

**Anatomy. — Preface to Volume II of the microscopical atlas of the human brain.** By C. WINKLER.

(Communicated at the meeting of September 28, 1929).

At Frankfurt am Main, during the meeting of the so-called Brain-commission (a commission for brain-research founded by the international Association of the Academies) a discussion took place in May 1912, after a proposition brought forward by Prof. W. WALDEYER of Berlin and by Prof. L. EDINGER of Frankfurt am Main.

They proposed to continue the admirable technical work, done, now more than 60 years ago by Dr. BERNARD STILLING, in drawing a macroscopical atlas of the human brain. They wanted the production of a new atlas, but now a microscopical one, made in an enlargement of forty times, because the better knowledge of the brain-tissue and the more evident details of the different fibre-systems and cell-groups contained in it, were asking for a renewal of STILLING's work.

Their proposition was warmly defended by Prof. C. VON MONAKOW of Zürich and by myself, but it did not seem so easy to prepare the publication of such an atlas. At first there must be made a standard-series of uninterrupted sections through the human brainstem. In order to have a very simple one, the brainstem of a normal child was chosen, not older than one year of age. This seemed to be a specimen of a brainstem with most simplified, not yet all medullated systems of fibres, less complicated than that of the adult man.

The commission accepted, that after fixation of such a brain in chromic salts, and embedding in celloidine, the sections should be made in a frontal direction, perpendicular to the longitudinal axis of the medulla oblongata, as was first proposed and done by MEYNERT. This series, in the so-called direction of MEYNERT, should be stained after the WEIGERT—PAL-method and with Carminas-Ammoniae.

I promised to make such a series. Dr. JOSSELIN DE JONG of Rotterdam, now Professor of pathological anatomy at the University of Utrecht, provided me with the brains of a normal child, aged one year, and dead of scarlatina.

The brain was taken out a few hours after death, hardened and embedded, and an uninterrupted series of sections was made in the direction as mentioned above. The series began at the second cervical segment and ended at the commissura cerebri anterior. It remained at the disposal of the Brain-commission and the medulla oblongata was sent to the Brain-institute

of Zürich, because Prof. VON MONAKOW had accepted the task to produce, in the laboratory of the Brain-institute of Zürich, six drawings of sections through the medulla oblongata.

In the laboratory of Amsterdam should be made the six following drawings through the entrance of the medulla oblongata in the pons of VAROLI and through the distal end of the latter, by Dr. ADA POTTER and by myself.

The first conception of the new atlas began in this way.

Moreover six other drawings were to be made of the middle of the pons, including the origin of the Nervus trigeminus, of its upper end and the caudal end of the mesencephalon. The six following drawings of sections were projected through the pedunculus cerebri and the hypothalamus, whereas the last six drawings were to be made from sections through the basal ganglia as far as the commissura cerebri anterior. The total project of the atlas, thus contained thirty drawings in MEYNERT's direction through the same brain of a normal child of one year, from sections magnified forty times, after staining by WEIGERT—PAL's method and with a cell-staining, controlled by the members of the Brain-institute and made by competent men. It was to become a standard-atlas for the use of medical men, interested in Neurology or Psychiatry.

Afterwards the atlas was to be completed by additionnal plates. Details of special parts of the nervous system, as f.i. the corpus geniculatum laterale, the nuclei thalami optici, the details of the fillet might be given therein, as well as drawings of sections in other directions through the brain.

Prof. VON MONAKOW found in Dr. FUSE, now Prof. of anatomy at the University of Sendai in Japan, not only an artist, but also an expert in the anatomy of the brain, a man able to draw the sections through the medulla oblongata. The first volume of the new atlas "the medulla oblongata" appeared in 1916.

The artistic plates drawn by Dr. FUSE were printed by the care of the ORELL-FÜSSLI-Institute of Zürich and were accompanied by an introduction by Prof. VON MONAKOW.

Dr. ADA POTTER and I began the drawing of the second volume of the atlas, the part of the nervous system where the frontal end of the medulla oblongata enters into the pons of VAROLI.

Now, however many difficulties arose.

The war was the cause of finantial obstacles, opposing themselves to the printing of the second volume, that had been drawn in Holland. They were so many that the publication of the second volume of the atlas was postponed from year to year. At the moment when the "Koninklijke Akademie van Wetenschappen" was able to give a solution to the finantial difficulties, in 1929, the second volume of the atlas was published.

But further difficulties arose from the fact that scientific men, drawing sections of the nervous system, differ so much from one another in their conception of the drawn specimen, that it was nearly impossible to

understand, how they could make such wholly different drawings of neighbouring slides from the same series.

The drawings of Dr. FUSE, of Dr. ADA POTTER and those made by myself, differed so much, that they could hardly be compared with each other. Therefore the first and the second volumes of the atlas cannot have the same standing. The two volumes represent quite different conceptions of the nervous system.

And, finally, a most annoying difficulty presented itself: it became clear, that it would not be possible to maintain an enlargement of forty times, adopted in the first volume, in drawings of the pons VAROLI, of the pedunculus cerebri and of the basal ganglia.

A diameter of 3 cm. in any direction of a section, would call for a drawing of 120 cm., a dimension much too large for the practical use of an atlas.

And yet, if a smaller scale were adopted, firstly the drawings from sections of the pons VAROLI, made on a smaller scale could no longer be compared with those made from sections of the medulla oblongata, and secondly it appeared that on a smaller scale, the details of many fibre-systems in the tegmentum pontis, were not quite so distinctly visible as they should have been.

If the Brain-commission had still existed, there would have been a new discussion in order to know whether it was desirable to have a total aspect in the drawings of sections through the pons, the pedunculus cerebri and the basal ganglia, with, if necessary, additional drawings on a much larger scale, or whether the total aspect of the sections should be given up, and different parts of given section be treated separately, e.g. between the ventral part of the pons and its tegmentum.

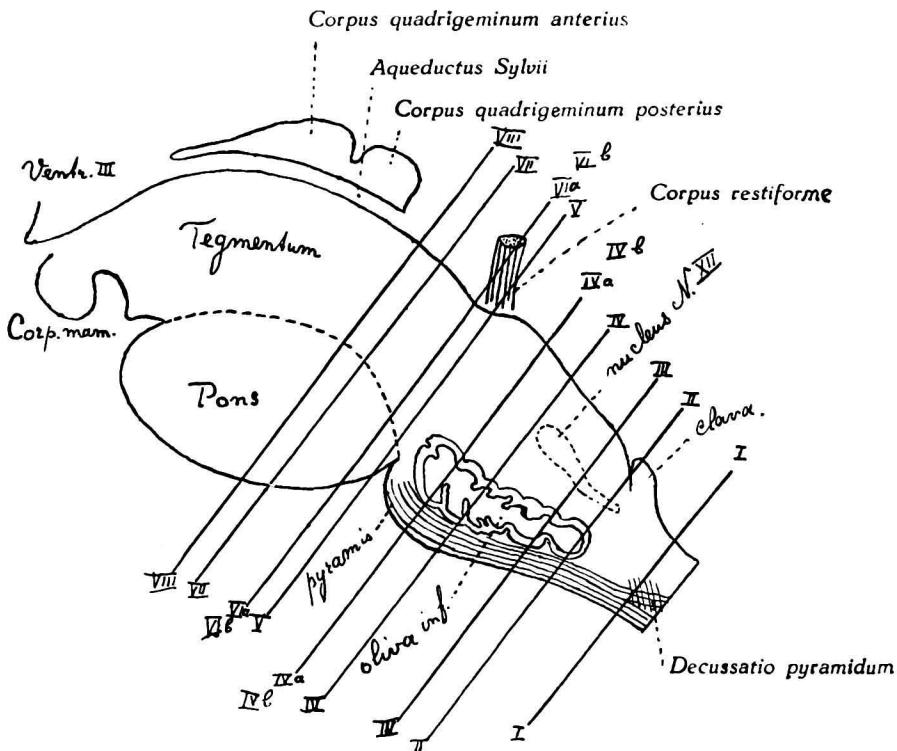
But now, since the "Koninklijke Akademie van Wetenschappen" has solved the financial difficulties, and the second volume has been published, a few words may be said regarding the details of this volume.

The same scheme, which was followed in the first volume by Prof. VON MONAKOW, has been adhered to in the second volume. The drawings given therein are the numbers IVa, IVb, VIa, VIb, VII and VIII of the scheme, corresponding to the numbers N°. 330, 328, 410, 406, 430, 442, of the series. They indicate the levels of the drawings, of which Tabula IVa and VIa were made by myself, and IVb, VIb, VII and VIII by Dr. ADA POTTER.

The cell-preparations were drawn after very good cell-preparations stained with carminas ammoniae, not after NISSL's method, because it seemed an advantage to use the same series of the WEIGERT—PAL preparations, which could not, at that time be used for the NISSL-method, as that staining was not yet possible in objects hardened in chromic salts.

We must say a few words on the nomenclature followed in this volume. As nearly as possible, we have followed the same nomenclature as used by VON MONAKOW and FUSE. A few changes were however necessary. In Germany the inner part of the corpus restiforme is described by MEYNERT

as the "innere Abtheilung des unteren Kleinhirn-Stieles" and VON MONAKOW has therefore called this part I. A. K. But in other countries



#### SCHEMA SAGITTALE

sectionum pedunculi cerebri transmissum in planam unum.

Lineae I, II, III, IV, V indicant tabulas Monakowi Fusceique.

Tabula IVa (Nº. 330) Tabula IVb (Nº. 328)

Tabula VIa (Nº. 410) Tabula VIb (Nº. 406)

Tabula VII (Nº. 430) Tabula VIII (Nº. 442)

the name "corpus juxta-restiforme" is used for this part of the corpus restiforme. In the drawings of this volume both names will be found.

As to the central bundle of the tegmentum pontis a difficulty arose, in its being a very badly defined tract. It is formed by a great number of fibres of different origin and ending.

A ventral part of it is seen as a solid fibre-mass of fine fibres packed together, without any grey reticula between their bundles. This centrifugal fibre-system receives its fibres, partly from the nucleus pallidus, partly from the red nucleus and finds its ending in the fibre-mantle of the nucleus olivaris inferior. This part of the tractus centralis tegmenti is called the tractus pallido-rubro-olivaris.

A more dorsal part of the central tract of the tegmentum, is formed by bundles of fibres, separated by small reticula of grey matter. Among

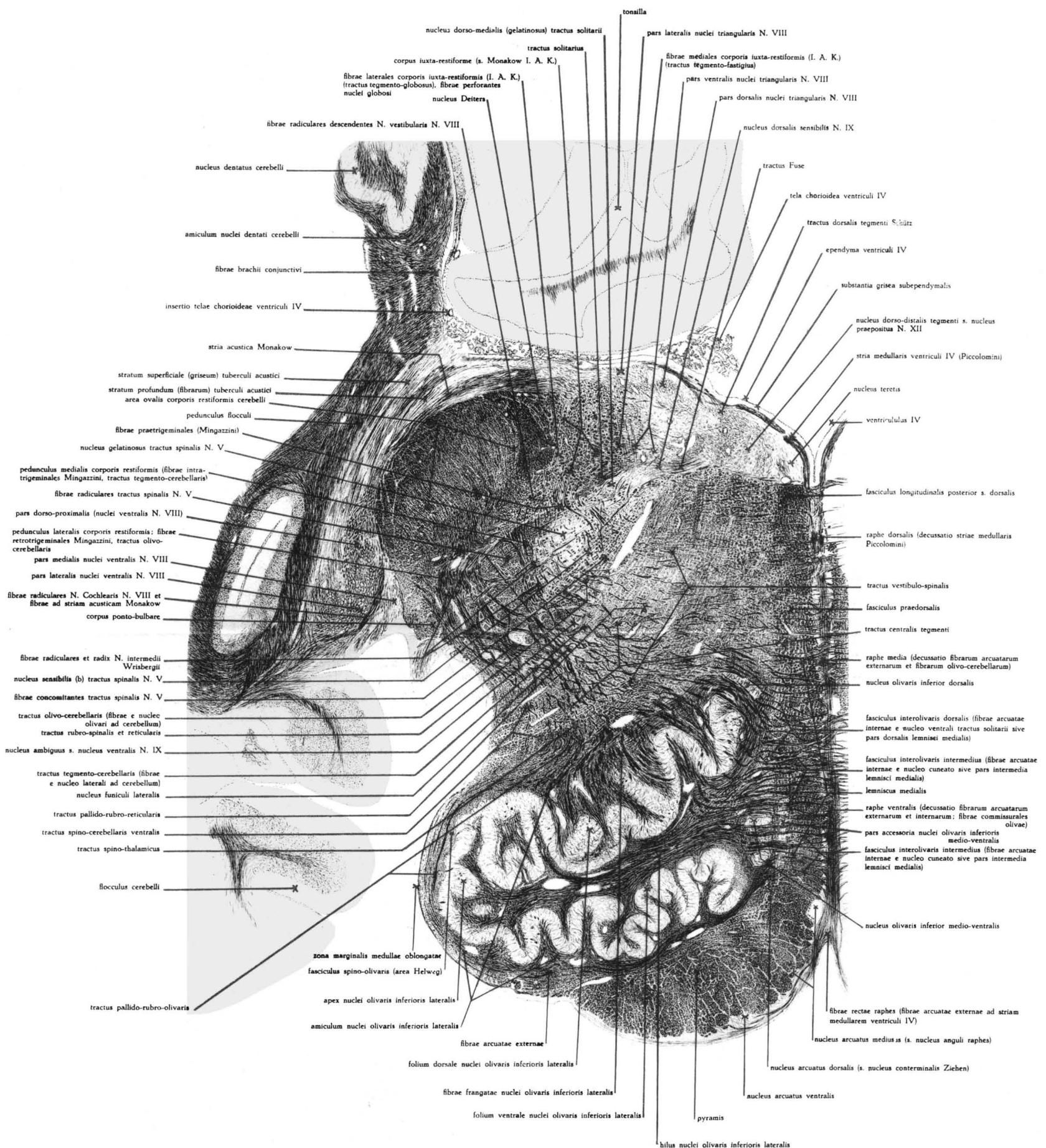
those fibres are also centrifugal fibres, issuing from the nucleus pallidus and the red nucleus, but their ending is found partly in the grey reticula separating the bundles, partly in the *formatio reticularis* *temmenti* of the medulla oblonata and even of the medulla spinalis. That part of the tractus centralis segmenti is called : "the tractus pallido-rubro-reticularis".

Besides these, there enter into the tractus centralis segmenti a great many of centripetal fibres, from the grey reticula and from the *formatio reticularis*, toward the nucleus pallidus and the red nucleus. These centripetal fibres join the two centrifugal fibre-systems, and it is not very easy to distinguish the centripetal system from the others.

In all drawings three bundles may be distinguished, a tractus pallido-rubro-olivaris, a tractus pallido-rubro-reticularis and a rest which is called the tractus centralis segmenti. Together they build up the tractus centralis segmenti of the anatomical books.

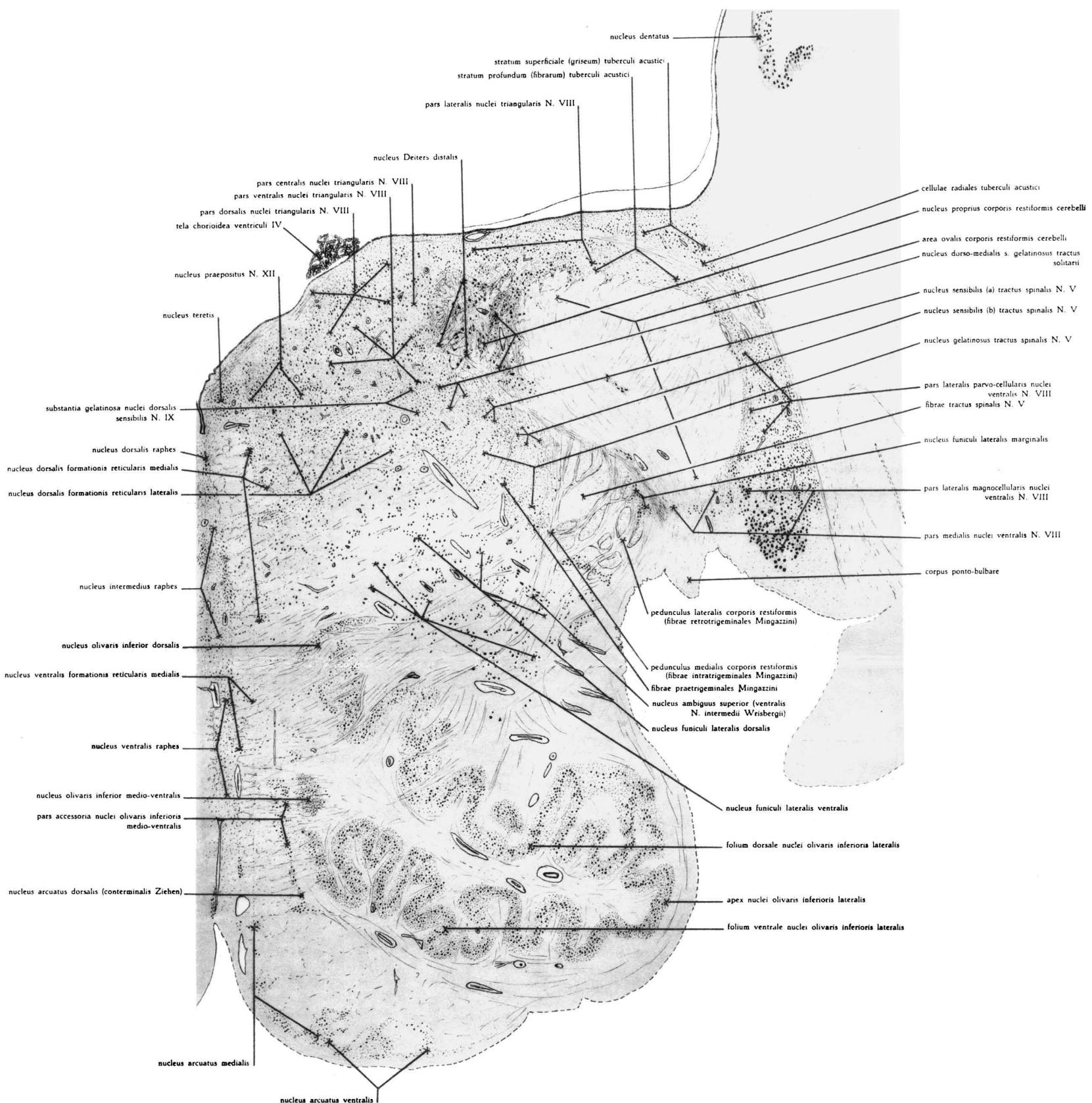
It certainly would be valuable, if a reconstructed Brain-commission were to reconsider the plan of the publication of the entire brain. This, however, will be the task of younger persons.

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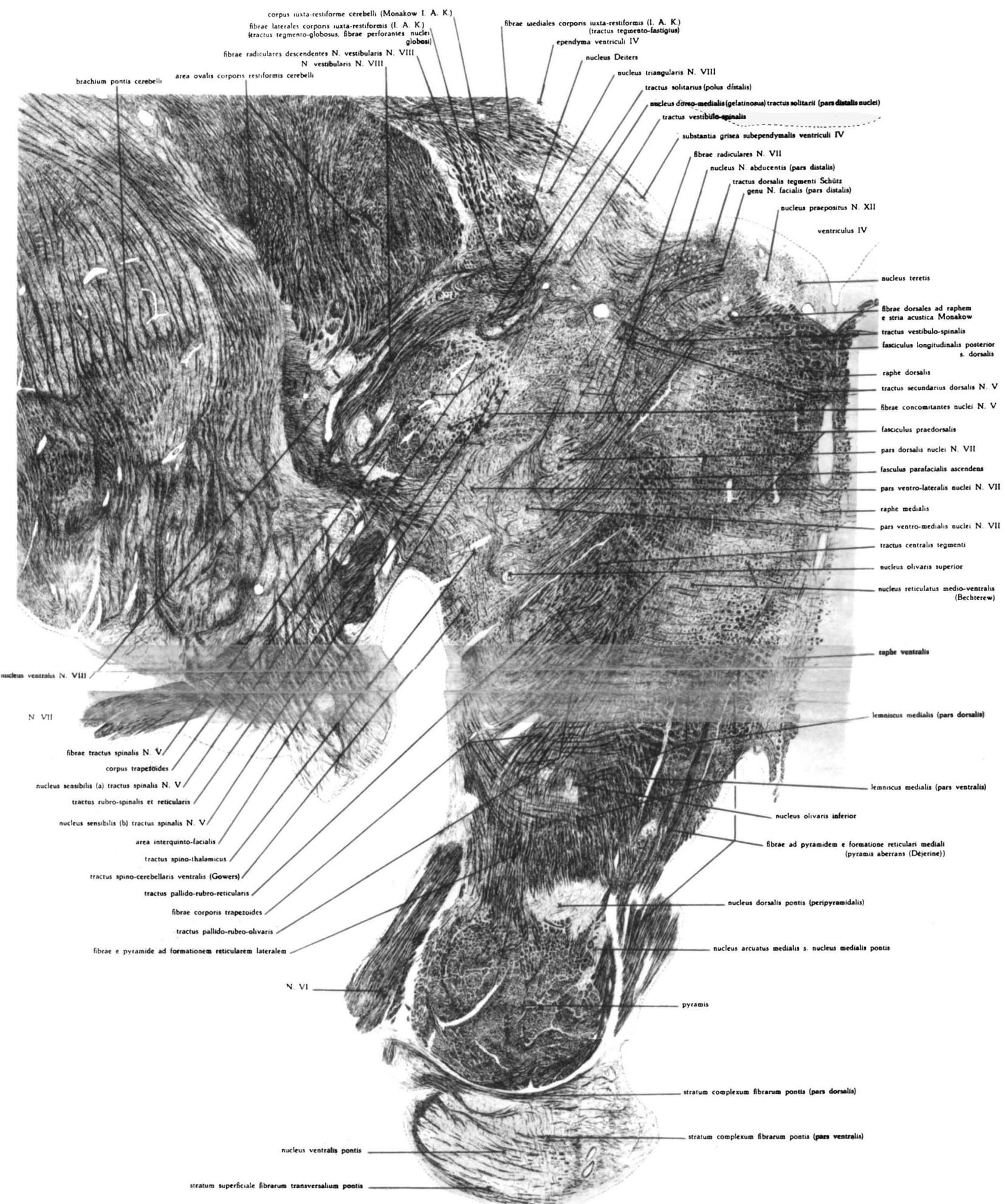
TABULA IV A  
SCHEMATIS SECTIO IV

C. WINKLER. DEL.

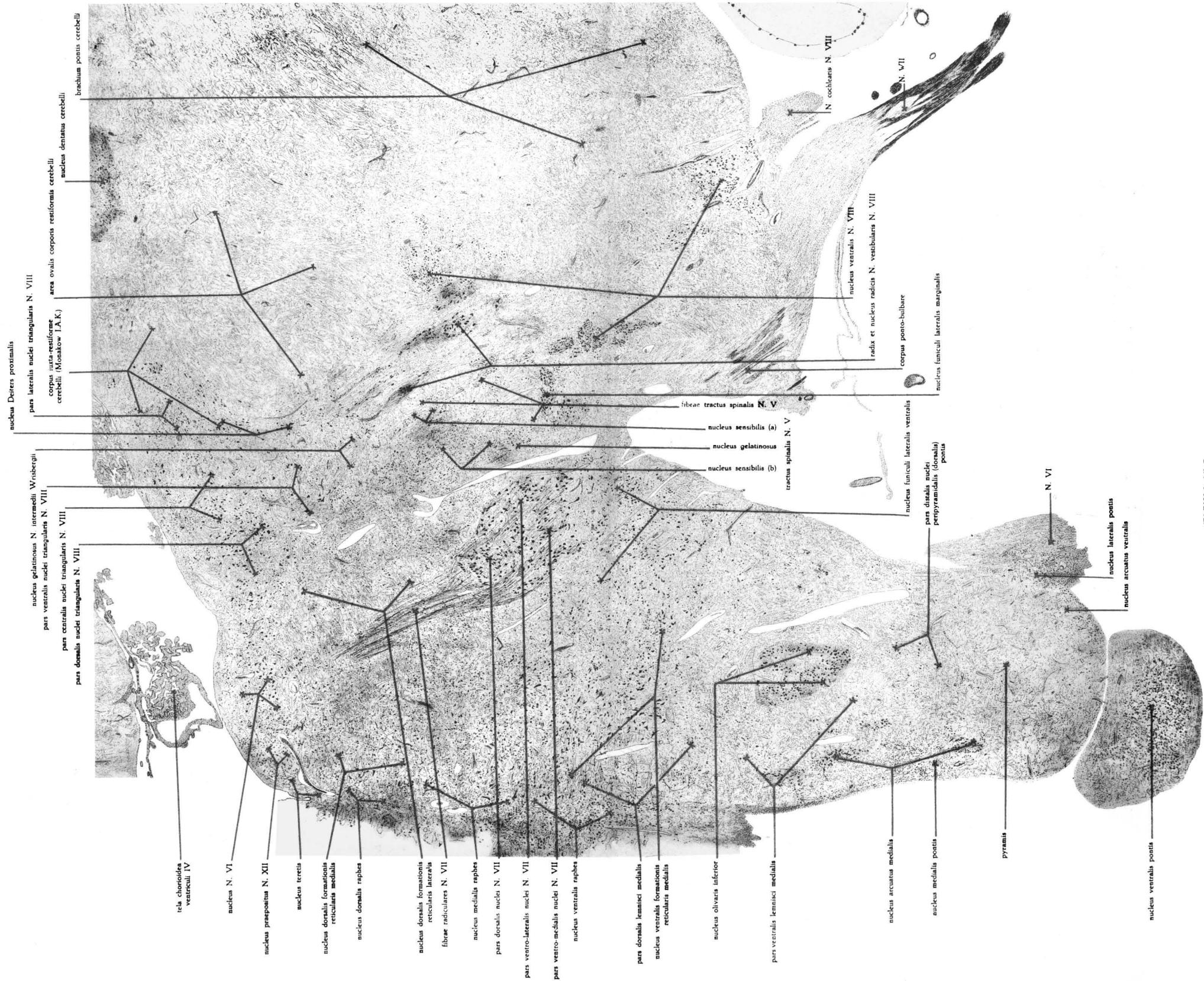


ADA POTTER DEL.

TABULA IV B  
SCHEMATICIS SECTIO IV

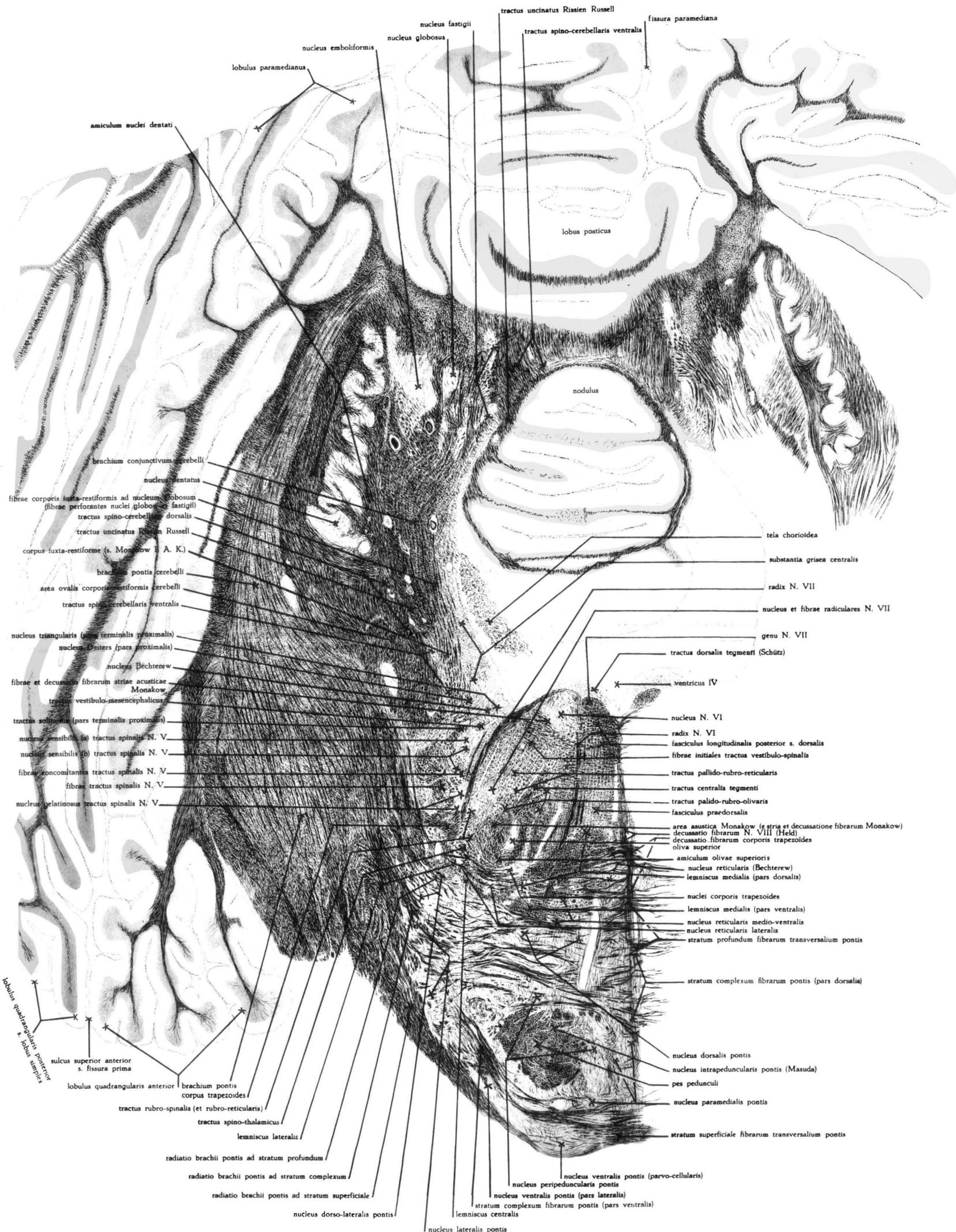


TABULA VI A  
SCHEMATICIS SECTIO VI

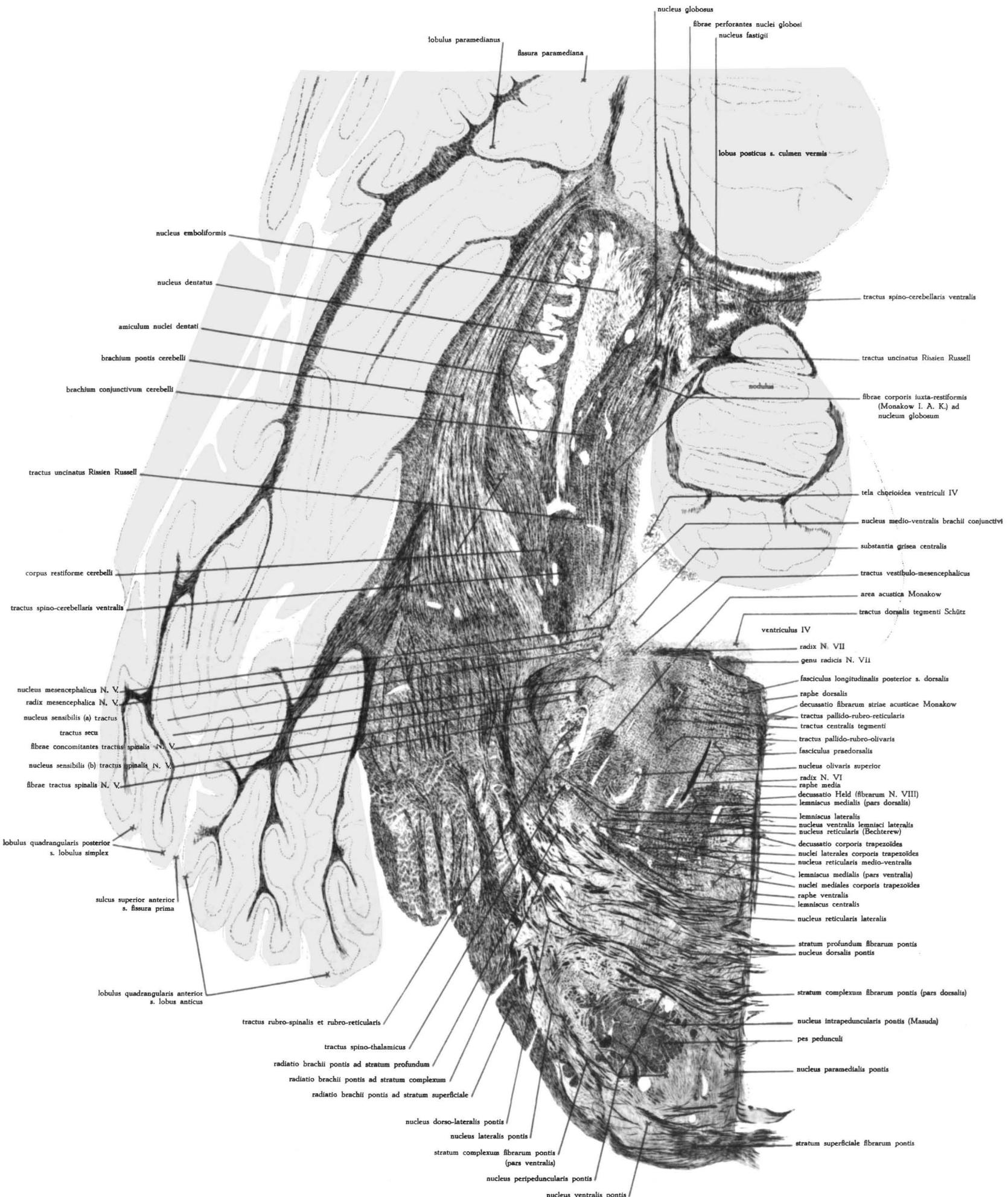


ADA FOTTER DEL

TABULA VI B  
SCHEMATIC SECTION VI



TABULA VII  
SCHEMATIC SECTION VII



TABULA VIII  
SCHEMATIC SECTION VIII