, run singly and form fascicles only at the boundary of the white matter. Giant cells can be seen among them. These fibers go as far as three-quarters of the way through the cortex and proximally they turn caudolaterally.

The tangential fibers, medium-sized and very closely packed, run mostly inside the area. The thin fibers, less numerous, form a bundle of parallel fibers which tend to the area cruciata posterior (FCrP) and to the medial surface of the area precentralis (PrC).

The superficial plexus is dense and composed of thin fibers with an admixture of medium-sized ones. It sends off numerous pseudoradial fibers deep into the cortex. Under the plexus there are numerous thin and very thin "grundfasern".

In Nissl sections layer I measures 150 μ. Layers II–IV contain small pale angular cells. Layer V is clear-cut and comprises giant cells, pyramidal and loosely scattered medium-sized cells. Layer VI shows a structure resembling that of layers II–IV.

The *area motoria* II (Mt II) is caudal to the area precentralis (PrC) and reaches up to the coronal fissure. The cruciate fissure squeezes into the area motoria II from in front and medially. This area resembles area ORB I' to some extent, but it differs from it in the proximal course of its radial fibers.

Radial fibers of medium caliber with an admixture of thin and single thick fibers run in small fascicles, arranged closely side by side. Proximally they bend at the edge of the white matter and run to the rear. The medium-sized fibers are joined by thin fibers, are accompanied by them and reach four-fifths of the way through the cortex. Thus a white band arises against the background of the cortex.

The tangential fibers, thin, very thin and dense, run in all directions, many of them obliquely among the radii.

The superficial plexus is poorly developed and consists of thin and medium-sized fibers.

In Nissl sections layer I is about 180 μ thick. Layers II–IV contain palely stained small angular cells. Layer V has loosely arranged large cells and layer VI has cells resembling those in layers II–IV.

The *area postcentralis I* (PoC I) is situated dorsally to area Mt II.

Medium-sized radial fibers arranged in fascicles are seen in the deep layer. Proximally they enter ventralwards deep into the white matter. In the upper layers the medium-sized fibers run singly and are joined by thin fibers, which extend for four-fifths of the thickness of the cortex.

The tangential fibers are moderately numerous, thin and medium-sized. They run in all directions but least in the parasagittal one. Often they have a diagonal course and some of them bend and become radial fibers. A bundle of tangential fibers goes to the gyrus marginalis.

The superficial plexus is moderately well developed and made up of medium-sized, thin and single thick fibers. The fibers extend in all directions, the parasagittal ones being prevalent.

In Nissl sections layer I is 225 μ in thickness, layer II is marked by a density of small perikarya and layer III contains small cells and, occasionally, somewhat larger ones rich in tigroid. Layer IV is composed of granules. The cells of layer V are scattered more loosely and those of layer VI are very small.

The *area postcentralis II* (PoC II) has a medial (dorsal) position in relation to area PoC I and stretches up to the ansate fissure. It is a heavily myelinated area.

The radial fibers, medium-sized with an admixture of thin ones, show a slight tendency to group in fascicles and go four-fifths of the way through the cortex. Proximaly they may be seen deep in the white matter, where they bend medially. Thin accessory radial fibers occur halfway through the cortex and contribute, together with the dense tangential fibers, to the formation of a white band. Below this band large cells accumulate.

The tangential fibers are very numerous, medium-sized with some thin ones, and run in all directions. They are most abundant in the middle zone of the cortex and rarest in the deep layer and above the tops of the radii. Many slanting tangential fibers turn into radial ones.

The superficial plexus is well developed, compact and intensely stained. It consists of medium-sized and thin fibers, which run in all directions, many of them being directed orodorsally.

In Nissl sections layer I measures about 150 μ and layer II is composed of very closely packed small cells, some of which resemble small pyramids. Layer III contains small pyramidal cells, layer IV small round cells. Large cells, partly pyramid-shaped, are noticeable in layer V, and layer VI is made up of pale small cells. All the layers are thicker than average.

The *area fissurae ansatae* (FA) lies in the bottom of the ansate fissure.

Its thin wavy radial fibers extend singly for a third of the way through the cortex. Proximally they are lost on the surface of the white matter or bend to form tangential fibers.

The thin and occasionally medium-sized tangential fibers accumulate in the lower half of the cortex, where they form a bundle, which goes to the area postcentralis II (PoC II). A weaker bundle runs to area BA.

The superficial plexus is poorly developed and composed of very thin fibers, showing a chaotic course.

In Nissl sections layer I measures 250 μ in thickness, and all the other layers together, 450 μ. Layer II comprises densely arranged small cells, and layers III–IV contain small cells, frequently triangular, with an admixture of somewhat larger ones. Layer V is characterized by the presence of cells larger than medium-sized and rich in tigroid. Layer VI has small cells.

The *area coronalis minor* (KM) is a small paragyral area in the fork of the ansate and coronal fissures.

The radial fibers come out of the white matter in fascicles, which split into single fibers in the cortex. Proximally they penetrate to a shallow depth and disappear in the white matter. In the upper layers a large number of very thin fibers join the radial fibers proper.

The tangential fibers are not very numerous. They are pale in coloration, vary in course, and produce connections with the area fissurae ansatae (FA).

The poor superficial plexus is woven of very thin fibers in various courses.

In Nissl sections layer I is about 180 μ thick. The remaining layers are made up of small cells, with somewhat larger ones, richer in tigroid, scattered among them.

Gyrus marginalis anterior

This gyrus is the oralmost part of the gyrus marginalis, which is stretched all along the margin of the hemisphere. It makes the substratum for the area postcentralis III (PoC III).

The *area postcentralis III* (PoC III) is a small well-myelinated area situated caudally to the area precentralis (PrC) and medially to the ansate fissure on the top of the gyrus marginalis.

The radial fibers of the lower layers of the cortex are medium-sized and go two-thirds of the way through the cortex. Proximally they have a ventral direction. In the upper layers they are joined by thin and very thin fibers grouped in fascicles, which reach three-quarters of the thickness of the cortex.

The tangential fibers are very numerous, of medium caliber in the deeper layers, and very thin in the superficial ones. They run in all directions, often diagonally all through the layers.

The superficial plexus is fairly wide and loosely woven of very thin and medium-sized fibers, which run in all directions.

In Nissl sections layer I is 150 μ thick. Layers II–IV consist of small cells and are distinguishable owing to differences in their density. Layer III has, in addition, some cells which are slightly larger and well stained. Among the small cells of layer V there occur large cells rich in tigroid, and small pale cells make up layer VI.

Orbitofrontal cortex

The cortex of this region is distributed on only one gyrus, i.e. the gyrus orbitalis.

Gyrus orbitalis

The gyrus orbitalis is bounded ventrally by the pseudopresylvian fissure, which posteriorly passes into the anterior rhinal fissure. Dorsally its boundary is marked out by a very variable furrow, called by Winkler and Potter (1914) the sulcus orbitalis. This sulcus is often joined to the ends of the coronal and anterior ectosylvian fissures. The pseudopresylvian fissure is frequently confused (also by Winkler and Potter, loc. cit.) with the presylvian fissure, which in the cat occurs only as a fragment of the orbital fissure. I have distinguished 8 eight areas on the surface of the gyrus orbitalis.

The *area sulci orbitalis* (SORB) occupies the bottom of the so called sulcus. This sulcus shows great variability. It either óccurs as a cryptosulcus or may partly dwindle away. It is not homologous with the dog's orbital fissure, which does not exist in the cat.

The radial fibers, very few in number, belong to the system of the superficial plexus. Only in the regions which are cryptosulcal in character are there fibers, not numerous and very thin, which extend for two-fifths of the cortex thickness. Proximally they get lost in the superficial layers of the white matter.

Numerous and very thin tangential fibers run in all directions and are linked with the plexus of the adjoining areas, especially ORB III and ORB I.

The superficial plexus is abundant, made up of thin fibers, and connected with the neighbouring areas. Parasagittal fibers are visible in the bottom of the sulcus.

The area is well delimited. Layer I is 500 μ thick and contains single cells. The other layers are composed of granular cells, which are tightly packed in layer II and irregularly strewn in the deeper layers. Single medium-sized cells rich in tigroid appear among them.

The *area fissurae pseudopresylviae* (FPPS) covers the bottom of a deep fissure which runs parasagittally as far forward as the vicinity of the cruciate fissure. In Winkler and Potter's (loc. cit.) atlas this fissure is erroneously designated as the presylvian fissure and is shown to be ventral to gyrus orbitalis, whereas the true presylvian fissure extends (e.g. in the dog) dorsal to the gyrus orbitalis. In the dog the homologue of the pseudopreylvian fissure may be poorly developed furrow lateral to the olfactory sulcus, between areas ORB and PORV. In the cat a strong development of the pseudopresylvian fissure entailed a reduction in the olfactory sulcus, which is represented only by a cryptosulcus situated in its typical position, below the olfactory peduncle. The architectonic of the pseudopresylvian fissure is typical of fissural areas.

No radial fibers are visible.

The fairly numerous tangential fibers gather in deep layers of the cortex (V and VI). They form a large bundle, which runs from the bottom of the fissure to the area paraorbitalis ventralis (PORV), where they enter all the deeper layers. Another bundle, markedly weaker, tends to the marginal subareas of the area orbitalis I'' (ORB I''). There are, besides, fairly numerous medium-sized fibers, which run to the rear with a medial or lateral deviation.

The superficial plexus is composed of moderately abundant, very thin fibers parallel to the bottom of the fissure. Towards the front the number of the tangential fibers decreases; instead, there are more "grundfasern".

In Nissl sections layer I is 300 thick. Layer II consists of very closely packed granules. In layers III–IV the small cells are arranged somewhat more loosely. Layer V contains slightly larger cells, densely arranged and well stained, with single large cells among them. Layer VI is narrow and comprises well-stained small fibers.

The *area motoria I* (Mt I) occurs as an intensely myelinated area with giant cells in layer V in the very oral portion of the gyrus orbitalis. It is marked by the presence of a characteristic white band, about 200 μ across, right under the surface. It is made up of tightly packed tangential fibers.

The radial fibers are mostly of medium size, with an admixture of thin and thick ones. They form fascicles, about 7 μ thick, and extend for four-fifths of the cortex thickness. Proximally they run, according to the curvature of the cortex in the given place, dorso- or mediocaudally. Additional thin fibers join them in the upper layers.

The tangential fibers are very dense and of various caliber (fairly many medium-sized ones) and they run in all directions. Accumulated more densely in layers II–IV, they form a typical white band, seen with the naked eye. In layer V gaps filled with the bodies of large cells are visible between the fibers, which gives the impression of a grey band.

The superficial plexus is moderately well developed and consists of thin and very thin fibers.

In Nissl sections layer I is 260 μ thick. Layers II–IV are made up of small cells, which in layer II are arranged more densely. Layer V is conspicuous; it is composed of fairly tightly packed large round cells rich in tigroid, mixed up with medium-sized and small cells. Layer VI is wide and contains numerous small cells.

The *area paramotoria* (PMt) is a well-myelinated paragyral area on the edge of the lateral wall of the pseudopresylvian fissure.

The radial fibers, medium-sized and thin, extend proximally in a dorsocaudal direction. In the cortex they do not form fascicles but run singly up to three-quarters of the cortex thickness.

The very densely distributed tangential fibers are medium-sized and thin, and run in all directions, many of them diagonally. In the upper layers they become denser and form a continuation of the white band described from the area motoria I (Mt I). There are many connections with the adjacent areas, especially with the area fissurae pseudopresyviae (FPPS) and motoria I (Mt I).

The well-developed superficial plexus is composed of very thin and thin fibers, which are intensely stained and run in a frontal plane.

The cytoarchitectonics of the cortex is well developed. Layer I is 250 μ in thickness. Layer II is distinct, and it passes unobtrusively into layers III–IV, which are composed of loosely arranged small cells. In layer V, which is far narrower than that in area Mt, there are fairly densely arranged medium-sized and large cells. Layer VI contains numerous small cells.

The *area orbitalis I'* (ORB I') is a strongly myelinated region in the oral portion of the gyrus orbitalis. Orally it passes into area Mt I, dorsally into area CE II, from which it is separated by a vestigial sulcus. Ventrally it is accompanied by area ORB I''.

The thin and medium-sized radial fibers are grouped in fascicles, which run fairly close to each other and are about 12 μ thick.

Thin fibers extend for about two-thirds, and the medium-sized ones for three-fifths, of the way through the cortex. Proximally they sink deep into the album gyri and next turn to the rear.

Abundant tangential fibers, medium-sized and thin, can be seen in all the layers but the one under the superficial plexus. They run in large numbers dorsally to area CE II, less numerously in a ventral direction to area ORB I''.

The poorly developed superficial plexus is built up of very thin fibers, which run parallel dorsocaudally.

In Nissl sections layer I is 270 μ thick. Layer II is composed of tightly packed small cells, layer II of somewhat larger and more loosely arranged diversiform cells rich in tigroid. Layer IV contains pale granules and layer V loosely distributed well-stained non-pyramidal medium-sized cells. Layer VI is wide and has small cells which appear deep in the white matter.

The *area orbitalis I''* (ORB I'') accompanies area ORB I' in the lateral wall of the pseudopresylvian fissure. It is strongly myelinated.

The numerous radial fibers, very thin, thin and medium-sized, form indistinct fascicles which go through four-fifths of the cortex thickness. Proximally they turn dorsocaudally.

The dense tangential fibers run through all the deeper layers to the adjoining areas, FPPS and ORB I'. Thick fibers with an orocaudal course can be seen deep in the cortex.

The dense superficial plexus is made up of very thin fibers with an admixture of medium-sized ones. The fibers run in all directions and, besides, form a fairly abundant subplexus.

The cytoarchitectonics of area ORB I'' very much resembles that of area ORB I' with the exception that single large cells occur in layer V.

The *area orbitalis II* (ORB II) of the cat is a moderately well-myelinated region caudal to area ORB I' in the dorsal part of the gyrus orbitalis.

The radial fibers, very thin and thin with a small addition of medium-sized ones, run in indistinct loose fascicles for two-thirds of the way through the cortex. Proximally they go far upwards and somewhat orally close to the claustrum.

The tangential fibers, thin and medium-sized, run from all the layers laterocaudally and dorsally to the sulcus orbitalis, which in this segment may be the homologue of the presylvian fissure of the dog (?). Posteriorly the number of fibers of this course increases. In the deep layers there are also medium-sized fibers which extend orocaudally.

The superficial plexus consists of thin and very thin fibers running parallel to each other laterodorsally and orally.

The stratification of the cortex is hardly visible. Layer I measures 250 μ. The remaining layers contain small pale cells, among which one is scarcely able to distinguish layer II with its somewhat more tightly packed cells and layer V, where there are a few somewhat larger and more loosely distributed cells. Layer VI is very wide.

The *area orbitalis III* (ORB III) is situated in the vicinity of the claustrum in the wall of the pseudopresylvian fissure (FPPS) or anterior rhinal fissure (FRhA). It is an intensely myelinated small area.

The radial fibers, thin and very thin with an addition of medium-sized ones, are loose or show only a slight tendency to form fascicles. Most of them reach halfway through the cortex, some as far as three-quarters of the way. Proximally they disappear in the extreme capsule or claustrum, and only some of them pierce through to the internal capsule.

In the lower layers the numerous tangential fibers are a component of the extreme capsule. These are mostly medium-sized fibers of a mediooral course. Some diagonal fibers run to the extreme capsule also from the upper layers. Weak associating bundles extend towards the area paraorbitalis dorsalis (PORD).

The fine and weak superficial plexus consists of thin fibers, which run parallel to each other in a mediodorsal direction.

In Nissl sections layer I is 310 μ thick. Layers II–IV are made up of small cells, which are arranged somewhat more densely in layer II. Layer V is made distinguishable by an admixture of slightly larger cells similar to the pyramidal ones. Layer VI is wide and reaches to the claustrum.

The *area paraorbitalis dorsalis* (PORD) occupies the dorsal part of the gyrus orbitalis.

The radial fibers, thin and medium-sized, show a weak tendency to gather together in fascicles and go through three-quarters of the thickness of the cortex. Proximally they turn to the front in the superficial layer of the white matter and pass by the claustrum.

The tangential fibers are abundant, thin and medium-sized, and run on a slant from the deep and middle layers to the extreme capsule. The thin fibers, besides, connect the middle layers with the area orbitalis III (ORB III) and area EV.

The superficial plexus is poorly developed and built up of very thin fibers varying in course.

The cortex of this area is made up of small cells, among which it is hard to distinguish any layers except for layer I, 320 μ thick.

Prorean cortex

The prorean cortex occupies only one gyrus, i.e. the gyrus proreus.

Gyrus proreus

This gyrus is stretched on the medial margin of the hemisphere from the cruciate fissure orally far on to the ventral surface of the hemisphere ventrally. The gyrus has no morphological delimitation on the medial side, and laterally it is bounded by the pseudopresylvian fissure (FPPS) and anterior rhinal fissure (FRhA). On the surface of the gyrus proreus (sometimes divided into gyrus proreus and gyrus subproreus) I have distinguished five areas.

The *area prorea* (PR) lies on the gyrus proreus and approaches the cruciate fissure, from which it is separated by a fragment of area XC. Ventrally it borders on the terminal portion of the pseudopresylvian fissure and on the area polaris (POL). It is moderately well myelinated.

The thin and very thin radial fibers are arranged in very thin fascicles and extend halfway through the cortex. Proximally they sink deep into the white matter and turn backwards.

The tangential fibers are very numerous, thin and very thin, and form a loose bundle, which runs dorsocaudally to the area precruciata centralis (XC) and downwards to the area polaris (POL).

The superficial plexus is composed of very thin fibers running in all directions and sends off single pseudoradial fibers.

In Nissl sections layer I is about 280 μ thick. The remaining layers are built up of small diversiform cells, some of which resemble pyramids. Well-stained larger cells, which are somewhat more loosely arranged, occur in wide layer V. Layer VI again contains small cells.

The well-myelinated *area polaris* (POL) spreads on the oral pole of the hemisphere. Dorsally it passes into the area prorea (PR) and ventrally into the area subprorea (SPR). On the lateral side it is limited by the anterior tip of the pseudopresylvian fissure.

The radial fibers, medium-sized, thick and thin, run in loose indistinct fascicles approximately halfway through the cortex. Proximally they can be traced far backwards and upwards in the white matter.

The fairly numerous tangential fibers, thin and medium-sized, run in a dorsoventral direction to the prorean (PR) and subprorean (SPR) areas.

The very scanty superficial plexus consists of very thin fibers and a small number of thin ones.

In Nissl sections layer I measures 220 μ. Layers II–IV are made up of small cells and layer V contains larger cells, which are more loosely arranged and similar to the pyramidal ones. Layer VI is wide and comprises loosely distributed small cells.

The *area subprorea* (SPR) is situated on the margin of the ventral portion of the gyrus proreus (=gyrus subproreus) and stretches up to the place where the hemisphere meets the olfactory peduncle. The area is moderately well myelinated; nevertheless, it has distinct projection fibers.

The radial fibers, which are thin and very thin, run loosely or in indistinct fascicles at the farthest halfway point through the cortex. Having entered the white matter, they arrange themselves into fascicles and proximally can be traced far dorsocaudally.

The tangential fibers, which are moderately numerous and accumulated in the lower half of the cortex, form connections with the adjoining areas. Within this area they arch more or less parallel to the surface of the gyrus.

There are also some medium-sized fibers which are dark in coloration and have a parasagittal course.

The superficial plexus, moved away from the surface and poorly developed, consists of thin fibers which go in all directions. There are somewhat thicker fibers among them and these run across the gyrus, sometimes for a long distance.

In Nissl sections layer I is about 220 μ thick. Layers II–IV are composed of small cells with a large nucleus, which are somewhat more tightly packed in layer II. The cells of layer V are somewhat larger, elongate and darker. In layer VI the cells are small and dark, and can be seen also deep in the white matter.

The *area sulci olfactorii* (SOl) is a cryptofissural region situated on the lateral slope of the ventral portion of the gyrus proreus (=gyrus subproreus).

The radial fibers, few in number and very thin, run singly and disappear among the tangential fibers in the lower layer of the cortex.

The tangential fibers are fairly abundant and connect the area sulci olfactorii (SOI) with the area subprorea (SPR) and area paraorbitalis ventralis (PORV).

The superficial plexus is sparse and consists of very thin fibers, which run in all directions.

In Nissl sections layer I is 300 μ thick, and the remaining layers are about 750 μ altogether. They are composed of small cells, which are somewhat better stained in layer V.

The moderately well-myelinated *area paraorbitalis ventralis* (PORV) lies on an inconspicuous anonymous gyrus protruding from the medial wall of the pseudopresylvian fissure. This position, seemingly different from that in the dog, is natural in view of the fact that this fissure, large in the cat, is only a vestigial groove in the dog.

The radial fibers, thin and very thin, extend in fascicles for three-fifths of the way through the cortex (the very thin fibers even somewhat higher). Proximally they are lost in the superficial layer of the white matter.

The tangential fibers, which are thin and very thin, aggregate in the lower half of the cortex. They form a large bundle, which goes to the area fissurae pseudopresylviae, and a smaller one tending to the area subprorea (SPR). Tangential fibers of a medium caliber also run along the gyrus.

The well-developed superficial plexus consists of thin and very thin fibers, which run in all directions. Some of them form pseudoradii. There are also fibers which have a parasagittal course.

In Nissl sections layer I is 370 μ thick. Layers II–IV are built up of small polygonal cells, which in layer II are somewhat better stained and more closely packed. Layer V is marked by the presence of slightly larger and better-stained cells. The cells of layer VI are again small and they encroach also upon the white matter.

Mediofrontal cortex

The mediofrontal cortex of the cat is stretched oral to the cingular cortex on the medial aspect of the hemisphere. This is a region devoid of deep fissures and protuberant gyri; there are only some cryptofissures or transitional fields at the boundary of its particular areas, their occurrence being, in additions, unsteady. This region is limited dorsally by the cruciatosplenial fissure, orally and ventrally by the margin of the hemisphere and caudally by the boundaries of areas G, GV and SG. Seven architectonic areas have been distinguished in it.

The poorly myelinated *area pregenualis II* (PG II) is fairly large. It is situated more or less in the middle of the medial surface of the hemisphere, and at the boundary of this area in some specimens there occurs a cryptosulcus homologous with the pregenual fissure of the dog.

The radial fibers are thin, with a small addition of medium-sized ones. Proximally the medium-sized fibers turn backwards to form small bundles. The thin fibers disappear on the surface of the white matter. They extend, respectively, for about a third of the way through the cortex.

The very thin tangential fibers of the "grundfasern" type run in all directions, including diagonally. They are rather accumulated in the deeper layers of the cortex.

The superficial plexus is not very dense and consists of thin fibers which go in various directions. The plexus does not reach the surface of the tissue.

In Nissl sections layer I is 300 μ thick and contains single small cells. Layers II–IV are composed of small cells, which are somewhat more tightly packed in layer II. In layer V the cells are only slightly larger and better stained. Layer VI contains small cells, which are also strewn in the white matter.

In the cryptosulcus which accompanies area PG II on its dorsal side (only in one specimen) layer I measures 450 μ and all the other layers together measure 650 μ. Layers II–IV are composed of small cells. In layer V the cells vary in shape and are somewhat better stained (many of them are triangular) and layer VI is thin and made up of very small cells.

The poorly myelinated *area pregenualis I* (PG I) is orodorsal to the area pregenualis II (PG II).

The radial fibers, which are medium-sized with a small number of thin ones, run singly or in loose fascicles about halfway through the cortex; the medium-sized fibers reach somewhat higher. Proximally they turn caudodorsally and run in the superficial layer of the white matter.

The tangential fibers are thin and run in all directions. They are more abundant in the deeper layers.

The superficial plexus is as in area PG II.

In Nissl sections layer I acquires a thickness of 370 μ. Layers II–IV are built up of small pale cells, only slightly denser in layer II. In layer V the cells are somewhat larger, pale and triangular, and in layer VI small, pale and diffusely arranged.

The strongly myelinated *area precruciata centralis* (XC) lies on the margin and medial surface of the hemisphere, close in front of the cruciate fissure.

The radial fibers, which are medium-sized, thin and well-stained, gather together in small fascicles and stretch halfway through the cortex. On entering the white matter they turn to the rear at a sharp angle and form a bundle separate form those coming from areas XPM and XPL.

The tangential fibers are not numerous; they are medium-sized or very thin, and go in all directions.

The superficial plexus is poorly developed.

In Nissl sections layer I measures about 180 μ. Thin layer II contains granules, and loosely distributed small triangular cells with a large amount of tigroid prevail in layers III and IV. The cells of layer V are larger with a great number of Nissl bodies. Layer VI is fairly wide and comprises small cells.

The moderately well-myelinated large *area precruciata medialis* (XM) is situated dorsocaudally to the pregenual areas II and I (PG II and PG I) on the medial aspect of the hemisphere.

Its radial fibers, thin and very thin, run singly farther than halfway through the cortex. In the white matter they turn caudally at a sharp angle.

The tangential fibers, thin and very thin, are mostly accumulated in the lower layers. The extensions of these fibers go to the ventrally and dorsally situated areas, i.e., to areas PG II and XPM.

The superficial plexus is more abundant than it is in area XPM. It is composed of thin fibers running in various directions, but mostly orocaudally.

In Nissl sections layer I is 300 μ thick and contains a small number of small cells. Layers II–IV are made up of small pale cells and layer V consists of perikarya which are larger and richer in tigroid. Layer VI has well-stained small cells.

The *area precruciata posterior medialis* (XPM) is a narrow region on the medial slope of the gyrus precruciatus. It is strongly myelinated like the neighbouring area, XPL.

The radial fibers are thin and very thin with an addition of medium-sized ones, which extend singly. The fibers run in fascicles, which entwine each other, as far as three-quarters of the way through the cortex. Proximally they penetrate deep into the album gyri and turn caudally by degrees.

The thin and very thin tangential fibers occur in all the layers of the cortex and form a very loose bundle which goes to the area precruciata medialis (XM) and area precruciata posterior lateralis (XPL).

The superficial plexus consists of a rather small number of thin fibers, which run in all directions in the deeper layers, chiefly in a frontal plane.

In Nissl sections layer I is 300 μ thick. Layers II–IV contain small ce'ls with a large amout of tigroid; the cells are somewhat more tightly distributed in layer II. Layer V comprises larger cells rich in Nissl bodies and small cells. In layer VI which is fairly wide, the cells are small, round or triangular. Many of them are scattered through the white matter.

The *area precruciata posterior lateralis* (XPL), which lies on the lateral slope of the gyrus precruciatus, is strongly myelinated and resembles area XPM.

Very thin radial fibers run three-quarters of the way through the cortex and thin, medium-sized and, occasionally, thick fibers run halfway through it. They run in fascicles grouped round a thick or medium-sized fiber. In the middle layer of the cortex there occur thin pararadial fibers (? fibers of interlaminar association), which accompany the radial fibers for a part of their course. Proximally the radial fibers enter fairly deep into the white matter and gradually turn caudally.

The tangential fibers are thin and very thin with an admixture of thick and medium-sized ones. They form a large loose bundle, which extends in the superficial layers towards the area precruciata lateralis (XL). Another, weaker, bundle runs in the lower half of the cortex. In addition, there are many tangential fibers with a parasagittal course.

The superficial plexus is sparse and composed of very thin fibers varying in course.

In Nissl sections layer I is hardly 200 μ thick and contains single cells. In layers II–IV the cells are small. Nearer the surface they are mostly round, and in deeper layers rather triangular. Among them in layer III there are single cells which are somewhat larger and richer in tigroid. The cells of layer V are medium-sized and large, rich in Nissl bodies and varying in shape, more numerous and more closely arranged than in area XPM. Layer VI is wide and made up of small cells, which are scattered in large numbers in the white matter.

The moderately well-myelinated paragyral *area precruciata lateralis* (XL) is hidden deep in the cruciate fissure, where it occupies a fairly large portion of its ventral wall.

The radial fibers are thin, very thin and medium-sized and have an undulate course. They are grouped in indistinct fascicles and go through two-thirds of the thickness of the cortex. Proximally they turn caudally and run right at the edge of the white matter.

The tangential fibers, which are very thin with only a few medium sized ones, are distributed uniformly in all the layers pierced through by the radial fibers. They run in all directions, producing connections with the neighbouring areas.

The superficial plexus is moderately well developed, composed of fibers which go in all directions.

In Nissl sections layer I is about 220 μ thick. Layer II is clear-cut, composed of tightly packed granules. Layer III is made up of small cells, mostly round, with an admixture of somewhat larger round cells abounding in Nissl bodies. Layer V is distinct for its large and medium-sized cells with a large amount of tigroid. Layer VI is not very wide and contains closely distributed small cells. The same cells can be seen in the white matter.

Cingular cortex

In the cingular cortex I have included the cortical area surrounding the callosal commissure. In this region one can distinguish the gyrus cinguli, dorsally delimited by the cruciatosplenial and splenial fissures, and the homologue of the gyrus genualis, which in the cat is not demarcated by a separate fissure. The cingular bundle runs through the white matter of nearly the whole region.

"Gyrus genualis"

This field, which here is considered to be the homologue of the gyrus genualis of other animals, covers a fragment of the cortex oral and ventral to the genu corporis callosi in the cat. Five architectonic areas have been distinguished in it, besides the fragment occupied by the hippocampus precommissuralis.

The heavily myelinated small *area genualis* (G) is situated in the dorsal part of the "gyrus genualis" at the boundary with the cruciatosplenial fissure.

The radial fibers, thin and very thin, extend in compact fascicles for three-quarters of the way through the cortex. Proximally they run in fascicles deep into the white matter, probably to the cingulum.

The tangential fibers are fairly numerous, thin and very thin, and they run in all directions. However, strong connections with the area precruciata lateralis (XL) and far weaker ones with the area genualis ventralis (GV) are distinguishable.

The superficial plexus is composed of very thin fibers, which aggregate in a narrow layer close to the surface of the tissue. They run in all directions. Single thin fibers occur under the plexus.

In Nissl sections layer I is about 320 μ thick. Layer II is built up of small diversiform cells and passes without a clear-cut boundary into layer III+IV, where similar cells are distributed more diffusely. Layer V is inconspicuous and composed of somewhat better stained cells. The fairly thick layer VI harbours small cells with a large nucleus. Many such cells can also be seen deep in the white matter.

The well-myelinated *area genualis ventralis* (GV) lies ventral to area G and oral to the genu corporis callosi.

Its very thin radial fibers leave the cingular bundle singly or in loose indistinct fascicles. Most of them do not go higher than a quarter of the way through the cortex and some reach as far as three-quarters of it.

The tangential fibers are very thin and, for the most part, aggregated in the deep layers. Most of them run parallel to the cingulum.

The superficial plexus consists of very thin and single medium-sized fibers. These last fibers run somewhat deeper, within the second cytoarchitectonic layer.

In Nissl sections layer I measures 320 μ. Layer II, made up of small cells, passes imperceptibly into layer III+IV+V, composed of somewhat larger polygonal cells. Layer VI contains very small cells, which are tightly packed, sometimes arranged in columns parallel to the course of the cingular fibers. Fairly many of these cells occur inside the white matter.

In the cat the *area subgenualis* (SG) is a fairly large, poorly-myelinated region ventral to the area genualis ventralis (GV) on the medial aspect of the hemisphere.

The radial fibers, thin and curled, extend singly or in loose fascicles up to a third of the thickness of the cortex. Proximally most of them swing orally and, only occasionally, caudally. They cross the cingular fibers in the superficial layers.

The tangential fibers, few in number and very thin, run in all directions inclusive of diagonal ones and are connected with the adjacent areas.

The superficial plexus is not very dense and consists of thin fibers going in all directions. Thin ventrodorsal fibers can be seen against this background.

In Nissl sections layer I is 300 μ thick. Layer II is composed of small diversiform cells and layers III–V are somewhat looser in structure and contain cells which stain well and somewhat resemble the pyramids. In layer VI the cells are pale, round or polygonal, and have a large nucleus.

The poorly myelinated *area subcallosa I* (SC I) is situated ventrally to the genu corporis callosi on the medial wall of the hemisphere. It borders dorsally on the hippocampus precommissuralis and ventrally on the area subcallosa II.

The radial fibers, thin and very thin, run singly for a third of the way through the cortex. Proximally they swing in various directions just at the edge of the white matter.

The tangential fibers are thin and not numerous and they accumulate in the deep layers of the cortex.

The superficial plexus, sparse and composed of very thin fibers with an admixture of medium-sized ones, associates with some fibers at the edge of the hippocampus precommissuralis.

In Nissl sections layer I is 320 μ thick. The other layers, being indistinguishable, form a whole made up of small cells.

The *area subcallosa II* (SC II) lies ventral to the previous area.

Its radial fibers are very thin and show a weak tendency to form fascicles. They extend halfway through the cortex and proximally turn orodorsally.

Very thin tangential fibers of the "grundfasern" type are visible all through the cortex.

The superficial plexus is moderately dense and composed of fibers of various calibers, running mostly in a frontal plane.

In Nissl sections layer I is 250 μ thick. The other layers consist of small cells. Differences in the density of these cells allow the distinction of layers II, III+IV and V+VI.

Gyrus cinguli

The gyrus cinguli stretches dorsal to the callosal commissure, between the callosomarginal fissure and the splenial fissure or the posterior portion of the cruciatosplenial fissure. Seven architectonic areas can be distinguished on its surface.

The *area fissurae calloso-marginalis* (FCM) is a narrow strip of cortex, adjacent to the corpus callosum. Its myeloarchitectonics is very much reduced.

The radial fibers occur singly and in a very small number.

The tangential fibers are very thin and sparse.

The superficial plexus is composed of very thin fibers parallel to the cingular bundle. These fibers gather together in the stria longitudinalis lateralis.

The cytoarchitectonics is greatly reduced. Layer I is distinct, the other layers are built up of small cells with large nuclei. However, these cells do not differ enough to justify a division into layers. On the surface of the corpus callosum the well-stained cells of the induseum griseum neighbour on the area fissurae calloso-marginalis.

The *area limbica anterior ventralis* (LAV) occupies the ventral edge of the oral portion of the gyrus cinguli. It is a relatively narrow strip of poorly myelinated cortex, closely related to the cingular bundle.

The radial fibers, which are thin or very thin and not very numerous, run singly or grouped in very loose fascicles for two-thirds of the way through the cortex. Proximally they arch in a ventromedial direction and disappear among the fibers of the medial cingular bundle.

The tangential fibers are very thin and not numerous, and they run mostly in an orocaudal direction. There are connections with the area limbica anterior dorsalis (LAD).

The weak superficial plexus consists of very thin fibers which run in all directions, with those arranged in a frontal plane being prevalent.

In Nissl sections layer I is 180 μ thick and the remaining layers are distinct. Layer II contains poorly stained small granules, which are numerous and diversiform. Layer III+IV is built up of similar cells but more loosely arranged. In layer V the cells are somewhat larger, rich in tigroid and loosely arranged. The cells of layer VI are small and closely packed. Single cells may be seen deep in the white matter.

The poorly myelinated wide *area limbica anterior dorsalis* (LAD) is situated on the dorsal margin of the anterior portion of the gyrus cinguli.

The radial fibers are single and thin. In the superficial layers they are very thin, and go through two-thirds of the thickness of the cortex. Proximally they enter deep among the fibers of the cingular bundle, reaching as far as its main and lateral fascicles.

The tangential fibers are very thin, not numerous, and have mostly a parasagittal course. There are connections with the area fissurae cruciatae posterioris.

The superficial plexus is rather thin and made up of very thin fibers, varying in course.

The cytoarchitectonics resembles that in the area limbica anterior ventralis (LAV) with the exception that in layer V there occur large pyriform well-stained cells mingled with small ones.

The *area limbica anterior dorsalis accessoria* (LADAc) occupies a narrow strip of cortex on the dorsal side of the cruciatosplenial fissure and, further to the front, passes into the area splenialis dorsalis (ND).

The radial fibers, which are thin and very thin, extend for about two-thirds of the way through the cortex. Proximally they run in the superficial layer of the white matter up to the bottom of the cruciatosplenial fissure, where they join a fascicle of the cingular bundle (this detail is decisive of their inclusion in the cingular cortex).

The very thin tangential fibers are of the "grundfasern" type and have a chaotic course.

The superficial plexus is thin and poorly developed. It consists of very thin fibers running in all directions.

In Nissl sections layer I is 220 μ thick. Layers II–III are built up of small cells, which resemble pyramids and are fairly densely distributed. Layer IV contains granules and layer V is composed of somewhat larger cells similar to pyramids. The cells of layer VI are small, round and scattered deep through the white matter.

The well-myelinated *area limbica posterior dorsalis* (LPD) is stretched in the form of a narrow stripe on the upper margin of the gyrus cinguli, along the caudal portion of the splenial fissure.

Its radial fibers vary in size. The thin fibers reach as far as three-quarters of the way through the cortex and the thick and medium-sized ones reach somewhat further than halfway through it. They are arranged in indistinct fascicles and, crossing the tangential fibers, form a kind of grille with them, which surrounds the cells. Proximally they sink deep into the white matter and reach the main fascicle of the cingulum (Kreiner 1962). Single fibers extend up to the callosal fibers.

The tangential fibers, very thin and grouped in bundles, come from the area limbica posterior ventralis (LPV) and in the area under description swing in a parasagittal direction. Other fibers tend towards the area limbica posterior lateralis (LPL).

The superficial plexus is dense and composed of very thin fibers running in all directions. It is about 100 μ across.

In Nissl section layer I, which contains fairly numerous single cells, measures about 200 μ. Layer II is distinct owing to the increased density of small cells, which are distributed more loosely in layers III and IV. In layer V the cells are larger, elongate, and have a higher tigroid content. Layer VI is made up of small pale cells arranged in columns. There are many such cells in the white matter.

The *area limbica posterior ventralis* (LPV) covers the ventral half of the caudal portion of the gyrus cinguli. It is a fairly well myelinated area, associated with the medial portion of the cingulum.

The radial fibers are mostly very thin and extend for five-sevenths of the way through the cortex. They form rather indistinct fascicles and proximally enter the medial portion of the cingulum to disappear in it.

The tangential fibers, densely arranged and very thin, form bundles, which cross the radial fibers. Dorsally they run to the area limbica posterior dorsalis and, occasionally, to the area fissurae calloso-marginalis (FCM).

The superficial plexus is dense and composed of thin and very thin fibers.

In Nissl sections layer I is 180 μ thick and contains single cells. Layers II–IV are built up of small cells, which are often triangular or resemble pyramids. They are packed tightly in layers II and IV and more loosely in layer III. The cells of layer IV are, in addition, somewhat larger. In layer V the cells are larger and similar to pyramids. They contain a large amount of tigroid, are arranged fairly loosely and mixed up with smaller cells with a low tigroid content. These cells are separated from layer IV by a zone of diffusely distributed cells. In this area the cells of layer V are never stained as intensely as those in the area limbica posterior dorsalis (LPD). Layer VI consists of closely packed small cells.

The *area limbica posterior lateralis* (LPL) lies in the ventral wall of the splenial fissure, along the area limbica posterior dorsalis. It is a moderately well-myelinated paragyral area.

The radial fibers, which are curled, very thin and, occasionally, medium-sized, run singly or in very loose fascicles. Proximally they turn backwards and probably join the cingular bundle. Many of them bend and give rise to tangential fibers, which tend to the area fissurae calloso-marginalis (FCM). Some radial fibers join the plexus.

The tangential fibers, not very numerous and very thin, connect the area limbica posterior lateralis with the area limbica posterior dorsalis (LPD).

The superficial plexus is scanty and composed of very thin fibers.

ERRATUM

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Page 193, three bottom lines:

instead of	FEP	*should be*	FCrP
	FCrP		FEA
	FEA		FEP

In Nissl sections layer I is 240 μ thick and contains fairly numerous cells. Layers II–IV are made up of small roundish cells with a small amount of tigroid. Layer II is clearly seen for its greater density. In layer V the cells are somewhat larger and better stained but not pyramidal. Layer VI consists of poorly stained small cells. There are many cells in the white matter.

SUMMARY

This paper is a monograph of the architectonics of the cat neocortex. The author starts it with the presentation of a fissural and gyral pattern and then, basing himself on series of Weigert and Nissl sections and also on series of Klüver sections and those impregnated with silver, divides the surface of the neocortex into areas, which he characterizes myelo- and cytoarchitectonically. He describes not only the areas situated on the tops of the gyri but also those hidden in the depth of the fissures. The work is expected to be useful to the workers who plan experimental studies or evaluate their results.

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Abbreviations

BA	Area entolateralis anterior (Fig. 3 IV–V)
BP	Area entolateralis posterior (Fig. 3 VI–XVIII)
CE I	Area composita ectosylvia I (Fig. 3 V–VII)
CE II	Area composita ectosylvia II (Fig. 3 IV–VII)
CPL I	Area composita posterior lateralis I (Fig. 3 XI–XIII)
CPL II	Area composita posterior lateralis II (Fig. 3 XIV–XVI)
CPM I	Area composita posterior medialis I (Fig. 3 X–XIV)
CPM II	Area composita posterior medialis II (Fig. 3 XV–XVI)
EA	Area ectosylvia anterior (Fig. 3 VII–IX)
ED	Area ectosylvia anterior dorsalis (Fig. 3 IX–XII)
EAD	Area ectosylvia dorsalis (Fig. 3 VIII)
EM I	Area ectosylvia anterior dorsali (Fig. 3 VIII–XII)
EM II	Area ectosylvia media II (Fig. 3 VIII–XII)
EP I	Area ectosylvia posterior I (Fig. 3 XII–XV)
EP II	Area ectosylvia posterior II (Fig. 3 XI–XIV)
EPD	Area ectosylvia posterior dorsalis (Fig. 3 XII–XIII)
EV	Area ectosylvia ventralis (Fig. 3 VII–IX)
FA	Area fissurae ansatae (Fig. 3 II–V)
FB	Area fissurae entolateralis (Fig. 3 VI–VIII)
FCM	Area fissurae celloso-marginalis (Fig. 3 VII–XIII)
FCr	Area fissurae cruciatae (Fig. 3 II–VI)
FEP	Area fissurae cruciatae posterioris (Fig. 3 VII–VIII)
FCrP	Area fissurae ectosylviae anterioris (Fig. 3 VIII–IX)
FEA	Area fissurae ectosylviae posterioris (Fig. 3 XII–XIV)

FK	Area fissurae coronalis (Fig. 3 IV)
FL	Area fissurae lateralis (Fig. 3 VI–XVII)
FO	Area fissurae suprasplenialis (Fig. 3 VIII–XVII)
FOP	Area fissurae splenialis posterior (Fig. 3 XV–XVII)
FPPS	Area fissurae pseudopresylviae (Fig. 3 I–VI)
FRe	Area fissurae pararecurrentis (Fig. 3 XV–XVII)
FRhA	Area fissurae rhinalis anterioris (Fig. 3 VI–XI)
FRhP	Area fissurae rhinalis posterioris (Fig. 3 XII–XVII)
FS I	Area fissurae sylviae I (Fig. 3 XI)
FS II	Area fissurae sylviae II (Fig. 3 XI)
FSS	Area fissurae suprasylviae (Fig. 3 VI–XVI)
G	Area genualis (Fig. 3 V–VI)
GV	Area genualis ventralis (Fig. 3 V–VI)
K	Area coronalis (Fig. 3 IV–VI)
KM	Area coronalis minor (Fig. 3 V)
LAD	Area limbica anterior dorsalis (Fig. 3 VII–VIII)
LADAc	Area limbica anterior accessoria (Fig. 3 VII–VIII)
LAV	Area limbica anterior ventralis (Fig. 3 VII–VIII)
LPD	Area limbica posterior dorsalis (Fig. 3 IX–XV)
LPL	Area limbica posterior lateralis (Fig. 3 IX–XIV)
LPV	Area limbica posterior ventralis (Fig. 3 IX–XV)
MA I	Area marginalis anterior I (Fig. 3 IV–VI)
MA II	Area marginalis anterior II (Fig. 3 V–VII)
MA III	Area marginalis anterior III (Fig. 3 IV)
MP	Area marginalis posterior (Fig. 3 VII–XVIII)
Mt I	Area motoria I (Fig. 3 I–II)
Mt II	Area motoria II (Fig. 3 I–IV)
ND	Area presplenialis dorsalis (Fig. 3 IV–VI)
NV	Area presplenialis ventralis (Fig. 3 V)
O	Area splenialis (Fig. 3 VII–XVIII)
OAc	Area splenialis accessoria (Fig. 3 VIII–XVI)
ORB I'	Area orbitalis I' (Fig. 3 II–IV)
ORB I"	Area orbitalis I" (Fig. 3 II–V)
ORB II	Area orbitalis II (Fig. 3 V–VI)
ORB III	Area orbitalis III (Fig. 3 VI–VII)
OV	Area splenialis ventralis (Fig. 3 IX–XVII)
PG I	Area pregenualis I (Fig. 3 II–III)
PG II	Area pregenualis II (Fig. 3 III–IV)
PMt	Area paramotoria (Fig. 3 II)
POL	Area polaris (Fig. 3 I–II)
PORD	Area paraorbitalis dorsalis (Fig. 3 VII–VIII)
PORV	Area paraorbitalis ventralis (Fig. 3 II–VI)
PoC I	Area postcentralis I (Fig. 3 II–IV)
PoC II	Area postcentralis II (Fig. 3 II–V)
PoC III	Area postcentralis III (Fig. 3 II)
PR	Area prorea (Fig. 3 I)
PrC	Area precentralis (Fig. 3 II)
PrCJ	Area precentralis interna (Fig. 3 II–IV)
QP	Area ectolateralis posterior (Fig. 3 VI–XIV)
RD	Area retrosplenialis dorsalis (Fig. 3 XVII)

RV	Area retrosplenialis ventralis (Fig. 3 XVII)
S	Area sylvia (Fig. 3 X–XIII)
SA	Area sylvia anterior (Fig. 3 X–XI)
SC I	Area subcallosa I (Fig. 3 VII)
SC II	Area subcallosa II (Fig. 3 VII)
SG	Area subgenualis (Fig. 3 V–VI)
SJ	Area sylvia insularis (Fig. 3 VIII–X)
SJM	Area sylvia insularis interna (Fig. 3 VIII–X)
SOl	Area sulci olfactorii Fig. 3 IV–V)
SORB	Area sulci orbitalis (Fig. 3 VI)
SP	Area sylvia posterior (Fig. 3 XI–XII)
SPR	Area subprorea (Fig. 3 II–V)
Sp	Area fissurae splenialis (Fig. 3 VI–XIV)
SS	Area suprasylvia (Fig. 3 VI–XVII)
SSQ	Area suprasylvio-ectolateralis (Fig. 3 X–XV)
SSAc	Area suprasylvia accessoria (Fig. 3 XIII)
XC	Area precruciata centralis (Fig. 3 I–II)
XL	Area precruciata lateralis (Fig. 3 II)
XM	Area precruciata medialis (Fig. 3 III–IV)
XPL	Area precruciata posterior lateralis (Fig. 3 III–IV)
XPM	Area precruciata posterior medialis (Fig. 3 II–IV)
ZL	Area pararecurrens lateralis (Fig. 3 XVII)
ZM	Area pararecurrens medialis (Fig. 3 XVII)

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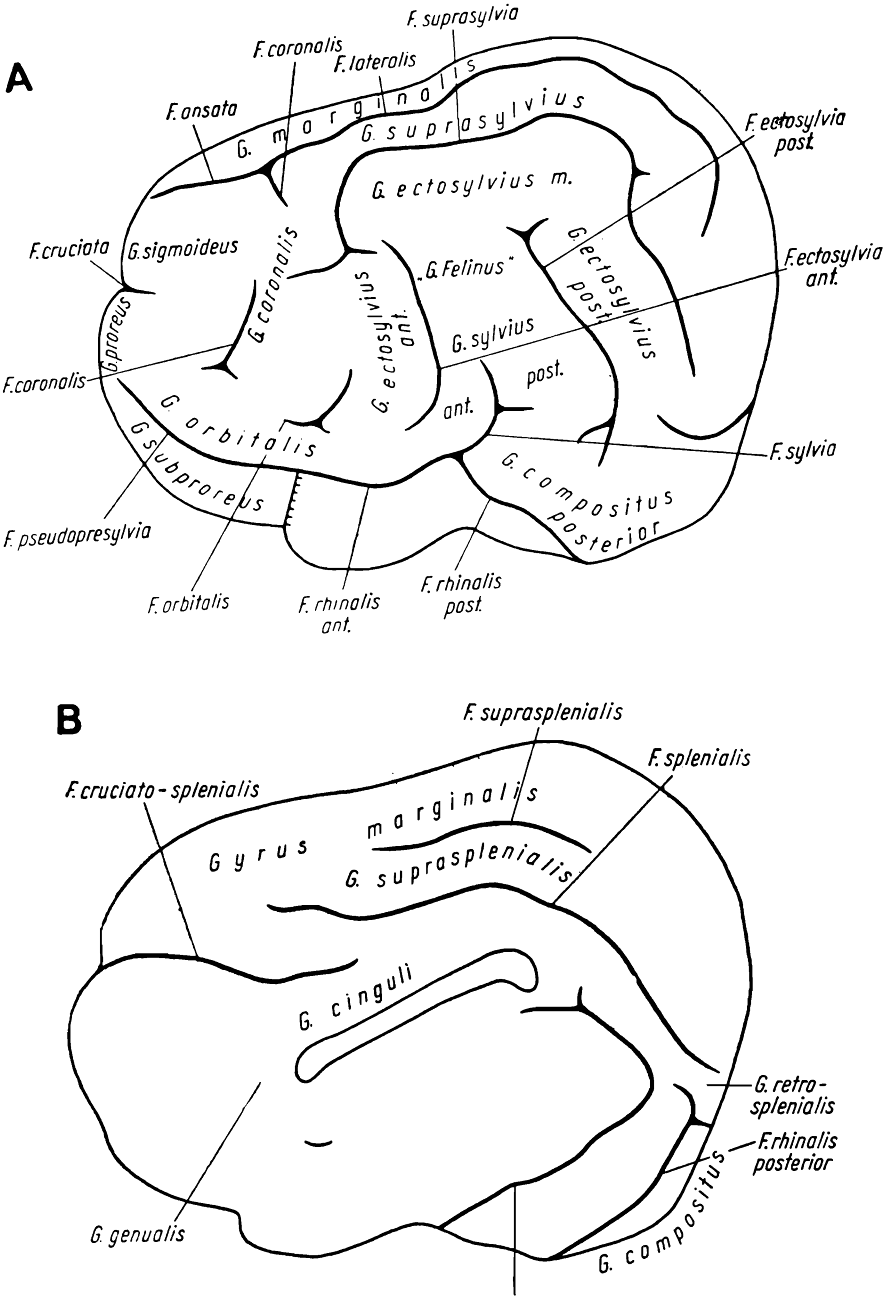


Fig. 1. Lateral and medial aspect of the cat's brain showing the arrangement of sulci and gyri.

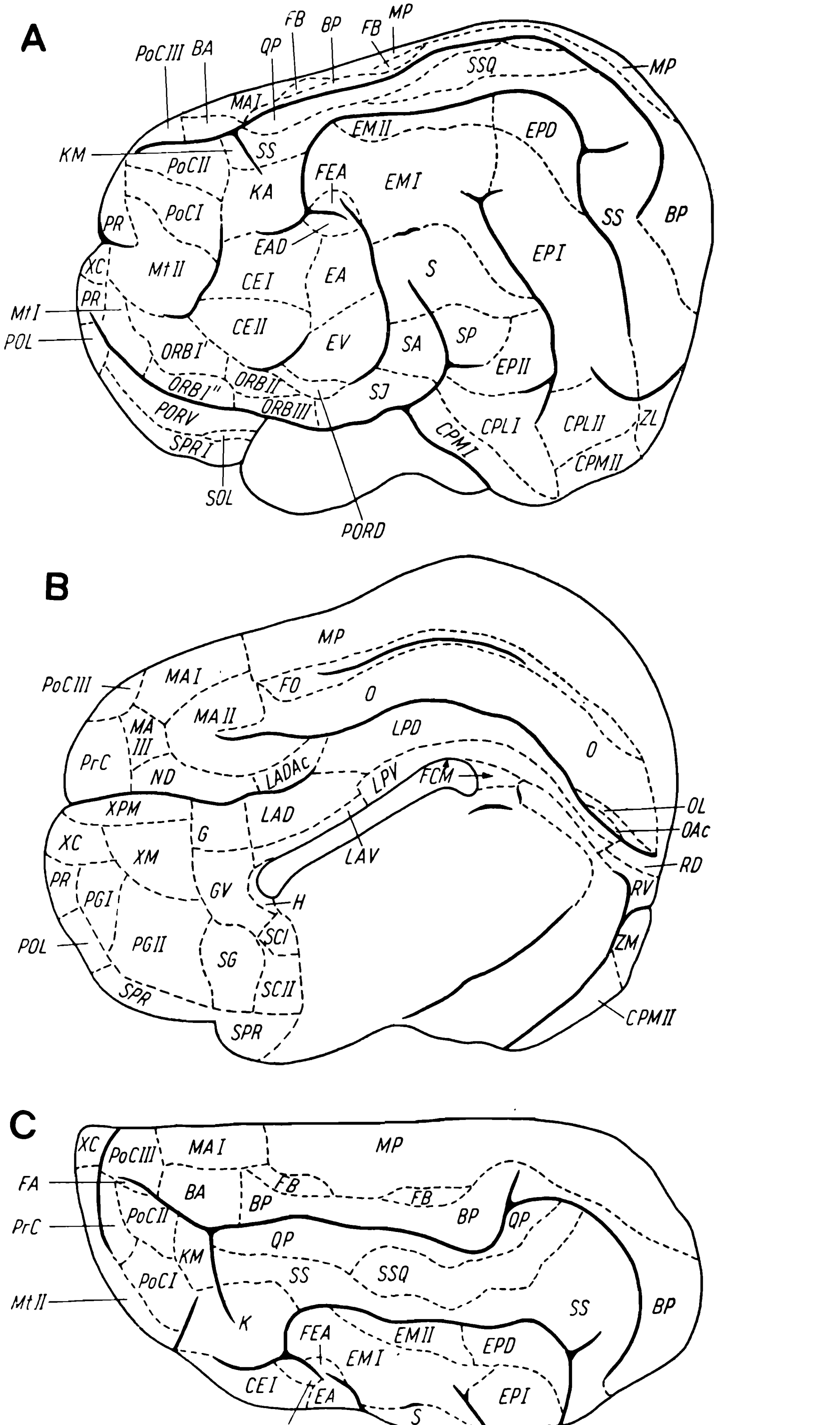
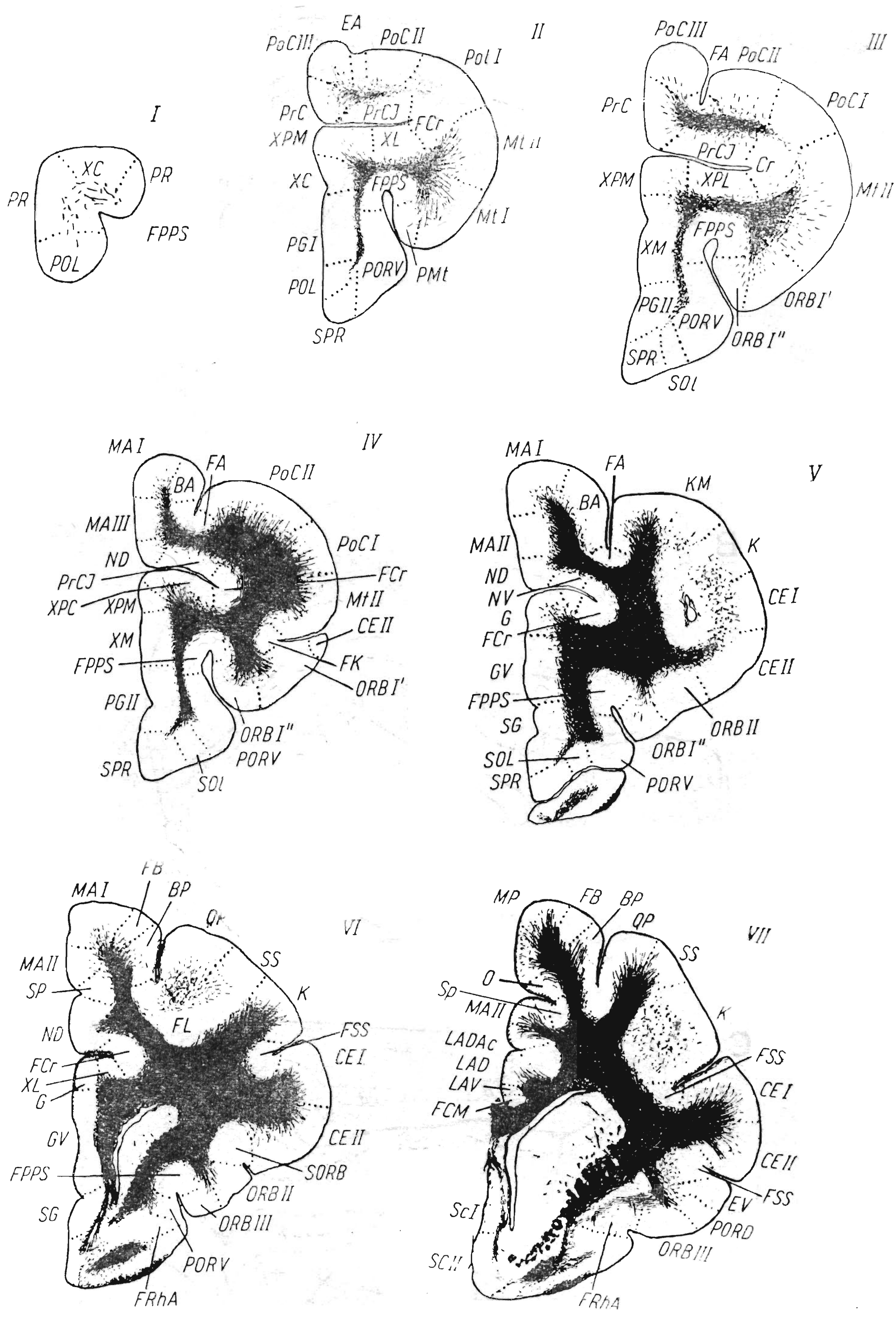


Fig. 2. Lateral, medial and dorsal aspect of the cat's brain showing the arrangement of architectonic areas.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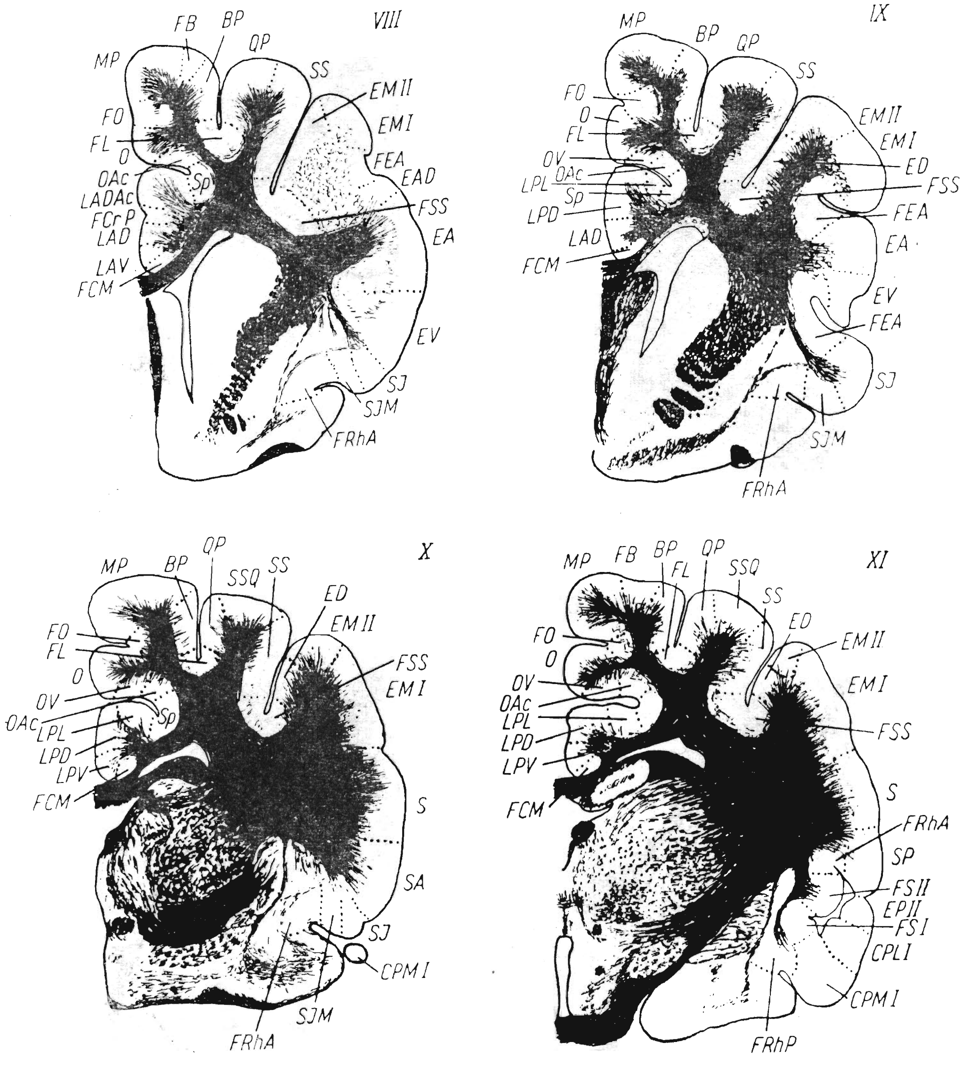
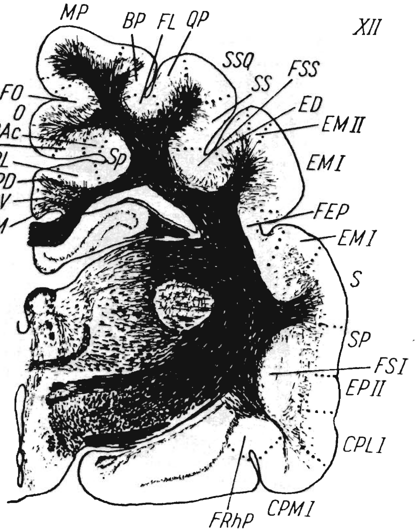


Fig. 3*a* (I–XI). A series of frontal sections of the brain of the cat. Symbols explained in text.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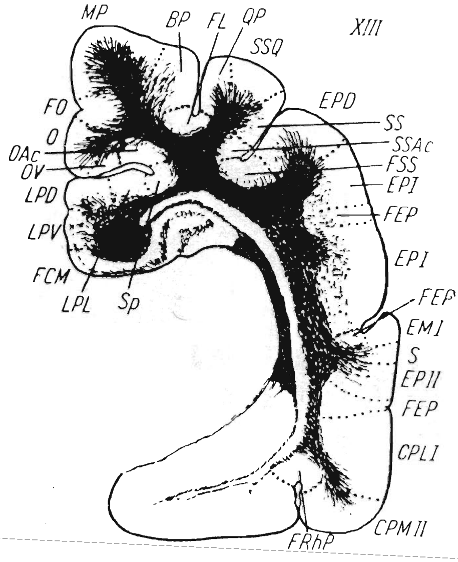
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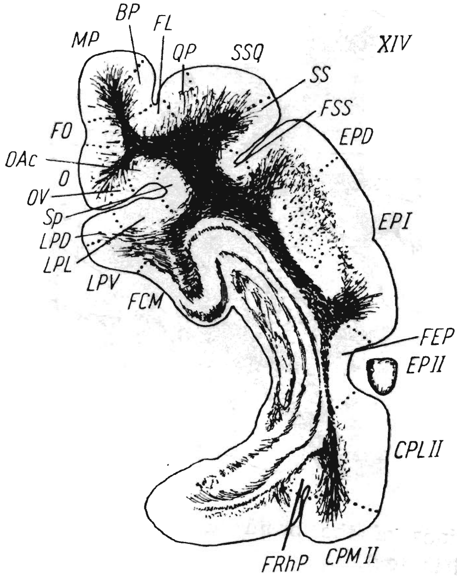
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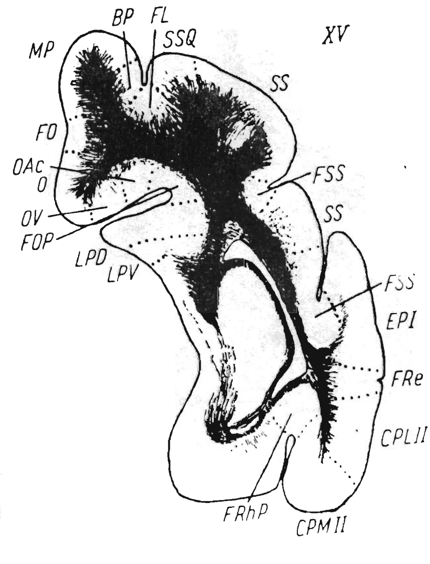
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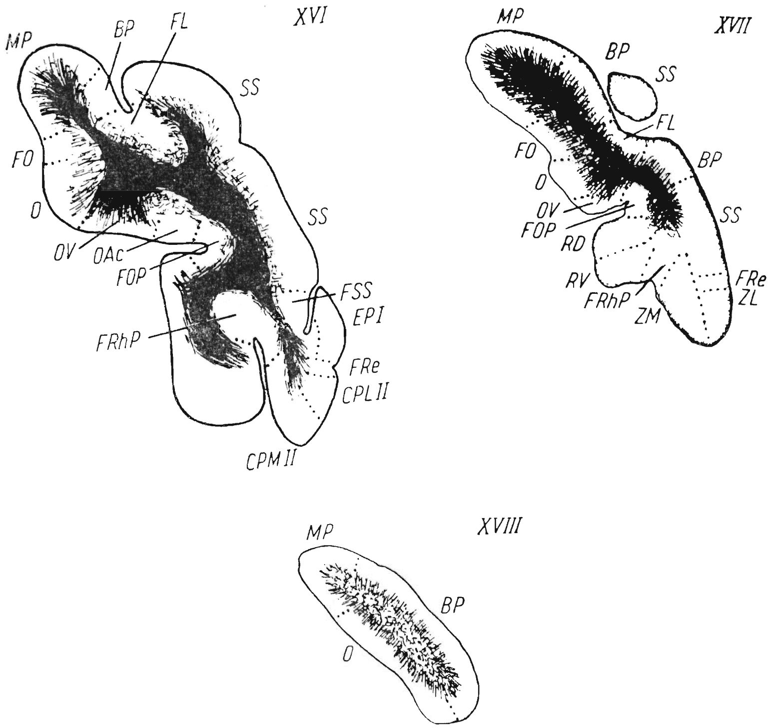

Fig. 3b (XII–XVIII). A series of frontal sections of the brain of the cat. Symbols explained in text.