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VERITATEM PER MEDICINAM QUÆRAMUS

Harris P. Mosher.

The Accessory Sinuses of the Nose in Children.

102 specimens reproduced in natural size from photographs

BY

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With a preface by

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MDCCCCXI

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To His Excellency

Johann Count Zichy of Zich and Vásankeö,

Imperial and Royal Chamberlain, Member of the Privy Council, Royal Hungarian Minister of Education,

this book is dedicated with deep respect and gratitude

by the Author.

Introduction.

I have gladly acceded to the request of my colleague Prof. Onodi that I should write an introduction to his book on the Anatomy and Topography of the Accessory Air Sinuses of the Nose in Childhood. In view of the fact that these pneumatic cavities of the skull are still so little understood, especially in their physiological bearings, every fresh contribution to their exact study is of value; but especial importance attaches to a research on their development, such as is given in this work. For our best method of elucidating the problems of Normal and Comparative Anatomy is always afforded by an investigation of the mode of development of the organs in question.

The object of this work has been to study the development of the air sinuses from their first appearance until after the beginning of puberty. To this end a number of sections have been cut through the skulls of infants and children of different ages. The sections have been laid in the three principal planes of the body and appear to me to have been well chosen. Since accurate measurements are given in every instance, a good idea is afforded of the gradual development of the frontal and sphenoidal sinuses, the anterior and posterior ethmoidal cells and the maxillary antrum. One of the necessary foundations has thus been laid upon which must rest any subsequent investigation of the form, relations and functions of these important air cavities.

From a practical point of view, the illustrations and measurements given in this book appear to me to have considerable importance particularly for the diagnosis and operative treatment of the accessory sinuses in children, since they enable the surgeon to select and to follow up the best route of access to such cavities. In view of the great difficulty of diagnosing and operating for diseases of the sinuses in children, every contribution should be welcomed which helps to overcome these obstacles.

Waldeyer.

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Preface.

In the investigations which I have hitherto undertaken on the accessory air sinuses of the nose, I have been keenly alive to the incompleteness of our knowledge of these sinuses in the child. So far as I know, the text-books contain only scanty and somewhat vague references to this subject. It has been my endeavour to supply this want, and at the same time to make the most complete use possible of the material at my disposal. My specimens have been cut with a fret-saw in coronal, longitudinal, and horizontal planes, and are reproduced photographically in their natural size. The series has been completed by the inclusion of skiagrams prepared from different skulls. The resulting atlas contains 102 plates, shewing, in various planes, the situation and size of the different sinuses, as well as their relations with one another and with the nasal cavity. The illustrations afford a clear view of the morphological aspect of the air sinuses in children, whilst the information given as to the natural size and measurements of these cavities should prove particularly instructive and useful in operative surgery. Of late years the number of operations on the diseased sinuses of children has shewn a considerable increase, such operations having been performed in children of $1^1/_3$, $2^1/_3$, 3, $3^1/_2$, 4, 5, 6, $6^1/_4$, $6^1/_2$, 7, 9, 10, 12, etc., years. The material from which the illustrations of this atlas have been prepared, was obtained from foetuses of $6^1/_2$ and 8 months, from new-born infants, and from a number of children, aged, respectively, 1, 2, 4, $4^1/_4$, $4^1/_2$, 5, $5^1/_2$, $6^1/_2$, 7, 8, 11, 12, 14, and 15 months, $1^1/_2$, 2, 3, $3^1/_2$, 6, $7^1/_2$, $8^1/_2$, 9, 11, 12, 13, $13^1/_2$, 14, 15, 18 and 19 years. Some of the skulls shewed variations in the size and general arrangement of the sinuses, such morphological differences being the forerunners of those variations which are so frequently observed in the sinuses of the adult.

I venture to hope that this volume which I am now publishing will successfully supply an often-felt want, and that it will be of general use to every physician who wishes to extend his knowledge and to obtain an exact insight into the complicated structure of the sinuses of the child. I trust that my atlas will be a welcome addition to the libraries of my brother specialists as well as of surgeons, specialists for diseases of children, oculists and otologists. May it thus prove a stimulus for the further and more detailed investigation of the pathology and treatment of the diseases of the sinuses in children.

I welcome the opportunity of expressing my most cordial thanks to the Hungarian Academy of Sciences for its valuable assistance, and further to Hofrat Professor Dr. *M. von Lenhossék* and to Prosector Dr. *L. Nagy* for their kindness in giving me the use of their material. I am indebted to my translators for the labour which they have devoted to their work. The French translation was kindly untertaken by Dr. *Lautmann* in Paris, the English translation by Dr. *Prausnitz* in Breslau. My special thanks are due to my publisher for the care which he has bestowed upon the arrangement and appearance of the book.

Budapest, 15th December 1910.

Ónodi.

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Synopsis of Results.

Synopsis of Results.

I.

The condition of the accessory sinuses of the nose in childhood has not hitherto been investigated systematically. Valuable data, it is true, are already known as to their early development in the foetus. But vague, general and often contradictory are the scanty items of information supplied by anatomical and rhinological text-books as to the condition of the sinuses in children. It has been the object of our investigations to fill this gap and to supplement the information both as regards purely anatomical data, and by reproducing the illustrations in their natural size and selecting them with a view to their use in operations. We will begin by giving a *résumé* of the anatomical data, and will afterwards consider the practical importance of these results in the treatment of diseases of the accessory sinuses in childhood.

1. The Frontal Sinus.

With regard to the development of the frontal sinus, I have taken account of the investigations of Steiner[1]), Merkel[2]), Killian[3]), Zuckerkandl[4]) and Boege[5]) in my monograph dealing with the frontal sinus (Vienna 1909). I do not propose to describe in detail the structural conditions of the foetal germs of these sinuses. I would, however, mention that the frontal depression called "frontal recess" by Killian, has been described by Mihálkovics[6]) under the name of "recess of the middle meatus". From this recess the frontal sinus arises directly, although according to Killian it may also develop indirectly from an ethmoidal cell, the so-called "frontal cell". The following data will serve to shew the views of different authors as to the development of the frontal sinus in childhood. Steiner described it as developing betwen the first and second year, and attaining the size of a pea about the sixth or seventh year. According to Aeby[7]) its development begins at the commencement of the second year, according to Monti[8]) in the third or fourth

[1]) Über die Entwicklung der Stirnhöhle etc. Langenbeck's Archiv 1872.
[2]) Anatomie. 1885—1890.
[3]) Heymann's Handbuch der Laryngologie. 1900, vol. III.
[4]) Anatomie der Nasenhöhle. 1902, I.
[5]) Zur Anatomie der Stirnhöhlen. Königsberg 1902.
[6]) Heymann's Handbuch der Laryngologie. 1900, vol. III.
[7]) Der Bau des menschlichen Körpers. 1872.
[8]) Anatomie. Modena 1891.

year, according to Engel[1]) after the twelfth year, according to R. Hartmann[2]) during puberty, and according to Tillaux[3]) after the twelfth year. Zuckerkandl, who does not regard the frontal sinus as derived from an ethmoidal cell, writes: "In the new-born infant no trace of a frontal sinus is visible." Mihálkovics states that "the frontal sinus arises out of the recess of the middle meatus; until the fourth year this protuberance remains small, and even at puberty it has only attained the size of a pea." According to Poirier[4]) the frontal sinus is first seen about the end of the second year and is then difficult to demonstrate; about the seventh year it attains the size of a pea and ceases to grow between the fifteenth and twentieth year. Spee[5]) makes the following statement: "Whilst the first rudiment of a frontal sinus is visible soon after the first year in the form of a shallow depression, it does not shew any considerable increase until the time immediately preceding puberty, its final size being attained, as a rule, about the twentieth year."

According to Langer-Toldt[6]) "the earliest sign of a frontal sinus is seen about the end of the first year in the form of a shallow depression. The depth of this cavity increases slowly, so that at the sixth year it has hardly reached the size of a pea. The development of the frontal sinus progresses more rapidly about the eleventh or twelfth year". Chiari[7]) says in his text-book: "The frontal sinus is completely absent in the new-born infant, and at puberty it is about the size of a pea". Zarnico[8]) writes in his text-book: "The frontal sinuses are not present at birth. Their development begins towards the end of the first year. About the sixth or seventh year their size is about that of a pea".

In Hajek's[9]) text book we find only an enumeration of the results of Killian's embryological researches.

According to Chiarugi[10]) the frontal sinuses are derived from the anterior ethmoidal cells; they are not distinctly visible until the eighth year, and attain the final stage of their development between the fifteenth and twentieth year, or even later.

In other German, French and English text-books no accurate data referring to the frontal sinuses in childhood are to be found. From the statements repeated above it will be obvious, that the views of the different authors vary and are often contradictory; the only uniform statement as to the measurements of the sinus is "the size of a pea", but the authors differ as to when this size is attained. I have been unable to trace any further anatomical data, more especially, any measurements of the frontal sinuses, either in anatomical or rhinological text-books.

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[1]) Anatomie. 1859.
[2]) Anatomie. 1881.
[3]) Anatomie. Paris 1884.
[4]) Traité d'anatomie. 1903.
[5]) Bardelebens Handbuch der Anatomie. Skelettlehre 1896.
[6]) Anatomie. 1897.
[7]) Die Krankheiten der Nase. Vienna 1903.
[8]) Die Krankheiten der Nase. 1910.
[9]) Patholog. u. Therap. der entzündlichen Erkrankungen der Nebenhöhlen der Nase. 1909.
[10]) Anatomie. 1904.

We will proceed to discuss the few publications dealing with skiagrams of the frontal sinus, viz. the researches of Eicken, Haike and myself. Five skiagrams from my monograph on the frontal sinus have been included in this atlas. In a skull of three years, two skulls of three and a half, one of four, one of six, one of eight and a half, one of nine, one of twelve and one of fourteen years, I have described the early and the later form of the sinus; the difference between these two forms consisting in the extent of their development in the frontal region. The early form of the frontal sinus was situated laterally of the olfactory cleft and shewed considerable variation in size. Eicken[1]) found an ethmoidal cell of distinctly frontal character only in one skull of seven years. Smaller frontal ethmoidal cells were seen by him in skulls under seven years. In skulls of twelve, fourteen and fifteen years frontal sinuses of varying magnitude were observed. Haike[2]) investigated the accessory sinuses in several children, also in diseased conditions of the sinuses. To this part of his work we shall refer later on. His skiagrams were taken both in the fronto-occipital and in the lateral direction. As regards the frontal sinus, he saw "the earliest evidence of independent frontal sinuses twice in girls of $3^1/_2$ years".

Haike also examined the frontal sinuses of children aged, respectively 5, 7, $7^1/_2$, $8^1/_2$, 10, $10^1/_2$, $11^1/_4$, 12, $13^1/_4$, $13^1/_2$, 14, and 16 years, and usually found fairly large cavities, those in children of $7^1/_2$, $8^1/_2$ and more years shewing a considerable size. The skiagrams of diseased frontal sinuses and their importance will be considered in the second section, when we will also deal with the case of Killian[3]) who opened up a diseased frontal sinus in a child one year and three months of age.

After this literary retrospect it will be convenient to summarize the results of our investigations, so far as they deal with the frontal sinus. The following tables contain concise details as to the heads examined, their age, the planes of section, and the measurements of the sinuses in each case, together with remarks and references to the number of the illustration. The first table comprises the data obtained from the sections, the second table those derived from skiagrams of bony skulls.

In connection with these tables we will briefly summarize the measurements of the frontal sinus at different ages.

In the *first year* (newborn infants, children of 1, $4^1/_4$, 5, $6^1/_2$, 8 and 12 months) the height of the frontal sinus was between $3^1/_2$ and 8 mm, its length between 3 and 9 mm, and its width between 2 and 6 mm.

In the *second year* (children of 15, 18 and 24 months) the height of the frontal sinus was between $4^1/_2$ and 9 mm, its length between 4 and $5^1/_2$ mm, and its width between 3 and 4 mm.

In the *third year* (children of 3) the height of the frontal sinus was between 14 and 18 mm, its length between 11 and 16 mm, and its width between 5 and 6 mm.

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[1]) Transactions of the I. Internat. Laryngological Congress. Vienna 1908.

[2]) Archiv f. Laryngologie. 1910. vol. 23.

[3]) Zeitschrift f. Ohrenheilkunde. vol. 56.

Frontal sinus.

Age	Plane of Section	Height mm	Length mm	Width mm	Remarks
Foetus of 8 months	longitud. vertical.	4½	4½	—	Frontal recess shewing marked development upwards and forwards, see Plate 2 *rf*
Newborn infant	do.	3½	3½	—	Plate 4 *rf*
do.	horizontal	5	3	2	Plate 7 *rf*
do.	do.	5	3	2	Plate 9 *rf*
1 month	longitud. vertical	4½	3½	3	The early form of the frontal sinus, its extent and situation are clearly visible; it opens immediately into the semilunar hiatus. Plate 12 *rf*
do.	coronal	6	5	2	Plate 14 *rf*
do.	longitud. vertical	5	4½	3½	The early form of the frontal sinus, its extent and situation are clearly visible; it opens into the anterior portion of the semilunar hiatus. Plate 14 *rf*
4½ months	coronal	6½	3	3½	Plate 25 *sf*
do.	horizontal	6	5½	3	Plate 28 *sf*
5 months	do.	7	5½	2	Plate 34 *sf*
do.	do.	7½	5	4	Plate 35 *sf*
5½ months	longitud. vertical	5½	6½	4	Plate 38 *sf*
8 months	horizontal	8	5	2	Plate 47 *sf*
do.	do.	5½	5	3	Plate 49 *sf*
12 months	coronal	6	5	5	The early form of the frontal sinus reaches the squamous portion of the frontal bone. Plate 52 *rf*
14 months	do.	6	4	3	Plate 55 *rf*
do.	longitud. vertical	10	9	6	Plate 58 *rf*
15 months	coronal	4½	4	3½	Plate 60 *sf*
do.	longitud. vertical	7	5	4	Plate 61 *sf*
do.	do.	7	5	4	Plate 62 *sf*
1½ years	coronal	5	3	3½	Plate 65 *sf*
do.	longitud. vertical	9	4½	7	Plate 68 *sf*
2 years	coronal	5½	3	4	Plate 69 *sf*
do.	longitud. vertical	7½	5½	3	Plate 72 *sf*
3 years	do.	11	14	5	The frontal ostium is 2½ mm long, its shape an elongated oval; it opens at the anterior end of the semilunar hiatus. Plate 73, 74, *sf*, *of*
do.	coronal	16	18	6	The frontal ostium is 2½ mm long, an elongated oval; it opens at the anterior end of the semilunar hiatus. Plate 75 *sf*
3½ years	do.	6	6½	5	The frontal ostium opens into the narrow frontal recess which lies above the hiatus. Plate 78, *sf*, *of*, *rf*
6 years	longitud. vertical	13	18	12	The frontal sinus opens into the anterior end of the semilunar hiatus. Plate 82 *sf*, *of*
do.	do.	10	17	11	The opening of the frontal sinus is continuous with the semilunar hiatus. Plate 84, 85. *sf*, *of*
7½ years	do.	11	17	7	The opening of the frontal sinus is continuous with the upper portion of the semilunar hiatus. Plate 88 *sf*
do.	coronal	4	14	9	The frontal sinus opens close to the anterior end of the semilunar hiatus. Plate 89 *sf*, *of*

Skiagraphic data of the frontal sinuses in the region of the forehead.

Age	Direction of Rays	Height mm	Width mm	Remarks
15 months	occipito-frontal	right 3 left 3½	right 5 left 5½	Plate 63 *sfd*, *sfs*
3½ years	do.	right 6 left 6	right 6 left 6	Plate 77 *sfd*, *sfs*
do.	do.	right 4 left 4	right 4 left 4	—
6 years	do.	right 8½ left 6	right 8½ left 6	Plate 87 *sfd*, *sfs*
8½ years	do.	right 21 left 21	right 19 left 19	Plate 91 *sfd*, *sfs*
do.	do.	right 22 left 10	right 22 left 10	Plate 92 *sfd*, *sfs*
9 years	do.	right 10 left 10	right 10 left 10	Plate 93 *sfd*, *sfs*
12 years	do.	right 10 left 17	right 20 left 20	Plate 94 *sfd*, *sfs*
13 years	do.	right 14 left 14	right 20 left 22	Plate 95 *sfd*, *sfs*
do.	do.	right 13 left 12	right 17 left 18	Plate 96 *sfd*, *sfs*
do.	do.	right 10	right 16	Left sinus undeveloped. Plate 97 *sfd*
13½ years	do.	right 18	right 21	Left sinus undeveloped. Plate 98 *sfd*
14 years	do.	left 10	left 10	Right sinus undeveloped. Plate 99 *sfs*
15 years	do.	right 5 left 11	right 5 left 8	Plate 100 *sfd*, *sfs*
18 years	do.	right 15 left 6	right 26 left 13	Plate 101 *sfd*, *sfs*
19 years	do.	right 21 left 16	right 21 left 24	Plate 102 *sfd*, *sfs*

In the *fourth year* (children of 3 and a half years) the height of the frontal sinus was 6½ mm, its length 6 mm and its width 5 mm.

In the *sixth year* (child of 6) the height of the frontal sinus was between 17 and 18 mm, its length between 10 and 13 mm and its width between 11 and 12 mm.

In the *eighth year* (child of 7½) the height of the frontal sinus varied between 14 and 17 mm, its length between 4 and 11 mm, and its width between7 and 9 mm.

Our skiagrams of the frontal region of bony skulls have furnished the following results:

In the *second year* (children of 15 months) the height of the frontal sinus varied from 3 to 3½ mm, its width from 5 to 5½ mm.

In the *fourth year* (children of 3½ years) the height of the frontal sinus varied from 4 to 6 mm, its width from 4 to 6 mm.

In the *sixth year* (child of 6 years) the height of the frontal sinus varied from 6 to 8½ mm, its width from 6 to 8½ mm.

In the *ninth year* (children of 8½ and 9 years) the height of the frontal sinus varied from 10 to 22 mm, its width from 10 to 29 mm.

In the *twelfth year* (child of 12 years) the height of the frontal sinus was 17 mm and its width 20 mm.

In the *thirteenth year* (child of 13 years) the height of the frontal sinus varied from 10 to 13 mm and its width from 16 to 18 mm.

In the *fourteenth year* (children of 13½ and 14 years) the height of the frontal sinus varied from 10 to 18 mm and its width from 10 to 21 mm.

In the *fifteenth year* (child of 15 years) the height of the frontal sinus varied from 5 to 11 mm and its width from 5 to 8 mm.

At the age of *eighteen* (youth of 18 years) the height of the frontal sinus varied from 6 to 15 mm and its width from 13 to 26 mm.

At the age of *nineteen* (youth of 19 years) the height of the frontal sinus varied from 16 to 21 mm and its width from 21 to 24 mm.

In passing I may mention that in some of the sections of heads one and two years old the expression "early form of the frontal sinus, frontal recess" has been used. This term serves to describe the stage of development of the frontal sinus which occurs in the first years of childhood, before it has reached the basal part of the squamous portion of the frontal bone, and prior to the formation of air spaces. With regard to this question detailed histological investigations are now being carried out in which we hope to elucidate the conditions prior to the extension of the frontal sinus into the region of the forehead.

From the above data, as well as the illustrations of coronal, horizontal and longitudinal vertical sections, it will be seen that we have figured the form, situation and size of the frontal sinus from its first appearance until the eighth year of life. In addition skiagrams are given of children and youths from 15 months to 19 years of age. Older investigations have thus been amplified and corrected in many details. With the practical employment in surgical work of these data, measurements and topographical illustrations, we shall deal in the second section of this summary.

2. The Maxillary Antrum.

The data found in literature as to the development of the maxillary antrum and as to its condition in childhood and youth are far more scanty than those referring to the frontal sinus. According to Gegenbaur[1]) "the first rudiment of the maxillary antrum is the earliest to appear, being seen even before the middle of foetal life; but it does not attain its complete development until comparatively late; nor does it shew any considerable growth before the second year of childhood. Even in the new-born infant the infraorbital furrow lies laterally of the developing maxillary antrum, whilst at a later stage it is situated on its superior aspect."

According to Mihálkovics[2]) "the epithelial depression which marks the earliest rudiment of the maxillary antrum is first observed in the middle of the third month;

[1]) Lehrbuch der Anatomie. 1883, 1890.

[2]) l. c.

in the fourth and fifth month the maxillary recess has become deeper; in the sixth or seventh month it develops into an elongated passage. In the fourth month the maxillary antrum is 1/2 mm, in the fifth month 5 mm in depth." According to Zuckerkandl [1]) "the germ of the maxillary antrum is represented by a shallow pit which stretches backwards from the lachrymal sulcus to the alveolus of the second molar. Laterally, the germ of the antrum reaches as far as the

Maxillary Antrum.

Age	Plane of section	Height mm	Length mm	Width mm	Remarks
Newborn infant	coronal	4	7	3	The antrum adjoins the lower meatus. Its opening is channel-shaped. Plate 5 *sm*
do.	horizontal	6	11	4	Plate 6 *sm*
do.	do.	5	13	3 1/2	Plate 8 *sm*
1 month	coronal	4	5	3 1/2	The antrum adjoins the lower meatus and lower concha. Plate 14, 15 *sm*
do.	longitud. vertical	4	10	4	Plate 18 *sm*
2 months	horizontal	3	7	2 1/2	Plate 20 *sm*
do.	longitud. vertical	4	11	3	Plate 21 *sm*
4 months	coronal	5	13	7	Plate 22 *sm*
do.	longitud. vertical	5	12	6	Plate 23 *sm*
do.	do.	5	12	4	Plate 24 *sm*
4 1/2 months	coronal	7	11	4 1/2	Plate 26 *sm*
do.	horizontal	8	19	4 1/2	Plate 27 *sm*
do.	longitud. vertical	6	16	5 1/2	Plate 29 *sm*
do.	horizontal	5	10	4	Plate 31 *sm*
5 months	do.	7	12	5	Plate 32 *sm*
do.	do.	5	14	6	Plate 33 *sm*
5 1/2 months	coronal	8	15	7	The antrum adjoins the lower meatus. Plate 36, 37 *sm*
6 1/2 months	do.	5	6	3 1/2	Plate 40 *sm*
7 months	longitud. vertical	4	22	6	Plate 44 *sm*
do.	coronal	5	16	4	Plate 45 *sm*
8 months	horizontal	10	13	5	Plate 46 *sm*
do.	do.	5	10	4 1/2	Plate 48 *sm*
11 months	do.	9	14	5	Plate 50 *sm*
12 months	coronal	7	11	8	Plate 53 *sm*
14 months	do.	11	18	15	The antrum adjoins the lower meatus. Plate 56 *sm*
1 1/2 years	do.	8	10	3	The antrum adjoins the lower meatus. Plate 64 *sm*
2 years	do.	9	12	7	Plate 70 *sm*
3 years	do.	13	2	13	Plate 76 *sm*
3 1/2 years	do.	13	26	12	The antrum adjoins the lower and middle meatus. A bristle has been passed through the maxillary ostium. Plate 79, 80 *sm, om*
7 1/2 years	do.	23	38	20	Plate 90 *sm*

[1]) l. c.

infraorbital canal, the lower aspect of which it hardly exceeds. In the second year of life the maxillary antrum has become deeper; anteriorly, it still only reaches as far as the infraorbital canal, but posteriorly it has already passed beyond it. The cavity has also increased in depth by this time, since it has grown down to the ridge of insertion of the concha. In the third or fourth year the anterior portion of the antrum has also advanced laterally beyond the infraorbital canal. In the seventh year this portion of the antrum reaches midway between the infraorbital canal and the malar process. In the eighth or ninth year the antrum has penetrated into the malar process, and has reached the limit of its growth in the transverse direction. The depth and height of the antrum are considerably influenced by the descent and eruption of the teeth; in these dimensions therefore the antrum does not attain its definite form until the end of the second dentition.

According to Langer-Toldt[1]) "in the fifth month of foetal life the antrum begins to develop in the form of an epithelial depression; at birth it already represents a well-marked recess."

According to Chiari[2]) "at the fifth month a depression 5 mm in depth is present. Until the sixth year the antrum remains spherical and very small. It then assumes the form of a triangular pyramid and gradually increases owing to the growth of the body of the maxilla, the descent of the permanent teeth and the absorption of the spongy substance of the body of the maxilla."

According to Zarnico[3]) "in the new-born infant the maxillary antrum is a very narrow fossa which reaches laterally to the infraorbital canal. The remainder of the body of the maxilla is filled up with dental germs and spongy bone substance. Even after the eruption of the milk-teeth the germs of the permanent teeth leave but little space for the antrum. Only at the commencement of the second dentition, about the seventh year, it begins to grow more rapidly; when the molars break through and the facial skull increases in height, the antrum soon assumes a notable size."

Haike[4]) carried out measurements of some skulls. In a child of $1^1/_2$ years he found an antrum 4 to 5 mm wide and 20 mm long; in a child of 2, an antrum 8 mm wide and 25 mm long; in a child of $2^1/_2$, an antrum 4 mm wide and 9 mm long; in a child of 5, an antrum 16 mm wide and 25 mm long. According to his statement the floor of the antrum has attained its greatest depth at or about the twelfth year. Haike also took skiagrams of several children, some of whom had diseased antra — this we shall refer to subsequently —; the children were aged, respectively, 18 months, 2, $2^1/_2$, $2^3/_4$, $3^1/_2$, 4, $4^1/_2$, 7, 8, $10^3/_4$, 11, $11^3/_4$, 15 and 16 years. In describing his skiagrams he gives no measurements of the antra. With the value of the skiagram from the diagnostic and surgical point of view, we shall deal in the second section.

The above data are not very specialised; in Zuckerkandl's detailed description

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[1]) l. c.
[2]) l. c.
[3]) l. c.
[4]) l. c.

of the development of the antrum in the first years of childhood no measurements are given, whilst in the measurements performed by Haike in four heads the height of the antrum is not stated.

With regard to the foetal germ of the antrum we dispose of one observation: in the coronal section of a foetus of 6½ months an antrum 3 mm long and 1½ mm wide (Pl. 1 *sm*) was found.

In connection with the foregoing table we will briefly summarize the measurements of the maxillary antrum according to the age of the specimen.

In the *first year* (new-born infant, and children of 1, 2, 4, 4¼, 4½, 5, 5½, 6½, 7, 8, 11 and 12 months) the length of the antrum varied between 5 and 19 mm, the height between 3 and 9 mm, and the width between 2½ and 8 mm.

Anterior Ethmoidal Cells.

Age	Plane of Section	Height mm	Length mm	Width mm	Remarks
Newborn infant	coronal	1—2½	1—2½	1—2½	Plate 5 *cea*
do.	horizontal	4—5	2—3	2—3	Plate 9 *cea*
1 month	longitud. vertical	2—6	2—4	2—2½	Plate 12 *cea*
do.	coronal	4	5	3	Plate 15 *cea*
do.	longitud. vertical	4	4½	3½	Plate 17 *cea*
4¼ months	horizontal	4—5	3—4½	2—4	Plate 28 *cea*
5 months	do.	6—7	4—6	2—5	Plate 34 *cea*
do.	do.	3—8	2½—6	2—5	Plate 35 *cea*
5½ months	coronal	3—6	2½—3	3½—4	Plate 36, 37 *cea*
6½ months	do.	4	5½	3	Plate 41 *cea*
8 months	horizontal	4—6½	4½	2—4	Plate 47 *cea*
do.	do.	5—7	6—7	3—4½	Plate 49 *cea*
11 months	coronal	8½	4½	4	Plate 51 *cea*
12 months	do.	2—4	2—4	2—4	
do.	longitud. vertical	8	9	6	Plate 54 *cea*
14 months	coronal	8	9	4	Plate 55 *cea*
do.	do.	4—8	6—9	4—5	Plate 56 *cea*
15 months	longitud. vertical	3—4½	3—4	3½—4½	Plate 62 *cea*
1½ years	coronal	10	2½	3½	Plate 65 *cea*
2 years	do.	5	3½	4	The cell extends from the plane of section into the uncinate process (*pu*) for a distance of 10 mm. Plate 69 *cea*
do.	longitud. vertical	5	4½	3½	Plate 72 *cea*
3 years	do.	6—7	6—7	3—4	The opening of an anterior ethmoidal cell into the bullar recess is plainly visible. Plate 73, 74 *cea*
3½ years	coronal	6	8	4	Plate 78 *cea*
do.	do.	3½—5	6—8	3—4	Plate 80 *cea*
do.	longitud. vertical	5—11	3—6	3½—7	Plate 81 *cea*
6 years	do.	8—11	5—6	6	Plate 82 *cea*
do.	do.	10—13	5—6	7	Plate 84 *cea*
7½ years	do.	13	5	7	Plate 88 *cea*
do.	coronal	8	11	7	Plate 89 *cea*

Posterior Ethmoidal Cells.

Age	Plane of Section	Height mm	Length mm	Width mm	Remarks
Newborn infant	coronal	2½	5	1½	Plate 5 *cep*
do.	horizontal	5	4½	2	Plate 9 *cep*
1 month	longitud. vertical	2—3	2½—3	2—4	Plate 12 *cep*
do.	coronal	3½	5	2½	Plate 15 *cep*
do.	longitud. vertical	3½	5	3	Plate 17 *cep*
4¼ months	coronal	7	6	3	Plate 26 *cep*
do.	horizontal	5	3—5	4½	Plate 28 *cep*
5 months	do.	8	9	4½	Plate 34 *cep*
do.	do.	6	10	4	Plate 35 *cep*
5½ months	longitud. vertical	5	5½	4	Plate 38 *cep*
6½ months	coronal	4	5½	3	Plate 41 *cep*
8 months	horizontal	4—5	2½—3½	2	Plate 47 *cep*
do.	do.	2—3	2½—4	1½—2	Plate 49 *cep*
12 months	coronal	2—4	2—4	2—4	Plate 53 *cep*
do.	longitud. vertical	5	5	8	Plate 54 *cep*
14 months	coronal	4—6	7—10	2—3	Plate 56 *cep*
15 months	longitud. vertical	5	6	4	Plate 62 *cep*
2 years	do.	5	4	3	Plate 72 *cep*
3 years	do.	6—7	6—7	3—4	The opening of a posterior ethmoidal cell into the upper meatus is distinctly visible. Plate 73, 74 *cep*
3½ years	coronal	5—6	6—11	3½—4	Plate 80 *cep*
do.	longitud. vertical	3½—10	3½—9	3—11	Plate 81 *cep*
7½ years	do.	10	17	9	Plate 88 *cep*
do.	coronal	10	11	6	Plate 90 *cep*

In the *second year* (children of 18 and 24 months) the length of the antrum was between 10 and 12 mm, the height between 8 and 9 mm, and the width between 3 and 7 mm.

In the *third year* (child of 3 years) the antrum was 23 mm long, 13 mm high, and 13 mm wide.

In the *fourth year* (child of 3½) it was 26 mm long, 13 mm high and 12 mm wide.

In the *eighth year* (child of 7½) it was 38 mm long, 23 mm high and 20 mm wide.

The figures are reproduced in natural size and shew in coronal, horizontal and longitudinal sections the topographical relations and form of the maxillary antrum from birth to the eighth year.

The concluding remarks of the chapter on the frontal sinus (see page 6) hold good also for this chapter.

The Ethmoidal Cells.

With regard to the development of the ethmoid bone, its cellular spaces and foetal ossifications, a number of data are found in the text books of anatomy.

In addition, the reader is referred to the investigations of Seydel [1]), Mihálkovics [2]), Killian [3]) and Zuckerkandl [4]) who have made a particular study of the development of the nasal cavity, its conchae and meatuses, and of the structural development of the ethmoidal labyrinth. In the chapter on the frontal sinus the theory of those investigators was mentioned who consider the frontal sinus to have been developed from an anterior ethmoidal cell, the so-called "frontal cell". For this reason we will not enter into the details of these embryological investigations, nor discuss the relations of the osseous plates of the ethmoid bone and the interturbinal meatuses to the ethmoidal cells. We were not able, however, to discover in the literature on the subject any further data as to the anterior and posterior ethmoidal cells and their measurements in childhood. Zarnico [5]) says in his textbook: "The ethmoidal cells are existent in the new-born infant in the form of narrow pouches and very soon attain a considerable size". Haike [6]) has published skiagraphical investigations of the ethmoidal cells which however deal more with diseased cavities and which will be considered in detail in the second section.

The foregoing tables shew the age, plane of section and measurements of the anterior and posterior ethmoidal cells, together with some remarks relative to them.

In connection with these tables we will summarize the measurements of the anterior and posterior ethmoidal cells according to the age of the specimen.

In the *first year* (new-born infant and children of 1, $4^1/_4$, 5, $5^1/_2$, $6^1/_2$, 8, 11 and 12 months) the length of the anterior ethmoidal cells varied between 1 and 9 mm, their height between 1 and 8 mm, and their width between 1 and 6 mm. The length of the posterior ethmoidal cells varied between 2 and 10 mm, their height between 2 and 8 mm and their width between $1^1/_2$ and 8 mm.

In the *second year* (children of 8 and 24 months) the length of the anterior ethmoidal cells varied between $2^1/_2$ and $4^1/_2$ mm, their heigth between 4 and 10 mm, and their width between $1^1/_2$ and 4 mm. The length of the posterior ethmoidal cells was 4 mm, their heigth 5 mm, and their width 3 mm.

In the *third year* (child of 3) the length of the anterior ethmoidal cells was between 6 and 7 mm, their height between 6 and 7 mm, and their width between 3 and 4 mm. The length of the posterior ethmoidal cells was between 6 and 7 mm, their height between 6 and 7 mm, and their width between 3 and 4 mm.

Iu the *fourth year* (child of $3^1/_2$) the length of the anterior ethmoidal cells varied between 3 and 8 mm, their height between $3^1/_2$ and 11 mm, and their width between 3 and 6 mm. The length of the posterior ethmoidal cells varied between $3^1/_2$ and 11 mm, their height between $3^1/_2$ and 10 mm, and their width between 3 and 11 mm.

In the *sixth year* (child of 6) the length of the anterior ethmoidal cells varied

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[1]) Über die Nasenhöhle der höheren Säugetiere und des Menschen. Morphol. Jahrb. 1891.
[2]) l. c.
[3]) l. c.
[4]) l. c.
[5]) l. c.
[6]) l. c.

between 5 and 6 mm, their height between 8 and 10 mm, and their width between 6 and 7 mm.

In the *eighth year* (child of 7 1/2), the length of the anterior ethmoidal cells varied between 5 and 6 mm, their height between 8 and 13 mm, and their width was 7 mm; the length of the posterior ethmoidal cells was between 11 and 17 mm, their width between 6 and 9 mm, and their height was 10 mm.

With regard to the results of our investigations of the anterior and posterior ethmoidal cells, which comprise the period from birth down to the eighth year, I would repeat the concluding remarks of the chapters on the frontal sinus and maxillary antrum (Pp. 6, 10).

The Sphenoidal Sinus.

The development of the sphenoidal sinus has received a comparatively detailed description in anatomical text-books, particularly as regards the influence of the sphenoidal conchae upon the development of the sphenoidal sinus and the posterior ethmoidal cells, as well as the ossification and consolidation of the sphenoidal conchae. The investigations of Toldt[1]), Zuckerkandl[2]) and Spee[3]) which deal with this subject are described in the treatises of these authors, whilst the statements of Toldt relative to the sphenoidal conchae have also been adopted by rhinological writers. Toldt regards the sphenoidal sinuses in the light of the most posteriorly situated ethmoidal cells, a view with which Zuckerkandl however does not agree. We will not enter into the details of this question, as it is only of embryological interest.

Merkel[4]) dates the first appearance of the sphenoidal sinus to the seventh year.

According to Mihálkovics[5]) "the first rudiments of the sphenoidal sinus are seen in the third month, but it is not until the sixth or seventh year that the body of the sphenoid bone forms the wall of the cavity."

According to Zuckerkandl[6]) "in the new-born infant and in young children the orifice of the germ of the sphenoidal sinus is narrowed by a semicircular fold of mucous membrane projecting from below. In the third year the sphenoidal sinus attains the size of a pea."

Spee[7]) states that the sphenoidal sinus is originally an open diverticulum of the nasal cavity; similarly, Chiarugi[8]) writes that the sphenoidal sinus is a diverticulum of the nasal cavity which develops about the third year.

According to Chiari[9]) "traces of the sphenoidal sinus are seen as early as the third foetal month in the shape of a double saccule, which soon afterwards increases in size."

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[1]) Osteologische Mitteilungen. Jahrb. f. Naturwissenschaften. 1882, vol. III—IV.
[2]) l. c.
[3]) l. c.
[4]) l. c.
[5]) l. c.
[6]) l. c.
[7]) l. c.
[8]) l. c.
[9]) l. c.

Sphenoidal Sinus.

Age	Plane of Section	Height mm	Length mm	Width mm	Remarks
Newborn infant	horizontal	4	2	2	Sphenoidal ostium 1/2 mm wide. Plate 10 *ss, os*
1 month	coronal	3	2	2 1/2	Sphenoidal ostium 1 1/4 mm wide. Plate 13 *ss, os*
do.	do.	4	2	2 1/2	Sphenoidal ostium 1 mm wide.
2 months		1	1	1	Sphenoidal ostium 1/2 mm wide.
4 months	coronal	2	2	2	Sphenoidal ostium 1/2 mm wide. Plate 22 *os*
4 1/2 months	longitud. vertical	4	2 1/2	2	Sphenoidal ostium 1 mm wide. Plate 30 *ss, os*
5 1/2 months	coronal	2	2	2	Sphenoidal ostium 1 1/2 mm wide. Plate 37 *os*
6 1/2 months	longitud. vertical	—	—	—	Sphenoidal ostium 2 mm wide. Plate 42 *os*
do.	coronal	5	4	4 1/2	Plate 43 *ss*
7 months	do.	2	2	2	Sphenoidal ostium 1/2 mm wide. Plate 45 *os*
8 months	horizontal	6	5 1/2	5	Sphenoidal ostium 1 mm wide. Plate 47 *os*
do.	do.	9	6	5	Sphenoidal ostium 1 mm wide. Plate 49 *ss, os*
14 months	coronal	5	4 1/2	4 1/2	Sphenoidal ostium 1 mm wide. Plate 57 *os*
do.	do.	5	4 1/2	4 1/2	Sphenoidal ostium 1 mm wide. Plate 59 *ss, os*
15 months	do.	3 1/2	5	3	Sphenoidal ostium 1 1/2 mm wide. Plate 62 *os*
1 1/2 years	do.	2	3	2	Sphenoidal ostium 1 mm wide. Plate 67 *os*
2 years	do.	6	5	7	Sphenoidal ostium 1 mm wide. Plate 71 *os*
do.	longitud. vertical	4	4 1/2	6 1/2	Sphenoidal ostium 1 mm wide. Plate 72 *ss*
3 years	do.	6	6	9	Situation of sinus and ostium clearly visible. Plate 73, 74 *ss, os*
3 1/2 years	coronal	5	6	7	Sphenoidal ostium 1/2 mm wide. Plate 80 *os*
do.	longitud. vertical	3 1/2	4 1/2	7	Sphenoidal ostium 1 1/2 mm wide. Plate 81 *os, ss*
6 years	do.	10	7	12	Sphenoidal ostium 1 1/2 mm wide. Plate 86 *os*
do.	do.	10	6	12	Sphenoidal ostium 1 1/2 mm wide. Plate 86 *os*
7 1/2 years	do.	12	13	9	Sphenoidal ostium 2 mm wide. Plate 88 *ss*
do.	coronal	8	2	11	Sphenoidal ostium 4 mm wide, of oblong shape. Plate 90 *os*

The statement of Zarnico[1]) is to the effect that "in the new-born infant the cavity is as large as a pin's head and opens through a fine canal at the level of Santorini's Concha. In the third year it then begins to grow more rapidly, and at puberty has reached the spheno-occipital synchondrosis".

Haike[2]) examined the sphenoidal sinus by means of skiagrams: in the sixth year the sinus was of the size of a bean; in the eighth and fourteenth year it was of considerable size: in a youth of sixteen the sinus was represented by a depression measuring 3 mm in the longitudinal direction, identification of the depression being obtained by the introduction of a probe. With the conclusions to be drawn from the results of skiagraphic examination of the sphenoidal sinus, we shall deal in the second section.

The foregoing table gives the age, plane of section, and measurements of the sphenoidal sinus and its ostium, together with a few remarks.

In connection with this table we will give a brief summary of the measurements of the sphenoidal sinus and its ostium according to the different ages.

In the *first year* (new-born infants and children of 1, 2, 4, $4^1/_2$, 5, $5^1/_2$, $6^1/_2$, 7 and 8 months) the height of the sphenoidal sinus varied from 1 to 6 mm, its length from 1 to 5 mm, and its width from 1 to 6 mm. The diameter of the circular sphenoidal ostium was between $^1/_2$ and 2 mm.

In the *second year* (children of 14, 15, 18 and 24 months) the height of the sphenoidal sinus varied from 2 to 6 mm, its length from 3 to 5 mm, and its width from 2 to 7 mm. The diameter of the circular sphenoidal ostium was between 1 and $1^1/_2$ mm.

In the *third year* (child of 3) the heigth of the sphenoidal sinus was 6 mm, its length 6 mm, and its width 9 mm. The diameter of the circular sphenoidal ostium was 2 mm.

In the *fourth year* (child of $3^1/_2$) the heigth of the sphenoidal sinus varied between $4^1/_2$ and 6 mm, its length between $3^1/_2$ and 5 mm, its width was 7 mm. The diameter of the circular sphenoidal ostium was $1^1/_2$ mm.

In the *sixth year* (child of 6) the length of the sphenoidal sinus varied between 6 and 7 mm, its height was 10 mm, and its width 12 mm. The diameter of the circular sphenoidal ostium was $1^1/_2$ mm.

In the *eighth year* (child of $7^1/_2$ years) the height of the sphenoidal sinus was between 8 and 12 mm, its length between 12 and 13 mm, its width was 11 mm. The width of the oval sphenoidal ostium was 4 mm.

In concluding this summary of data relative to the sphenoidal sinus and its ostium we would again refer to the concluding remarks of the chapters on the frontal sinus (page 6), the maxillary antrum (page 10) and the ethmoidal cells (page 12).

II.

We will now proceed to supplement the anatomical results given in the first chapter by certain practical remarks. Since the publications dealing with affec-

[1]) l. c.
[2]) l. c.

Author	Age of patient	Cavity diseased	Treatment	Result	Remarks
Killian [1])	15 months	Frontal sinus	Operation	Death	Scarlet Fever; thrombophlebitis of sinus.
Lange [2])	2 1/3 years	Maxillary antra	Operation	Cure	Scarlet Fever.
E. Meyer [3])	3 1/2 years	Frontal sinus, ethmoidal cells and maxillary antrum	Operation	Cure	Scarlet Fever.
Lange [4])	4 years	Ethmoidal cells on both sides	Operation	Cure	Scarlet Fever.
Preysing [5])	5 years	Frontal sinus and ethmoidal cells	Operation	Cure	Scarlet Fever. The right frontal sinus was of the size of a pea.
Lange [6])	5 years	Both frontal sinuses and ethmoidal cells	Operation	Cure	Scarlet Fever. Right frontal sinus size of a bean, left frontal sinus size of a cherry.
Killian [7])	6 years	Frontal sinus, ethmoidal cells, sphenoidal sinus and maxillary antrum	Operation	Cure	Scarlet Fever. Left frontal sinus size of a bean.
Preysing [8])	years	Ethmoidal cells and sphenoidal sinus of one side	Operation	Cure	Scarlet Fever. Orbital abscess. The ethmoidal cells and sphenoidal sinus were opened up from the orbit.
Preysing [9])	6 years	Ethmoidal cells and sphenoidal sinus of one side	Operation	Cure	
Lange [10])	6 1/4 years	Frontal sinus	Operation	Cure	Scarlet Fever. Left frontal sinus size of a hazel-nut
Haenel [11])	6 1/2 years	All the accessory sinuses	Operation	Cure	Scarlet Fever.
Lange [12])	6 1/2 years	Right ethmoidal cells	Operation	Cure	Scarlet Fever. Abscess at the inner canthus.
Hinsberg [13])	7 years	Maxillary antrum and ethmoidal cells	Operation	Cure	Scarlet Fever.
Killian [14])	7 years	Frontal sinus	Operation	Cure	Scarlet Fever.
Hoffmann [15])	7 years	Frontal sinus, ethmoidal cells and maxillary antrum	Operation	Cure	Scarlet Fever. Abscess of the orbital wall.
Haike [16])	8 years	Maxillary antrum	Operation	Cure	Punction and irrigation.
Scholle [17])	9 years	Frontal sinus	Operation of ear	Death	Scarlet Fever. Operation of ear without effect. Post mortem examination revealed diseased frontal sinus and meningitis.
Tilley [18])	9 years	Frontal sinus	Operation	Cure	Scarlet Fever.
Ónodi	9 1/2 years	Frontal sinus	Operation	Cure	Scarlet Fever.
Scholle [19])	10 years	Frontal sinus	Operation of ear	Death	Scarlet Fever. Operation of ear without effect. Post mortem examination revealed diseased frontal sinus and meningitis.
Haike [20])	11 years	Maxillary antrum	Operation	Cure	Punction and irrigation.
Killian [21])	12 years	Frontal sinus, ethmoidal cells and maxillary antrum	Operation	Cure	Scarlet Fever. Ethmoidal cells opened from the nasal cavity. Irrigation of frontal sinus and maxillary antrum.
Haike [22])	15 1/2 years	Maxillary antrum, ethmoidal cells and sphenoidal sinus	Operation	Cure	

1) Die Erkrankungen der Nebenhöhlen der Nase bei Scharlach. Zeitschr. f. Ohrenheilk. 1908. 2) Medizinische Klinik. 1906. 3) Berliner klin. Wochenschr. 1905. 4) l. c. 5) Zeitschr. f. Ohrenheilk. 1898. 6) l. c. 7) l. c. 8) Münchener mediz. Wochenschr. 1905. 9) l. c. 10) l. c. 11) Verhandl. d. Vereins süddeutscher Laryngologen. 1908. 12) l. c. 13) Killian l. c. 14) l. c. 15) Zeitschrift f. Augenheilk. Vol. XVI. 16) l. c. 17) Detesk. Med. 1904. Killian l. c. 18) Journal of Laryngology. 1905. 19) l. c. 20) l. c. 21) l. c. 22) l. c.

tions of the accessory sinuses in childhood are steadily increasing, we may conclude that diseases of these cavities occur more frequently in childhood than was generally recognised in the past. It should be regarded as an etablished fact that when children suffer from frequent attacks of acute cold in the head, some of the accessory sinuses are also affected, and that as a rule infectious diseases attack the partially developed accessory sinuses. In the first years of childhood it is difficult to ascertain such disease of the different cavities; besides, at this age, the possibility of treating such affections is somewhat limited.

It need hardly be pointed out that many fatal cases of this disease remain obscure, and that only a small number of *post-mortem* reports has hitherto been published. In 62 out of 394 autopsies performed on children, Harke[1]) opened the accessory sinuses; he found them diseased in 52 cases which were between 9 months and 15 years of age: in 47 cases the maxillary antra, in 3 the ethmoidal cells, and in 2 the sphenoidal sinuses were affected. In an autopsy performed on a child of 3 years, Harke found empyema of the maxillary antrum, whilst the frontal and sphenoidal sinuses were not developed. Wolff[2]) performed *post mortem* examinations in two children of 3, two of 5 and one of 6 years; the sphenoidal sinus was undeveloped in both children of 3, one child of 5 and one of 6 years. Wertheim[3]) found well-developed frontal sinuses in a child of two years and two months; in a child of five, the ethmoidal cells were diseased and the sphenoidal sinuses well-developed, in another child of five all the accessory sinuses were developed, whilst in a child of eight the frontal and sphenoidal sinuses were absent.

The foregoing table (Page 15) comprises the cases which have come under our notice, in which diseases of the accessory sinuses were ascertained and treated in children. With exception of the cases of Haike all the cases published suffered from scarlatinal affections of the nose.

With regard to the diagnostic employment of *electrical transillumination* of the frontal sinus and maxillary antrum, and to the *skiagraphic examination* of the accessory sinuses in childhood, the reader is referred to my monograph on the frontal sinus[4]) where these questions are discussed in detail. Our investigations which were performed on 1200 skulls demonstrated the unreliability of electrical transillumination. For by this method absence of both frontal sinuses was diagnosed in 30 per cent., absence of the right frontal sinus in 10 per cent., of the left frontal sinus in 10 per cent.; yet skiagraphical examination carried out on the same skulls revealed absence of both frontal sinuses in only 5 per cent., absence of the right frontal sinus in less than 1 per cent, and of the left frontal sinus in the same ratio. We also noted the drawbacks of skiagraphic examination and discussed why it can not be regarded as an infallible method; but as to its superiority to transillumination there can be no doubt. The determination of the absence or the extent of the frontal sinuses by means of skiagraphy has greatly assisted the

[1]) Beitr. zur Pathol. u. Therap. d. oberen Atmungswege. Wiesbaden 1895.
[2]) Zeitschr. f. Hygiene 1895, vol. XIX.
[3]) Arch. f. Laryngologie, vol. XI.
[4]) l. c.

progress of surgical treatment; in diagnosis, also, skiagraphy represents a valuable aid. Needless to say, the chief importance attaches to the clinical investigation and to the result of rhinoscopic examination. The same argument holds good for the maxillary antrum, where electrical transillumination and skiagraphy are also employed as aids to diagnosis, and for the ethmoidal cells and the sphenoidal sinus with reference to skiagraphy. Corresponding views on the electrical transillumination of the frontal sinus and the maxillary antrum of children are expressed by Haike [1]): "Whilst even in adults the results obtained by this method must be used with caution, it proves utterly unreliable in children." We will therefore limit ourselves to a consideration of the skiagraphic examination of the accessory sinuses in children. With regard to the frontal sinus, even in adults skiagraphy has furnished erroneous results; thus in the cases of Albrecht [2]), Wassermann [3]), Chiari [4]), Ónodi [5]) and others, the frontal sinus appeared fogged or obscured in the skiagram, yet this appearance was not confirmed by the operation.

Obviously, the employment of skiagraphy for purposes of diagnosis is still more limited in childhood. Haike himself says: "The difficulties in diagnosing empyema of the frontal sinus in children are even greater than those encountered in adults. In drawing any conclusions from the skiagram still greater care is required in order to avoid errors. For we observe more often than in the fully developed cavity a certain amount of blurring and indistinctness of the outlines, although the sinus may be perfectly healthy. In consequence of this indistinctness of the pictures, which is due to the anatomical condition of the developing frontal sinus, it is almost always advisable to supplement the picture by a lateral skiagram, and occasionally even this may not clear up every doubt. In view of these difficulties in judging the picture, it becomes necessary, so far as possible, to consider also the clinical features of the case, and in older children to employ the other methods of examination in order to secure the diagnosis."

Besides the skiagrams of the normal frontal sinus by Haike which were mentioned previously, only a few cases have been published where the skiagram indicated disease of the frontal sinus, viz. a case of 13 and one of 16 years. Cases of disease of the sinus, treated surgically, in younger children have not been recorded by Haike [6]). In the published cases which have come to our knowledge the diseased condition of the frontal sinus was determined and operation performed without the aid of skiagraphy; the only exception being the case of Killian [7]), a child of twelve, where the antrum, the frontal sinus and the ethmoidal cells were undoubtedly blurred in the skiagram. In the first years of childhood the value of skiagraphy and the conclusions to be drawn from it, so far as the frontal sinus is concerned, are very limited; this is shewn by our results and pictures where, with few exceptions, the sinus in the first years only reaches the lower

[1]) l. c.
[2]) Archiv f. Laryngologie, 1907.
[3]) Verhandl. des intern. Laryngologenkongresses. 1908.
[4]) Archiv f. Laryngologie. 1908.
[5]) „Stirnhöhle", Vienna, 1909.
[6]) l. c.
[7]) l. c.

limit of the basal portion of the squama or exists as a definite cavity only in the inferior basal portion of the squama. As a rule, therefore, a skiagram taken during the first years of childhood will shew not only the frontal sinus, but also the adjoining anterior ethmoidal cells; in case of their being diseased, it is therefore also applicable. From what has already been said, it will hardly be necessary to point out, that in the first place the clinical signs and, wherever possible, inspection of the nasal cavity should be taken into consideration. In such cases however, where the frontal sinus can be ascertained in the frontal region, and particularly where there is unilateral disease of the frontal sinus, the skiagram may be of the same value as in the adult.

In the first year we found the largest *frontal sinus* to be 9 mm long, 8 mm high, and 6 mm wide; the early form of the frontal sinus attained the base of the squamous portion of the frontal bone towards the end of the first year. In the second year we found the largest frontal sinus to be 9 mm high, $5^1/_2$ mm long, and 7 mm wide. Early in the second year, in a child of 15 months, we saw the frontal sinus situated in the basal part of the squamous portion; in another child of the same age the skiagram of the forehead shewed a frontal sinus measuring 3 to $3^1/_2$ mm in height and 5 to $5^1/_2$ mm in width. In a child of 15 months Killian[1]) opened the diseased frontal sinus. In a child of three and a half years we found the frontal sinus $6^1/_2$ mm high, 6 mm long and 5 mm wide, in skiagrams the frontal sinus was shewn to be 6 to 9 mm high and 4 to 6 mm wide. In a case of E. Meyer[1]), a child of the same age, the diseased frontal sinus was opened and cured. These facts prove that even in the first years the frontal sinus may sometimes be seen in the skiagram; its diseased condition may thus be recognised and radically cured.

In the cases of Preysing[2]) and Lange[3]) the diseased frontal sinus was opened and cured in children of five years. In the sixth year we found a frontal sinus measuring 17 to 18 mm in height, 10 to 13 mm in length and 11 to 12 mm in width, and in one case the skiagram shewed a frontal sinus 6 to $8^1/_2$ mm high and 6 to $8^1/_2$ mm wide. In Killian's[4]) case disease of the frontal sinus was cured by operation in a child of six. In the case of Lange[5]) the diseased frontal sinus was successfully opened in a child six and a quarter years old. In the cases of Hoffmann[6]) and Killian[7]) the diseased frontal sinus was cured by operation in children of seven years. At seven and a half years of age we found a frontal sinus 14 to 17 mm high, 4 to 11 mm long and 7 to 9 mm wide. At eight and a half years a skiagram of the forehead shewed the frontal sinus measuring 10 to 22 mm in height and 10 to 29 mm in width. In Tilley's[8]) case the diseased frontal sinus was successfully opened in a child of nine.

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[1]) l. c.
[2]) l. c.
[3]) l. c.
[4]) l. c.
[5]) l. c.
[6]) l. c.
[7]) l. c.
[8]) l. c.

In our case, disease of the frontal sinus was cured by operation in a child of nine and a half years. The foregoing are the cases that have come to our knowledge in children under ten. In the following years the frontal sinuses shew a varying degree of development in the frontal region: this is illustrated by the skiagrams published by Haike[1]), as well as by the figures and measurements given by us. The experiences which have been gained hitherto are quite insufficient to allow a definite conclusion to be drawn as to the diagnostic value of skiagraphy in children; there can be no doubt that on the whole it is a valuable supplementary method of diagnosis. On the other hand, it is a necessary consequence of the peculiarities in the form and situation of the frontal sinus which have already been noted that the value of such skiagrams taken in early childhood is more limited and that their drawbacks are perhaps greater than in adults. For this reason, great importance attaches to the clinical signs and to the result of rhinoscopic examination. The difficulties encountered in such examinations are due to the narrowness of the nasal cavity and the necessarily incomplete character of such investigations in the first years of life; endonasal inspection revealing the pathological secretion, but failing to determine its origin. In such cases occasionally the skiagram considered in conjunction with the clinical signs may give a decisive indication for the mode of treatment.

In the majority of the cases quoted previously it will be remembered, that surgical treatment was carried out. Among these the case of E. Meyer[2]) is unique, for here, in a child of three and a half years, the maxillary antrum was first opened and from here the frontal sinus was exposed together with the ethmoidal cells. Otherwise the region of the frontal sinus with the ethmoidal cells was opened by an arc-shaped incision beginning at the root of the nose and following the line of the eye-brow. In the first years of childhood the frontal sinus can not be reached from the forehead owing to its peculiar shape and situation which have been described previously. The exceptions which have already been mentioned and illustrated, cannot of course be taken into account. In young children, therefore, the frontal sinus is exposed from a spot close to the inner canthus where the frontal bone, the nasal bone and the frontal process of the maxilla meet. The line of incision already mentioned together with this spot serve as a guide not only for operations on the frontal sinus, but also for exposing and clearing the ethmoidal labyrinth and the sphenoidal sinus. This question will be considered in detail subsequently. Naturally, in all those cases where the skiagram and the age of the patient point to the existence of the sinus in the frontal region, the ordinary method of resection and radical operation of the sinus is employed. Particularly for surgical treatment the skiagram is valuable, since it allows us to determine the presence or absence of the frontal sinus in the region of the forehead and to gain an idea as to its extent.

The *Maxillary Antrum* is the cavity where diseased conditions have been observed most often. We have shewn that the measurements of the antrum at birth, and in the first, second, third, fourth and eighth year vary considerably,

[1]) l. c.
[2]) l. c.

the longitudinal diameter however being greatest. Until the fourth year the height of the cavity was intermediate between its length and its width. In the fourth and eighth years, however, the width of the antrum had already exceeded the height and was second only to its length. The skiagrams of children taken by Haike[1]) have already been mentioned; besides normal antra, he saw diseased ones in children of $4^1/_2$, 7, 8, $10^3/_4$ and 11 years. In such pictures the antrum appeared blurred and ill-defined. In some cases the skiagram furnished a decisive argument in favour of an operation. Yet Haike[2]) himself states that in one case the dark shadow in the region of the antrum did not indicate the presence of pus in the cavity, whilst in another case no difference was observed between the two antra, although there was a collection of serous fluid in one of them. He remarks as follows: "Naturally, careful consideration of the pictures will protect us against mistakes due to faults in the photograph and other causes, which might give a semblance of disease. Here again, we would point out that the greatest importance attaches to the clinical signs and to the results of rhinological examination, although we admit that skiagraphy represents a valuable aid to diagnosis. Of the different methods of examination those chiefly employed are endonasal punction and irrigation of the antrum. Taken in conjunction with these methods, the skiagram may convey information as to the extent and depth of the antrum. In the adult, punction of the antrum is usually performed from the lower meatus, from where the endonasal resection of the antrum is also carried out. In the first years of childhood this method is beset by several difficulties." Mihálkovics was one of the first to point out the narrowness of the lower meatus and its impermeability: "In children the meatus is very low and narrow, the free edge of the lower concha meets the floor of the nasal cavity, its thick mucous membrane entirely occludes the lower meatus; the middle meatus alone is permeable, so that in the infant only this meatus and the corresponding portion of the common nasal passage can serve as respiratory space."

According to Zarnico[3]) exposure of the maxillary antrum in young children prior to the second dentition is best attempted from the middle meatus. It should not be performed from the other spots until after the eruption of the first permanent molars."

Haike[4]) remarks "that until the time when the floor of the cavity has quite, or almost, attained its permanent depth, i. e. about the twelfth year, it is hardly accessible for punction from the lower meatus. One might easily penetrate into the bone below the antrum." Cases are recorded where even in adults attempts at punction from the lower meatus failed, the canula perforating the thin wall of the antrum and emerging in the tissues of the cheek. Thus, too, in a child of $11^3/_4$ years, Haike[5]) records the canula having penetrated into the cheek, whilst in a child of 8 it perforated the spongy bone below the antrum.

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[1]) l. c.
[2]) l. c.
[1]) l. c.
[2]) l. c.
[3]) l. c.

Our descriptions and illustrations of the morphological conditions of the maxillary antrum shew that punction should be performed from the middle meatus, although in exceptional cases we have found the antrum adjoining the lower meatus even in the first years of childhood. At the same time we would point out the comparatively slight extent of the antrum in the transverse direction. This is important, since if the canula were introduced too forcibly, it might easily penetrate the opposite, lateral wall of the cavity and injure the cheek. In children under ten years of age, radical operation of the antrum has repeatedly been performed, viz. by E. Meyer[1]) in a child of $3^1/_2$, by Killian in a child of 6, by Haenel[2]) in a child of $6^1/_2$, and by Hoffmann[3]) in a child of 7 years, the treatment proving successful. Our illustrations in natural size and the measurements of the antrum recorded will prove of use both in endonasal and in radical operations on this cavity.

Disease of the *Ethmoidal Cells* has usually been observed in conjunction with disease of the frontal and sphenoidal sinus and of the maxillary antrum.

Skiagrams have been published by Killian[4]) of the case of a child of twelve, where the frontal sinus, ethmoidal cells and maxillary antrum appeared markedly blurred; also in the cases of Haike[5]), children of 4, $4^1/_2$, 8, $10^3/_4$, 11 and 12 years, in all of which the ethmoidal cells appeared obscured and indistinct; in two of these cases only the ethmoidal cells were affected, in the remaining five the antrum was also diseased. In the first years of childhood it is difficult to distinguish the ethmoidal cells from the early form of the frontal sinus; the frontal sinus can only be differentiated, if it is already situated in the region of the forehead. In consequence of the difficulty of rhinoscopic examination at this age, Haike[6]) considers "that a reliable diagnosis of ethmoidal affections in children can only be obtained by skiagraphy." On the other hand, he does not over-estimate the value of the skiagram, as is shewn by the following passage: "In young children the picture of the ethmoidal cells in the skiagram is so narrow that it is sometimes difficult to arrive at a definite diagnosis; thus, even moderate congestion of the mucous membrane may veil the lumina of the small ethmoidal cells"; and again; "With regard to the question whether the anterior or posterior ethmoidal cells are affected, the skiagram can give no more information in children than in the adult".

The greater part of the cases mentioned by us were cured by operation without consulting the skiagram. Together with the clinical signs and the evidence of rhinoscopy, the skiagram may doubtless be employed as a valuable diagnostic aid, provided that its drawbacks are duly considered. Our pictures and measurements shew that even in the first years both the anterior and the posterior ethmoidal cells are fairly well developed. The narrowness of the nasal cavity and its meatuses explains why it is difficult to expose the ethmoidal cells by endonasal

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[1]) l. c.
[2]) l. c.
[3]) l. c.
[4]) l. c.
[5]) l. c.
[6]) l. c.

operation: endonasal treatment thus being practically limited to irrigation or suction. The situation and extent of the ethmoidal cells however provide arguments in favour of radical operation. This operation was performed in one case through the maxillary antrum, in most of the other cases together with resection of the frontal sinus. Obviously, the ethmoidal labyrinth may also be exposed by resection of the orbital plate from the orbit. For such operations, the morphological conditions of the anterior and posterior ethmoidal cells described and illustrated by us will be found instructive and useful. In the case of E. Meyer[1]) the diseased ethmoidal cells of a child of $3^1/_2$ years were successfully exposed and cleared out from the maxillary antrum. In the cases of Preysing[2]) and Lange[3]) — children of five years — the diseased ethmoidal cells were opened together with the frontal sinus, the affection being cured. In the cases of Preysing[4]), children of six, the diseased ethmoidal cells as well as the sphenoidal sinus, in Killians[5]) case, also a child of six, the diseased ethmoidal cells and the frontal sinus, were operated and cured. In Lange's[6]) case, a child of $6^1/_2$ years, the diseased ethmoidal cells only, and in Haenel's[7]) case, also a child of $6^1/_2$ years, the ethmoidal cells together with the frontal sinus were cured by surgical treatment. In Hoffmann's[8]) case, a child of seven, the diseased ethmoidal cells as well as the frontal sinus were cured by operation. We have mentioned these cases in children under ten years of age, since the success obtained with them is a strong argument in favour of radical operation. Complications may of course arise from the orbit, the disease of the ethmoidal cells spreading to the orbit: in such cases, this must also receive surgical treatment.

With regard to the *Sphenoidal Sinus*, its disease has been observed far more rarely in children. By skiagraphic examination Haike twice shewed the absence of the sphenoidal sinus in children of $2^1/_2$ and 4 years respectively, whilst in skiagrams of a child of 6 and one of 8 years he found decisive evidence of their existence. He mentions one case, a patient aged $15^1/_2$ years, where the sphenoidal sinus appeared obscured. Diagnosis of a diseased condition of the sphenoidal sinus has to deal with the same difficulties which have been mentioned for the frontal sinus and the ethmoidal cells. Haike[9]) himself remarks: "It is true, that the scope of the skiagram is considerably restricted." In view of the difficulty of endonasal investigation Haike hopes to obtain conclusive evidence from the skiagram alone. Yet he is fain to admit,' "that we must always remain conscious of the limitations of the method. In older children, on the other hand, one ought always to be guided more by the result of clinical examination." The rule that the clinical signs should be considered principally and the skiagram only be used

[1]) l. c.
[2]) l. c.
[3]) l. c.
[4]) l. c.
[5]) l. c.
[6]) l. c.
[7]) l. c.
[8]) l. c.
[9]) l. c.

as a secondary aid to diagnosis, is particulary applicable to diseases of the sphenoidal sinus in children. Our experience on this subject is but scanty. In the two cases published by Preysing [1]), in children of 6 years, the sphenoidal sinus was successfully operated upon together with the diseased ethmoidal cells; in Haenel's [2]) case, also a child of six, where all the accessory sinuses were well developed and diseased, a cure was effected by radical operation. We are of opinion that the details of the sphenoidal sinus described and figured in this book will prove instructive for operations carried out in the first years of childhood; resection of this sinus should be performed through the ethmoidal labyrinth. In later years, and also in certain exceptional cases which we have seen in young children, endonasal treatment of the sphenoidal sinus may be attempted. Its success will depend upon the degree of development of the sinus.

We conclude the synopsis of our results in the hope that the sections reproduced in natural size and the accurate measurements given in every case may have served to extend and amplify our knowledge of the anatomy and development of the accessory sinuses in childhood, and that this more accurate information will prove helpful in the diagnosis and surgical treatment of the affections of these sinuses occuring in childhood.

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[1]) l. c.

[2]) l. c.

Tafel 1.

Frontalschnitt.

Natürliche Grösse. — 6 1/2 Monate alter Fötus.

Planche 1.

Coupe frontale.

Grandeur nature. — Foetus de 6 mois 1/2.

Plate 1.

Coronal section.

Natural size. — Foetus of 6 1/2 months.

Tafel 1.

Natürliche Grösse. — $6\frac{1}{2}$ Monate alter Fötus.

sm sinus maxillaris, *cea* cellula ethmoidalis, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatus narium medius, *pu* processus uncinatus, *cs* concha superior, *mns* meatus narium superior, *s* septum.

Der Frontalschnitt eines $6\frac{1}{2}$ Monate alten Fötus zeigt die von der Nasenscheidewand (*s*) getrennten Nasenhöhlen, die untere (*ci*), mittlere (*cm*) und obere (*cs*) Nasenmuschel, den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang, ferner die Kieferhöhle (*sm*) und die vordere Siebbeinzelle (*cea*). Die Kieferhöhle (*sm*) ist 3 mm lang und $1\frac{1}{2}$ mm breit.

Planche 1.

Grandeur nature. — Foetus de 6 mois $\frac{1}{2}$.

sm sinus maxillaire, *cea* cellule ethmoïdale, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *pu* processus uncinatus, *cs* cornet supérieur, *mns* méat supérieur, *s* septum.

Coupe frontale d'un foetus de 6 mois $\frac{1}{2}$ montrant les fosses nasales séparées par le septum (*s*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), de plus le sinus maxillaire (*sm*) et la cellule ethmoïdale antérieure (*cea*). Le sinus maxillaire (*sm*) a 3 millim. de long, et $1\frac{1}{2}$ millim. de large.

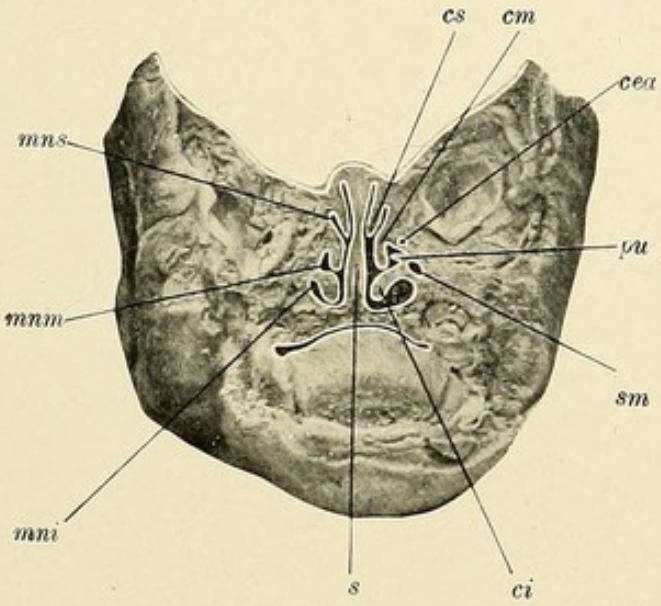
Plate 1.

Natural size. — Foetus of $6\frac{1}{2}$ months.

sm maxillary antrum, *cea* ethmoidal cell, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *pu* uncinate process, *cs* upper concha, *mns* upper meatus, *s* septum.

Coronal section through the head of a foetus $6\frac{1}{2}$ months old, shewing the nasal fossae separated by the septum (*s*), the lower (*ci*), middle (*cm*) and upper (*cs*) concha, the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, the maxillary antrum (*sm*) and the anterior ethmoidal cell (*cea*). The maxillary antrum (*sm*) is 3 mm long and $1\frac{1}{2}$ mm wide.

Tafel 1.



Tafel 2.

Sagittalschnitt.

Natürliche Grösse. — 8 Monat alter Fötus.

Planche 2.

Coupe sagittale.

Grandeur nature. — Foetus de 8 mois.

Plate 2.

Longitudinal vertical section.

Natural size. — Foetus of 8 months.

Tafel 2.

Natürliche Grösse. — 8 Monat alter Fötus.

rf recessus frontalis, *hs* hiatus semilunaris, *pu* processus uncinatus, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *t* tuba Eustachii, *cr* cysta retropharyngealis.

Der Sagittalschnitt eines 8 Monat alten Fötus zeigt die laterale Nasenwand nach Entfernung der mittleren Nasenmuschel. Man sieht die Ansatzlinie der mittleren Nasenmuschel (*cm*), durch ihre Entfernung ist freigelegt das Gebiet des hiatus semilunaris (*hs*), welchen oben die Lamelle der bulla ethmoidalis und unten der processus uncinatus (*pu*) begrenzt. Oberhalb des scharf abgegrenzten vordersten Teiles des hiatus semilunaris (*hs*) ist der ausgeprägt vorhandene recessus frontalis (*rf*) zu sehen, welcher sich in einer Ausdehnung von 4½ mm nach oben und vorne erstreckt. Oberhalb der Ansatzlinie der mittleren Muschel (*cm*) ist der obere Nasengang (*mns*) und die obere Nasenmuschel (*cs*), rückwärts die Mündung der Eustachschen Röhre (*t*) und die in der Tafel 3 erwähnte Retropharyngealzyste (*cr*) zu übersehen.

Planche 2.

Grandeur nature. — Foetus de 8 mois.

rf recessus frontal, *hs* hiatus semilunaire, *pu* processus uncinatus, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur, *t* trompe d'Eustache, *cr* kyste rétropharyngé.

Coupe sagittale d'un foetus de 8 mois montrant la paroi latérale de la fosse nasale après section du cornet moyen. On voit la ligne d'insertion du cornet moyen (*cm*). Par la section du cornet moyen la région de l'hiatus semilunaire (*hs*) est devenue visible. Ses limites sont en haut la lame de la bulle ethmoïdale et en bas le processus uncinatus (*pu*). Au dessus de la partie antérieure de l'hiatus semilunaire (*hs*) bien limitée se trouve le recessus frontal (*rf*) très marqué, s'étendant sur une longueur de 4½ millim. en haut et en avant. Au dessus de la ligne d'insertion du cornet moyen (*cm*) se trouvent le méat supérieur (*mns*) et le cornet supérieur (*cs*). En arrière, l'ouverture de la trompe d'Eustache (*t*) et le kyste rétropharyngé (*cr*) mentionné sur le planche 3.

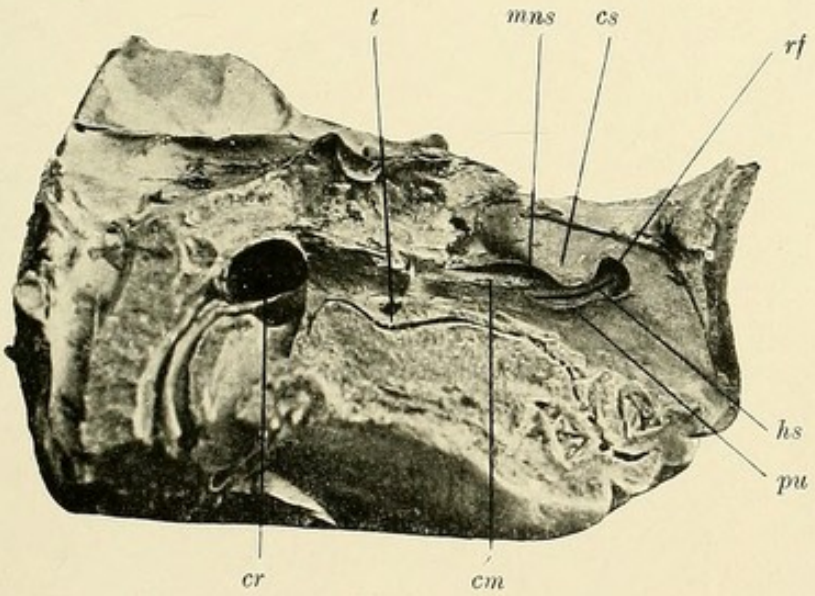
Plate 2.

Natural size. — Foetus of 8 months.

rf frontal recess, *hs* semilunar hiatus, *pu* uncinate process, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *t* Eustachian tube, *cr* retropharyngeal cyst.

Longitudinal vertical section through the head of a foetus 8 months old, shewing the lateral aspect of the nasal fossa after removal of the middle concha. The ridge of insertion of the middle concha (*cm*) is visible. Through the removal of this concha the region of the semilunar hiatus (*hs*) has been exposed. It is bounded above by the lamina of the ethmoidal bulla, below by the uncinate process (*pu*). Above the sharp anterior margin of the semilunar hiatus (*hs*) the well marked frontal recess (*rf*) may be seen extending upwards and forwards for a distance of 4½ mm. Above the ridge of insertion of the middle concha (*cm*) are the upper meatus (*mns*) and upper concha (*cs*). Further backwards, the orifice of the Eustachian tube (*t*) and the retro-pharyngeal cyst (*cr*) mentioned in the description of plate 3 are visible.

Tafel 2.



Tafel 3.

Sagittalschnitt.

Natürliche Grösse. — 8 Monat alter Fötus.

Planche 3.

Coupe sagittale.

Grandeur nature. — Foetus de 8 mois.

Plate 3.

Longitudinal vertical section.

Natural size. — Foetus of 8 months.

Tafel 3.

Natürliche Grösse. — 8 Monat alter Fötus.

ci concha inferior, *mni* meatus narium inferior, *cm* concha media. *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior, *mnsr* meatus narium supremus. *cr* cystis retropharyngealis, *cp* cystis palatina.

Der Sagittalschnitt eines 8 Monat alten Fötus zeigt die laterale Wand der Nasenhöhle, die untere (*ci*), mittlere (*cm*) und obere (*cs*), Nasenmuschel und den Rest der obersten Nasenmuschel begrenzt von dem kurzen Rest des obersten Nasenganges (*mnsr*), ferner den unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasengang. Der Schnitt zeigt ausserdem zwei kongenitale Schleimzysten im Gebiete des weichen Gaumens und des Retropharynx. Die Retropharyngealzyste (*cr*) hat eine Ausdehnung von 10 mm Länge, 13 mm Höhe und 16 mm Breite, die Gaumenzyste (*cp*) hat eine Ausbreitung von 9 mm Länge, 9 mm Höhe und 10 mm Breite.

Planche 3.

Grandeur nature. — Foetus de 8 mois.

ci cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur, *mnsr* meat supreme, *cr* kyste rétropharyngé, *cp* kyste palatin.

Sur cette coupe sagittale d'un foetus de 8 mois, on voit la paroi latérale de la fosse nasale, les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*) et le reste du quatrième cornet. On voit les méats suprême (*mnsr*), supérieur (*mns*), moyen (*mnm*) et inférieur (*mni*). Sur la coupe on voit de plus deux kystes congénitaux, l'un dans le voile du palais et l'autre dans le cavum. Le kyste du pharynx (*cr*) a une longueur de 10 millim., une hauteur de 13 millim. et une largeur de 16 millim. Les dimensions du kyste palatin (*cp*) sont respectivement 9 millim., 9 millim., et 10 millim.

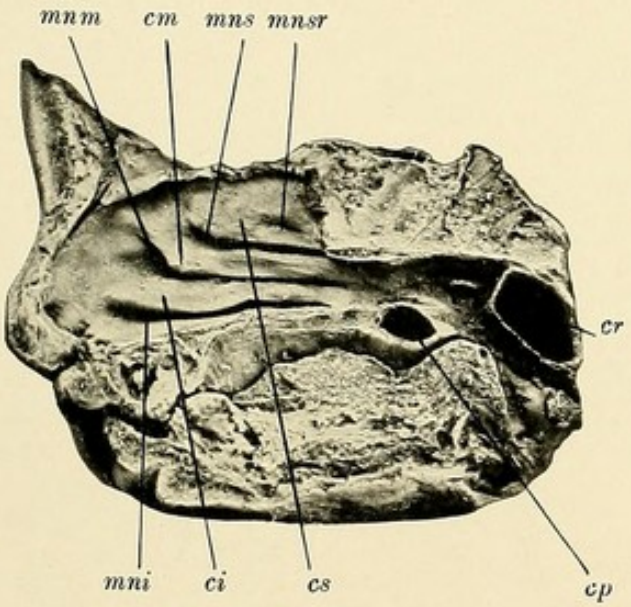
Plate 3.

Natural size. — Foetus of 8 months.

ci lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *cs* upper concha *mns* upper meatus, *mnsr* uppermost meatus, *cr* retropharyngeal cyst, *cp* palatine cyst.

Longitudinal vertical section through the head of a foetus of 8 months, shewing the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*), and upper (*cs*) concha, and a vestige of the uppermost concha bounded by vestiges of the short uppermost meatus (*mnsr*); the lower (*mni*), middle (*mnm*), and upper (*mns*) meatus are also visible. The section shews, besides, two congenital mucous cysts situated respectively in the palatal and retro-pharyngeal regions. The retro-pharyngeal cyst (*cr*) is 10 mm long, 13 mm high, and 16 mm wide; the palatal cyst (*cp*) is 9 mm long, 9 mm high, and 10 mm wide.

Tafel 3.



Tafel 4.

Sagittalschnitt.

Natürliche Grösse. — Neugeborenes Kind.

Planche 4.

Coupe sagittale.

Grandeur nature. — Enfant nouveau-né.

Plate 4.

Longitudinal vertical section.

Natural size. — New-born infant.

Tafel 4.

Natürliche Grösse. — Neugeborenes Kind.

rf recessus frontalis, *pu* processus uncinatus, *hs* hiatus semilunaris, *lbe* lamina bullae ethmoidalis, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *csr* concha suprema.

Der Sagittalschnitt des Kopfes eines Neugeborenen zeigt die laterale Nasenhöhlenwand nach der Entfernung der mittleren Nasenmuschel. Man sieht die Ansatzlinie der mittleren Nasenmuschel (*cm*), durch ihre Entfernung ist freigelegt das Gebiet des hiatus semilunaris (*hs*), welchen oben die Lamelle der bulla ethmoidalis (*lbe*) und unten der processus uncinatus (*pu*) begrenzt. Oberhalb des scharf abgegrenzten vordersten Teiles des hiatus semilunaris (*hs*) ist der ausgeprägt vorhandene recessus frontalis (*rf*) zu sehen, welcher sich in einer Ausdehnung von $3\frac{1}{2}$ mm nach oben und vorne erstreckt. Oberhalb der Ansatzlinie der mittleren Muschel (*cm*) ist der obere Nasengang (*mns*), die obere Nasenmuschel (*cs*) und der Rest der obersten Nasenmuschel (*csr*) zu übersehen.

Planche 4.

Grandeur nature. — Enfant nouveau-né.

rf recessus frontal, *pu* processus uncinatus, *hs* hiatus semilunaire, *lbe* lame de la bulle ethmoïdale, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur, *csr* quatrième cornet.

Coupe sagittale d'un enfant nouveau-né montrant la paroi latérale de la fosse nasale après section du cornet moyen. On voit la ligne d'insertion du cornet moyen. Par la section du cornet moyen la region de l'hiatus semilunaire limitée en haut par la lame de la bulle ethmoïdale et en bas par le processus uncinatus est devenue visible. Au dessus de la partie antérieure de l'hiatus semilunaire (*hs*), très marquée, se voit très distinctement le recessus frontal (*rf*), qui s'étend sur une longueur de $3\frac{1}{2}$ millim. en haut et en avant. On voit au dessus de la ligne d'insertion du cornet moyen (*cm*) le méat supérieur (*ms*), le cornet supérieur (*cs*) et le reste du quatrième cornet (*csr*).

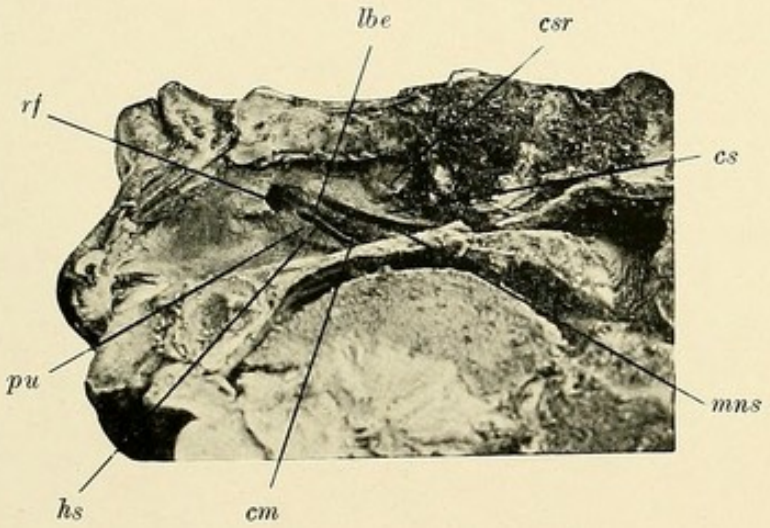
Plate 4.

Natural size. — New-born infant.

rf frontal recess, *pu* uncinate process, *hs* semilunar hiatus, *lbe* lamina of ethmoidal bulla, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *csr* uppermost concha.

Longitudinal vertical section through the head of a new-born infant, shewing the lateral wall of the nasal fossa after removal of the middle concha. The ridge of insertion of the middle concha (*cm*) is visible. Through the removal of the middle concha the region of the semilunar hiatus (*hs*) has been exposed; it is bounded above by the lamina of the ethmoidal bulla (*lbe*), below by the uncinate process (*pu*). Above the clearly defined anterior portion of the semilunar hiatus (*hs*) a well marked frontal recess (*rf*) may be seen extending upwards and forwards for a distance of $3\frac{1}{2}$ mm. Above the ridge of insertion of the middle concha (*cm*), the upper meatus (*mns*), upper concha (*cs*), and vestiges of the uppermost concha (*csr*) are visible.

Tafel 4.



Tafel 5.

Frontalschnitt.

Natürliche Grösse. — Neugeborenes Kind.

Planche 5.

Coupe frontale.

Grandeur nature. — Enfant nouveau-né.

Plate 5.

Coronal section.

Natural size. — New-born infant.

Tafel 5.

Natürliche Grösse. — Neugeborenes Kind.

sm sinus maxillaris, *pu-hs* processus uncinatus, hiatus semilunaris, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior, *s* septum.

Der Frontalschnitt des Kopfes eines Neugeborenen zeigt die enge linke Nasenhöhle, an ihrer äusseren Wand die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang. Im mittleren Nasengange (*mnm*) ist der hiatus semilunaris (*hs*) begrenzt vom processus uncinatus (*pu*), mit der Mündung der Kieferhöhle (*sm*) zu übersehen. Die Kieferhöhle (*sm*) liegt im Bereiche des unteren Nasenganges (*mni*) und der unteren Muschel (*ci*), ist 7 mm lang, 4 mm hoch und 3 mm breit. Die vorderen Siebbeinzellen (*cea*) haben eine Ausdehnung von 1—2½ mm, die hintere Siebbeinzelle (*cep*) ist 5 mm lang, 2½ mm hoch und 1½ mm breit.

Planche 5.

Grandeur nature. — Enfant nouveau-né.

sm sinus maxillaire, *pu-hs* processus uncinatus, hiatus semilunaire, *cea* cellule ethmoïdale antérieur, *cep* cellule ethmoïdale postérieure, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur, *s* septum.

La coupe frontale de la tête d'un nouveau-né montre la paroi latérale de la fosse nasale gauche étroite, les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). Dans le méat moyen (*mnm*) on peut voir l'hiatus semilunaire (*hs*) limité par le processus uncinatus (*pu*) et l'ostium du sinus maxillaire (*sm*). Le sinus maxillaire (*sm*) se trouve au niveau du méat inférieur (*mni*) et du cornet inférieur (*ci*) et est long de 7 millim., haut de 4 millim. et large de 3 millim. Les cellules ethmoïdales antérieures (*cea*) ont une étendue de 1 à 2½ millim.; la cellule ethmoïdale postérieure a 5 millim. de longeur, 2½ miliim. de hauteur et 1½ millim. de largeur.

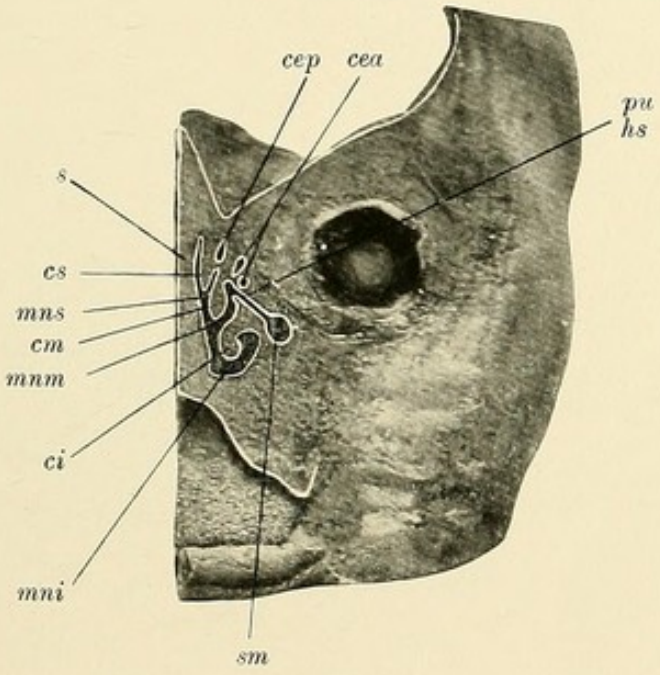
Plate 5.

Natural size. — New-born infant.

sm maxillary antrum, *pu-hs* uncinate process, semilunar hiatus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus, *s* septum.

Coronal section through the head of a new-born infant, shewing the narrow left nasal fossa, and on its lateral wall the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. In the middle meatus (*mnm*) the semilunar hiatus (*hs*) is seen bounded by the uncinate process (*pu*) and opening into it, the maxillary antrum (*sm*). The maxillary antrum (*sm*) is situated near the lower meatus (*mni*) and the lower concha (*ci*); it is 7 mm long, 4 mm high and 3 mm wide. The anterior ethmoidal cells (*cea*) are between 1 and 2½ mm in size. The posterior ethmoidal cell (*cep*) is 5 mm long, 2½ mm high and 1½ mm wide.

Tafel 5.



Tafel 6.

Horizontalschnitt.

Natürliche Grösse. — Neugeborenes Kind.

Planche 6.

Coupe horizontale.

Grandeur nature. — Enfant nouveau-né.

Plate 6.

Horizontal section.

Natural size. — New-born infant.

Tafel 6.

Natürliche Grösse. — Neugeborenes Kind.

sm sinus maxillaris, *dnl* ductus nasolacrimalis, *mni* meatus narium inferior, *ci* concha inferior, *am* fossa cranii media.

Der Horizontalschnitt des Kopfes eines Neugeborenen zeigt die Kieferhöhle (*sm*), den ductus nasolacrimalis (*dnl*), die untere Nasenmuschel (*ci*) und den unteren Nasengang (*mni*). Die Kieferhöhle (*sm*) ist 11 mm lang, 6 mm hoch und 4 mm breit.

Planche 6.

Grandeur nature. — Enfant nouveau-né.

sm sinus maxillaire, *dnl* conduit nasolacrymal, *mni* méat inférieur, *ci* cornet inférieur, *am* fosse cérébrale moyenne.

Coupe horizontale de la tête d'un nouveau-né, montrant le sinus maxillaire (*sm*), le conduit nasolacrymal (*dnl*), le cornet inférieur (*ci*) et le méat inférieur (*mni*). Le sinus maxillaire a 11 millim. de long, 6 millim de haut et 4 millim. de large.

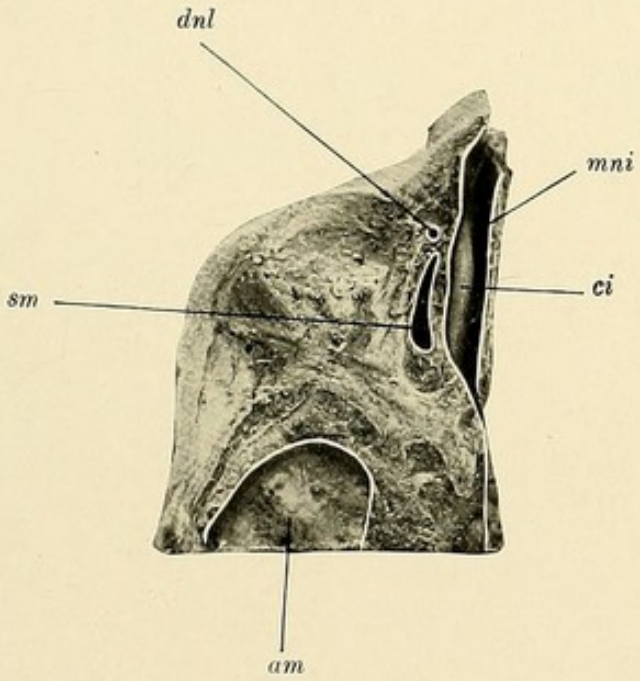
Plate 6.

Natural size. — New-born infant.

sm maxillary antrum, *dnl* nasal duct, *mni* lower meatus, *ci* lower concha, *am* middle fosse of internal base of skull.

Horizontal section through the head of a new-born infant, shewing the maxillary antrum (*sm*), the nasal duct (*dnl*), the lower concha (*ci*) and lower meatus (*mni*). The maxillary antrum (*sm*) is 11 mm long, 6 mm high and 4 mm wide.

Tafel 6.



Tafel 7.

Horizontalschnitt.

Natürliche Grösse. — Neugeborenes Kind.

Planche 7.

Coupe horizontale.

Grandeur nature. — Enfant nouveau-né.

Plate 7.

Horizontal section.

Natural size. — New-born infant.

Tafel 7.

Natürliche Grösse. — Neugeborenes Kind.

rf recessus frontalis, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *cn* cavum narium, *s* septum, *mnm* meatus narium medius, *am* fossa cranii media.

Der Horizontalschnitt des Kopfes eines Neugeborenen ist am oberen Teile des mittleren Nasenganges (*mnm*) geführt und zeigt die Nasenhöhle (*cn*), begrenzt von der Nasenscheidenwand (*s*), in der Reihenfolge von vorne nach rückwärts den recessus frontalis (*rf*), die vorderen (*cea*) und die hinteren (*cep*) Siebbeinzellen.

Planche 7.

Grandeur nature. — Enfant nouveau-né.

rf recessus frontal, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *cn* cavité nasale, *s* septum, *mnm* méat moyen, *am* fosse cérébrale moyenne.

Coupe horizontale de la tête d'un nouveau-né passant par la partie supérieure du méat moyen (*mnm*) et montrant la cavité nasale (*cn*) limitée par la cloison du nez (*s*); allant d'avant en arrière, on voit le recessus frontal (*rf*), la cellule ethmoïdale antérieure (*cea*) et postérieure (*cep*).

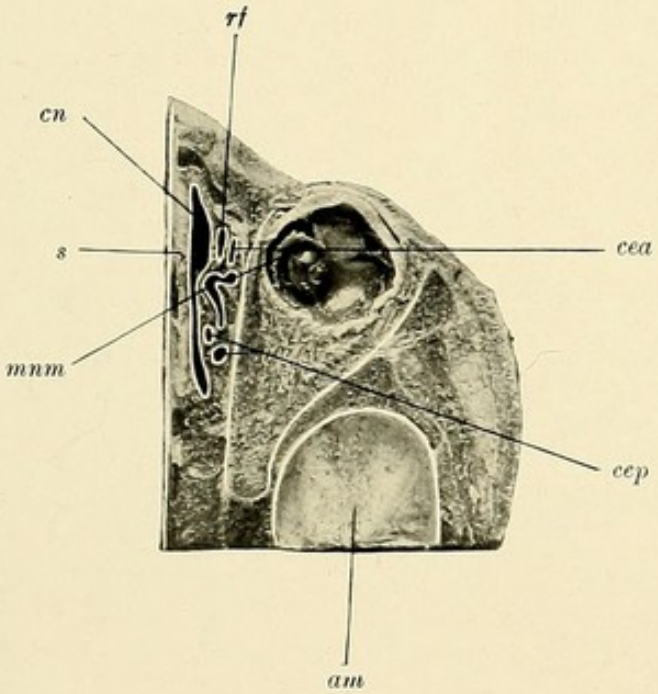
Plate 7.

Natural size. — New-born infant.

rf frontal recess, *cea* anterior ethomidal cell, *cep* posterior ethmoidal cell, *cn* nasal cavity, *s* septum, *mnm* middle meatus, *am* middle fossa of internal base of skull.

Horizontal section through the head of a new-born infant. The section is cut through the top of the middle meatus (*mnm*). It shews the nasal cavity (*cn*) bounded by the septum (*s*), and from before backwards, the frontal recess (*rf*), the anterior (*cea*) and posterior (*cep*) ethmoidal cells.

Tafel 7.



Tafel 8.

Horizontalschnitt.

Natürliche Grösse. — Neugeborenes Kind.

Planche 8.

Coupe horizontale.

Grandeur nature. — Enfant nouveau-né.

Plate 8.

Horizontal section.

Natural size. — New-born infant.

Tafel 8.

Natürliche Grösse. — Neugeborenes Kind.

sm sinus maxillaris, *dnl* ductus nasolacrimalis, *mni* meatus narium inferior, *ci* concha inferior, *cm* concha media, *s* septum narium.

Der Horizontalschnitt des Kopfes eines Neugeborenen zeigt oberhalb der Ansatzlinie der unteren Nasenmuschel (*ci*) die Kieferhöhle (*sm*) und zwischen den vordersten Teil der Kieferhöhle (*sm*) und der unteren Muschel (*ci*) den ductus nasolacrimalis (*dnl*). Der Schnitt zeigt noch einen kleinen Teil der mittleren Nasenmuschel (*cm*), den unteren Nasengang (*mni*) und die Nasenscheidewand (*s*). Die Kieferhöhle (*sm*) ist 13 mm lang, 5 mm hoch und 3½ mm breit.

Planche 8.

Grandeur nature. — Enfant nouveau-né.

sm sinus maxillaire, *dnl* conduit nasolacrymal, *mni* méat inférieur, *ci* cornet inférieur, *cm* cornet moyen, *s* septum nasal.

Coupe horizontale de la tête d'un nouveau-né montrant au-dessus de la ligne d'insertion du cornet inférieur (*ci*) le sinus maxillaire (*sm*), et entre la partie antérieure du sinus maxillaire (*sm*) et le cornet inférieur (*ci*) le conduit nasolacrymal. La coupe montre encore une petite partie du cornet moyen (*cm*), le méat inférieur (*min*) et le septum (*s*). Le sinus maxillaire a 13 millim. de long, 5 millim. de haut et 3½ millim. de large.

Plate 8.

Natural size. — New-born infant.

sm maxillary antrum, *dnl* nasal duct, *mni* lower meatus, *ci* lower concha, *cm* middle concha, *s* nasal septum.

Horizontal section through the head of a new-born infant, shewing the maxillary antrum (*sm*) situated above the ridge of insertion of the lower concha (*ci*). Between the anterior part of the maxillary antrum (*sm*) and the lower concha (*ci*) is the nasal duct (*dnl*). The section also shews a small portion of the middle concha (*cm*), the lower meatus (*mni*) and the septum (*s*). The maxillary antrum (*sm*) is 13 mm long, 5 mm high and 3½ mm wide.

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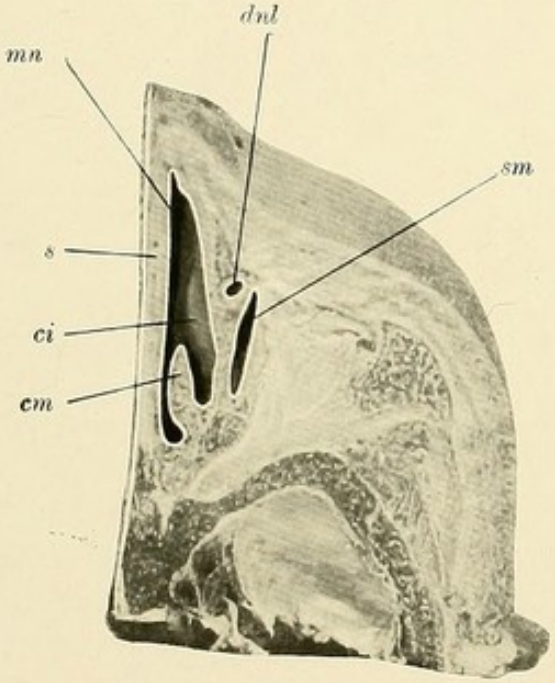
Tafel 8.



Tafel 9.

Horizontalschnitt.

Natürliche Grösse. — Neugeborenes Kind.

Planche 9.

Coupe horizontale.

Grandeur nature. — Enfant nouveau-né.

Plate 9.

Horizontal section.

Natural size. — New-born infant.

Tafel 9.

Natürliche Grösse. — Neugeborenes Kind.

rf recessus frontalis, *pu* processus uncinatus, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *cn* cavum narium, *s* septum.

Der Horizontalschnitt des Kopfes eines Neugeborenen ist am obersten Teile des mittleren Nasenganges geführt und zeigt den recessus frontalis (*rf*), den processus uncinatus (*pu*), die vorderen Siebbeinzellen (*cea*), die hinteren Siebbeinzellen (*cep*), die schmale Nasenhöhle (*cn*) und die Nasenscheidewand (*s*). Der recessus frontalis (*rf*) ist 5 mm hoch, 3 mm lang und 2 mm breit. Die vordere Siebbeinzellen (*cea*) sind 2—3 mm lang, 4—5 mm hoch, 2—3 mm breit. Die hintere Siebbeinzelle (*cep*) ist 5 mm hoch, 4½ mm lang und 2 mm breit.

Planche 9.

Grandeur nature. — Enfant nouveau-né.

rf recessus frontal, *pu* processus uncinatus, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *cn* cavité nasale, *s* septum.

Coupe horizontale de la tête d'un nouveau-né passant par la partie supérieure du méat moyen et montrant le recessus frontal (*rf*), le processus uncinatus (*pu*), la cellule ethmoïdale antérieure (*cea*), la cellule ethmoïdale postérieure (*cep*), l'étroite cavité nasale (*cn*) et le septum (*s*). Le recessus frontal (*rf*) a 5 millim. de haut, 3 millim. de long et 2 millim. de large. La cellule ethmoïdale antérieure (*cea*) a de 2 à 3 millim. de long, de 4 à 5 millim. de haut, de 2 à 3 millim. de large. La cellule ethmoïdale postérieure (*cep*) a 5 millim. de haut, 4½ millim. de long et 2 millim. de large.

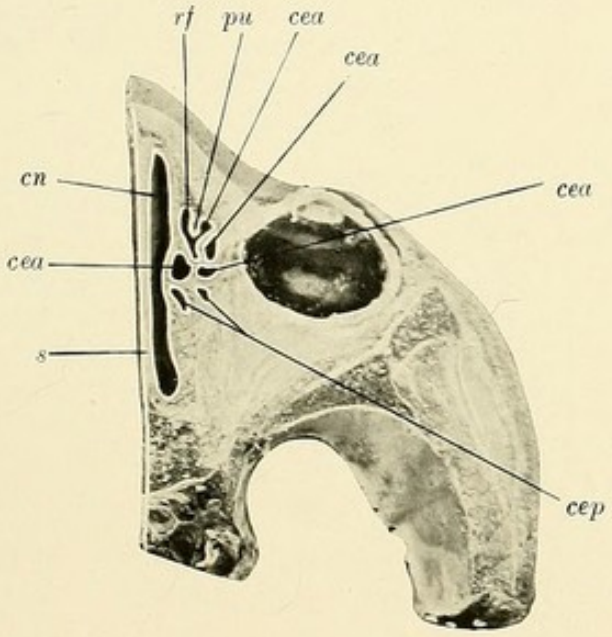
Plate 9.

Natural size. — New-born infant.

rf frontal recess, *pu* uncinate process, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *cn* nasal cavity, *s* septum.

Horizontal section through the head of a new-born infant, carried through the highest part of the middle meatus, so as to shew the frontal recess (*rf*), the uncinate process (*pu*), the anterior (*cea*) and posterior ethmoidal cells (*cep*), the narrow nasal cavity (*cn*) and the nasal septum (*s*). The frontal recess (*rf*) is 5 mm high, 3 mm long and 2 mm wide. The anterior ethmoidal cells (*cea*) are 2 to 3 mm long, 4 to 5 mm high and 2 to 3 mm wide. The posterior ethmoidal cell (*cep*) is 5 mm high, 4½ mm long and 2 mm wide.

Tafel 9.



Tafel 10.

Horizontalschnitt.

Natürliche Grösse. — Neugeborenes Kind.

Planche 10.

Coupe horizontale.

Grandeur nature. — Enfant nouveau-né.

Plate 10.

Horizontal section.

Natural size. — New-born infant.

Tafel 10.

Natürliche Grösse. — Neugeborenes Kind.

ss sinus sphenoidalis, *os* ostium sphenoidale, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Horizontalschnitt des Kopfes eines Neugeborenen zeigt von oben die Keilbeinhöhle (*ss*) und ihre Mündung (*os*), von seitwärts den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), mittlere (*cm*) und die obere (*cs*) Nasenmuschel. Die Keilbeinhöhle (*ss*) ist 4 mm hoch, 2 mm lang und 2 mm breit, das ostium sphenoidale (*os*) ist ½ mm weit und mündet nahe dem Nasendache.

Planche 10.

Grandeur nature. — Enfant nouveau-né.

ss sinus sphénoïdal, *os* ostium du sinus sphénoïdal, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe horizontale de la tête d'un nouveau-né montrant par en haut le sinus sphénoïdal (*ss*) et son ostium (*os*), de côté les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*). Le sinus sphénoïdal (*ss*) a 4 millim. de haut, 2 millim. de long et 2 millim. de large; l'ostium du sinus sphénoïdal (*os*) a ½ millim. de large et s'ouvre près du toit de la fosse nasale.

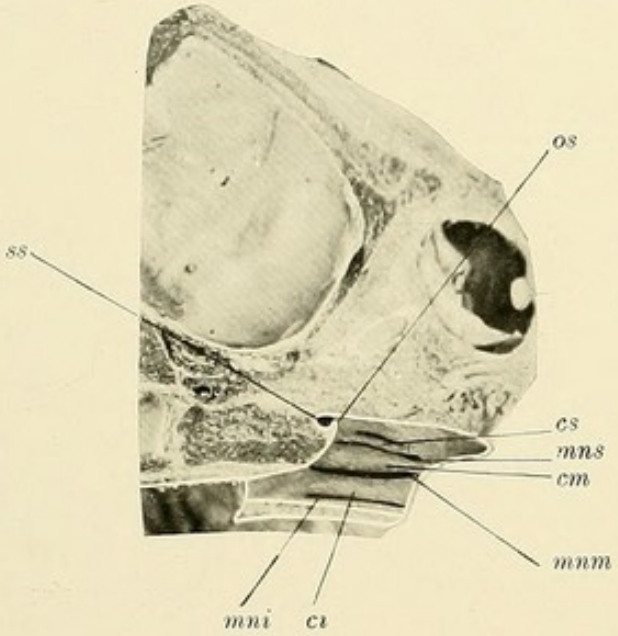
Plate 10.

Natural size. — New-born infant.

ss sphenoidal sinus, *os* sphenoidal ostium, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Horizontal section through the head of a new-born infant, shewing a view from above of the sphenoidal sinus (*ss*) and its orifice (*os*), a side view of the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus and the lower (*ci*), middle (*cm*) and upper (*cs*) concha. The sphenoidal sinus (*ss*) is 4 mm high, 2 mm long and 2 mm wide; the sphenoidal ostium (*os*), ½ mm in diameter, is situated near the roof of the nasal cavity.

Tafel 10.



Tafel 11.

Sagittalschnitt.

Natürliche Grösse. — Neugeborenes Kind.

Planche 11.

Coupe sagittale.

Grandeur nature. — Enfant nouveau-né.

Plate 11.

Longitudinal vertical section.

Natural size. — New-born infant.

Tafel 11.

Natürliche Grösse. — Neugeborenes Kind.

ci concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatum narium meatus, *cs* concha superior, *mns* meatus narium superior, *csr* concha suprema, *mnsr* meatus narium supremus.

Der Sagittalschnitt des Kopfes eines Neugeborenen zeigt die laterale Nasenhöhlenwand, die untere (*ci*), mittlere (*cm*), obere (*cs*) Nasenmuschel und den Rest der obersten Muschel (*csr*), ferner den unteren (*mni*), den mittleren (*mnm*), den oberen (*mns*) Nasengang und den Rest des kurzen obersten Nasenganges (*mnsr*).

Planche 11.

Grandeur nature. — Enfant nouveau-né.

ci cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur *mns* méat supérieur, *mnsr* méat suprême, *csr* quatrième cornet.

Coupe sagittale de la tête d'un nouveau-né montrant la paroi latérale de la fosse nasale, le cornet inférieur (*ci*), le cornet moyen (*cm*), le cornet supérieur (*cs*) et le reste du quatrième cornet (*csr*). De plus on voit le méat inférieur (*mni*), le méat moyen (*mnm*), le méat supérieur (*mns*) et le reste du méat suprême (*mnsr*) très court,

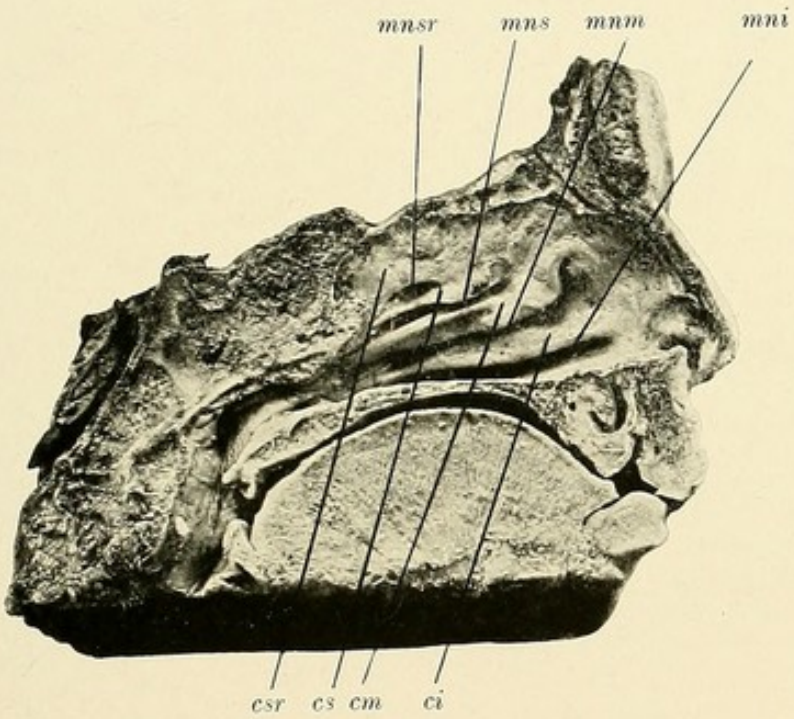
Plate 11.

Natural size. — New-born infant.

ci lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus, *csr* uppermost concha, *mnsr* uppermost meatus.

Longitudinal vertical section through the head of a new-born infant, shewing the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*), upper (*cs*), and vestiges of the uppermost (*csr*) concha, the lower (*mni*), middle (*mnm*), upper (*mns*), and vestiges of the short uppermost (*mnsr*) meatus.

Tafel 11.



Tafel 12.

Sagittalschnitt.

Natürliche Grösse. — 1 Monate altes Kind.

Planche 12.

Coupe sagittale.

Grandeur nature. — Enfant de 1 mois.

Plate 12.

Longitudinal vertical section.

Natural size. — Child 1 month old.

Tafel 12.

Natürliche Grösse. — 1 Monat altes Kind.

rf recessus frontalis, *be* bulla ethmoidalis, *hs*, *pu* hiatus semilunaris, processus uncinatus, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *ci* concha inferior, *cm* concha media, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior.

Der Sagittalschnitt des 1 Monat alten Kopfes zeigt die Stirnhöhle in ihrer frühen Form als recessus frontalis (*rf*), die vorderen (*cea*) und hinteren (*cep*) Siebbeinzellen, einen Teil der unteren (*ci*), mittleren (*cm*) und der oberen (*cs*) Nasenmuschel und einen Teil des mittleren (*mnm*) und oberen (*mns*) Nasenganges. Der recessus frontalis (*rf*) ist $4\frac{1}{2}$ mm hoch, $3\frac{1}{2}$ mm lang und 3 mm breit, er mündet direkt in den hiatus semilunaris (*hs*), welcher zwischen der bulla ethmoidalis und dem processus uncinatus (*pu*) zu sehen ist. Die vorderen Siebbeinzellen (*cea*) sind 2—6 mm hoch, 3—4 mm lang und 2—$2\frac{1}{2}$ mm breit. Die hinteren Siebbeinzellen (*cep*) sind 2—3 mm hoch, $2\frac{1}{2}$—3 mm lang und 2—4 mm breit.

Planche 12.

Grandeur nature. — Enfant de 1 mois.

rf recessus frontal, *be* bulle ethmoïdale, *hs*, *pu* hiatus semilunaire, processus uncinatus, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *ci* cornet inférieur, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur.

Coupe sagittale de la tête d'un enfant de 1 mois montre le sinus frontal dans la forme primitive d'un recessus frontal (*rf*), les cellules ethmoïdales antérieures (*cea*) et postérieures (*cep*), une partie des cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*) et une partie des méats moyen (*mnm*) et supérieur (*mns*). Le recessus frontal (*rf*) est haut de $4\frac{1}{2}$ millim., long de $3\frac{1}{2}$ millim. et large de 3 millim. Il se termine directement dans l'hiatus semilunaire (*hs*) que l'on peut voir entre la bulle ethmoïdale et le processus uncinatus (*pu*). Les cellules ethmoïdales antérieures (*cea*) ont une hauteur de 2 à 6 millim., une longueur de 3 à 4 millim. et une largeur de 2 à $2\frac{1}{2}$ millim. Les cellules ethmoïdales postérieures (*cep*) ont une hauteur de 2 à 3 millim., une longueur de $2\frac{1}{2}$ à 3 millim. et une largeur de 2 à 4 millim.

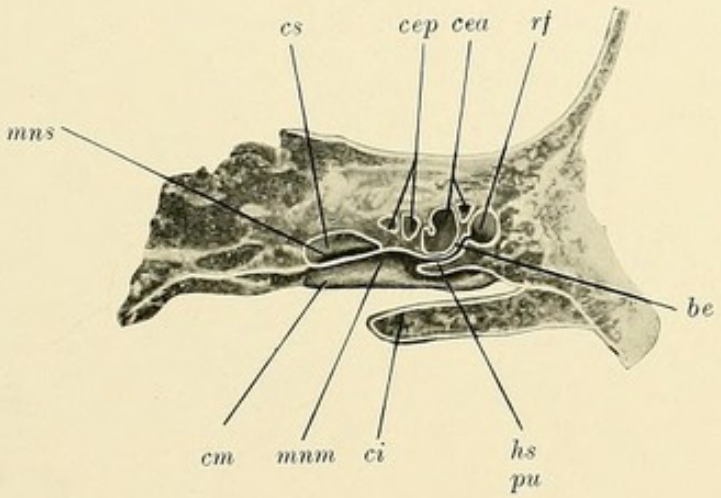
Plate 12.

Natural size. — Child 1 month old.

rf frontal recess, *be* ethmoidal bulla, *hs*, *pu* semilunar hiatus, uncinate process, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *ci* lower concha, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus.

Longitudinal vertical section through the head of a child 1 month old, shewing the frontal sinus in its earlier developmental stage of a frontal recess (*rf*), the anterior (*cea*) and posterior (*cep*) ethmoidal cells, parts of the lower (*ci*), middle (*cm*) and upper (*cs*) concha and of the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. The frontal recess (*rf*) is $4\frac{1}{2}$ mm high, $3\frac{1}{2}$ mm long and 3 mm wide. It opens directly into the semilunar hiatus (*hs*) which is seen enclosed between the ethmoidal bulla (*be*) and the uncinate process (*pu*). The anterior ethmoidal cells (*cea*) are 2 to 6 mm in height, 3 to 4 mm in length and 2 to $2\frac{1}{2}$ mm in width. The posterior ethmoidal cells (*cep*) are 2 to 3 mm in height, $2\frac{1}{2}$ to 3 mm in length and 2 to 4 mm in width.

Tafel 12.



Tafel 13.

Frontalschnitt.

Natürliche Grösse. — 1 Monat altes Kind.

Planche 13.

Coupe frontale.

Grandeur nature. — Enfant de 1 mois.

Plate 13.

Coronal section.

Natural size. — Child of 1 month.

Tafel 13.

Natürliche Grösse. — 1 Monat altes Kind.

ss sinus sphenoidalis, *os* ostium sphenoidale.

Der Frontalschnitt eines 1 Monat alten Kopfes zeigt die Keilbeinhöhle (*ss*) im Keilbeinkörper, sie ist 3 mm hoch, 2½ mm breit und 2 mm lang, ihre Mündung, das ostium sphenoidale (*os*) bildet eine 1¼ mm weite runde Öffnung. An diesem Kopfe ist die Kieferhöhle 8 mm lang, 7 mm hoch und 2½ mm breit. Die vorderen Siebbeinzellen sind 3—5 mm lang, 2—5 mm hoch und 2—2½ mm breit. Die hintere Siebbeinzelle ist 5 mm lang, 4 mm hoch und 3½ mm breit.

Planche 13.

Grandeur nature. — Enfant de 1 mois.

ss sinus sphénoïdal, *os* ostium du sinus sphénoïdal.

La coupe frontale de la tête d'un enfant de 1 mois montre le sinus sphénoïdal dans le corps de l'os sphénoïdal; il a une hauteur de 3 millim., une largeur de 2½ millim. et une longueur de 2 millim. L'ostium du sinus sphénoïdal (*os*) forme une ouverture ronde, large de 1¼ millim. Sur cette tête le sinus maxillaire a 8 millim. de long, 7 millim. de haut et 2½ millim. de large. La cellule ethmoïdale antérieure a de 3 à 5 millim. de long, de 2 à 5 millim. de haut et de 2 à 2½ millim. de large. La cellule ethmoïdale postérieure a 5 millim. de longueur, 4 millim. de hauteur et 3½ millim. de largeur.

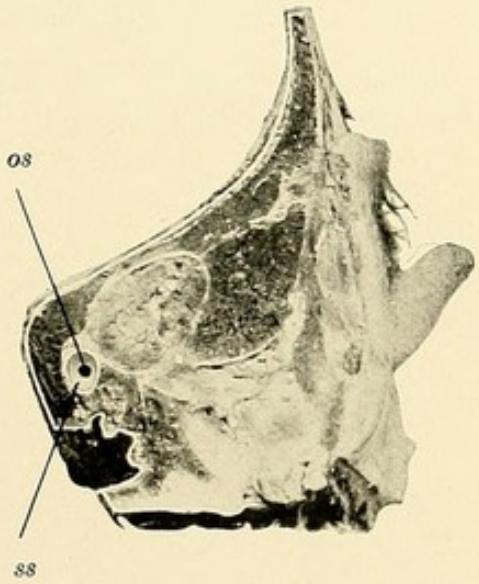
Plate 13.

Natural size. — Child 1 month old.

ss sphenoidal sinus, *os* sphenoidal ostium.

Coronal section through the head of a child one month old, shewing the sphenoidal sinus (*ss*) situated within the body of the sphenoid bone; the sinus is 3 mm high, 2½ mm wide and 2 mm long. Its orifice, the sphenoidal ostium (*os*), is a circular aperture, 1¼ mm in diameter. The maxillary antrum of this skull is 8 mm long, 7 mm high and 2½ mm wide. The anterior ethmoidal cells are 3 to 5 mm long, 2 to 5 mm high and 2 to 2½ mm wide. The posterior ethmoidal cell is 5 mm long, 4 mm high and 3½ mm wide.

Tafel 13.



Tafel 14.

Frontalschnitt.

Natürliche Grösse. — 1 Monat altes Kind.

Planche 14.

Coupe frontale.

Grandeur nature. — Enfant de 1 mois.

Plate 14.

Coronal section.

Natural size. — Child 1 month old.

Tafel 14.

Natürliche Grösse. — 1 Monat altes Kind.

rf recessus frontalis, *cea* cellula ethmoidalis anterior, *sm* sinus maxillaris, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *pu* processus uncinatus, *cm* concha media.

Der Frontalschnitt eines 1 Monat alten Kopfes zeigt die laterale Wand der Nasenhöhle, die untere (*ci*) und mittlere (*cm*) Nasenmuschel, den unteren (*mni*) und mittleren (*mnm*) Nasengang. Im mittleren Nasengange (*mnm*) ist der processus uncinatus (*pu*) und der hiatus semilunaris zu sehen, oberhalb des mittleren Nasenganges (*mnm*) ist der 6 mm hohe, 5 mm lange und 2 mm breite recessus frontalis (*rf*) zu sehen, ferner im Bereiche des mittleren Nasenganges (*mnm*) vordere Siebbeinzellen (*cea*) und im Bereiche des unteren Nasenganges (*mni*) die Kieferhöhle (*sm*).

Planche 14.

Grandeur nature. — Enfant de 1 mois.

rf recessus frontal, *cea* cellule ethmoïdale antérieure, *sm* sinus maxillaire, *mni* méat inférieur *ci* cornet inférieur, *mnm* méat moyen, *pu* processus uncinatus, *cm* cornet moyen.

Coupe frontale d'une tête d'enfant de 1 mois montrant la paroi latérale de la fosse nasale, les cornets inférieur (*ci*) et moyen (*cm*), les méats inférieur (*mni*) et moyen (*mnm*). Dans le méat moyen (*mnm*) on peut voir le processus uncinatus (*pu*) et l'hiatus semilunaire; au-dessus du méat moyen (*mnm*) on voit le recessus frontal (*rf*) haut de 6 millim., long de 5 millim. et large de 2 millim., de plus au niveau du méat moyen (*mnm*) se trouvent les cellules ethmoïdales antérieures (*cea*) et au niveau du méat inférieur (*mni*) le sinus maxillaire (*sm*).

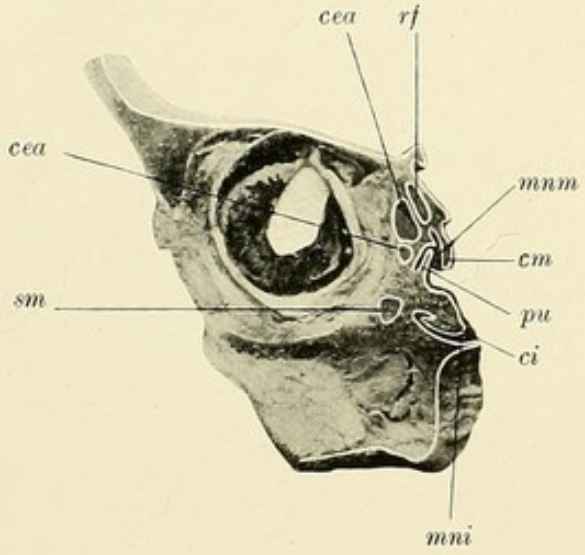
Plate 14.

Natural size. — Child 1 month old.

rf frontal recess, *cea* anterior ethmoidal cell, *sm* maxillary antrum, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *pu* uncinate process, *cm* middle concha.

Coronal section through the head of a child one month old, shewing the lateral wall of the nasal fossa, the lower (*ci*) and middle (*cm*) concha, the lower (*mni*) and middle (*mnm*) meatus. In the middle meatus (*mnm*) the uncinate process (*pu*) and the semilunar hiatus are visible. Above the middle meatus (*mnm*) is the frontal recess (*rf*), measuring 6 mm in height, 5 mm in length and 2 mm in width. Adjoining the middle meatus (*mnm*) are the anterior ethmoidal cells (*cea*), adjoining the lower meatus (*mni*) the maxillary antrum (*sm*).

Tafel 14.



Tafel 15.

Frontalschnitt.

Natürliche Grösse. — 1 Monat altes Kind.

Planche 15.

Coupe frontale.

Grandeur nature. — Enfant de 1 mois.

Plate 15.

Coronal section.

Natural size. — Child 1 month old.

Tafel 15.

Natürliche Grösse. — 1 Monat altes Kind.

sm sinus maxillaris, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Frontalschnitt des 1 Monat alten Kopfes zeigt die laterale Wand der Nasenhöhle, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang. Im Bereiche des unteren Nasenganges (*mni*) und der unteren Nasenmuschel (*ci*) ist die Kieferhöhle (*sm*), im Bereiche des mittleren Nasenganges (*mnm*) sind die vorderen Siebbeinzellen (*cea*) und im Bereiche des oberen Nasenganges die hinteren Siebbeinzellen (*cep*) zu sehen. Die Kieferhöhle (*sm*) ist 5 mm lang, 4 mm hoch und 3½ mm breit. Die vordere Siebbeinzelle (*cea*) ist 5 mm lang, 4 mm hoch und 3 mm breit. Die hintere Siebbeinzelle (*cep*) ist 5 mm lang, 3½ mm hoch und 2½ mm breit. Die Keilbeinhöhle ist 4 mm lang, 2½ mm breit und 2 mm hoch, ihre Mündung bildet eine 1 mm runde Öffnung.

Planche 15.

Grandeur nature. — Enfant de 1 mois.

sm sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe frontale d'une tête d'enfant de 1 mois montrant la paroi latérale de la fosse nasale, les cornets inférieur (*ci*), moyen et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). On peut voir au niveau du méat inférieur (*mni*) et du cornet inférieur (*ci*) le sinus maxillaire (*sm*); au niveau du méat moyen (*mnm*) les cellules ethmoïdales antérieures (*cea*) et au niveau du méat supérieur les cellules ethmoïdales postérieures (*cep*). Le sinus maxillaire (*sm*) a 5 millim. de long, 4 millim. de haut et 3½ millim. de large. La cellule ethmoïdale antérieure (*cea*) a 5 millim. de long, 4 millim. de haut et 3 millim. de large. La cellule ethmoïdale postérieure (*cep*) a 5 millim. de long, 3½ millim. de haut et 2½ millim. de large. Le sinus sphénoïdal a 4 millim. de long, 2½ millim. de large et 2 millim. de haut. Son ostium forme une ouverture ronde de 1 millim.

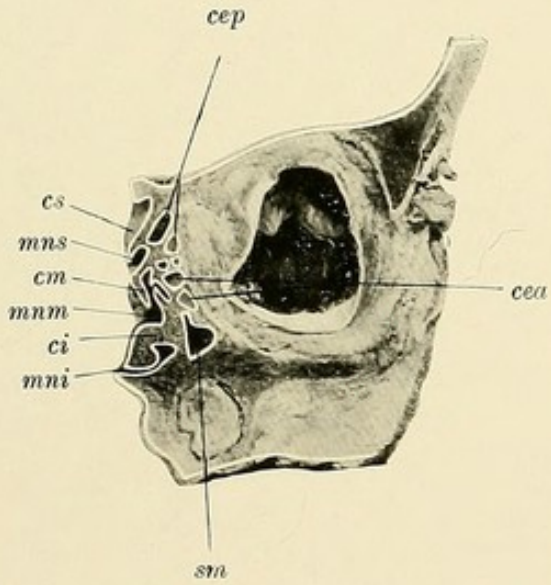
Plate 15.

Natural size. — Child 1 month old.

sm maxillary antrum, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Coronal section through the head of a child one month old, shewing the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*) and upper (*cs*) concha and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. Adjoining the lower meatus (*mni*) and ower concha (*ci*) is the maxillary antrum (*sm*), adjoining the middle meatus (*mnm*) are the anterior ethmoidal cells (*cea*), and adjoining the upper meatus (*mns*) are the posterior ethmoidal cells (*cep*). The maxillary antrum (*sm*) is 5 mm long, 4 mm high and 3½ mm wide. The anterior ethmoidal cell (*cea*) is 5 mm long, 4 mm high and 3 mm wide. The posterior ethmoidal cell (*cep*) is 5 mm long, 3½ mm high, and 2½ mm wide. The sphenoidal sinus is 4 mm long, 2½ mm wide and 2 mm high; its opening is a circular aperture 1 mm in diameter.

Tafel 15.



Tafel 16.

Sagittalschnitt.

Natürliche Grösse. — 1 Monate altes Kind.

Planche 16.

Coupe sagittale.

Grandeur nature. — Enfant de 1 mois

Plate 16.

Longitudinal vertical section.

Natural size. — Child 1 month old.

Tafel 16.

Natürliche Grösse. — 1 Monat altes Kind.

os ostium sphenoidale, *cs* concha superior, *mns* meatus narium superior, *cm* concha media, *mnm* meatus narium medius, *ci* concha inferior, *mni* meatus narium inferior.

Der Sagittalschnitt eines 1 Monat alten Kopfes zeigt die untere (*ci*), mittlere (*cm*) und die obere (*cs*) Nasenmuschel, den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang. Nahe dem Nasendache ist das ½ mm weite ostium sphenoidale (*os*) zu sehen, welches in eine 1½ mm weite Vertiefung führt.

Planche 16.

Grandeur nature. — Enfant de 1 mois.

os ostium du sinus sphénoïdal, *cs* cornet supérieur, *mns* méat supérieur, *cm* cornet moyen, *mnm* méat moyen, *ci* cornet inférieur, *mni* méat inférieur.

Coupe sagittale d'une tête d'enfant de 1 mois montrant les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). Près du toit de la fosse nasale on peut voir l'ostium du sinus sphénoïdal (*os*), large de ½ millim., qui conduit dans une depression large de 1½ millim.

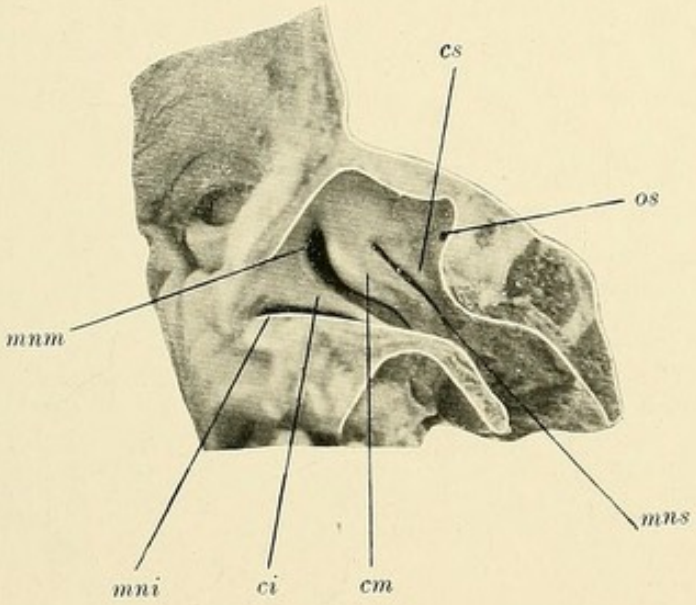
Plate 16.

Natural size. — Child of one month.

os sphenoidal ostium, *cs* upper concha, *mns* upper meatus, *cm* middle concha, *mnm* middle meatus, *ci* lower concha, *mni* lower meatus.

Longitudinal vertical section through the head of a child one month old, shewing the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. Near the roof of the nasal fossa the sphenoidal ostium (*os*) may be seen; it is ½ mm in diameter and leads into a cavity 1½ mm in width.

Tafel 16.



Tafel 17.

Sagittalschnitt.

Natürliche Grösse. — 1 Monat altes Kind.

Planche 17.

Coupe sagittale.

Grandeur nature. — Enfant de 1 mois.

Plate 17.

Longitudinal vertical section.

Natural size. — Child of 1 month.

Tafel 17.

Natürliche Grösse. — 1 Monat altes Kind.

rf recessus frontalis, *pu* processus uncinatus, *cea* cellula ethmoidalis anterior, *hs* hiatus semilunaris, *cep* cellula ethmoidalis posterior, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *t* tuba Eustachii.

Der Sagittalschnitt eines 1 Monat alten Kopfes zeigt den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*) und die mittlere (*cm*) Nasenmuschel. Durch das Wegfallen des vordersten Teiles der mittleren Muschel (*cm*) ist der hiatus semilunaris (*hs*) zu sehen, begrenzt vom processus uncinatus (*pu*) und der bulla ethmoidalis (*cea*). Im Bereiche des oberen Nasenganges (*mns*) ist die hintere Siebbeinzelle (*cep*) und in der Linie des unteren Nasenganges (*mni*) hinten die tuba Eustachii (*t*) zu sehen. Die Frühform der Stirnhöhle, der recessus frontalis (*rf*) ist 5 mm hoch, 4½ mm breit und 3½ mm lang, er mündet am oberen vorderen Teile des hiatus semilunaris (*hs*). Die vordere Siebbeinzelle (*cea*) ist 4½ mm lang, 4 mm hoch und 3½ mm breit. Die hintere Siebbeinzelle (*cep*) ist 5 mm lang, 3½ mm breit und 3 mm hoch.

Planche 17.

Grandeur nature. — Enfant de 1 mois.

rf recessus frontal, *pu* processus uncinatus, *cea* cellule ethmoïdale antérieure, *hs* hiatus semilunaire, *cep* cellule ethmoïdale postérieure, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *t* trompe d'Eustache.

Coupe sagittale d'une tête de 1 mois montrant les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*) et moyen (*cm*). Par la section de la partie antérieure du cornet moyen, on peut voir l'hiatus semilunaire limité par la processus uncinatus (*pu*) et la bulle ethmoïdale (*be*). Au niveau du méat supérieur (*mns*) on peut voir la cellule ethmoïdale postérieure (*cep*) et dans la direction du méat inférieur (*mni*), la trompe d'Eustache (*t*). La forme précoce du sinus frontal (*sf*). le recessus frontal, a 5 millim. de haut, 4½ millim. de large et 3½ millim. de long; il s'ouvre à la partie antéro-supérieure de l'hiatus semilunaire (*hs*). La cellule ethmoïdale antérieure (*cea*) a 4½ millim. de long, 4 millim. de haut et 3½ millim. de large. La cellule ethmoïdale postérieure (*cep*) a 5 millim. de long, 3½ millim. de large et 3 millim. de haut.

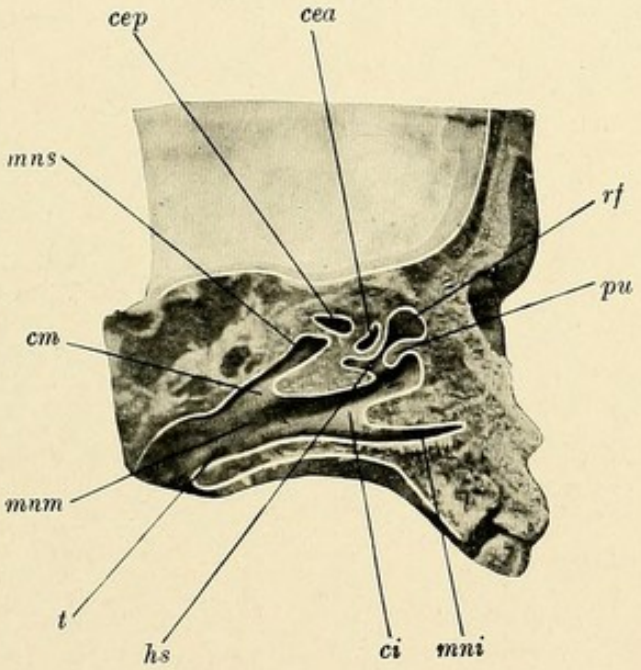
Plate 17.

Natural size. — Child of 1 month.

rf frontal recess, *pu* uncinate process, *cea* anterior ethmoidal cell, *hs* semilunar hiatus, *cep* posterior ethmoidal cell, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *t* Eustachian tube.

Longitudinal vertical section through the head of a child aged one month, shewing the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, and the lower (*ci*) and middle (*cm*) concha. Through the removal of the anterior part of the middle concha (*cm*) the semilunar hiatus (*hs*) has been exposed; it is enclosed between the uncinate process (*pu*) and the ethmoidal bulla (under *cea*). Adjoining the upper meatus (*mns*), is the posterior ethmoidal cell (*cep*); in a line with the lower meatus (*nmi*) but further backwards, the Eustachian tube (*t*) is visible. The early developmental stage of the frontal sinus or frontal recess (*rf*) is 5 mm high, 4½ mm wide and 3½ mm long; it opens into the upper, anterior part of the semilunar hiatus (*hs*). The anterior ethmoidal cell (*cea*) is 4½ mm long, 4 mm high and 3½ mm wide. The posterior ethmoidal cell (*cep*) is 5 mm long, 3½ mm wide and 3 mm high.

Tafel 17.



Tafel 18.

Sagittalschnitt.

Natürliche Grösse. — 1 Monat altes Kind.

Planche 18.

Coupe sagittale.

Grandeur nature. — Enfant de 1 mois.

Plate 18.

Longitudinal vertical section.

Natural size. — Child of 1 month.

Tafel 18.

Natürliche Grösse. — 1 Monat altes Kind.

sm sinus maxillaris.

Der Sagittalschnitt eines 1 Monat alten Kopfes zeigt die 10 mm lange, 4 mm hohe und 4 mm breite Kieferhöhle (*sm*).

Planche 18.

Grandeur nature. — Enfant de 1 mois.

sm sinus maxillaire.

Coupe sagittale d'une tête de 1 mois montrant le sinus maxillaire (*sm*) long de 10 millim., haut de 4 millim. et large de 4 millim.

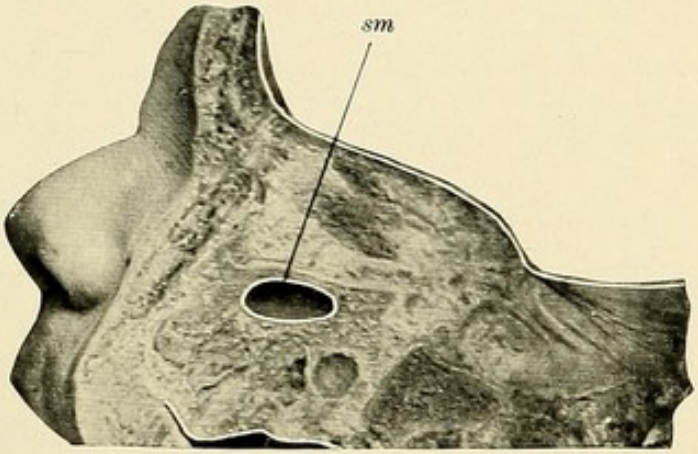
Plate 18.

Natural size. — Child of 1 month.

sm maxillary antrum.

Longitudinal vertical section through the head of a child aged one month, shewing the maxillary antrum (*sm*), which is 10 mm long, 4 mm high and 4 mm wide.

Tafel 18.



Tafel 19.

Sagittalschnitt.

Natürliche Grösse. — 1 Monat altes Kind.

Planche 19.

Coupe sagittale.

Grandeur nature. — Enfant de 1 mois.

Plate 19.

Longitudinal vertical section.

Natural size. — Child of 1 month.

Tafel 19.

Natürliche Grösse. — 1 Monat altes Kind.

rf recessus frontalis, *cea* celula ethmoidalis anterior, *cs* concha superior, *mns* meatus narium superior, *cm* concha media, *hs* hiatus semilunaris, *pu* processus uncinatus, *be* bulla ethmoidalis, *rb* recessus bullaris.

Der Sagittalschnitt eines 1 Monat alten Kopfes zeigt die Schnittlinie der entfernten mittleren Nasenmuschel (*cm*) und das auf diese Weise freigelegte Gebiet des hiatus semilunaris (*hs*), welchen der processus uncinatus (*pu*) und die bulla ethmoidalis (*be*) begrenzt. Oberhalb des vorderen Endes des hiatus semilunaris ist der Reihenfolge nach von vorn nach rückwärts der recessus frontalis (*rf*) und zwei vordere Siebbeinzellen (*cea*); die zweite vordere Siebbeinzelle (*cea*) mündet in den recessus bullaris (*rb*). Die Figur zeigt noch den oberen Nasengang (*mns*) und die obere Nasenmuschel (*cs*).

Planche 19.

Grandeur nature. — Enfant de 1 mois.

rf recessus frontal, *cea* cellule ethmoïdale antérieure, *cs* cornet supérieur, *mns* méat supérieur, *cm* cornet moyen, *hs* hiatus semilunaire, *pu* processus uncinatus, *be* bulle ethmoïdale, *rb* recessus bullaire.

Coupe sagittale d'une tête de 1 mois montrant la ligne de section du cornet moyen (*cm*) et la région de l'hiatus semilunaire (*hs*) mise à nu de cette façon et limitée par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*). Au-dessus de l'extrémité antérieure de l'hiatus semilunaire en allant d'avant en arrière on voit le recessus frontal (*rf*) deux cellules ethmoïdales antérieures (*cea*); dont une s'ouvre dans le recessus bullaire (*rb*). La figure montre encore le méat supérieur (*mns*) et le cornet supérieur (*cs*).

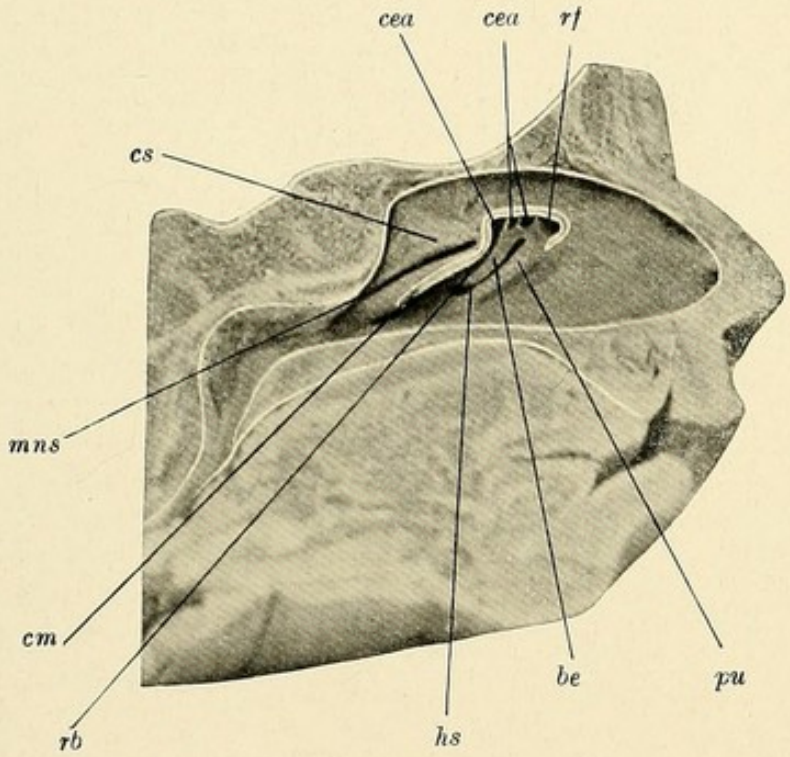
Plate 19.

Natural size. — Child of 1 month.

rf frontal recess, *cea* anterior ethmoidal cell, *cs* upper concha, *mns* upper meatus, *cm* middle concha, *hs* semilunar hiatus, *pu* uncinate process, *be* ethmoidal bulla, *rb* bullar recess.

Longitudinal vertical section through the head of a child aged one month, shewing the cut edge of the middle concha (*cm*) which has been removed in order to expose the region of the semilunar hiatus (*hs*); the hiatus is enclosed between the uncinate process (*pu*) and the ethmoidal bulla (*be*). Above the anterior extremity of the semilunar hiatus may be seen, from before backwards, the frontal recess (*rf*), and two anterior ethmoidal cells (*cea*); the second anterior ethmoidal cell (*cea*) opens into the bullar recess (*rb*). The illustration also shews the upper meatus (*mns*) and upper concha (*cs*).

Tafel 19.



Tafel 20.

Horizontalschnitt.

Natürliche Grösse. — 2 Monate altes Kind.

Planche 20.

Coupe horizontale.

Grandeur nature. — Enfant de 2 mois.

Plate 20.

Horizontal section.

Natural size. — Child of 2 months.

Tafel 20.

Natürliche Grösse. — 2 Monate altes Kind.

dnl ductus nasolacrimalis, *sm* sinus maxillaris, *ci* concha inferior.

Der Horizontalschnitt eines 2 Monate alten Kopfes zeigt die 7 mm lange, 3 mm hohe und 2½ mm breite Kieferhöhle (*sm*) im unmittelbaren Nachbarverhältnisse zum ductus nasolacrimalis (*dnl*). An diesem Präparate ist das ostium sphenoidale ½ mm weit und führt in die 1 mm weite Keilbeinhöhle.

Planche 20.

Grandeur nature. — Enfant de 2 mois.

dnl conduit nasolacrymal, *sm* sinus maxillaire, *ci* cornet inférieur.

Coupe horizontale d'une tête de 2 mois montrant le sinus maxillaire long de 7 millim., haut de 3 millim., large de 2½ millim. dans le voisinage immédiat du conduit nasolacrymal (*dnl*). Sur cette préparation l'ostium du sinus sphénoïdal a ½ millim. de large et conduit dans le sinus sphénoïdal large de 1 millim.

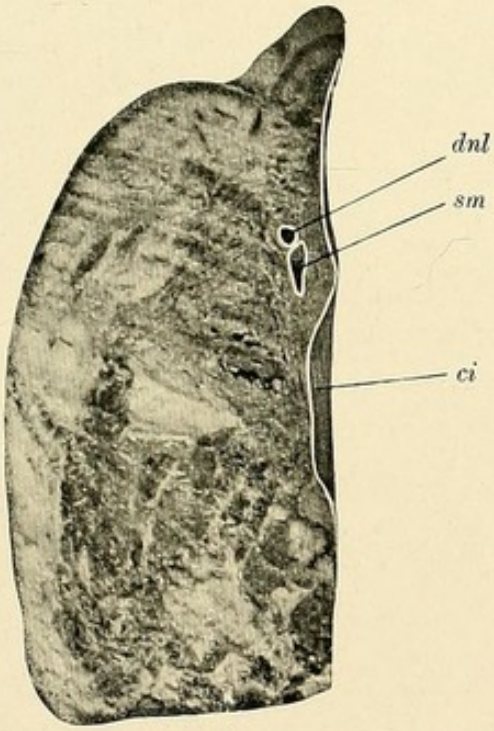
Plate 20.

Natural size. — Child of 2 months.

dnl nasal duct, *sm* maxillary antrum, *ci* lower concha.

Horizontal section through the head of a child aged 2 months, shewing the maxillary antrum (*sm*) in close contact with the nasal duct (*dnl*). The maxillary antrum is 7 mm long, 3 mm high and 2½ mm wide. In this specimen the sphenoidal ostium is ½ mm in diameter and leads into the sphenoidal sinus which is 1 mm wide.

Tafel 20.



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Tafel 21.

Sagittalschnitt.

Natürliche Grösse. — 2 Monate altes Kind.

Planche 21.

Coupe sagittale.

Grandeur nature. — Enfant de 2 mois.

Plate 21.

Longitudinal vertical section.

Natural size. — Child of 2 months.

Tafel 21.

Natürliche Grösse. — 2 Monate altes Kind.

sm sinus maxillaris.

Der Sagittalschnitt des Kopfes eines 2 Monate alten Kindes zeigt die 11 mm lange, 4 mm breite und 3 mm hohe Kieferhöhle (*sm*).

Planche 21.

Grandeur nature. — Enfant de 2 mois.

sm sinus maxillaire.

Coupe sagittale d'une tête d'enfant de 2 mois montrant le sinus maxillaire (*sm*), long de 11 millim., large de 4 millim. et haut de 3 millim.

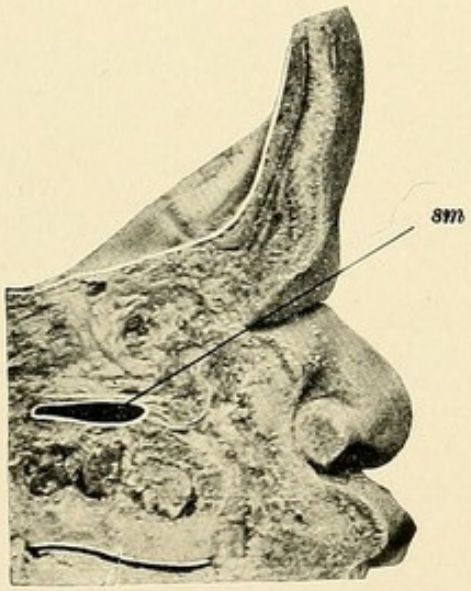
Plate 21.

Natural size. — Child of 2 months.

sm maxillary antrum.

Longitudinal vertical section through the head of a child aged 2 months, shewing the maxillary antrum (*sm*), which is 11 mm long, 4 mm wide and 3 mm high.

Tafel 21.



Tafel 22.

Frontalschnitt.

Natürliche Grösse. — 4 Monate altes Kind.

Planche 22.

Coupe frontale.

Grandeur nature. — Enfant de 4 mois.

Plate 22.

Coronal section.

Natural size. — Child of 4 months.

Tafel 22.

Natürliche Grösse. — 4 Monate altes Kind.

sm sinus maxillaris, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *os* ostium sphenoidale.

Der Frontalschnitt des Kopfes eines 4 Monate alten Kindes zeigt die 13 mm lange, 7 mm breite und 5 mm hohe Kieferhöhle, den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel. Das ostium sphenoidale (*os*) ist kaum ein ½ mm weit und führt in eine 2 mm weite Keilbeinhöhle.

Planche 22.

Grandeur nature. — Enfant de 4 mois.

sm sinus maxillaire, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur, *os* ostium du sinus sphénoïdal.

Coupe frontale d'une tête de 4 mois montrant le sinus maxillaire long de 13 millim., large de 7 millim. et haut de 5 millim., les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*). L'ostium du sinus sphénoïdal (*os*) a à peine ½ millim. de large et conduit dans un sinus sphénoïdal large de 2 millim.

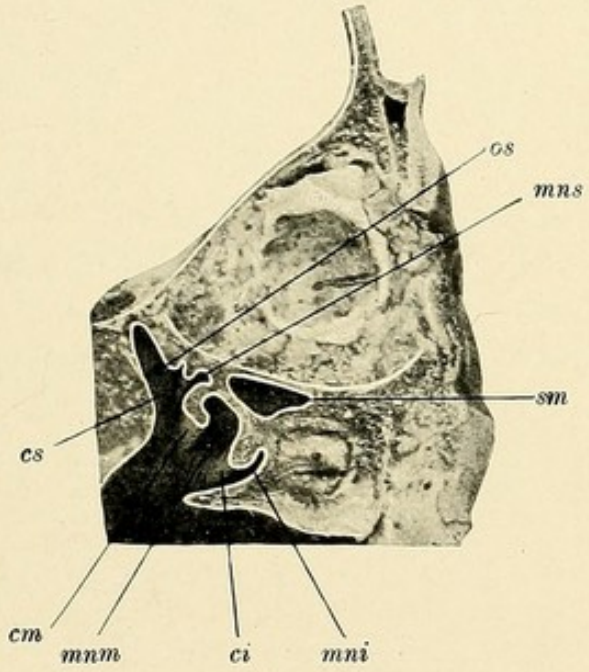
Plate 22.

Natural size. — Child of 4 months.

sm maxillary antrum, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *os* sphenoidal ostium.

Coronal section through the head of a child aged 4 months, shewing the maxillary antrum (*sm*), which is 13 mm long, 7 mm wide and 5 mm high, the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus and the lower (*ci*), middle (*cm*) and upper (*cs*) concha. The sphenoidal ostium (*os*), an orifice hardly ½ mm in diameter, leads into the sphenoidal sinus, which is 2 mm wide.

Tafel 22.



Tafel 23.

Sagittalschnitt.

Natürliche Grösse. — 4 Monate altes Kind.

Planche 23.

Coupe sagittale.

Grandeur nature. — Enfant de 4 mois.

Plate 23.

Longitudinal vertical section.

Natural size. — Child of 4 months.

Tafel 23.

Natürliche Grösse. — 4 Monate altes Kind.

sm sinus maxillaris.

Der Sagittalschnitt des Kopfes eines 4 Monate alten Kindes zeigt die 12 mm lange, 5 mm hohe und 6 mm breite Kieferhöhle (*sm*). An diesem Präparate ist das ostium sphenoidale ½ mm weit und führt in eine 3 mm weite Keilbeinhöhle.

Planche 23.

Grandeur nature. — Enfant de 4 mois.

sm sinus maxillaire.

Coupe sagittale d'une tête d'enfant de 4 mois montrant le sinus maxillaire (*sm*) long de 12 millim., haut de 5 millim. et large de 6 millim. Sur cette préparation l'ostium du sinus sphénoïdal a ½ millim. de large et conduit dans un sinus sphénoïdal large de 3 millim.

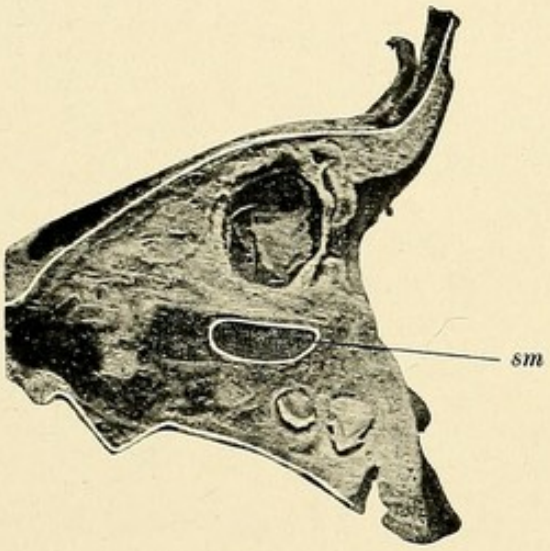
Plate 23.

Natural size. — Child of 4 months.

sm maxillary antrum.

Longitudinal vertical section through the head of a child aged 4 months, shewing the maxillary antrum (*sm*) which is 12 mm long, 5 mm high and 6 mm wide. In this specimen the sphenoidal ostium is ½ mm wide and leads into the sphenoidal sinus which is 3 mm wide.

Tafel 23.



Tafel 24.

Sagittalschnitt.

Natürliche Grösse. — 4 Monate altes Kind.

Planche 24.

Coupe sagittale.

Grandeur nature. — Enfant de 4 mois.

Plate 24.

Longitudinal vertical section.

Natural size — Child of 4 months.

Tafel 24.

Natürliche Grösse. — 4 Monate altes Kind.

sm sinus maxillaris.

Der Sagittalschnitt des Kopfes eines 4 Monate alten Kindes zeigt die 12 mm lange, 5 mm hohe und 4 mm breite Kieferhöhle (*sm*).

Planche 24.

Grandeur nature. — Enfant de 4 mois.

sm sinus maxillaire.

Coupe sagittale d'une tête d'enfant de 4 mois montrant le sinus maxillaire (*sm*) long de 12 millim., haut de 5 millim. et large de 4 millim.

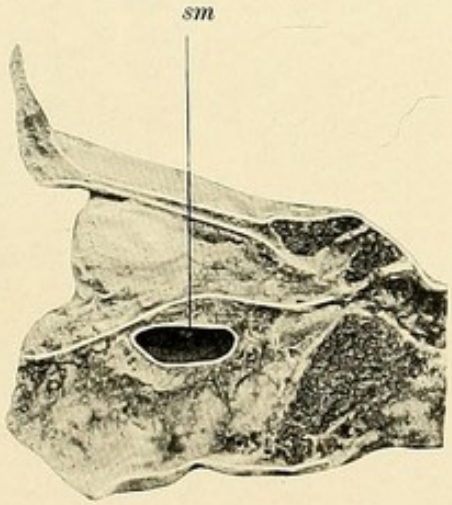
Plate 24.

Natural size. — Child of 4 months.

sm maxillary antrum.

Longitudinal vertical section through the head of a child aged 4 months, shewing the maxillary antrum (*sm*) which is 12 mm long, 5 mm high and 4 mm wide.

Tafel 24.



Tafel 25.

Frontalschnitt.

Natürliche Grösse. — 4¼ Monate altes Kind.

Planche 25.

Coupe frontale.

Grandeur nature. — Enfant de 4 mois ¼.

Plate 25.

Coronal section.

Natural size. — Child of 4¼ months.

Tafel 25.

Natürliche Grösse. — $4\frac{1}{4}$ Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *cn* cavum narium, *cm* concha media, *mnm* meatus narium medius, *ci* concha inferior, *mni* meatus narium inferior, *dnl* ductus nasolacrimalis.

Der Frontalschnitt des $4\frac{1}{4}$ Monate alten Kopfes zeigt die $6\frac{1}{2}$ mm hohe, $3\frac{1}{2}$ mm breite und 3 mm lange Stirnhöhle (*sf*), die vordere Siebbeinzelle (*cea*), den unteren (*mni*) und mittleren (*mnm*) Nasengang, die untere (*ci*) und die mittlere (*cm*) Nasenmuschel. Im Bereiche des unteren Nasenganges (*mni*) ist der ductus nasolacrimalis (*dnl*) zu sehen.

Planche 25.

Grandeur nature. — Enfant de 4 mois $\frac{1}{4}$.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *cn* cavité nasale, *cm* cornet moyen, *mnm* méat moyen, *ci* cornet inférieur, *mni* méat inférieur, *dnl* conduit nasolacrymal.

Coupe frontale d'un crâne de 4 mois $\frac{1}{4}$, montrant le sinus frontal (*sf*) haut de $6\frac{1}{2}$ millim., large de $3\frac{1}{2}$ millim. et long de 3 millim., lacellule ethmoïdale antérieure (*cea*), les méats inférieur (*mni*) et moyen (*mnm*), les cornets inférieur (*ci*) et moyen (*cm*). Au niveau du méat inférieur (*mni*) on peut voir le conduit nasolacrymal (*dnl*).

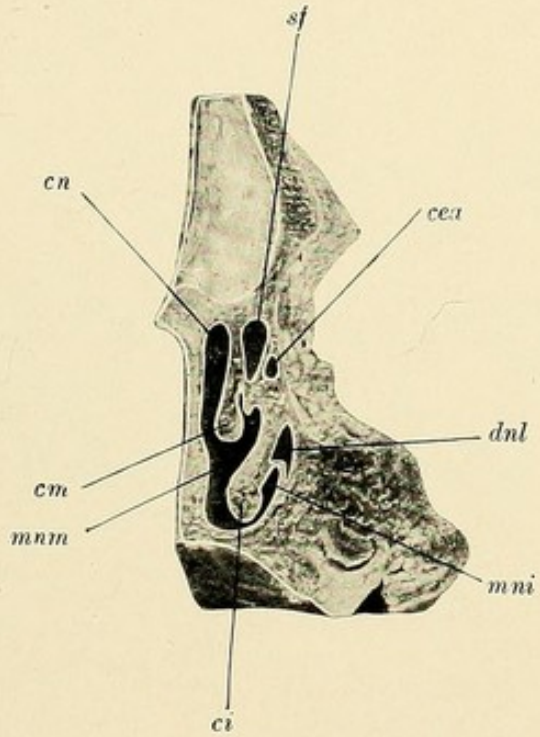
Plate 25.

Natural size. — Child of $4\frac{1}{4}$ months.

sf frontal sinus, *cea* anterior ethmoidal cell, *cn* nasal cavity, *cm* middle concha, *mnm* middle meatus, *ci* lower concha, *mni* lower meatus, *dnl* nasal duct.

Coronal section through the head of a child aged $4\frac{1}{4}$ months, shewing the frontal sinus (*sf*), measuring $6\frac{1}{2}$ mm in height, $3\frac{1}{2}$ mm in width and 3 mm in length, the anterior ethmoidal cell (*cea*), the lower (*mni*) and middle (*mnm*) meatus, and the lower (*ci*) and middle (*cm*) concha. Adjoining the lower meatus (*mni*) the nasal duct (*dnl*) is visible.

Tafel 25.



Tafel 26.

Frontalschnitt.

Natürliche Grösse. — 4 1/4 Monate altes Kind.

Planche 26.

Coupe frontale.

Grandeur nature. — Enfant de 4 mois 1/4.

Plate 26.

Coronal section.

Natural size. — Child of 4 1/4 months.

Tafel 26.

Natürliche Grösse. — 4¼ Monate altes Kind.

sm sinus maxillaris, *cep* cellula ethmoidalis posterior, *cea* cellula ethmoidalis anterior, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior, *cn* cavum narium.

Der Frontalschnitt eines 4¼ Monate alten Kopfes zeigt die äussere Wand der Nasenhöhle, den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, die Kieferhöhle (*sm*), die vordere (*cea*) und die hintere (*cep*) Siebbeinzelle. Die Kieferhöhle (*sm*) ist 11 mm lang, 7 mm hoch und 4½ mm breit. Die hintere Siebbeinzelle (*cep*) ist 7 mm hoch, 6 mm lang und 3 mm breit.

Planche 26.

Grandeur nature. — Enfant de 4 mois ¼.

sm sinus maxillaire, *cep* cellule ethmoïdale postérieure, *cea* cellule ethmoïdale antérieure, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur, *cn* cavité nasale.

Coupe frontale d'une tête de 4 mois ¼ montrant la paroi latérale de la fosse nasale, les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), le sinus maxillaire (*sm*), la cellule ethmoïdale antérieure (*cea*) et postérieure (*cep*). Le sinus maxillaire (*sm*) a 11 millim. de long, 7 millim. de haut et 4½ millim. de large. La cellule ethmoïdale postérieure (*cep*) a 7 millim. de haut, 6 millim. de long et 3 millim. de large.

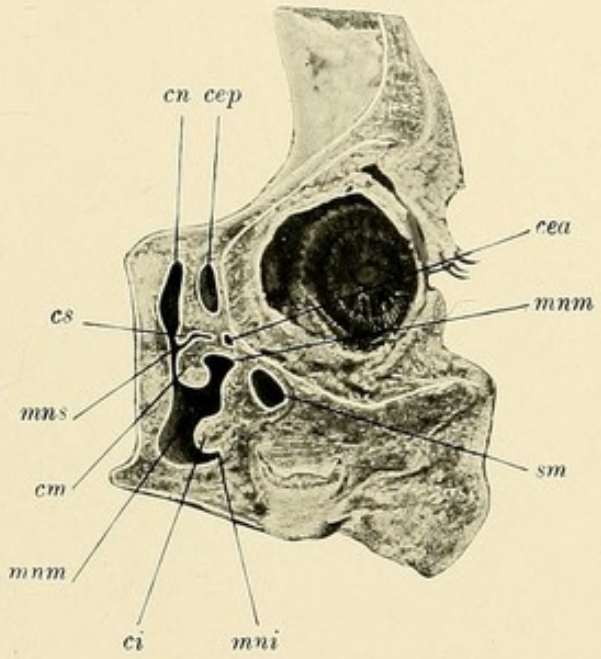
Plate 26.

Natural size. — Child of 4¼ months.

sm maxillary antrum, *cep* posterior ethmoidal cell, *cea* anterior ethmoidal cell, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus, *cn* nasal cavity.

Coronal section through the head of a child aged 4¼ months, shewing the lateral wall of the nasal fossa, the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus and the lower (*ci*), middle (*cm*) and upper (*cs*) concha, the maxillary antrum (*sm*), anterior (*cea*) and posterior (*cep*) ethmoidal cells. The maxillary antrum is 11 mm long, 7 mm high and 4½ mm wide. The posterior ethmoidal cell (*cep*) is 7 mm high, 6 mm long and 3 mm wide.

Tafel 26.



Tafel 27.

Horizontalschnitt.

Natürliche Grösse. — 4 1/4 Monate altes Kind.

Planche 27.

Coupe horizontale.

Grandeur nature. — Enfant de 4 mois 1/4.

Plate 27.

Horizontal section.

Natural size. — Child of 4 1/4 months.

Tafel 27.

Natürliche Grösse. — 4¼ Monate altes Kind.

sm sinus maxillaris, *dnl* ductus nasolacrimalis, *mnm* meatus narium medius, *ci* concha inferior.

Der Horizontalschnitt eines 4¼ Monate alten Kopfes zeigt die Kieferhöhle (*sm*) und, zwischen ihr und dem mittleren Nasengange (*mnm*), den ductus nasolacrimalis (*dnl*). Die Kieferhöhle ist 19 mm lang, 8 mm hoch und 4½ mm breit.

Planche 27.

Grandeur nature. — Enfant de 4 mois ¼.

sm sinus maxillaire, *dnl* conduit nasolacrymal, *mnm* méat moyen, *ci* cornet inférieur.

Coupe horizontale d'une tête d'enfant de 4 mois¼ montrant le sinus maxillaire (*sm*), et entre lui et le méat moyen (*mnm*), le conduit nasolacrymal (*dnl*). Le sinus maxillaire a 19 millim. de long, 8 millim. de haut et 4½ millim. de large.

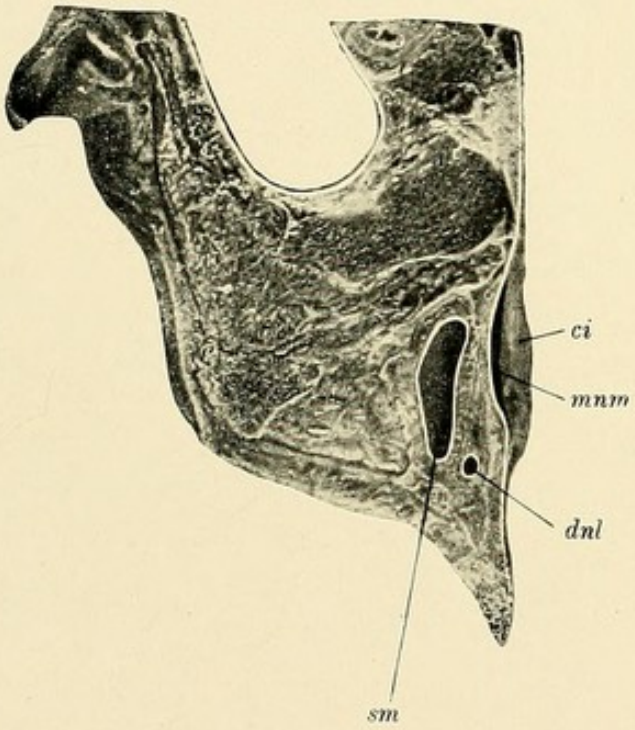
Plate 27.

Natural size. — Child of 4¼ months.

sm maxillary antrum, *dnl* nasal duct, *mnm* middle meatus, *ci* lower concha.

Horizontal section through the head of a child, aged 4¼ months, shewing the maxillary antrum (*sm*) and the nasal duct (*dnl*). The latter is situated between the antrum and the middle meatus (*mnm*). The maxillary antrum is 19 mm long, 8 mm high and 4½ mm wide.

Tafel 27.



Tafel 28.

Horizontalschnitt.

Natürliche Grösse. — 4 1/4 Monate altes Kind.

Planche 28.

Coupe horizontale.

Grandeur nature. — Enfant de 4 mois 1/4.

Plate 28.

Horizontal section.

Natural size. — Child of 4 1/4 months.

Tafel 28.

Natürliche Grösse. — 4¼ Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *mnm* meatus narium medius.

Der Horizontalschnitt eines 4¼ Monate alten Kopfes ist am obersten Teile des mittleren Nasenganges (*mnm*) geführt und zeigt in der Reihenfolge von vorne nach rückwärts die Stirnhöhle (*sf*), die vorderen (*cea*) und die hinteren (*cep*) Siebbeinzellen. Die Stirnhöhle (*sf*) ist 6 mm hoch, 5½ mm lang und 3 mm breit. Die vorderen Siebbeinzellen (*cea*) sind 4—5 mm hoch, 3—4½ mm lang und 2—4 mm breit. Die hinteren Siebbeinzellen (*cep*) sind 5 mm hoch, 3—5 mm lang und 4½ mm breit.

Planche 28.

Grandeur nature. — Enfant de 4 mois ¼.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *mnm* méat moyen.

Coupe horizontale d'une tête de 4 mois ¼ passant par la partie supérieure du méat moyen (*mnm*) et montrant, situés d'avant en arrière: le sinus frontal (*sf*), la cellule ethmoïdale antérieure (*cea*) et postérieure (*cep*). Le sinus frontal (*sf*) a 6 millim. de haut, 5½ millim. de long et 3 millim. de large. La cellule ethmoïdale antérieure (*cea*) a de 4 à 5 millim. de haut, de 3 à 4½ millim. de long et de 2 à 4 millim. de large Les cellules ethmoïdales postérieures (*cep*) otn 5 millim. de haut, de 3 à 5 millim. de long et 4½ millim. de large.

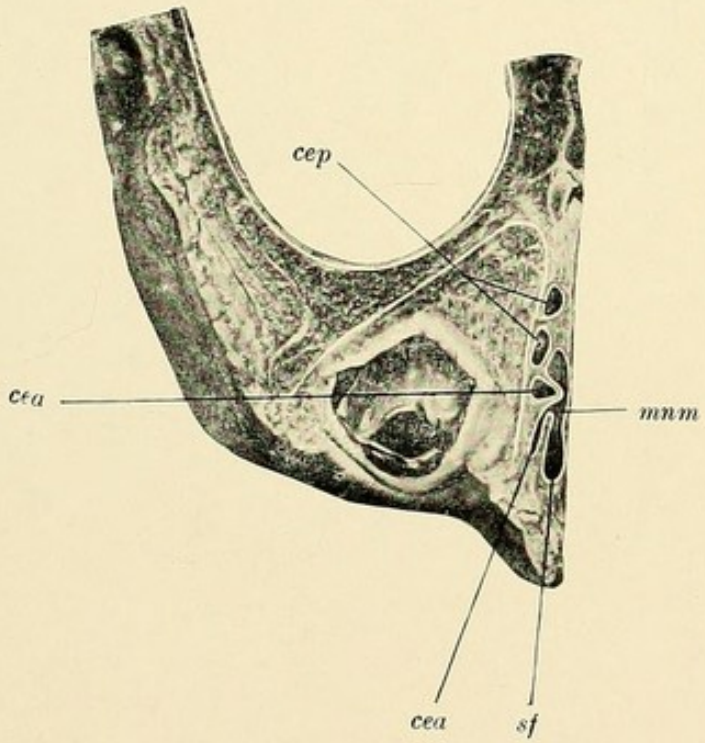
Plate 28.

Natural size. — Child of 4¼ months.

sf frontal sinus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *mnm* middle meatus.

Horizontal section through the head of a child aged 4¼ months. The section is cut through the uppermost part of the middle meatus and shews, from before backwards, the frontal sinus (*sf*), the anterior (*cea*) and posterior (*cep*) ethmoidal cells. The frontal sinus (*sf*) is 6 mm high, 5½ mm long and 3 mm wide. The anterior ethmoidal cells (*cea*) are 4 to 5 mm high, 3 to 4½ mm long and 2 to 4 mm wide. The posterior ethmoidal cells (*cep*) are 5 mm high, 3 to 5 mm long and 4½ mm wide.

Tafel 28.



Tafel 29.

Sagittalschnitt.

Natürliche Grösse. — 4 1/2 Monate altes Kind.

Planche 29.

Coupe sagittale.

Grandeur nature. — Enfant de 4 mois 1/2.

Plate 29.

Longitudinal vertical section.

Natural size. — Child of 4 1/2 months.

Tafel 29.

Natürliche Grösse. — 4½ Monate altes Kind.

sm sinus maxillaris.

Der Sagittalschnitt eines 4½ Monate alten Kopfes zeigt die 16 mm lange, 6 mm hohe und 5½ mm breite Kieferhöhle (*sm*). An diesem Präparate ist die Keilbeinhöhle 3 mm lang, 2½ mm hoch und 1½ mm breit.

Planche. 29

Grandeur nature. — Enfant de 4 mois ½.

sm sinus maxillaire.

Coupe sagittale d'une tête de 4 mois ½ montrant le sinus maxillaire (*sm*) long de 16 millim., haut de 6 millim. et large de 5½ millim. Sur cette préparation le sinus sphénoïdal a 3 millim. de long, 2½ millim. de haut et 1½ millim. de large.

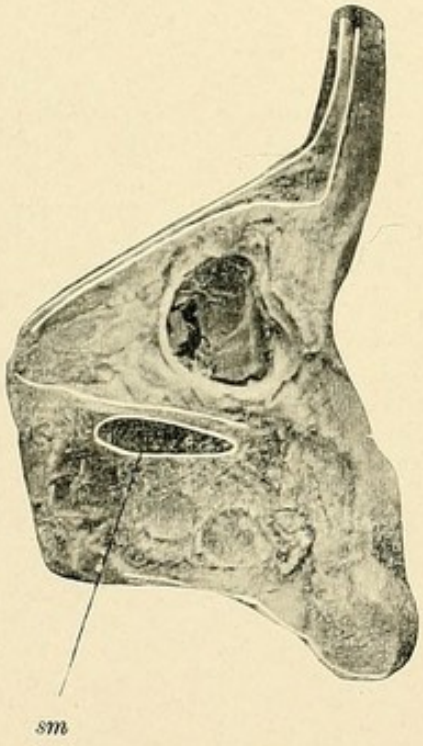
Plate 29.

Natural size. — Child of 4½ months.

sm maxillary antrum.

Longitudinal vertical section through the head of a child aged 4½ months, shewing the maxillary antrum (*sm*) which is 16 mm long, 6 mm high and 5½ mm wide. The sphenoidal sinus of this specimen is 3 mm long, 2½ mm high and 1½ mm wide.

Tafel 29.



Tafel 30.

Sagittalschnitt.

Natürliche Grösse. — 4 1/2 Monate altes Kind.

Planche 30.

Coupe sagittale.

Grandeur nature. — Enfant de 4 mois 1/2.

Plate 30.

Longitudinal vertical section.

Natural size. — Child of 4 1/2 months.

Tafel 30.

Natürliche Grösse. — 4½ Monate altes Kind.

ss sinus sphenoidalis, *os* ostium sphenoidale, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *mnsr* meatus narium supremus.

Der Sagittalschnitt eines 4½ Monate alten Kopfes zeigt den unteren (*mni*), den mittleren (*mnm*), den oberen (*mns*) und den obersten (*mnsr*) Nasengang, ferner die 4 mm hohe, 2½ mm lange und 2 mm breite Keilbeinhöhle (*ss*) mit ihrer 1 mm weiten Mündung, dem ostium sphenoidale (*os*) nahe zum Nasendache.

Planche 30.

Grandeur nature.— Enfant de 4 mois ½.

ss sinus sphénoidal, *os* ostium du sinus sphénoïdal, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur, *mnsr* méat suprême.

Coupe sagittale d'une tête de 4 mois ½ montrant les méats inférieur (*mni*), moyen (*mnm*) supérieur (*mns*) et suprême (*mnsr*) de plus le sinus sphénoïdal (*ss*) haut de 4 millim., long de 2½ millim. et large de 2 millim. avec son ostium (*os*) large de 1 millim. près du toit de la fosse nasale.

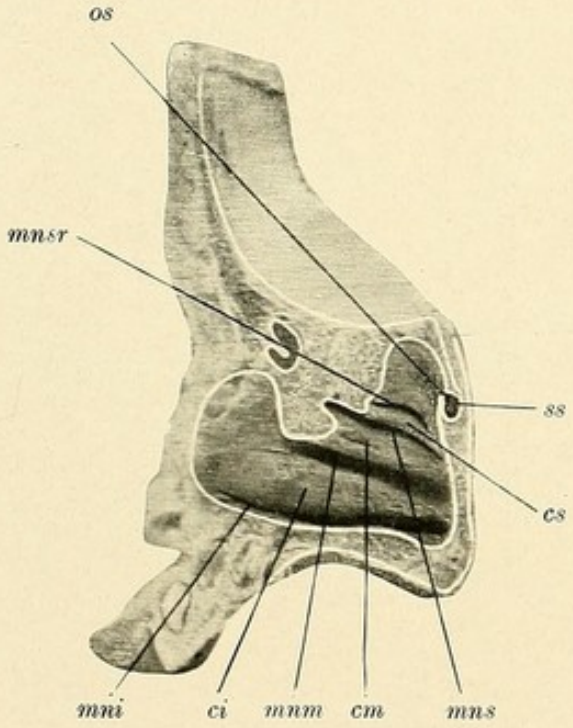
Plate 30.

Natural size. — Child of 4½ months.

ss sphenoidal sinus, *os* sphenoidal ostium, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *mnsr* uppermost meatus.

Longitudinal vertical section through the skull of a child aged 4½ months, shewing the lower (*mni*), middle (*mnm*), upper (*mns*) and uppermost (*mnsr*) meatus and the sphenoidal sinus (*ss*), which is 4 mm high, 2½ mm long and 2 mm wide. Its orifice, the sphenoidal ostium (*os*), is 1 mm wide and lies near the roof of the nasal cavity.

Tafel 30.



Tafel 31.

Horizontalschnitt.

Natürliche Grösse. — 4 1/2 Monate altes Kind.

Planche 31.

Coupe horizontale.

Grandeur nature. — Enfant de 4 mois 1/2.

Plate 31.

Horizontal section.

Natural size. — Child of 4 1/2 months.

Tafel 31.

Natürliche Grösse. — 4½ Monate altes Kind.

sm sinus maxillaris, *dnl* ductus nasolacrimalis, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media.

Der Horizontalschnitt des 4½ Monate alten Kopfes zeigt die 10 mm lange, 5 mm hohe und 4 mm breite Kieferhöhle (*sm*), den ductus nasolacrimalis (*dnl*), den mittleren Nasengang (*mnm*), die mittlere (*cm*) und die untere (*ci*) Nasenmuschel.

Planche 31.

Grandeur nature. — Enfant de 4 mois ½.

sm sinus maxillaire, *dnl* conduit nasolacrymal, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen.

Coupe horizontale d'une tête de 4 mois ½ montrant le sinus maxillaire long de 10 millim., haut de 5 millim. et large de 4 millim. le conduit nasolacrymal (*dnl*), le méat moyen (*mnm*), les cornets moyen (*cm*) et inférieur (*ci*).

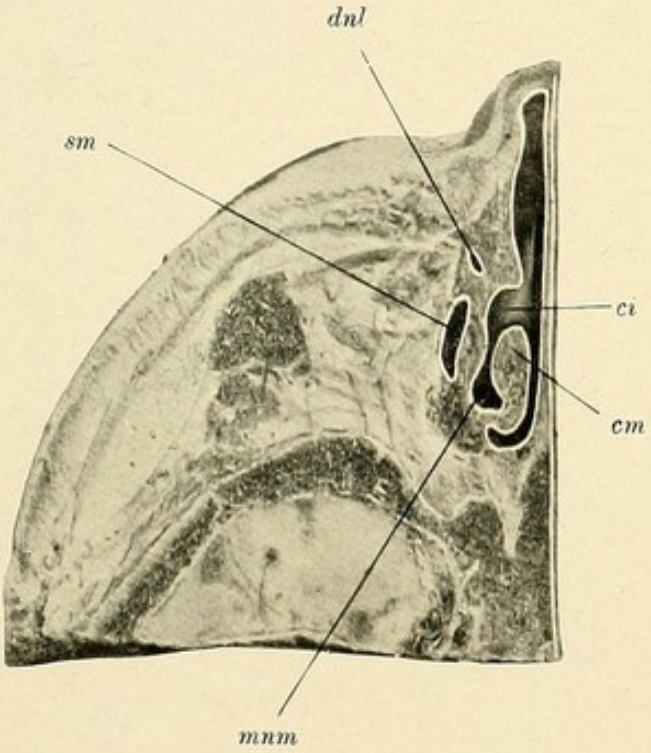
Plate 31.

Natural size. — Child of 4½ months.

sm maxillary antrum, *dnl* nasal duct, *ci* lower concha, *mnm* middle meatus, *cm* middle concha.

Horizontal section through the head of a child aged 4½ months, shewing the maxillary antrum (*sm*) which is 10 mm long, 5 mm high and 4 mm wide, the nasal duct (*dnl*), middle meatus (*mnm*) and lower concha (*ci*).

Tafel 31.



Tafel 32.

Horizontalschnitt.

Natürliche Grösse. — 5 Monate altes Kind.

Planche 32.

Coupe horizontale.

Grandeur nature. — Enfant de 5 mois.

Plate 32.

Horizontal section.

Natural size. — Child of 5 months.

Tafel 32.

Natürliche Grösse. — 5 Monate altes Kind.

sm sinus maxillaris, *dnl* ductus nasolacrimalis, *ci* concha inferior, *mni* meatus narium inferior.

Der Horizontalschnitt eines fünf Monate alten Kopfes zeigt oberhalb der Ansatzlinie der unteren Nasenmuschel (*ci*) die Kieferhöhle (*sm*), vor der Kieferhöhle (*sm*) neben der unteren Muschel (*ci*) den ductus nasolacrimalis (*dnl*). Die Kieferhöhle ist 12 mm lang, 7 mm hoch und 5 mm breit. An diesem Kopfe ist der sinus frontalis 7 mm hoch, 5½ mm lang und 2 mm breit. Die vordere Siebbeinzellen sind 4—6 mm lang, 6—7 mm hoch und 2—5 mm breit. Die hintere Siebbeinzelle ist 9 mm lang, 8 mm hoch und 4½ mm breit.

Planche 32.

Grandeur nature. — Enfant de 5 mois.

sm sinus maxillaire, *dnl* conduit nasolacrymal, *ci* cornet inférieur, *mni* méat inférieur.

Coupe horizontale d'une tête de 5 mois montrant au-dessus du point d'insertion du cornet inférieur (*ci*) le sinus maxillaire (*sm*), devant le sinus maxillaire (*sm*) près du cornet inférieur (*ci*) le conduit nasolacrymal (*dnl*). Le sinus maxillaire a 12 millim. de long, 7 millim de haut et 5 millim. de large. Le sinus frontal de cette tête a 7 millim. de haut, 5½ millim. de long et 2 millim. de large. La cellule ethmoïdale antérieure a de 4 à 6 millim. de long, de 6 à 7 millim. de haut et de 2 à 5 millim. de large. La cellule ethmoïdale postérieure a 9 millim. de long, 8 millim. de haut et 4½ millim. de large.

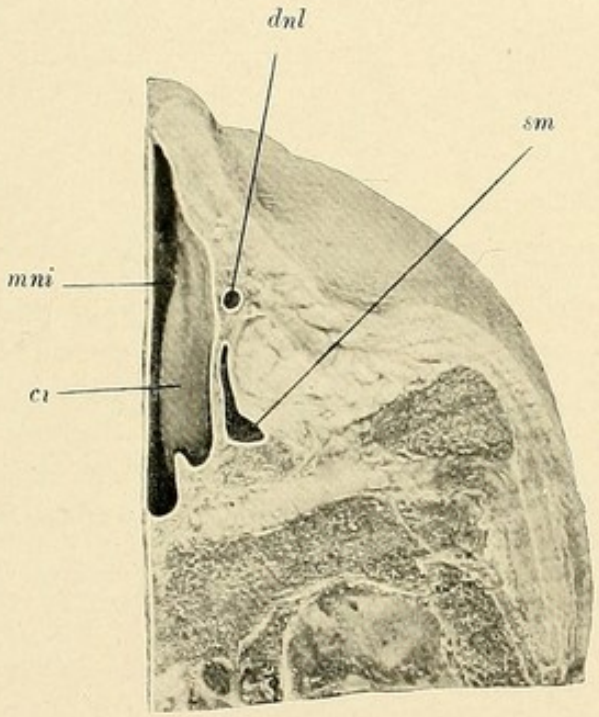
Plate 32.

Natural size. — Child of 5 months.

sm maxillary antrum, *dnl* nasal duct, *ci* lower concha, *mni* lower meatus.

Horizontal section through the head of a child aged 5 months, shewing the maxillary antrum (*sm*) situated above the ridge of insertion of the lower concha (*ci*); in front of the antrum (*sm*) and adjoining the lower concha (*ci*) is the nasal duct (*dnl*). The maxillary antrum is 12 mm long, 7 mm high and 5 mm wide. The frontal sinus of this head is 7 mm high, 5½ mm long and 2 mm wide. The anterior ethmoidal cells are 4 to 6 mm long, 6 to 7 mm high and 2 to 5 mm wide. The posterior ethmoidal cell is 9 mm long, 8 mm high and 4½ mm wide.

Tafel 32.



Tafel 33.

Horizontalschnitt.

Natürliche Grösse. — 5 Monate altes Kind.

Planche 33.

Coupe horizontale.

Grandeur nature. — Enfant de 5 mois.

Plate 33.

Horizontal section.

Natural size. — Child of 5 months.

Tafel 33.

Natürliche Grösse. — 5 Monate altes Kind.

sm sinus maxillaris, *dnl* ductus nasolacrimalis, *ci* concha inferior, *mni* meatus narium inferior.

Der Horizontalschnitt eines fünf Monate alten Kopfes zeigt in der Gegend des oberen Teiles der unteren Nasenmuschel (*ci*) die Kieferhöhle (*sm*) und den ductus nasolacrimalis (*dnl*), welcher in dem unteren Nasengange (*mni*) mündet. Die Kieferhöhle (*sm*) ist 14 mm lang, 6 mm breit und 5 mm hoch. An diesem Kopfe ist die Stirnhöhle $7\frac{1}{2}$ mm hoch, 5 mm lang und 4 mm breit. Die vordere Siebbeinzellen sind 3—8 mm hoch, $2\frac{1}{2}$—6 mm lang und 2—5 mm breit. Die hintere Siebbeinzelle ist 9 mm lang, 6 mm hoch und 4 mm breit. Die Keilbeinhöhle ist 5 mm hoch, $3\frac{1}{2}$ mm lang und 3 mm breit. Die Keilbeinhöhlenmündung ist 1 mm weit.

Planche 33.

Grandeur nature. — Enfant de 5 mois.

sm sinus maxillaire, *dnl* conduit nasolacrymal, *ci* cornet inférieur, *mni* méat inférieur.

Coupe horizontale d'une tête de 5 mois, montrant, dans la région de la partie supérieure du cornet inférieur (*ci*), le sinus maxillaire (*sm*) et le conduit nasolacrymal (*dnl*) qui s'ouvre dans le méat inférieur (*mni*). Le sinus maxillaire (*sm*) a 14 millim. de long, 6 millim. de large et 5 millim de haut. Le sinus frontal de cette tête a $7\frac{1}{2}$ millim. de haut, 5 millim. de long et 4 millim. de large. La cellule ethmoïdale antérieure a de 3 à 8 millim. de haut, de $2\frac{1}{2}$ à 6 millim. de long et de 2 à 5 millim. de large. La cellule ethmoïdale postérieure a 9 millim. de long, 6 millim. de haut et 4 millim. de large. Le sinus sphénoïdal a 5 millim. de haut, $3\frac{1}{2}$ millim. de long et 3 millim. de large. L'ostium du sinus sphénoïdal a 1 millim. de large.

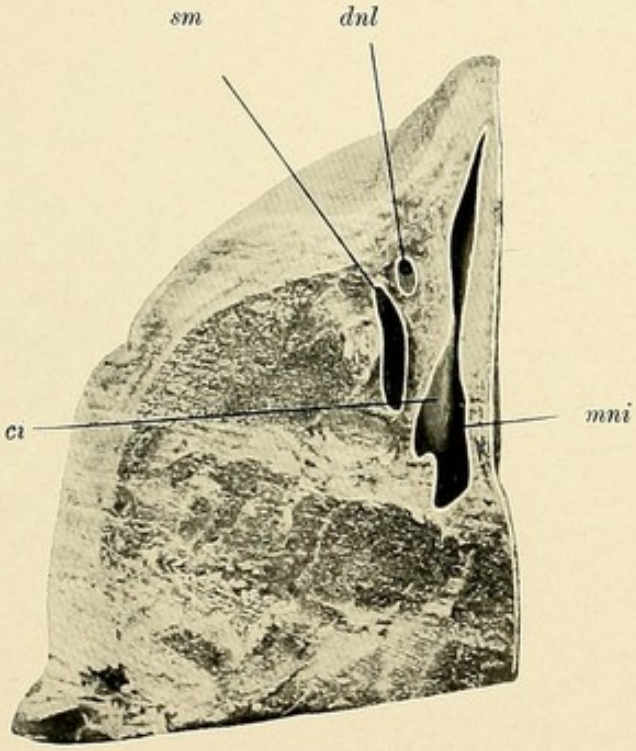
Plate 33.

Natural size. — Child of 5 months.

sm maxillary antrum, *dnl* nasal duct, *ci* lower concha, *mni* lower meatus.

Horizontal section through the head of a child aged 5 months. Adjoining the upper portion of the lower concha (*ci*) are the maxillary antrum (*sm*) and the nasal duct (*dnl*); the latter opens into the lower meatus (*mni*). The maxillary antrum (*sm*) is 14 mm long, 6 mm wide and 5 mm high. The frontal sinus of this head is $7\frac{1}{2}$ mm high, 5 mm long and 4 mm wide. The anterior ethmoidal cells are 3 to 8 mm high, $2\frac{1}{2}$ to 6 mm long and 2 to 5 mm wide. The posterior ethmoidal cell is 9 mm long, 6 mm high and 4 mm wide. The sphenoidal sinus is 5 mm high, $3\frac{1}{2}$ mm long and 3 mm wide. The sphenoidal ostium is 1 mm in diameter.

Tafel 33.



Tafel 34.

Horizontalschnitt.

Natürliche Grösse. — 5 Monate altes Kind.

Planche 34.

Coupe horizontale.

Grandeur nature. — Enfant de 5 mois.

Plate 34.

Horizontal section.

Natural size. — Child of 5 months.

Tafel 34.

Natürliche Grösse. — 5 Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *cn* cavum narium, *s* septum.

Der Horizontalschnitt des 5 Monate alten Kopfes ist am oberen Teile der Nasenhöhle geführt und zeigt die Stirnhöhle (*sf*), die vordere Siebbeinzelle (*cea*), die hintere Siebbeinzelle (*cep*), die Nasenhöhle (*cn*) und die Nasenscheidewand (*s*). Die Stirnhöhle (*sf*) ist 7 mm hoch, $5\frac{1}{2}$ mm lang und 2 mm breit. Die vordere Siebbeinzellen (*cea*) sind 4—6 mm lang, 6—7 mm hoch und 2—5 mm breit. Die hintere Siebbeinzelle (*cep*) ist 9 mm lang, 8 mm hoch und $4\frac{1}{2}$ mm breit.

Planche 34.

Grandeur nature. — Enfant de 5 mois.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *cn* cavité nasale, *s* septum.

Coupe horizontale d'une tête de 5 mois passant par la partie supérieure de la cavité nasale, et montrant le sinus frontal (*sf*), la cellule ethmoïdale antérieure (*cea*), la cellule ethmoïdale postérieure (*cep*), la cavité nasale (*cn*) et le septum (*s*). Le sinus frontal (*sf*) a 7 millim de haut, $5\frac{1}{2}$ millim de long et 2 millim. de large. La cellule ethmoïdale antérieure (*cea*) a de 4 à 6 millim. de long., de 6 à 7 millim. de haut et de 2 à 5 millim. de large. La cellule ethmoïdale postérieure (*cep*) a 9 millim. de long, 8 millim. de haut et $4\frac{1}{2}$ millim. de large.

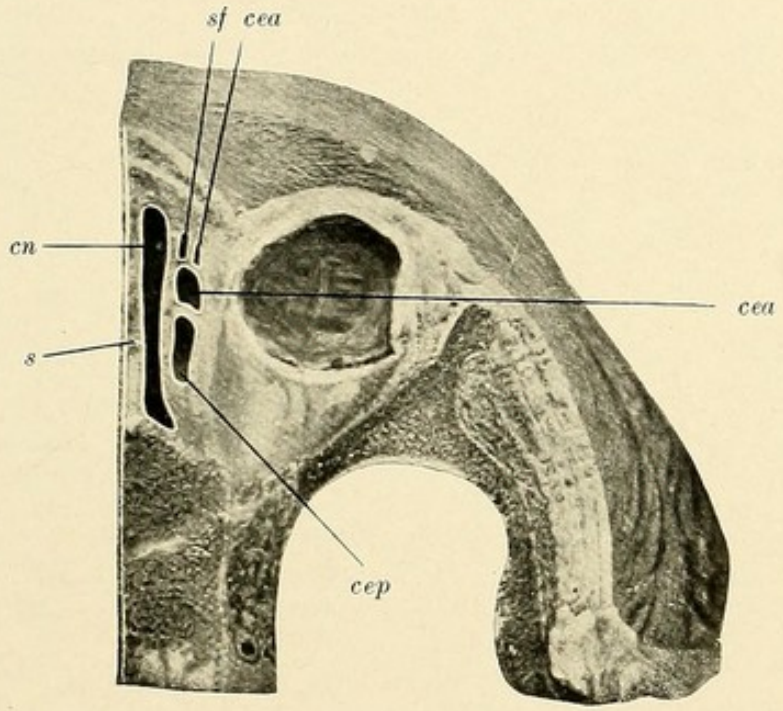
Plate 34.

Natural size. — Child of 5 months.

sf frontal sinus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *cn* nasal cavity, *s* septum.

Horizontal section through the skull of a child aged 5 months. The section is cut through the upper part of the nasal fossa and shews the frontal sinus (*sf*), the anterior (*cea*) and posterior (*cep*) ethmoidal cells, the nasal cavity (*cn*) and the septum (*s*). The frontal sinus (*sf*) is 7 mm high, $5\frac{1}{2}$ mm long and 2 mm wide. The anterior ethmoidal cells (*cea*) are 4 to 6 mm long, 6 to 7 mm high and 2 to 5 mm wide. The posterior ethmoidal cell (*cep*) is 9 mm long, 8 mm high and $4\frac{1}{2}$ mm wide.

Tafel 34.



Tafel 35.

Horizontalschnitt.

Natürliche Grösse. — 5 Monate altes Kind.

Planche 35.

Coupe horizontale.

Grandeur nature. — Enfant de 5 mois.

Plate 35.

Horizontal section.

Natural size — Child of 5 months.

Tafel 35.

Natürliche Grösse. — 5 Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *cn* cavum narium, *s* septum.

Der Horizontalschnitt eines 5 Monate alten Kopfes ist am oberen Teile der Nasenhöhle geführt und zeigt die Stirnhöhle (*sf*), die vordere Siebbeinzelle (*cea*), die hintere Siebbeinzelle (*cep*) die Nasenhöhle (*cn*) und die Scheidewand (*s*). Die Stirnhöhle (*sf*) ist $7\frac{1}{2}$ mm hoch, 5 mm lang und 4 mm breit. Die vordere Siebbeinzellen (*cea*) sind $2\frac{1}{2}$—6 mm lang, 3—8 mm hoch und 2—5 mm breit. Die hintere Siebbeinzelle (*cep*) ist 10 mm lang, 6 mm hoch und 4 mm breit. An diesem Präparate ist die Keilbeinhöhle 5 mm hoch, $3\frac{1}{2}$ mm lang und 3 mm breit, ihre Mündung, das ostium sphenoidale, ist 1 mm weit.

Planche 35.

Grandeur nature. — Enfant de 5 mois.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *cn* cavité nasale, *s* septum.

Coupe horizontale d'une tête de 5 mois passant par la partie supérieure de la cavité nasale, et montrant le sinus frontal (*sf*), la cellule ethmoïdale antérieure (*cea*), le cellule ethmoïdale postérieure (*cep*), la cavité nasale (*cn*) et le septum (*s*). Le sinus frontal (*sf*) a $7\frac{1}{2}$ millim. de haut, 5 millim. de long et 4 millim. de large. Les cellules ethmoïdales antérieures (*cea*) ont de $2\frac{1}{2}$ à 6 millim. de long, de 3 à 8 millim. de haut et de 2 à 5 millim. de large. La cellule ethmoïdale postérieure (*cep*) a 10 millim. de long, 6 millim. de haut et 4 millim. de large. Sur cette préparation, le sinus sphénoïdal a 5 millim. de haut, $3\frac{1}{2}$ millim. de long et 3 millim. de large, son ostium a 1 millim. de large.

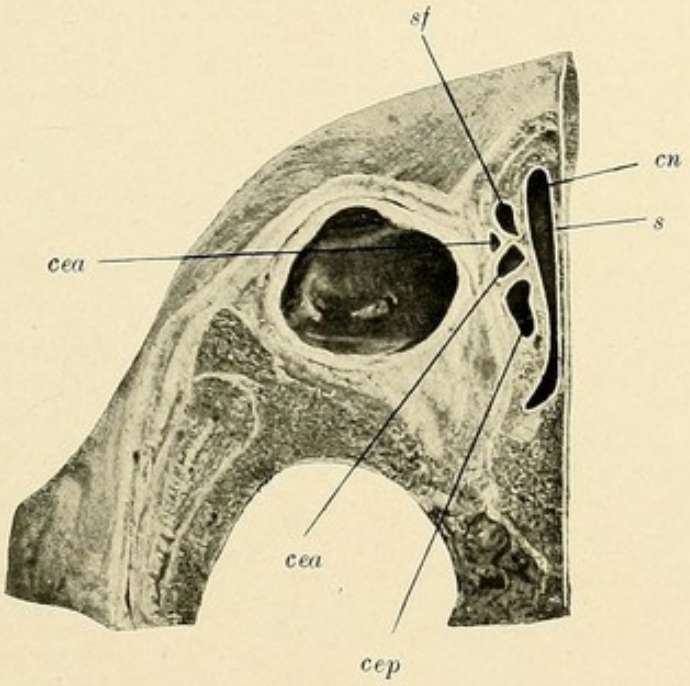
Plate 35.

Natural size. — Child of 5 months.

sf frontal sinus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *cn* nasal cavity, *s* septum.

Horizontal section through the head of a child aged 5 months, passing through the upper part of the nasal fossa, and shewing the frontal sinus (*sf*), the anterior (*cea*) and posterior (*cep*) ethmoidal cells, the nasal cavity (*cn*) and the septum (*s*). The frontal sinus (*sf*) is $7\frac{1}{2}$ mm high, 5 mm long and 4 mm wide. The anterior ethmoidal cells (*cea*) are $2\frac{1}{2}$ to 6 mm long, 3 to 8 mm high and 2 to 5 mm wide. The posterior ethmoidal cell (*cep*) is 10 mm long, 6 mm high and 4 mm wide. The sphenoidal sinus of this specimen is 5 mm high, $3\frac{1}{2}$ mm long and 3 mm wide. Its orifice, the sphenoidal ostium, is 1 mm in diameter.

Tafel 35.



Tafel 36.

Frontalschnitt.

Natürliche Grösse. — $5^1/_2$ Monate altes Kind.

Planche 36.

Coupe frontale.

Grandeur nature. — Enfant de 5 mois $^1/_2$.

Plate 36.

Coronal section.

Natural size. — Child of $5^1/_2$ months.

Tafel 36.

Natürliche Grösse. — 5½ Monate altes Kind.

sm sinus maxillaris, *cea* cellula ethmoidalis anterior, (*cep*) cellula ethmoidalis posterior, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media.

Der Frontalschnitt eines 5½ Monate alten Kopfes zeigt die untere (*ci*) und die mittlere (*cm*) Nasenmuschel, den unteren (*mni*) und den mittleren (*mnm*) Nasengang, die Kieferhöhle (*sm*) und die vorderen Siebbeinzellen (*cea*). Die zwei zusammen bezeichneten vorderen Siebbeinzellen (*cea*) hängen miteinander zusammen, die Mündung ist im hiatus semilunaris.

Planche 36.

Grandeur nature. — Enfant de 5 mois ½.

sm sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen.

Coupe frontale d'une tête de 5 mois ½ montrant les cornets inférieur (*ci*) et moyen (*cm*), les méats inférieur (*mni*) et moyen (*mnm*), le sinus maxillaire (*sm*) et les cellules ethmoïdales antérieures (*cea*). Les deux cellules ethmoïdales antérieures (*cea*) indiquées par le même signe communiquent entre elles; leur ostium est dans l'hiatus semilunaire.

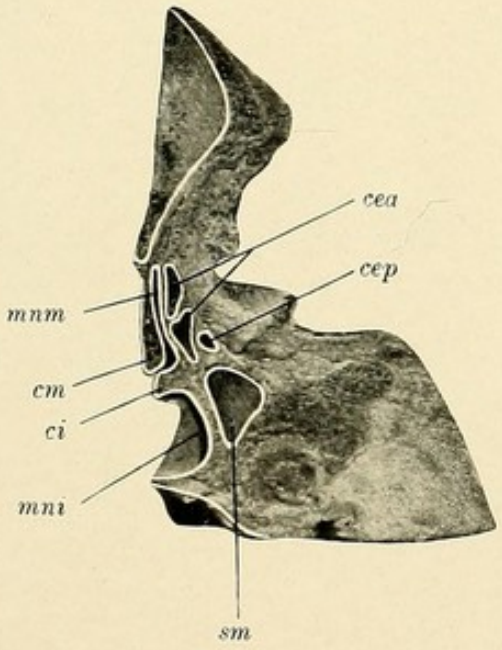
Plate 36.

Natural size. — Child of 5½ months.

sm maxillary antrum, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha,

Coronal section through the skull of a child aged 5½ months, shewing the lower (*ci*) and middle (*cm*) concha, the lower (*mni*) and middle (*mnm*) meatus, the maxillary antrum (*sm*) anterior (*cea*) and posterior ethmoidal cells (*cep*). The two anterior ethmoidal cells (*cea*) bracketed together communicate with one another; their orifices are situated in the semilunar hiatus.

Tafel 36.



Tafel 37.

Frontalschnitt.

Natürliche Grösse. — 5½ Monate altes Kind.

Planche 37.

Coupe frontale.

Grandeur nature. — Enfant de 5 mois ½.

Plate 37.

Coronal section.

Natural size. — Child of 5½ months.

Tafel 37.

Natürliche Grösse. — 5½ Monate altes Kind.

sm sinus maxillaris, *om* ostium maxillare, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *os* ostium sphenoidale, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *mnsr* meatus narium supremus, *pu* processus uncinatus.

Der Frontalschnitt eines 5½ Monate alten Kopfes zeigt den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), mittlere (*cm*) und die obere (*cs*) Nasenmuschel, die Kieferhöhle (*sm*), die hinteren Siebbeinzellen (*cep*) und die Mündung der Keilbeinhöhle (*os*). Die 15 mm lange, 8 mm hohe und 7 mm breite Kieferhöhle (*sm*) ist im Bereiche des unteren Nasenganges (*mni*) und der unteren Muschel (*ci*) zu sehen mit ihrer Mündung (*om*), welche in den hiatus semilunaris führt, begrenzt vom processus uncinatus (*pu*). Das ostium sphenoidale (*os*) ist 1½ mm weit und führt in eine 2 mm weite Keilbeinhöhle.

Planche 37.

Grandeur nature. — Enfant de 5 mois ½.

sm sinus maxillaire, *om* ostium du sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *os* ostium du sinus sphénoïdal, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur, *mnsr* méat suprême.

Coupe frontale d'une tête d'enfant de 5 mois ½ montrant les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), le sinus maxillaire (*sm*), les cellules ethmoïdales postérieures (*cep*) et l'ostium du sinus sphénoïdal (*os*). On peut voir le sinus maxillaire (*sm*) long de 5 millim, haut de 8 millim., large de 7 millim., au niveau du méat inférieur (*mni*) et du cornet inférieur (*ci*), avec son ostium (*om*), qui conduit dans l'hiatus semilunaire, limité par le processus uncinatus (*pu*). L'ostium du sinus sphénoïdal (*os*) a 1½ millim. de large et conduit dans le sinus sphénoïdal large de 2 millim.

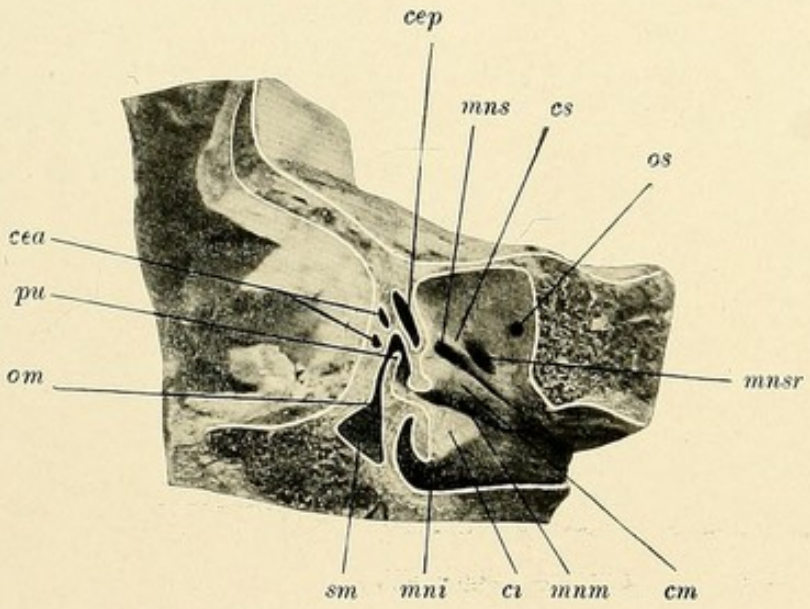
Plate 37.

Natural size. — Child of 5½ months.

sm maxillary antrum, *om* maxillary ostium, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *os* sphenoidal ostium, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *mnsr* uppermost meatus, *pu* uncinate process.

Coronal section through the skull of a child aged 5½ months, shewing the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, the maxillary antrum (*sm*), the anterior (*cea*) and posterior (*cep*) ethmoidal cells, and the orifice of the sphenoidal sinus (*os*). The maxillary antrum (*sm*) measures 15 mm in length, 8 mm in height and 7 mm in width. It can be seen in its relations with the lower meatus (*mni*) and lower concha (*ci*); its orifice (*om*) is also shewn, leading into the semilunar hiatus, which is bounded by the uncinate process (*pu*). The sphenoidal ostium (*os*) is 1½ mm in diameter and leads into the sphenoidal sinus which is 2 mm wide.

Tafel 37.



Tafel 38.

Sagittalschnitt.

Natürliche Grösse. — 5 1/2 Monate altes Kind.

Planche 38.

Coupe sagittale.

Grandeur nature. — Enfant de 5 mois 1/2.

Plate 38.

Longitudinal vertical section.

Natural size. — Child of 5 1/2 months.

Tafel 38.

Natürliche Grösse. — 5½ Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *hs* hiatus semilunaris, *pu* processus uncinatus, *be* bulla ethmoidalis, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *mns* meatus narium superior.

Der Sagittalschnitt eines 5½ Monate alten Kopfes zeigt die durchschnittene untere Nasenmuschel (*ci*), den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang. Das Gebiet des hiatus semilunaris (*hs*) ist freigelegt mit der umgebenden bulla ethmoidalis (*be*) und dem processus uncinatus (*pu*). Oben in der Reihenfolge von vorne nach hinten ist die Stirnhöhle (*sf*), die vordere (*cea*) und die hintere (*cep*) Siebbeinzelle zu sehen. Die Frühform der Stirnhöhle (*sf*) ist 6½ mm lang, 5½ mm hoch und 4 mm breit, sie mündet breit am oberen Teile des hiatus semilunaris (*hs*). Die vorderen Siebbeinzellen (*cea*) sind 3—6 mm hoch, 3½—4 mm breit und 2½—3 mm lang. Die hintere Siebbeinzelle (*cep*) ist 5½ mm lang, 5 mm hoch und 4 mm breit.

Planche 38.

Grandeur nature. — Enfant de 5 mois ½.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *hs* hiatus semilunaire, *pu* processus uncinatus, *be* bulle ethmoïdale, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *mns* méat supérieur.

Coupe sagittale d'une tête d'enfant de 5 mois ½ montrant le cornet inférieur (*ci*) sectionné, les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). La région de l'hiatus semilunaire (*hs*) est mise à nu avec la bulle ethmoïdale (*be*) environnante et le processus uncinatus (*pu*). Au-dessus on peut voir, d'avant en arrière, le sinus frontal (*sf*), les cellules ethmoïdales antérieure (*cea*) et postérieure (*cep*). La forme précoce du sinus frontal (*sf*) a 6½ millim. de long, 5½ millim. de haut, et 4 millim. de large; le sinus s'ouvre largement à la partie supérieure de l'hiatus semilunaire. La cellule ethmoïdale antérieure (*cea*) a de 3 à 6 millim. de haut, de 3½ à 4 millim. de large et de 2½ à 3 millim. de long. La cellule ethmoïdale postérieure (*cep*) a 5½ millim. de long, 5 millim. de haut et 4 millim. de large.

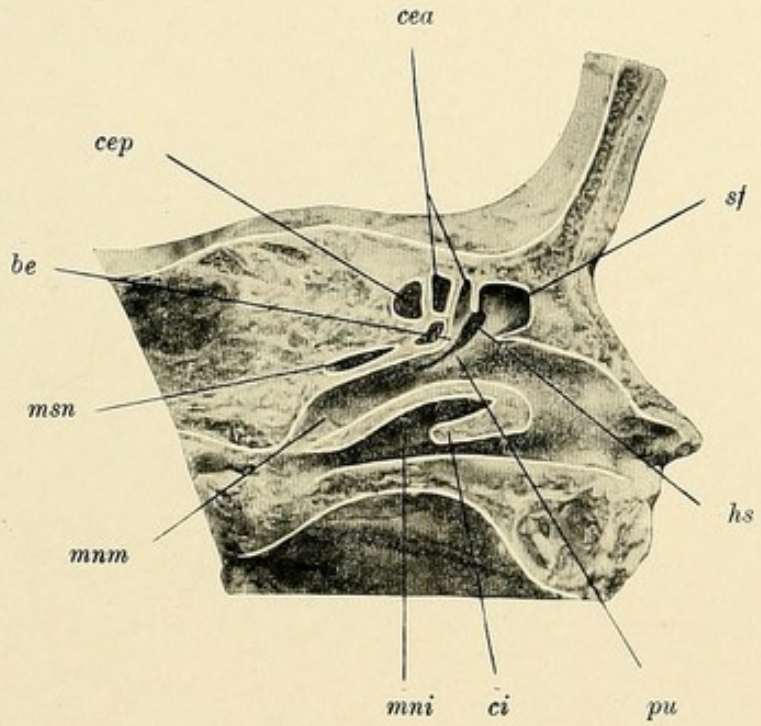
Plate 38.

Natural size. — Child of 5½ months.

sf frontal sinus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *hs* semilunar hiatus, *pu* uncinate process, *be* ethmoidal bulla, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *mns* upper meatus.

Longitudinal vertical section through the head of a child aged 5½ months, shewing the cut surface of the lower concha (*ci*), the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. The region of the semilunar hiatus (*hs*) has been exposed; the hiatus is enclosed between the ethmoidal bulla (*be*) and the uncinate process (*pu*). Above the hiatus may be seen, from before backwards, the frontal sinus (*sf*), the anterior (*cea*) and posterior (*cep*) ethmoidal cells. The early form of the frontal sinus (*sf*) is 6½ mm long, 5½ mm high and 4 mm wide; it opens freely into the upper part of the semilunar hiatus (*hs*). The anterior ethmoidal cells (*cea*) are 3 to 6 mm high, 3½ to 4 mm wide and 2½ to 3 mm long. The posterior ethmoidal cell (*cep*) is 5½ mm long, 5 mm high and 4 mm wide.

Tafel 38.



Tafel 39.

Sagittalschnitt.

Natürliche Grösse. — 5 1/2 Monate altes Kind.

Planche 39.

Coupe sagittale.

Grandeur nature. — Enfant de 5 mois 1/2.

Plate 39.

Longitudinal vertical section.

Natural size. — Child of 5 1/2 months.

Tafel 39.

Natürliche Grösse. — 5½ Monate altes Kind.

dnl ductus nasolacrimalis, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *mnsr* meatus narium supremus.

Der Sagittalschnitt eines 5½ Monate alten Kopfes zeigt die untere (*ci*), mittlere (*cm*) und die obere (*cs*) Nasenmuschel, den unteren (*mni*), den mittleren (*mnm*), den oberen (*mns*) und den obersten (*mnsr*) Nasengang. Der vorderste Teil der unteren Muschel (*ci*) ist entfernt, um die Mündung des ductus nasolacrimalis (*dnl*) zu zeigen. Die länglich ovale Öffnung des Tränennasenkanals (*dnl*) ist 2½—3 mm weit.

Planche 39.

Grandeur nature. — Enfant de 5 mois ½.

dnl conduit nasolacrymal, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur, *mnsr* méat suprême.

Coupe sagittale d'une tête d'enfant de 5 mois ½ montrant les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*), supérieur (*mns*), et le méat suprême. La partie antérieure du cornet inférieur (*ci*) est sectionnée pour montrer l'ostium du conduit nasolacrymal (*dnl*). L'ouverture ovalaire allongée du canal naso lacrymal (*dnl*) a de 2½ à 3 millim. de large.

Plate 39.

Natural size. — Child of 5½ months.

dnl nasal duct, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *mnsr* uppermost meatus.

Longitudinal vertical section through the skull of a child aged 5½ months, shewing the lower (*ci*), middle (*cm*) and upper (*cs*) concha, the lower (*mni*), middle (*mnm*), upper (*mns*) and uppermost (*mnsr*) meatus. The front part of the lower concha (*ci*) has been removed, in order to expose the opening of the nasal duct (*dnl*). The elongated oval opening of this duct measures 2½ by 3 mm.

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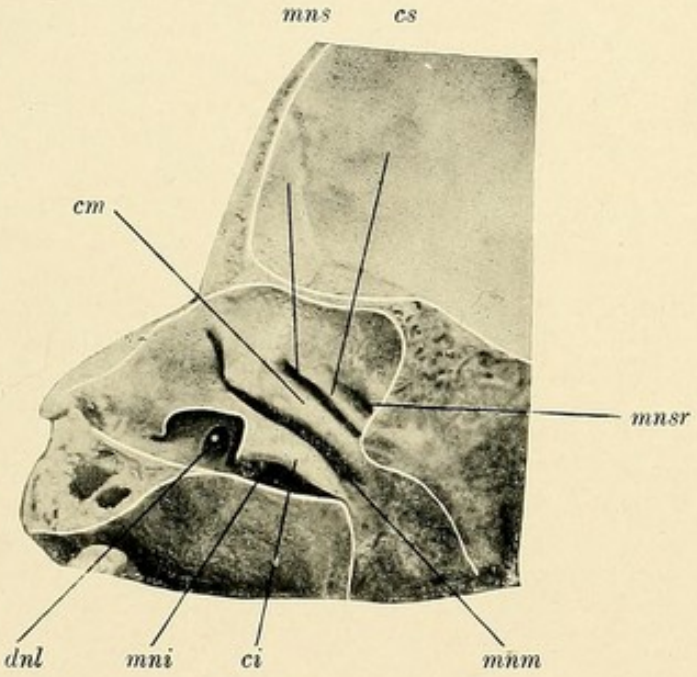
Tafel 39.



Tafel 40.

Frontalschnitt.

Natürliche Grösse. — 6½ Monate altes Kind.

Planche 40.

Coupe frontale.

Grandeur nature. — Enfant de 6 mois ½.

Plate 40.

Coronal section.

Natural size. — Child of 6½ months.

Tafel 40.

Natürliche Grösse. — $6\frac{1}{2}$ Monate altes Kind.

sm sinus maxillaris, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior.

Der Frontalschnitt eines $6\frac{1}{2}$ Monate alten Kopfes zeigt die laterale Wand der Nasenhöhle, die untere (*ci*), mittlere (*cm*) und die obere (*cs*) Nasenmuschel, den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang. Im Bereiche des mittleren Nasenganges (*mnm*) ist die Kieferhöhle (*sm*) zu sehen, sie ist 6 mm lang, 5 mm hoch und $3\frac{1}{2}$ mm breit. Die Stirnhöhle ist $6\frac{1}{2}$ mm lang, 6 mm hoch und 5 mm breit.

Planche 40.

Grandeur nature. — Enfant de 6 mois $\frac{1}{2}$.

sm sinus maxillaire, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur.

Coupe frontale d'une tête d'enfant de 6 mois $\frac{1}{2}$ montre la paroi latérale de la fosse nasale, les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). Au niveau du méat moyen (*mnm*) on peut voir le sinus maxillaire (*sm*) long de 6 millim., haut de 5 millim. et large de $3\frac{1}{2}$ millim. Le sinus frontal est long de $6\frac{1}{2}$ millim., haut de 6 millim. et large de 5 millim.

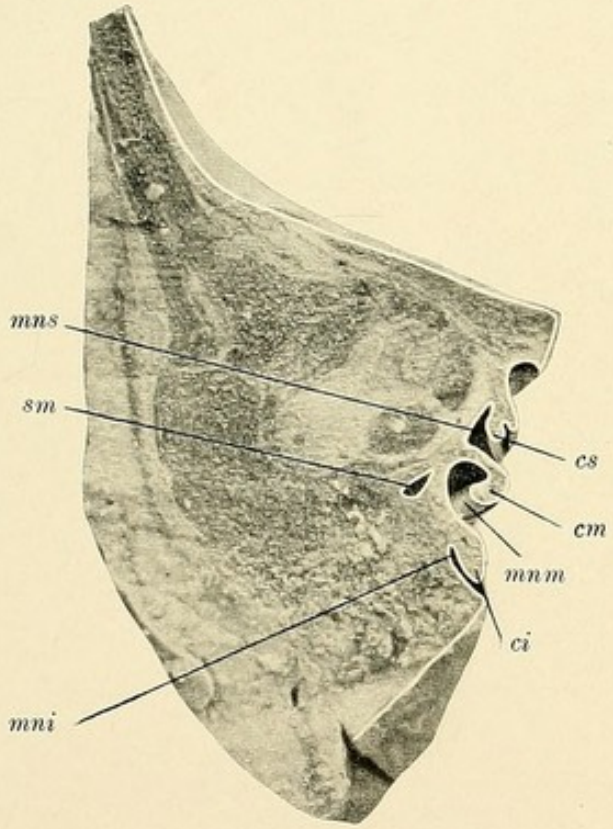
Plate 40.

Natural size. — Child of $6\frac{1}{2}$ months.

sm maxillary antrum, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus.

Coronal section through the head of a child $6\frac{1}{2}$ months old, shewing the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. Adjoining the middle meatus (*mnm*) is the maxillary antrum (*sm*), which is 6 mm long, 5 mm high and $3\frac{1}{2}$ mm wide. The frontal sinus is $6\frac{1}{2}$ mm long, 6 mm high and 5 mm wide.

Tafel 40.



Tafel 41.

Frontalschnitt.

Natürliche Grösse. — 6 1/2 Monate altes Kind.

Planche 41.

Coupe frontale.

Grandeur nature. — Enfant de 6 mois 1/2.

Plate 41.

Coronal section.

Natural size. — Child of 6 1/2 months.

Tafel 41.

Natürliche Grösse. — 6½ Monate altes Kind.

cep cellula ethmoidalis posterior, *cea* cellula ethmoidalis anterior, *lbe* lamina bullae ethmoidalis, *cm* concha media, *mnm* meatus narium medius, *ci* concha inferior, *mni* meatus narium inferior.

Der Frontalschnitt des 6½ Monate alten Kopfes zeigt die äussere Wand der Nasenhöhle, den unteren (*mni*) und den mittleren (*mnm*) Nasengang, die untere (*ci*) und die mittlere (*cm*) Nasenmuschel. Die vordere Siebbeinzelle (*cea*) ist 5½ mm lang, 4 mm hoch und 3 mm breit. Die hintere Siebbeinzelle (*cep*) ist 5½ mm lang, 5 mm hoch und 2 mm breit.

Planche 41.

Grandeur nature. — Enfant de 6 mois ½.

cep cellule ethmoïdale postérieure, *cea* cellule ethmoïdale antérieure, *lbe* lame de la bulle ethmoïdale, *cm* cornet moyen, *mnm* méat moyen, *ci* cornet inférieur, *mni* méat inférieur.

Coupe frontale d'une tête d'enfant de 6 mois ½ montrant la paroi latérale de la fosse nasale, les méats inférieur (*mni*) et moyen (*mnm*), les cornets inférieur (*ci*) et moyen (*cm*). La cellule ethmoïdale antérieure (*cea*) a 5½ millim. de long, 4 millim. de haut et 3 millim. de large. La cellule ethmoïdale postérieure a 5½ millim. de long, 5 millim. de haut et 2 millim. de large.

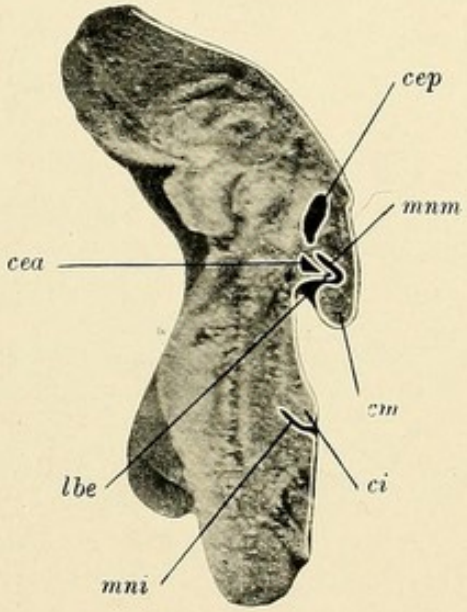
Plate 41.

Natural size. — Child of 6½ months.

cep posterior ethmoidal cell, *cea* anterior ethmoidal cell, *lbe* lamina of ethmoidal bulla, *cm* middle concha, *mnm* middle meatus, *ci* lower concha, *mni* lower meatus.

Coronal section through the head of a child 6½ months old, shewing the lateral wall of the nasal fossa, the lower (*mni*) and middle (*mnm*) meatus, and the lower (*ci*) and middle (*cm*) concha. The anterior ethmoidal cell (*cea*) is 5½ mm long, 4 mm high and 3 mm wide. The posterior ethmoidal cell (*cep*) is 5½ mm long, 5 mm high and 2 mm wide.

Tafel 41.



Tafel 42.

Sagittalschnitt.

Natürliche Grösse. — 6 1/2 Monate altes Kind.

Planche 42.

Coupe sagittale.

Grandeur nature. — Enfant de 6 mois 1/2.

Plate 42.

Longitudinal vertical section.

Natural size. — Child of 6 1/2 months.

Tafel 42.

Natürliche Grösse. — 6½ Monate altes Kind

os ostium sphenoidale, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *mnsr* meatus narium supremus, *csr* concha suprema.

Der Sagittalschnitt des 6½ Monate alten Kopfes zeigt den unteren (*mni*) den mittleren (*mnm*), den oberen (*mns*) und den obersten (*mnsr*) Nasengang, die untere (*ci*), die mittlere (*cm*), die obere (*cs*) und die oberste (*csr*) Nasenmuschel, ferner im hinteren Teile der Nasenhöhle nahe dem Nasendache die Keilbeinhöhlenmündung (*os*). Das ostium sphenoidale (*os*) bildet eine 2 mm weite runde Öffnung.

Planche 42.

Grandeur nature. — Enfant de 6 mois ½.

os ostium du sinus sphénoïdal, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen *mns* méat supérieur, *cs* cornet supérieur, *mnsr* méat suprême, *csr* quatrième cornet.

Coupe sagittale d'une tête d'enfant de 6 mois ½ montrant les méats inférieur (*mni*), moyen (*mnm*), supérieur (*mns*) et suprême (*mnsr*), les cornets inférieur (*ci*), moyen (*cm*), supérieur (*cs*) et suprême (*csr*), de plus à la partie postérieure de la cavité nasale, près du toit de la fosse nasale, l'ostium du sinus sphénoïdal (*os*) formant une ouverture ronde, large de 2 millim.

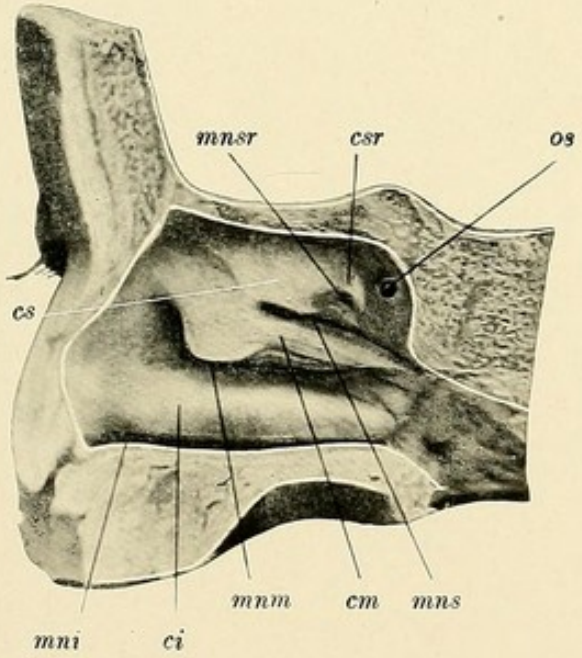
Plate 42.

Natural size. — Child of 6½ months.

os sphenoidal ostium, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *mnsr* uppermost meatus, *csr* uppermost concha.

Longitudinal vertical section through the head of a child aged 6½ months, shewing the lower (*mni*), middle (*mnm*), upper (*mns*) and uppermost (*mnsr*) meatus and the lower (*ci*), middle (*cm*), upper (*cs*) and uppermost (*csr*) concha. At the back part of the nasal fossa, near the roof of the nasal cavity, is the sphenoidal ostium (*os*), a circular aperture 2 mm in diameter.

Tafel 42.



Tafel 43.

Frontalschnitt.

Natürliche Grösse. — $6^1/_2$ Monate altes Kind.

Planche 43.

Coupe frontale.

Grandeur nature. — Enfant de 6 mois $^1/_2$.

Plate 43.

Coronal section.

Natural size. — Child of $6^1/_2$ months.

Tafel 43.

Natürliche Grösse. — $6\frac{1}{2}$ Monate altes Kind.

ss sinus sphenoidalis, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius *cm* concha media, *mns* meatus narium superior.

Der Frontalschnitt eines $6\frac{1}{2}$ Monate alten Kopfes zeigt den unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasengang, die untere (*ci*), mittlere (*cm*) Nasenmuschel und die Keilbeinhöhle (*ss*). Die Keilbeinhöhle (*ss*) ist 5 mm lang, $4\frac{1}{2}$ mm breit und 4 mm hoch.

Planche 43.

Grandeur nature. — Enfant de 6 mois $\frac{1}{2}$.

ss sinus sphénoïdal, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur.

Coupe frontale de la tête d'un enfant de 6 mois $\frac{1}{2}$ montrant les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*) et moyen (*cm*) et le sinus sphénoïdal (*ss*). Le sinus sphénoïdal (*ss*) a 5 millim. de long, $4\frac{1}{2}$ millim. de large et 4 millim. de haut.

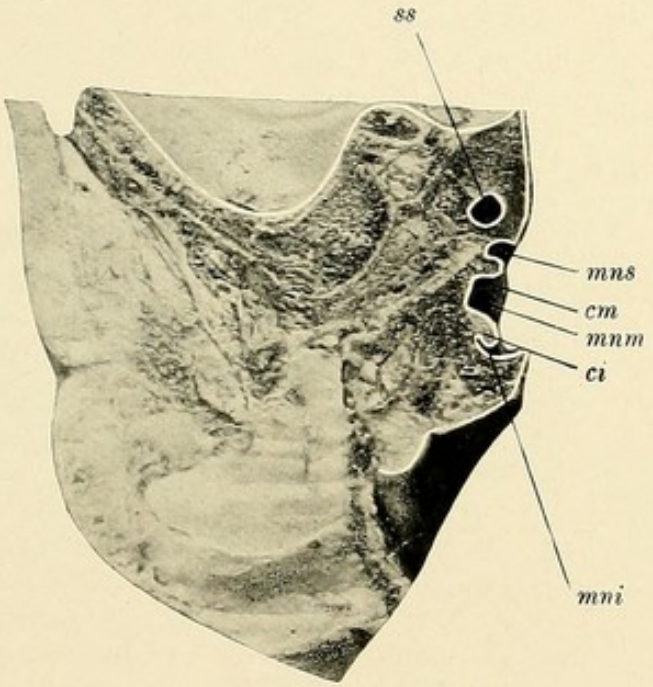
Plate 43.

Natural size. — Child of $6\frac{1}{2}$ months.

ss sphenoidal sinus, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus.

Coronal section through the head of a child aged $6\frac{1}{2}$ months, shewing the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, the lower (*ci*), and middle (*cm*) concha and the sphenoidal sinus (*ss*). The sphenoidal sinus (*ss*) is 5 mm long, $4\frac{1}{2}$ mm wide and 4 mm high.

Tafel 43.



Tafel 44.

Sagittalschnitt.

Natürliche Grösse. — 7 Monate altes Kind.

Planche 44.

Coupe sagittale.

Grandeur nature. — Enfant de 7 mois.

Plate 44.

Longitudinal vertical section.

Natural size. — Child of 7 months.

Tafel 44.

Natürliche Grösse. — 7 Monate altes Kind.

sm sinus maxillaris.

Der Sagittalschnitt eines 7 Monate alten Kopfes zeigt die 22 mm lange, 6 mm breite und 4 mm hohe Kieferhöhle.

Planche 44.

Grandeur nature. — Enfant de 7 mois.

sm sinus maxillaire.

Coupe sagittale de la téte d'un enfant de 7 mois montrant le sinus maxillaire long de 22 millim. large de 6 millim. et haut de 4 millim.

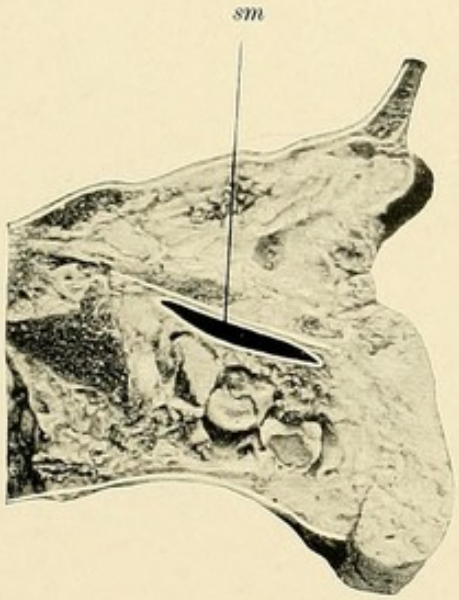
Plate 44.

Natural size. — Child of 7 months.

sm maxillary antrum.

Longitudinal vertical section through the head of a child aged 7 months, shewing the maxillary antrum, which is 22 mm long, 6 mm wide and 4 mm high.

Tafel 44.



Tafel 45.

Frontalschnitt.

Natürliche Grösse. — 7 Monate altes Kind.

Planche 45.

Coupe frontale.

Grandeur nature. — Enfant de 7 mois.

Plate 45.

Coronal section.

Natural size. — Child of 7 months.

Tafel 45.

Natürliche Grösse. — 7 Monate altes Kind.

sm sinus maxillaris, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *os* ostium sphenoidale.

Der Frontalschnitt eines 7 Monate alten Kopfes zeigt die 16 mm lange, 5 mm hohe und 4 mm breite Kieferhöhle (*sm*), den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, ferner das ½ mm weite ostium sphenoidale (*os*), welches in eine 2 mm weite Keilbeinhöhle führt.

Planche 45.

Grandeur nature. — Enfant de 7 mois.

sm sinus maxillaire, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur, *os* ostium du sinus sphénoïdal.

Coupe frontale de la tête d'un enfant de 7 mois montrant le sinus maxillaire (*sm*) long de 16 millim., haut de 5 millim. et large de 4 millim., les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), de plus l'ostium du sinus sphénoïdal (*os*) large de ½ millim. conduisant dans le sinus sphénoïdal large de 2 millim.

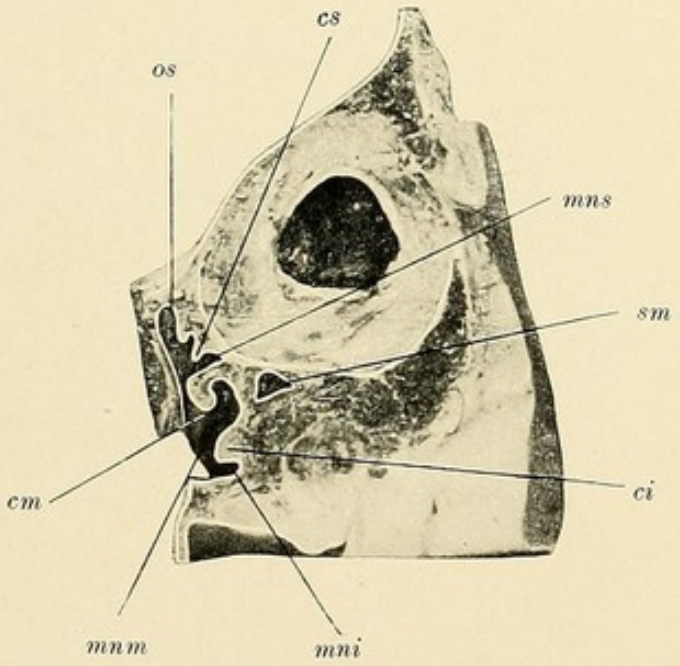
Plate 45.

Natural size. — Child of 7 months.

sm maxillary antrum, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *os* sphenoidal ostium.

Coronal section through the head of a child aged 7 months, shewing the maxillary antrum (*sm*), measuring 16 mm in length, 5 mm in height and 4 mm in width, the ower (*mni*), middle (*mnm*) and upper (*mns*) meatus, the lower (*ci*), middle (*cm*) and upper (*cs*) concha and the sphenoidal ostium. This orifice, ½ mm in diameter, leads into the sphenoidal sinus, which is 2 mm wide.

Tafel 45.



Tafel 46.

Horizontalschnitt.

Natürliche Grösse. — 8 Monate altes Kind.

Planche 46.

Coupe horizontale.

Grandeur nature. — Enfant de 8 mois.

Plate 46.

Horizontal section.

Natural size. — Child of 8 months.

Tafel 46.

Natürliche Grösse. — 8 Monate altes Kind.

sm sinus maxillaris, *om* ostium maxillare, *dnl* ductus nasolacrimalis, *cm* concha media, *mnm* meatus narium medius.

Der Horizontalschnitt eines 8 Monate alten Kopfes zeigt die Kieferhöhle (*sm*), ihre Mündung (*om*), den ductus nasolacrimalis (*dnl*), den mittleren Nasengang (*mnm*) und die untere Nasenmuschel (*ci*). Die Kieferhöhle (*sm*) ist 13 mm lang, 10 mm hoch und 5 mm breit. Das vorne gelegene ostium maxillare (*om*) mündet in dem mittleren Nasengang (*mnm*), der ductus nasolacrimalis (*dnl*) mündet im unteren Nasengang (*mni*).

Planche 46.

Grandeur nature. — Enfant de 8 mois.

sm sinus maxillaire, *om* ostium du sinus maxillaire, *dnl* conduit nasolacrymal, *cm* cornet moyen, *mnm* méat moyen.

Coupe horizontale d'une tête d'enfant de 8 mois montrant le sinus maxillaire (*sm*), son sotium (*om*), le conduit nasolacrymal (*dnl*), le méat moyen (*mnm*) et le cornet inférieur (*ci*). Le sinus maxillaire a 13 millim. de long, 10 millim. de haut et 5 millim. de large. L'ostium du sinus maxillaire situé en avant (*om*) s'ouvre dans le méat moyen (*mnm*); le conduit nasolacrymal (*dnl*) s'ouvre dans le méat inférieur (*mni*).

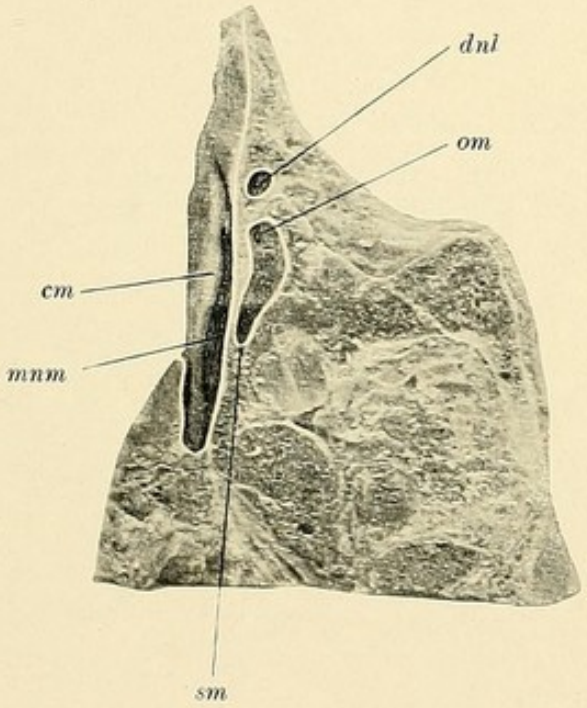
Plate 46.

Natural size. — Child of 8 months.

sm maxillary antrum, *om* maxillary ostium, *dnl* nasal duct, *cm* middle concha, *mnm* middle meatus.

Horizontal section through the head of a child aged 8 months, shewing the maxillary antrum (*sm*) and its orifice (*om*), the nasal duct (*dnl*), the middle meatus (*mnm*) and the lower concha (*ci*). The maxillary antrum (*sm*) is 13 mm long, 10 mm high and 5 mm wide. Its orifice (*om*) is situated anteriorly and opens into the middle meatus (*mnm*). The nasal duct (*dnl*) opens into the lower meatus (*mni*).

Tafel 46.



Tafel 47.

Horizontalschnitt.

Natürliche Grösse. — 8 Monate altes Kind.

Planche 47.

Coupe horizontale.

Grandeur nature. — Enfant de 8 mois.

Plate 47.

Horizontal section.

Natural size. — Child of 8 months.

Tafel 47.

Natürliche Grösse. — 8 Monate altes Kind.

sf sinus frontalis, *pu* processus uncinatus, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *ss* sinus sphenoidalis, *os* ostium sphenoidale, *cn* cavum narium, *s* septum, *mns* meatus narium superior, *cs* concha superior.

Der Horizontalschnitt eines 8 Monate alten Kopfes ist am obersten Teile des mittleren Nasenganges geführt und zeigt die Frühform der Stirnhöhle, den recessus frontalis (*sf*), den processus uncinatus (*pu*), die vorderen Siebbeinzellen (*cea*), die hinteren Siebbeinzellen (*cep*), die Keilbeinhöhle (*ss*), den oberen Nasengang (*mns*), die obere Muschel (*cs*), den oberen Teil der Nasenhöhle (*cn*) und die Nasenscheidewand (*s*). Die Stirnhöhle (*sf*) ist 8 mm hoch, 5 mm lang und 2 mm breit. Die vordere Siebbeinzellen (*cea*) sind 4—6½ mm hoch, 4½ mm lang und 2—4 mm breit. Die hintere Siebbeinzellen (*cep*) sind 4—5 mm hoch, 2½—3½ mm lang und 2 mm breit. Die Keilbeinhöhle (*ss*) ist 6 mm hoch, 5½ mm lang und 5 mm breit, ihre Mündung (*os*) bildet eine 1 mm weite runde Öffnung.

Planche 47.

Grandeur nature. — Enfant de 8 mois.

sf sinus frontal, *pu* processus uncinatus, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *ss* sinus sphénoïdal, *os* ostium du sinus sphénoïdal, *cn* cavité nasale, *s* septum, *mns* méat supérieur, *cs* cornet supérieur.

Coupe horizontale d'une tête d'enfant de 8 mois passant par la partie supérieure du méat moyen et montrant la forme primitive du sinus frontal, le recessus frontal (*sf*), le processus uncinatus (*pu*), les cellules ethmoïdales antérieures (*cea*), les cellules ethmoïdales postérieures (*cep*), le sinus sphénoïdal (*ss*), le méat supérieur (*mns*), le cornet supérieur (*cs*), la partie supérieure de la cavité nasale (*cn*) et le septum (*s*). Le sinus frontal a 8 millim. de haut, 5 millim. de long et 2 millim. de large. Les cellules ethmoïdales antérieures (*cea*) ont de 4 à 6½ millim. de haut, 4½ millim. de long et 2 à 4 millim. de large. Les cellules ethmoïdales postérieures (*cep*) ont de 4 à 5 millim. de haut, de 2½ à 3½ millim. de large. Le sinus sphénoïdal (*ss*) a 6 millim. de haut, 5½ millim. de long et 5 millim. de large; son ostium (*os*) forme une ouverture ronde, large de 1 millim.

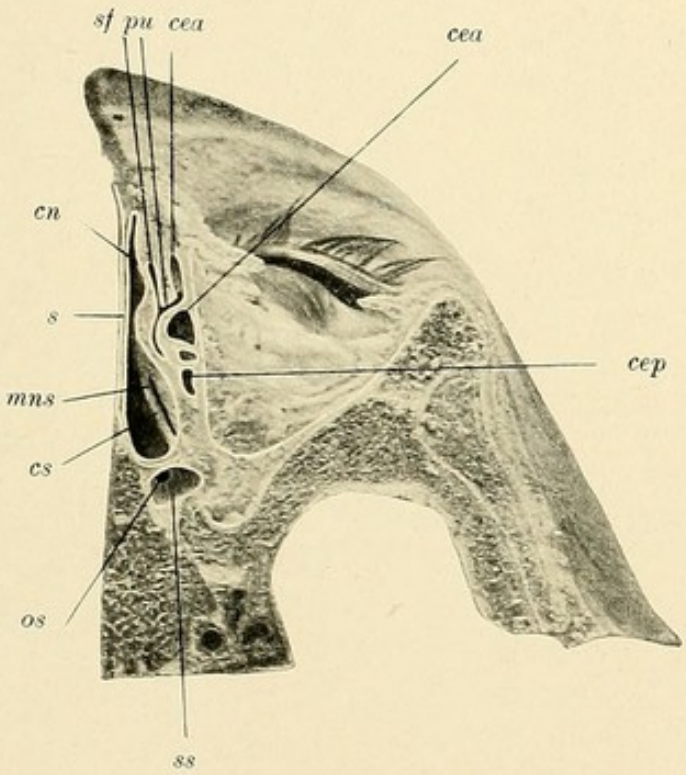
Plate 47.

Natural size. — Child of 8 months.

sf frontal sinus, *pu* uncinate process, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *ss* sphenoidal sinus, *os* sphenoidal ostium, *cn* nasal cavity, *s* septum, *mns* upper meatus, *cs* upper concha.

Horizontal section through the head of a child aged 8 months, carried along the top of the middle meatus and shewing the early developmental stage of the frontal sinus, the frontal recess (*sf*), the uncinate process (*pu*), the anterior (*cea*) and posterior ethmoidal cells (*cep*), the sphenoidal sinus (*ss*), upper meatus (*mns*), upper concha (*cs*), upper part of the nasal cavity (*cn*) and septum (*s*). The frontal sinus (*sf*) is 8 mm high, 5 mm long and 2 mm wide. The anterior ethmoidal cells (*cea*) are 4 to 6½ mm high, 4½ mm long and 2 to 4 mm wide. The posterior ethmoidal cells (*cep*) are 4 to 5 mm high, 2½ to 3½ mm long and 2 mm wide. The sphenoidal sinus (*ss*) is 6 mm high, 5½ mm long and 5 mm wide. Its ostium (*os*) is a circular opening, one mm in diameter.

Tafel 47.



Tafel 48.

Horizontalschnitt.

Natürliche Grösse. — 8 Monate altes Kind.

Planche 48.

Coupe horizontale.

Grandeur nature. — Enfant de 8 mois.

Plate 48.

Horizontal section.

Natural size. — Child of 8 months.

Tafel 48.

Natürliche Grösse. — 8 Monate altes Kind.

sm sinus maxillaris, *dnl* ductus nasolacrimalis, *c* concha inferior, *mnm* meatus narium medius.

Der Horizontalschnitt eines 8 Monate alten Kopfes zeigt die Kieferhöhle (*sm*), den ductus nasolacrimalis (*dnl*), den mittleren Nasengang (*mnm*) und die untere Nasenmuschel (*ci*). Die Kieferhöhle (*sm*) ist 10 mm lang, 5 mm hoch und 4½ mm breit.

Planche 48.

Grandeur nature. — Enfant de 8 mois.

sm sinus maxillaire, *dnl* conduit nasolacrymal, *ci* cornet inférieur, *mnm* méat moyen.

Coupe horizontale d'une tête d'enfant de 8 mois montrant le sinus maxillaire (*sm*), le conduit nasolacrymal (*dnl*), le méat moyen (*mnm*) et le cornet inférieur (*ci*). Le sinus maxillaire (*sm*) a 10 millim. de long, 5 millim. de haut et 4½ millim. de large.

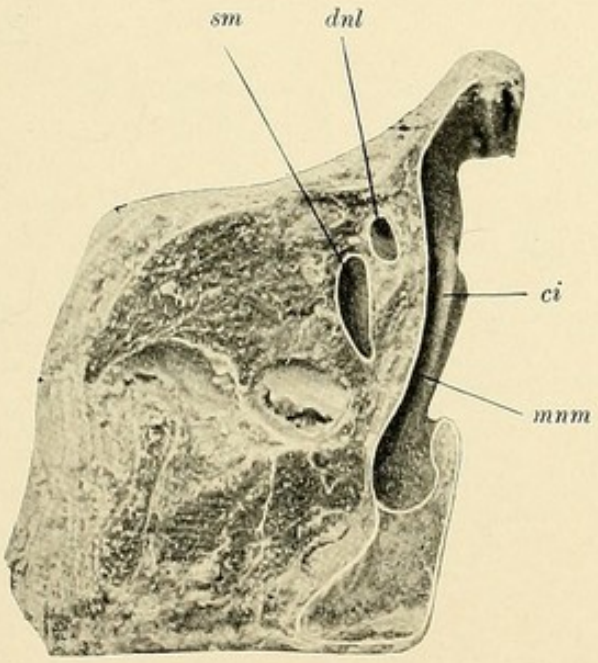
Plate 48.

Natural size. — Child of 8 months.

sm maxillary autrum, *dnl* nasal duct, *ci* lower concha, *mnm* middle meatus.

Horizontal section through the head of a child aged 8 months, shewing the maxillary antrum (*sm*), the nasal duct (*dnl*), the middle meatus (*mnm*) and the lower concha (*ci*). The maxillary antrum (*sm*) is 10 mm long, 5 mm high and 4½ mm wide.

Tafel 48.



Tafel 49.

Horizontalschnitt.

Natürliche Grösse. — 8 Monate altes Kind.

Planche 49.

Coupe horizontale.

Grandeur nature. — Enfant de 8 mois.

Plate 49.

Horizontal section.

Natural size. — Child of 8 months.

Tafel 49.

Natürliche Grösse. — 8 Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *pu* processus uncinatus, *mnm* meatus narium medius, *cep* cellula ethmoidalis posterior, *ss* sinus sphenoidalis, *cn* cavum narium, *s* septum.

Der Horizontalschnitt eines 8 Monate alten Kopfes ist am obersten Teile des mittleren Nasenganges (*mnm*) geführt und zeigt die Frühform der Stirnhöhle (*sf*), den recessus frontalis, den processus uncinatus (*pu*), die vordere Siebbeinzelle (*cea*), die hintere Siebbeinzelle (*cep*), den mittleren Nasengang (*mnm*), die Keilbeinhöhle (*ss*), den oberen Teil der Nasenhöhle (*cn*) und die Nasenscheidewand (*s*). Die Stirnhöhle (*sf*) ist $5\frac{1}{2}$ mm hoch, 5 mm lang und 3 mm breit. Die vorderen Siebbeinzellen (*cea*) sind 6—7 mm lang, 5—7 mm hoch und 3—$4\frac{1}{2}$ mm breit. Die hinteren Siebbeinzellen (*cep*) sind $2\frac{1}{2}$—4 mm lang, 2—3 mm hoch und $1\frac{1}{2}$—2 mm breit. Die Keilbeinhöhle (*ss*) ist 9 mm hoch, 6 mm breit und 5 mm lang. Das ostium sphenoidale ist 1 mm weit.

Planche 49.

Grandeur nature. — Enfant de 8 mois.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *pu* processus uncinatus, *mnm* méat moyen, *cep* cellule ethmoïdale postérieure, *ss* sinus sphénoïdal, *cn* cavité nasale, *s* septum.

Coupe horizontale d'une tête d'enfant de 8 mois passant par la partie supérieure du méat moyen (*mnm*) et montrant la forme précoce du sinus frontal (*sf*), le recessus frontal, le processus uncinatus (*pu*), la cellule ethmoïdale antérieure (*cea*), la cellule ethmoïdale postérieure (*cep*), le méat moyen (*mnm*), le sinus sphénoïdal (*ss*), la partie supérieure de la cavité nasale (*cn*) et le septum (*s*). Le sinus frontal (*sf*) a $5\frac{1}{2}$ millim. de haut, 5 millim. de long et 3 mililm. de large. Les cellules ethmoïdales antérieures (*cea*) ont de 6 à 7 millim. de long, de 5 à 7 millim. de haut et de 3 à $4\frac{1}{2}$ millim. de large. Les cellules ethmoïdales postérieures ont de $2\frac{1}{2}$ à 4 millim. de long, de 2 à 3 millim. de haut et de $1\frac{1}{2}$ à 2 millim. de large. Le sinus sphénoïdal (*ss*) a 9 millim. de haut, 6 millim. de large et 5 millim. de long. Son ostium a 1 millim. de large.

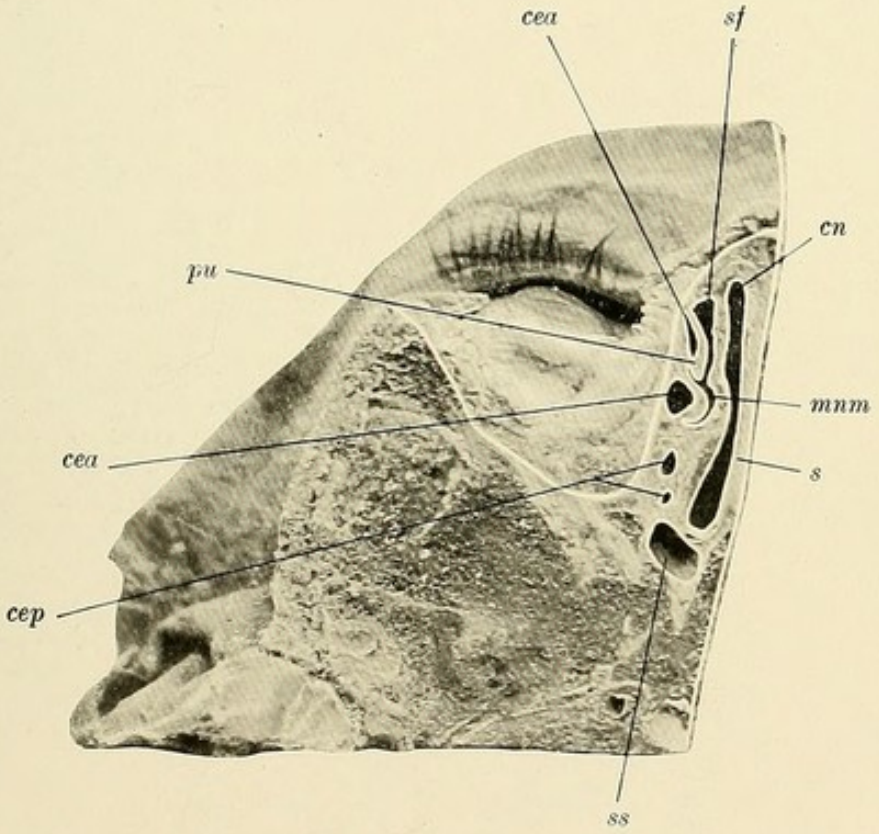
Plate 49.

Natural size. — Child of 8 months.

sf frontal sinus, *cea* anterior ethmoidal cell, *pu* uncinate process, *mnm* middle meatus, *cep* posterior ethmoidal cell, *ss* sphenoidal sinus, *cn* nasal cavity, *s* septum.

Horizontal section through the head of a child aged 8 months, carried through the highest part of the middle meatus (*mnm*) and shewing the frontal sinus (*sf*) in an early stage of its development as frontal recess, the uncinate process (*pu*), anterior (*cea*) and posterior (*cep*) ethmoidal cells, middle meatus (*mnm*), sphenoidal sinus (*ss*), the upper portion of the nasal cavity (*cn*) and the septum (*s*). The frontal sinus (*sf*) is $5\frac{1}{2}$ mm high, 5 mm long and 3 mm wide. The anterior ethmoidal cells (*cea*) are 6 to 7 mm long, 5 to 7 mm high and 3 to $4\frac{1}{2}$ mm wide. The posterior ethmoidal cells (*cep*) are $2\frac{1}{2}$ to 4 mm long, 2 to 3 mm high and $1\frac{1}{2}$ to 2 mm wide. The sphenoidal sinus (*ss*) is 9 mm high, 6 mm wide and 5 mm long. The sphenoidal ostium is one mm in diameter.

Tafel 49.



Tafel 50.

Horizontalschnitt.

Natürliche Grösse. — 11 Monate altes Kind.

Planche 50.

Coupe horizontale.

Grandeur nature. — Enfant de 11 mois.

Plate 50.

Horizontal section.

Natural size. — Child of 11 months.

Tafel 50.

Natürliche Grösse. — 11 Monate altes Kind.

sm sinus maxillaris, *dnl* ductus nasolacrimalis.

Der Horizontalschnitt eines 11 Monate alten Kopfes zeigt die 14 mm lange, 9 mm hohe und 5 mm breite Kieferhöhle (*sm*) und den ductus nasolacrimalis (*dnl*), welcher in den unteren Nasengang mündet.

Planche 50.

Grandeur nature. — Enfant de 11 mois.

sm sinus maxillaire, *dnl* conduit nasolacrymal.

Coupe horizontale d'une tête d'enfant de 11 mois montrant le sinus maxillaire (*sm*) long de 14 millim., haut de 9 millim. et large de 5 millim. et le conduit nasolacrymal (*dnl*), qui s'ouvre dans le méat inférieur.

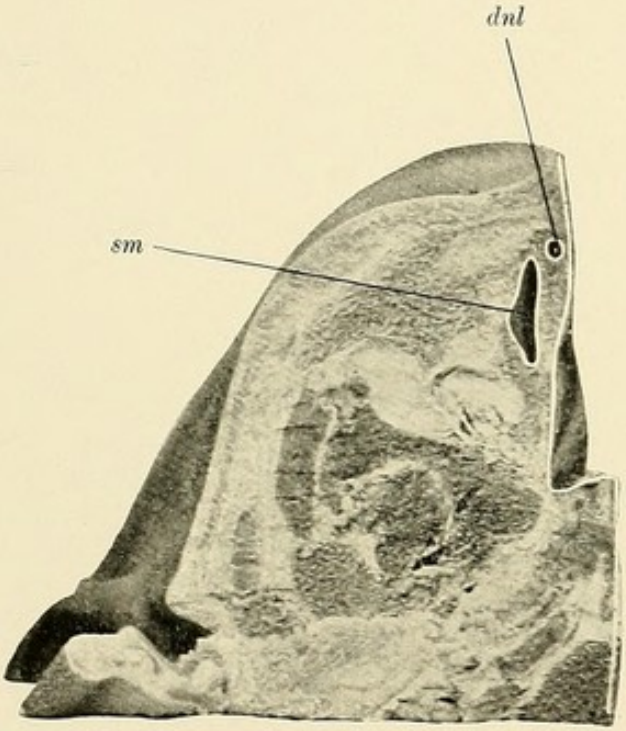
Plate 50.

Natural size. — Child of 11 months.

sm maxillary antrum, *dnl* nasal duct.

Horizontal section through the head of a child aged 11 months, shewing the maxillary antrum (*sm*) which is 14 mm long, 9 mm high and 5 mm wide, and the nasal duct (*dnl*) opening into the lower meatus.

Tafel 50.



Tafel 51.

Frontalschnitt.

Natürliche Grösse. — 12 Monate altes Kind.

Planche 51.

Coupe frontale.

Grandeur nature. — Enfant de 12 mois.

Plate 51.

Coronal section.

Natural size. — Child of 12 months.

Tafel 51.

Natürliche Grösse. — 11 Monate altes Kind.

ci concha inferior, *mni* meatus narium inferior, *cm* concha media, *pu* processus uncinatus, *hs* hiatus semilunaris, *be* bulla ethmoidalis, *cea* cellula ethmoidalis anterior, *mns* meatus narium superior, *cs* concha superior, *cep* cellula ethmoidalis posterior.

Der Frontalschnitt eines 11 Monate alten Kopfes zeigt den unteren (*mni*), mittleren und oberen (*mns*) Nasengang, die untere (*ci*), mittlere (*cm*) und obere (*cs*) Nasenmuschel, die vordere Siebbeinzelle (*cea*) und die hintere Siebbeinzelle (*cep*). Im mittleren Nasengang durch den Wegfall der mittleren Muschel (*cm*) ist das Gebiet des hiatus semilunaris (*hs*), begrenzt vom processus uncinatus (*pu*) und von der bulla ethmoidalis (*be*), freigelegt. Die 8½ mm hohe, 4½ mm lange und 4 mm breite vordere Siebbeinzelle (*cea*) mündet oberhalb der bulla ethmoidalis (*be*).

Planche 51.

Grandeur nature. — Enfant de 11 mois.

ci cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *pu* processus uncinatus, *hs* hiatus semilunaire, *be* bulle ethmoïdale *cea* cellule ethmoïdale antérieure, *mns* méat supérieur, *cs* cornet supérieur, *cep* cellule ethmoïdale postérieure.

Coupe frontale d'une tête d'enfant de 11 mois montrant les méats inférieur (*mni*), moyen et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) etsupérieur (*cs*), la cellule ethmoïdale antérieure (*cea*) et la cellule ethmoïdale postérieure (*cep*). Dans le méat moyen, par l'ablation du cornet moyen (*cm*), la région de l'hiatus semilunaire (*hs*), limitée par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*), est mise à nu. La cellule ethmoïdale antérieure (*cea*) haute de 8½ millim., longue de 4½ millim. et large de 4 millim. s'ouvre au-dessus de la bulle ethmoïdale (*be*).

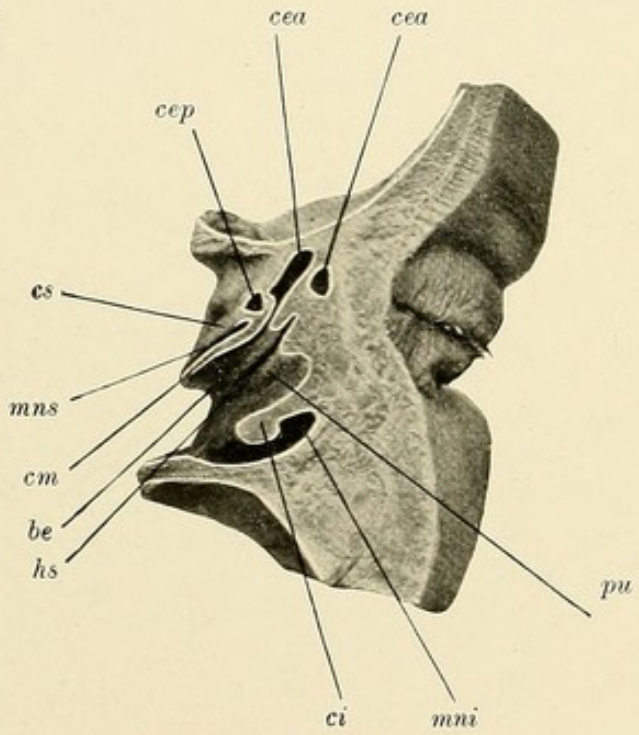
Plate 51.

Natural size. — Child of 11 months.

ci lower choncha, *mni* lower meatus, *cm* middle concha, *pu* uncinate process, *hs* semilumar hiatus, *be* ethmoidal bulla, *cea* anterior ethmoidal cell, *mns* upper meatus, *cs* upper concha, *cep* posterior ethmoidal cell.

Coronal section through the head of a child aged 11 months, shewing the lower (*mni*), middle and upper (*mns*) meatus, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, the anterior (*cea*) and posterior (*cep*) ethmoidal cells. In the middle meatus, the region of the semilunar hiatus (*hs*), has been exposed through the removal of the middle concha (*cm*). The semilunar hiatus is enclosed between the uncinate process (*pu*) and the ethmoidal bulla (*be*). The anterior ethmoidal cell (*cea*), which is 8½ mm high, 4½ mm long and 4 mm wide, opens above the ethmoidal bulla (*be*).

Tafel 51.



Tafel 52.

Frontalschnitt.

Natürliche Grösse. — 12 Monate altes Kind.

Planche 52.

Coupe frontale.

Grandeur nature. — Enfant de 12 mois.

Plate 52.

Coronal section.

Natural size. — Child of 12 months.

Tafel 52.

Natürliche Grösse. — 12 Monate altes Kind.

rf recessus frontalis, *pu* processus uncinatus, *be* lamina bullae ethmoidalis, *hs* hiatus semilunaris, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *dnl* ductus nasolacrimalis.

Der Frontalschnitt des 12 Monate alten Kopfes ist etwas schräg geführt und zeigt die Stirnhöhle in ihrer frühen Form eines recessus frontalis (*rf*), welcher die Basis des Schuppenteiles des Stirnbeines erreicht und 6 mm hoch, 5 mm lang und 5 mm breit ist. Der recessus frontalis (*rf*) mündet oberhalb des hiatus semilunaris (*hs*), welchen die bulla ethmoidalis (*be*) und der processus uncinatus (*pu*) begrenzt. Ein Teil der mittleren (*cm*) und oberen (*cs*) Nasenmuschel ist entfernt worden um das Gebiet des hiatus semilunaris (*hs*) frei zu legen. Im Bereiche des mittleren Nasenganges und der unteren Nasenmuschel (*ci*) ist in einer Länge von 13 mm der Verlauf des ductus nasolacrimalis (*dnl*) zu sehen.

Planche 52.

Grandeur nature. — Enfant de 12 mois.

rf recessus frontal, *pu* processus uncinatus, *be* lame de la bulle ethmoïdale, *hs* hiatus semilunaire, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur, *dnl* conduit nasolacrymal.

La coupe frontale d'une tête d'enfant de 12 mois est légèrement oblique et montre le sinus frontal dans la forme précoce d'un recessus frontal (*rf*), qui atteint la base de la squame de l'os frontal et est haut de 6 millim., long de 5 millim. et large de 5 millim. Le recessus frontal (*rf*) se termine au dessus de l'hiatus semilunaire (*hs*), qui est limité par la bulle ethmoïdale (*be*) et le processus uncinatus (*pu*). Une partie des cornets moyen (*cm*) et supérieur (*cs*) a été enlevée, pour libérer la région de l'hiatus semilunaire (*hs*). Au niveau du méat moyen et du cornet inférieur (*ci*) on peut voir le conduit nasolacrymal (*dnl*) sur une longueur de 13 millim.

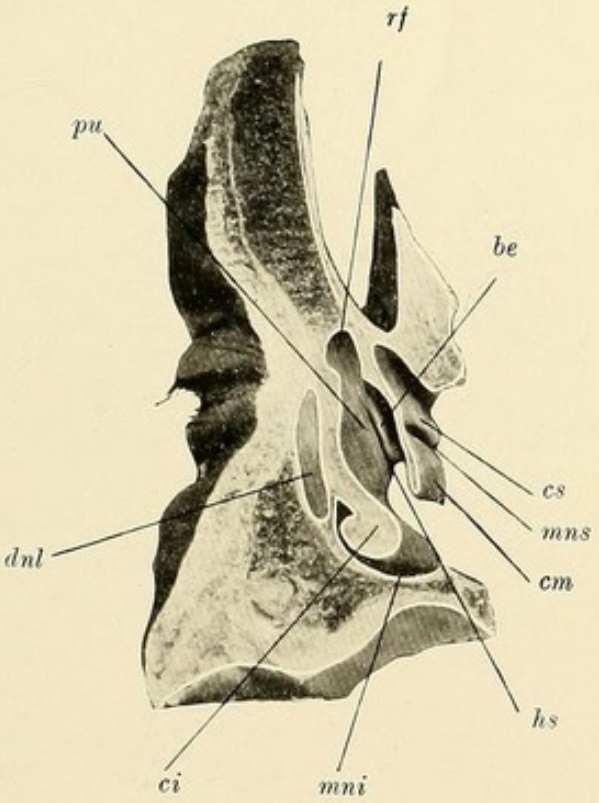
Plate 52.

Natural size. — Child of 12 months.

rf frontal recess, *pu* uncinate process, *be* lamina of ethmoidal bulla, *hs* semilunar hiatus, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha, *dnl* nasal duct.

Coronal section through the head of a child aged 12 months, cut in a slightly oblique direction, so as to shew the frontal sinus in an earlier stage of its development as frontal recess (*rf*); the sinus reaches the base of the squamous part of the frontal bone and is 6 mm high, 5 mm long and 5 mm wide. The opening of the frontal recess (*rf*) lies above the semilunar hiatus (*hs*) which is enclosed between the ethmoidal bulla (*be*) and the uncinate process (*pu*). Portions of the middle (*cm*) and upper (*cs*) conchae have been removed so as to expose the region of the semilunar hiatus (*hs*). Adjoining the middle meatus and the lower concha (*ci*) a portion, 13 mm long, of the nasal duct (*dnl*) can be seen.

Tafel 52.



Tafel 53.

Frontalschnitt.

Natürliche Grösse. — 12 Monate altes Kind.

Planche 53.

Coupe frontale.

Grandeur nature. — Enfant de 12 mois.

Plate 53.

Coronal section.

Natural size. — Child of 12 months.

Tafel 53.

Natürliche Grösse. — 12 Monate altes Kind.

sm sinus maxillaris, *hs* hiatus semilunaris, *cep* cellula ethmoidalis posterior, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior, *s* septum.

Der Frontalschnitt eines 12 Monate alten Kopfes zeigt die rechte Nasenhöhle, den Boden, das Dach, die innere und die äussere Wand der Nasenhöhle. An der äusseren Nasenhöhlenwand sind die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, der untere (*mni*), der mittlere (*mnm*) und der obere (*mns*) Nasengang zu übersehen. Im mittleren Nasengang (*mnm*) ist das hintere Ende des hiatus semilunaris (*hs*), im Bereiche des mittleren Nasenganges (*mnm*) und der unteren Muschel (*ci*) die Kieferhöhle (*sm*) und im Bereiche des oberen Nasenganges (*mns*) die hinteren Siebbeinzellen (*cep*) zu sehen. Die Kieferhöhle (*sm*) ist 11 mm lang, 8 mm breit und 7 mm hoch. Die Siebbeinzellen haben eine Ausbreitung von 2—4 mm.

Planche 53.

Grandeur nature. — Enfant de 12 mois.

sm sinus maxillaire, *hs* hiatus semilunaire, *cep* cellule ethmoïdale postérieure, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur, *s* septum.

La coupe frontale d'une tête d'un enfant de 12 mois montre la fosse nasale droite, le plancher, le toit, la paroi interne et externe de la fosse nasale. Sur la paroi externe de la fosse nasale on voit les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). On peut voir dans le méat moyen (*mnm*) la partie postérieure de l'hiatus semilunaire (*hs*), au niveau du méat moyen (*mnm*) et du cornet inférieur (*ci*) le sinus maxillaire (*sm*) et au niveau du méat supérieur (*mns*) les cellules ethmoïdales postérieures (*cep*). Le sinus maxillaire (*sm*) est long de 11 millim., large de 8 millim. et haut de 7 millim. Les cellules ethmoïdales ont une étendue de 2 à 4 millim.

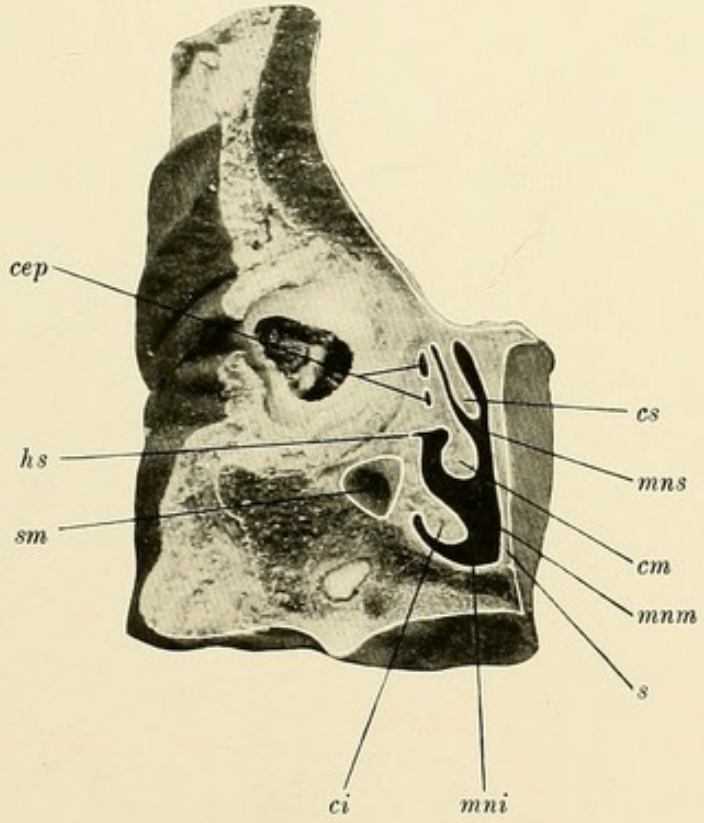
Plate 53.

Natural size. — Child of 12 months.

sm maxillary antrum, *hs* semilunar hiatus, *cep* posterior ethmoidal cell, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus, *s* septum.

Coronal section through the head of a child aged 12 months, shewing the right nasal fossa, its floor, roof, mesial and lateral walls. In the lateral wall, the lower (*ci*), middle (*cm*), and upper (*cs*) concha, the lower (*mni*), middle (*mnm*), and upper (*mns*) meatus are shewn. In the middle meatus (*mnm*) the posterior extremity of the semilunar hiatus (*hs*) is visible; adjoining the middle meatus (*mnm*) and lower concha (*ci*) is the maxillary antrum (*sm*), adjoining the upper meatus are the posterior ethmoidal cells (*cep*). The maxillary antrum (*sm*) is 11 mm long, 8 mm wide and 7 mm high. The diameter of the ethmoidal cells is between 2 and 4 mm.

Tafel 53.



Tafel 54.

Sagittalschnitt.

Natürliche Grösse. — 12 Monate altes Kind.

Planche 54.

Coupe sagittale.

Grandeur nature. — Enfant de 12 mois.

Plate 54.

Longitudinal vertical section.

Natural size. — Child of 12 months.

Tafel 54.

Natürliche Grösse. — 12 Monate altes Kind.

rf recessus frontalis, *cea* cellula ethmoidalis anterior, *be* bulla ethmoidalis, *cep* cellula ethmoidalis posterior, *pu* processus uncinatus, *hs* hiatus semilunaris, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior, *s* septum.

Der Sagittalschnitt eines 12 Monate alten Kopfes zeigt einen kleinen recessus frontalis (*rf*) knapp ober dem vorderen Ende des hiatus semilunaris (*hs*), welchen der processus uncinatus (*pu*) und die bulla ethmoidalis (*be*) begrenzt. Im vorderen Teil des hiatus semilunaris (*hs*) mündet die vordere Siebbeinzelle (*cea*), die 9 mm lang, 8 mm hoch und 6 mm breit ist. Die bulla ethmoidalis (*be*) hat eine Ausdehnung von 3—4 mm. Die hintere Siebbeinzelle (*cep*) ist 8 mm breit, 5 mm lang und hoch. Der Schnitt zeigt ferner einen Teil der unteren (*ci*), mittleren (*cm*) und oberen (*cs*) Muschel, des unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasenganges.

Planche 54.

Grandeur nature. — Enfant de 12 mois.

rf recessus frontal, *cea* cellule ethmoïdale antérieure, *be* bulle ethmoïdale, *cep* cellule ethmoïdale postérieure, *pu* processus uncinatus, *hs* hiatus semilunaire, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur, *s* septum.

La coupe sagittale de la tête d'un enfant de 12 mois montre un petit recessus frontal (*rf*), juste à l'extremité antérieure de l'hiatus semilunaire (*hs*), limité par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*). Dans la partie antérieure de l'hiatus semilunaire (*hs*) se termine la cellule ethmoïdale antérieure (*cea*), qui est longue de 9 millim., haute de 8 millim. et large de 6 millim. La bulle ethmoïdale (*be*) a une étendue de 3 à 4 millim. La cellule ethmoïdale postérieure (*cep*) a une largeur de 8 millim., une longueur et une hauteur de 5 millim. La coupe montre de plus une partie des cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), des méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*).

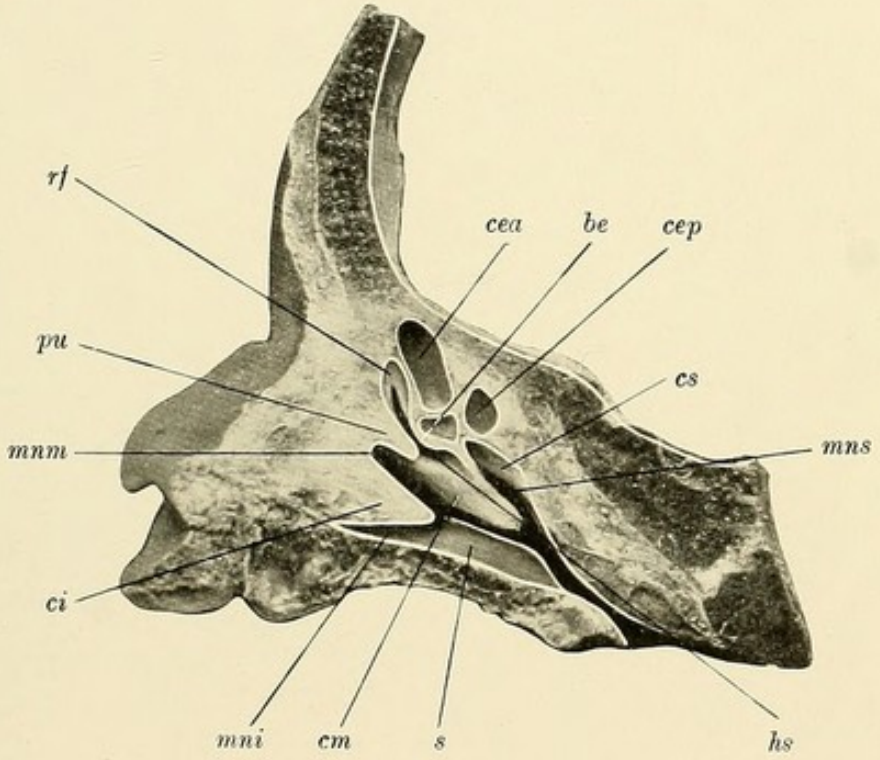
Plate 54.

Natural size. — Child of 12 months.

rf frontal recess, *cea* anterior ethmoidal cell, *be* ethmoidal bulla, *cep* posterior ethmoidal cell, *pu* uncinate process, *hs* semilunar hiatus, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus, *s* septum.

Longitudinal vertical section through the head of a child aged 12 months, shewing a small frontal recess (*rf*) situated immediately above the anterior extremity of the semilunar hiatus (*hs*) which is enclosed between the uncinate process (*pu*) and the ethmoidal bulla (*be*). In the anterior portion of the semilunar hiatus (*hs*) is the opening of the anterior ethmoidal cell (*cea*); this cell is 9 mm long, 8 mm high and 6 mm wide. The ethmoidal bulla (*be*) is 3 to 4 mm in size. The posterior ethmoidal cell (*cep*) is 8 mm in width, 5 mm in length and height. The section also shews parts of the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and of the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus.

Tafel 54.



Tafel 55.

Frontalschnitt.

Natürliche Grösse. — 14 Monate altes Kind.

Planche 55.

Coupe frontale.

Grandeur nature. — Enfant de 14 mois.

Plate 55.

Coronal section.

Natural size. — Child of 14 months.

Tafel 55.

Natürliche Grösse. — 14 Monate altes Kind.

rf recessus frontalis, *cea* cellula ethmoidalis anterior, *dnl* ductus nasolacrimalis, *pu* processus uncinatus, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Frontalschnitt eines 14 Monate alten Kopfes zeigt die laterale Wand der Nasenhöhle mit der unteren (*ci*), mittleren (*cm*) und oberen (*cs*) Nasenmuschel, mit dem unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasengang. Am vordersten obersten Teile des mittleren Nasenganges (*mnm*) ist der 6 mm hohe, 4 mm breite und 3 mm lange recessus frontalis (*rf*) zu sehen, er mündet oberhalb des hiatus semilunaris. Oberhalb des processus uncinatus (*pu*) ist eine 9 mm lange, 8 mm hohe und 4 mm breite vordere Siebbeinzelle (*cea*) zu sehen.

Planche 55.

Grandeur nature. — Enfant de 14 mois.

rf recessus frontal, *cea* cellule ethmoïdale antérieure, *dnl* conduit nasolacrymal, *pu* processus uncinatus, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe frontale de la tête d'un enfant de 14 mois montrant la paroi latérale de la fosse nasale avec les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). A la partie antérieure la plus haute du méat moyen (*mnm*) on peut voir un recessus frontal (*rf*) haut de 6 millim., large de 4 millim. et long de 3 millim.; il s'ouvre au-dessus de l'hiatus semilunaire. Au-dessus du processus uncinatus (*pu*) on peut voir une cellule ethmoïdale antérieure longue de 9 millim., haute de 8 millim. et large de 4 millim.

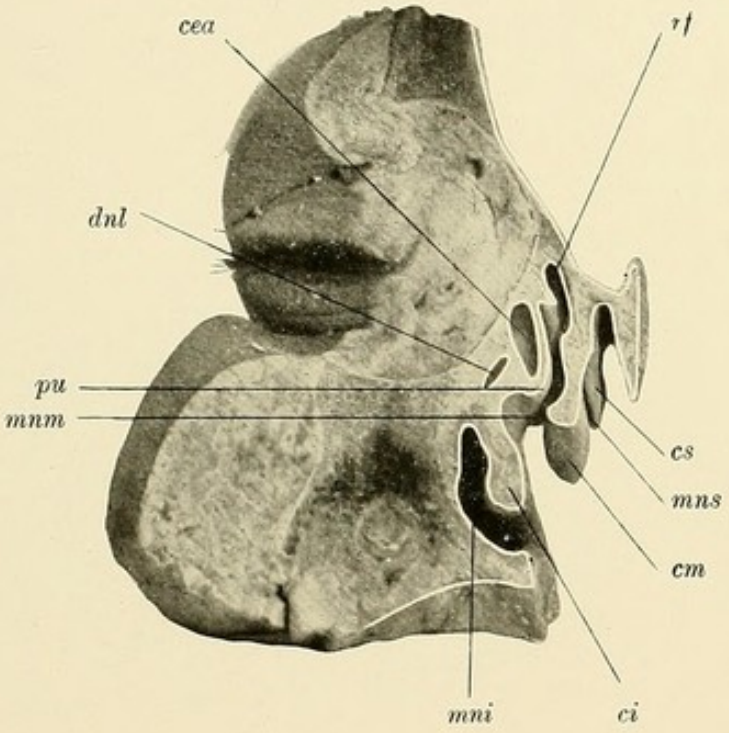
Plate 55.

Natural size. — Child of 14 months.

rf frontal recess, *cea* anterior ethmoidal cell, *dnl* nasal duct, *pu* uncinate process, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Coronal section through the head of a child aged 14 months, shewing the lateral wall of the nasal fossa with the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. At the upper anterior extremity of the middle meatus (*mnm*) the frontal recess (*rf*) is visible; it is 6 mm high, 4 mm wide and 3 mm long, and opens above the semilunar hiatus. Above the uncinate process (*pu*) is an anterior ethmoidal cell (*cea*), measuring 9 mm in length, 8 mm in height and 4 mm in width.

Tafel 55.



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Tafel 56.

Frontalschnitt.

Natürliche Grösse. — 14 Monate altes Kind.

Planche 56.

Coupe frontale.

Grandeur nature. — Enfant de 14 mois.

Plate 56.

Coronal section.

Natural size. — Child of 14 months.

Tafel 56.

Natürliche Grösse. — 14 Monate altes Kind.

sm sinus maxillaris, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *mni* meatus narium inferior, *mnm* meatus narium medius, *mns* meatus narium superior, *ci* concha inferior, *cm* concha media, *cs* concha superior.

Der Frontalschnitt eines 14 Monate alten Kopfes zeigt die laterale Wand der Nasenhöhle, die untere (*ci*), mittlere (*cm*) und obere (*cs*) Nasenmuschel, den unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasengang. Im Bereiche des unteren (*mni*) und des mittleren (*mnm*) Nasenganges ist die Kieferhöhle (*sm*) zu sehen, sie ist 18 mm lang, 15 mm breit und 11 mm hoch, sie mündet mit einer 5 mm länglich ovalen Öffnung im hinteren Teile des hiatus semilunaris. Die vorderen Siebbeinzellen (*cea*) sind 4—8 mm hoch, 6—9 mm lang und 4—5 mm breit. Die hinteren Siebbeinzellen (*cep*) sind 7—10 mm lang, 4—6 mm hoch und 2—3 mm breit.

Planche 56.

Grandeur nature. — Enfant de 14 mois.

sm sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *mni* méat inférieur, *mnm* méat moyen, *mns* méat supérieur, *ci* cornet inférieur, *cm* cornet moyen, *cs* cornet supérieur.

Coupe frontale de la tête d'un enfant de 14 mois montrant la paroi latérale de la fosse nasale, les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*) Au niveau des méats inférieur (*mni*) et moyen (*mnm*) on peut voir le sinus maxillaire (*sm*); il est long de 18 millim. large de 15 millim., et haut de 11 millim.; il s'ouvre par une ouverture ovale longue de 5 millim. dans la partie postérieure de l'hiatus semilunaire. Les cellules ethmoïdales antérieures (*cea*) ont une hauteur de 4 à 8 millim., une longueur de 6 à 9 millim. et une largeur de 4 à 5 millim. Les cellules ethmoïdales postérieures (*cep*) ont une longueur de 7 à 10 millim., une hauteur de 4 à 6 millim. et une largeur de 2 à 3 millim.

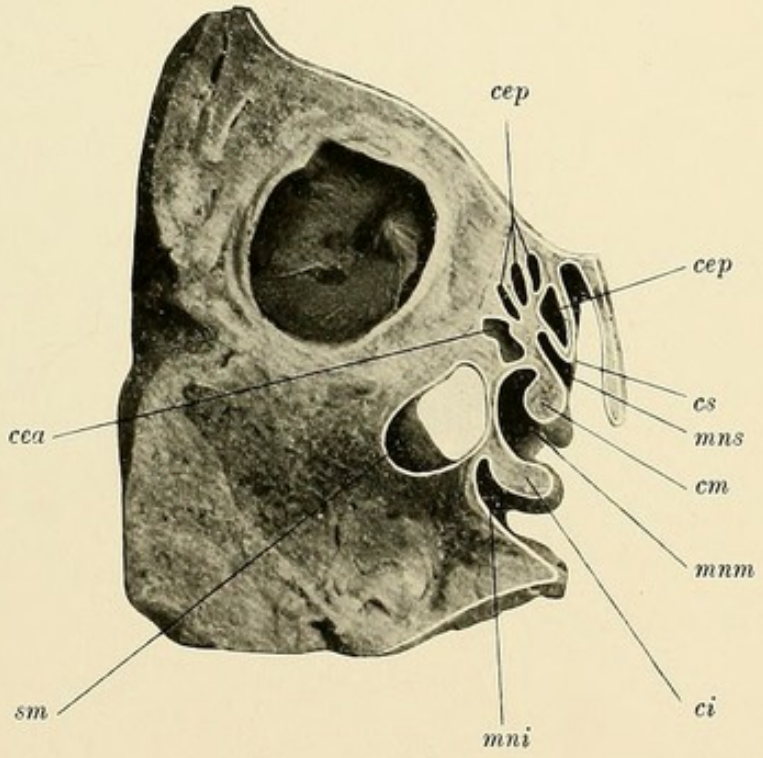
Plate 56.

Natural size. — Child of 14 months.

sm maxillary antrum, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *mni* lower meatus, *mnm* middle meatus, *mns* upper meatus, *ci* lower concha, *cm* middle concha, *cs* upper concha.

Coronal section through the head of a child aged 14 months, shewing the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*) and upper (*cs*) concha and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. Adjoining the lower (*mni*) and middle (*mnm*) meatus lies the maxillary antrum (*sm*); it is 18 mm long, 15 mm wide and 10 mm high, and communicates with the posterior portion of the semilunar hiatus by an elongated oval opening 5 mm in width. The anterior ethmoidal cells (*cea*) are 4 to 8 mm in height, 6 to 9 mm in length and 4 to 5 mm in width. The posterior ethmoidal cells (*cep*) are 7 to 10 mm in length, 4 to 6 mm in height and 2 to 3 mm in width.

Tafel 56.



Tafel 57.

Frontalschnitt.

Natürliche Grösse. — 14 Monate altes Kind.

Planche 57.

Coupe frontale.

Grandeur nature. — Enfant de 14 mois.

Plate 57.

Coronal section.

Natural size. — Child of 14 months.

Tafel 57.

Natürliche Grösse. — 14 Monate altes Kind.

os ostium sphenoidale, *cep* cellula ethmoidalis posterior, *t* tegmen cav. nar., *cs* concha superior, *mns* meatus narium superior, *cm* concha media, *mnm* meatus narium medius, *ci* concha inferior, *mni* meatus narium inferior.

Der Frontalschnitt eines 14 Monate alten Kopfes zeigt die laterale Wand der Nasenhöhle in ihrem hinteren Abschnitte, die untere (*ci*), mittlere (*cm*) und obere (*cs*) Nasenmuschel, den unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasengang. Zwischen der oberen Nasenmuschel (*cs*) und dem Nasendach (*t*) ist das 1 mm weite ostium sphenoidale (*os*) zu sehen, es führt in die 5 mm hohe, 4½ mm lange und 4½ mm breite Keilbeinhöhle.

Planche 57.

Grandeur nature. — Enfant de 14 mois.

os ostium du sinus sphénoïdal, *cep* cellule ethmoïdale postérieure, *t* toit de la fosse nasale, *cs* cornet supérieur, *mns* méat supérieur, cm cornet moyen, *mnm* méat moyen, *ci* cornet inférieur, *mni* méat inférieur.

Coupe frontale d'une tête de 14 mois montrant la paroi latérale de la fosse nasale dans sa partie postérieure, les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). Entre le cornet supérieur et le toit de la fosse nasale (*t*) on peut voir l'ostium du sinus sphénoïdal (*os*), large de 1 millim.; il conduit dans le sinus sphénoïdal haut de 5 millim., long de 4½ millim. et large de 4½ millim.

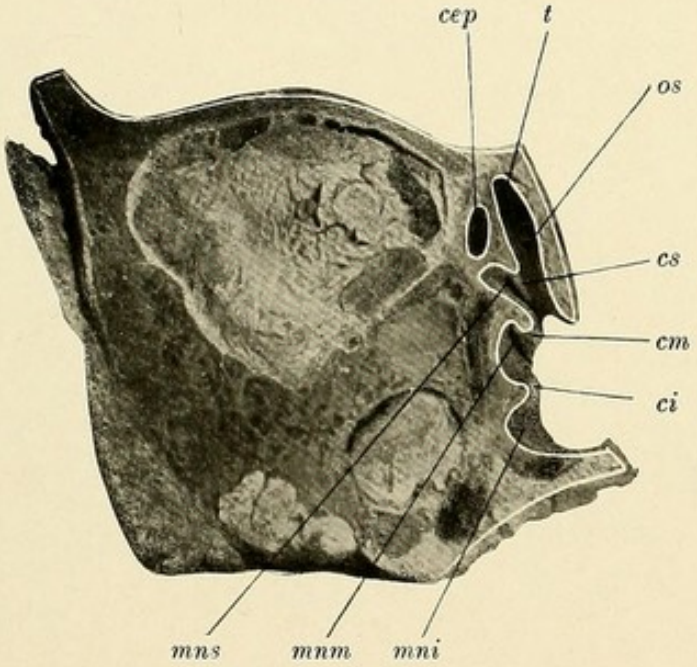
Plate 57.

Natural size. — Child of 14 months.

os sphenoidal ostium, *cep* posterior ethmoidal cell, *t* roof of nasal fossa, *cs* upper concha, *mns* upper meatus, *cm* middle concha, *mnm* middle meatus, *ci* lower concha, *mni* lower meatus.

Coronal section through the head of a child aged 14 months, shewing the lateral wall of the nasal fossa, at its posterior extremity, the lower (*ci*), middle (*cm*) and upper (*cs*) concha and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. Between the upper concha (*cs*) and the roof of the nasal fossa (*t*) the sphenoidal ostium (*os*) may be detected. It is 1 mm wide and leads into the sphenoidal sinus which is 5 mm high, 4½ mm long and 4½ mm wide.

Tafel 57.



Tafel 58.

Sagittalschnitt.

Natürliche Grösse. — 14 Monate altes Kind.

Planche 58.

Coupe sagittale.

Grandeur nature. — Enfant de 14 mois.

Plate 58.

Longitudinal vertical section.

Natural size. — Child of 14 months.

Tafel 58.

Natürliche Grösse. — 14 Monate altes Kind.

rf recessus frontalis, *oce* ostium cellulae ethmoidalis anterioris, *hs* hiatus semilunaris, *om* ostium maxillare, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Sagittalschnitt eines 14 Monate alten Kopfes zeigt nach Entfernung der mittleren Nasenmuschel (*cm*) das Gebiet des hiatus semilunaris (*hs*) und den recessus frontalis (*rf*). Der recessus frontalis (*rf*) ist 10 mm hoch, 9 mm lang und 6 mm breit. Im Recessus mündet vor dem hiatus semilunaris (*hs*) eine kleine vordere Siebbeinzelle (*oce*). Am hinteren Ende des hiatus semilunaris (*hs*) ist die ovale Mündung der Kieferhöhle (*om*) zu sehen.

Planche 58.

Grandeur nature. — Enfant de 14 mois.

rf recessus frontal, *oce* ostium de la cellule ethmoïdale antérieure, *hs* hiatus semilunaire, *om* ostium du sinus maxillaire, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe sagittale d'une tête d'enfant de 14 mois montrant après section du cornet moyen (*cm*) la région de l'hiatus semilunaire (*hs*) et le recessus frontal (*rf*). Le recessus frontal a une hauteur de 10 millim, une longueur de 9 millim. et une largeur de 6 millim. Dans le recessus s'ouvre devant l'hiatus semilunaire (*hs*) une petite cellule ethmoïdale antérieure (*oce*). A la partie postérieure de l'hiatus semilunaire on peut voir l'ouverture ovale du sinus maxillaire (*sm*).

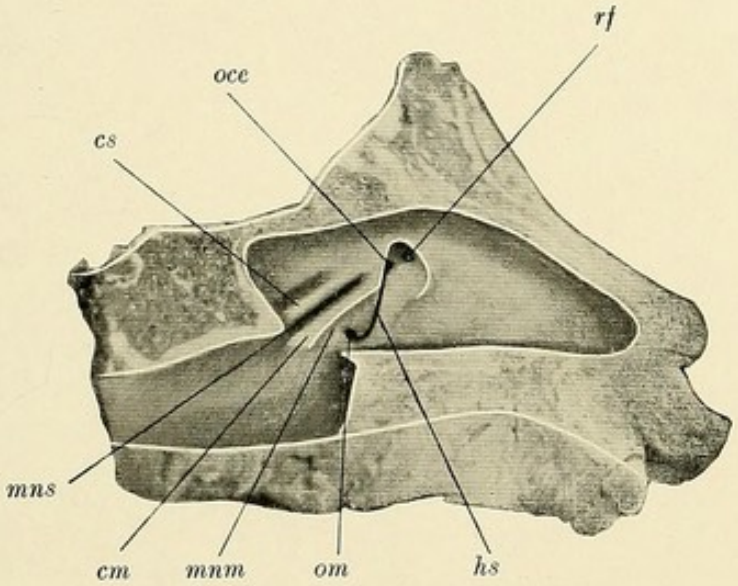
Plate 58.

Natural size. — Child of 14 months.

rf frontal recess, *oce* aperture of anterior ethmoidal cell, *hs* semilunar hiatus, *om* opening of maxillary antrum, *mnm* middle meatus *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Longitudinal vertical section through the head of a child aged 14 months; the middle concha (*cm*) has been removed in order to shew the region of the semilunar hiatus (*hs*) and the frontal recess (*rf*). The frontal recess (*rf*) is 10 mm high, 9 mm long and 6 mm wide. In the recess, above the semilunar hiatus (*hs*), lies the opening of a small anterior ethmoidal cell (*oce*). At the posterior end of the semilunar hiatus (*hs*) the oval opening of the maxillary antrum (*om*) may be seen.

Tafel 58.



Tafel 59.

Frontalschnitt.

Natürliche Grösse. — 14 Monate altes Kind.

Planche 59.

Coupe frontale.

Grandeur nature. — Enfant de 14 mois.

Plate 59.

Coronal section.

Natural size. — Child of 14 months.

Tafel 59.

Natürliche Grösse. — 14 Monate altes Kind.

ss sinus sphenoidalis, *os* ostium sphenoidale.

Der Frontalschnitt eines 14 Monate alten Kopfes zeigt die eröffnete Keilbeinhöhle (*ss*) mit ihrer Mündung (*os*). Die Keilbeinhöhle (*ss*) ist 4½ mm lang, 5 mm hoch und 4½ mm breit, ihre Mündung, das ostium sphenoidale (*os*) bildet eine 1 mm weite runde Öffnung.

Planche 59.

Grandeur nature. — Enfant de 14 mois.

ss sinus sphénoidal, os ostium du sinus sphénoidal.

La coupe frontale d'une tête d'un enfant de 14 mois montre le sinus sphénoïdal (*ss*) ouvert avec son ostium (*os*). Le sinus sphénoïdal est long de 4½ millim., haut de 5 millim. et large de 4½ millim., son ouverture, l'ostium du sinus sphénoïdal (*os*), forme une ouverture ronde, large de 1 millim.

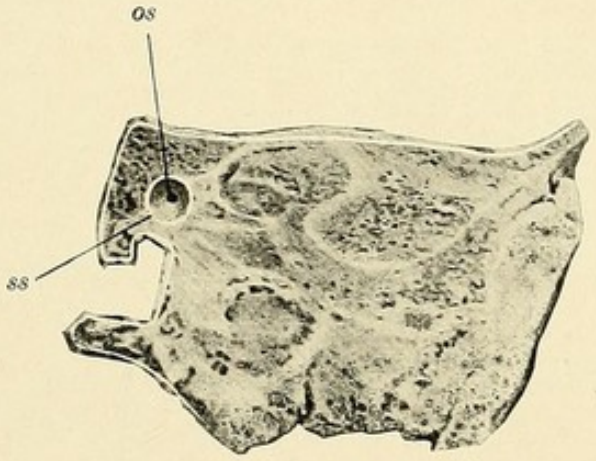
Plate 59.

Natural size. — Child of 14 months.

ss sphenoidal sinus, *os* sphenoidal ostium.

Coronal section through the head of a child 14 months old, shewing the sphenoidal sinus (*ss*) laid open, with its ostium (*os*). The sphenoidal sinus (*ss*) is 4½ mm long, 5 mm high and 4½ mm wide. Its opening, the sphenoidal ostium (*os*), is a circular aperture 1 mm in diameter.

Tafel 59.



Tafel 60.

Frontalschnitt.

Natürliche Grösse. — 15 Monate altes Kind.

Planche 60.

Coupe frontale.

Grandeur nature. — Enfant de 15 mois.

Plate 60.

Coronal section.

Natural size. — Child of 15 months.

Tafel 60.

Natürliche Grösse. — 15 Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Frontalschnitt eines 15 Monate alten Kopfes zeigt die 4½ mm hohe, 4 mm lange und 3½ mm breite Stirnhöhle (*sf*), sie mündet am obersten vordersten Teile des hiatus semilunaris, ferner die vordere Siebbeinzelle (*cea*), den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), mittlere (*cm*) und obere (*cs*) Nasenmuschel.

Planche 60.

Grandeur nature. — Enfant de 15 mois.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe frontale d'une tête d'enfant de 15 mois montrant le sinus frontal (*sf*) haut de 4½ millim., long de 4 millim. et large de 3½ millim.; il s'ouvre à la partie antéro-supérieure de l'hiatus semilunaire; de plus on voit les cellules ethmoïdales antérieures (*cea*), les méats inférieur (*mni*), moyen *mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*).

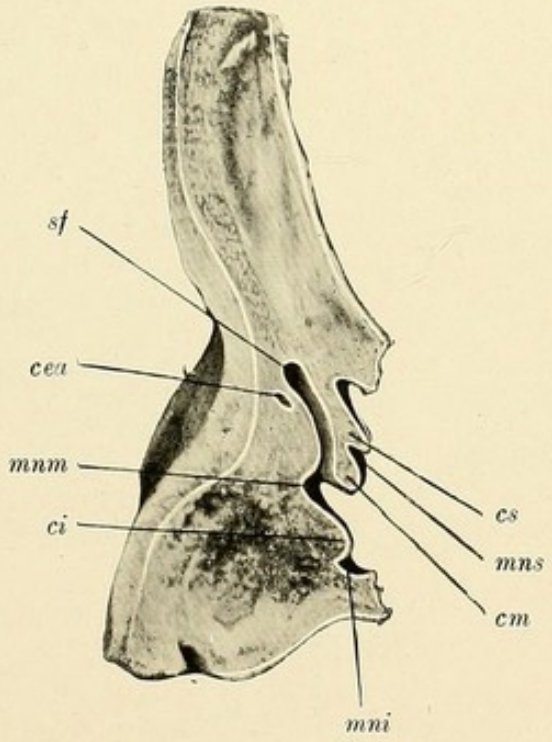
Plate 60.

Natural size. — Child of 15 months

sf frontal sinus, *cea* anterior ethmoidal cell, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Coronal section through the head of a child aged 15 months, shewing the frontal sinus (*sf*), which is 4½ mm high, 4 mm long and 3½ mm wide, opening at the upper anterior extremity of the semilunar hiatus. The anterior ethmoidal cell (*cea*), the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus and the lower (*ci*), middle (*cm*) and upper (*cs*) concha are also illustrated.

Tafel 60.



Tafel 61.

Sagittalschnitt.

Natürliche Grösse. — 15 Monate altes Kind.

Planche 61.

Coupe sagittale.

Grandeur nature. — Enfant de 15 mois.

Plate 61.

Longitudinal vertical section.

Natural size. — Child of 15 months.

Tafel 61.

Natürliche Grösse. — 15 Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *pu* processus uncinatus, *be* bulla ethmoidalis, *cep* cellula ethmoidalis posterior, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Sagittalschnitt eines 15 Monate alten Kopfes zeigt die 7 mm hohe, 5 mm lange und 4 mm breite Stirnhöhle (*sf*), sie mündet in den vordersten Teil des hiatus semilunaris, welchen der processus uncinatus (*pu*) und die bulla ethmoidalis (*be*) begrenzt. Ferner ist die vordere Siebbeinzelle (*cea*), mit ihrer Mündung in dem mittleren Nasengange und die hintere Siebbeinzelle (*cep*) mit ihrer Mündung in den oberen Nasengang (*mns*) zu sehen.

Planche 61.

Grandeur nature. — Enfant de 15 mois.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *pu* processus uncinatus, *be* bulle ethmoïdale, *cep* cellule ethmoïdale postérieure, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet superieur.

Coupe sagittale d'une tête d'enfant de 15 mois montrant le sinus frontal (*sf*) haut de 7 millim. long de 5 millim. et large de 4 millim.; il s'ouvre dans la partie antérieure de l'hiatus semilunaire, limité par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*). De plus on peut voir la cellule ethmoïdale antérieure (*cea*) avec son ostium dans le méat moyen et la cellule ethmoïdale postérieure (*cep*) avec son ostium dans le méat supérieur.

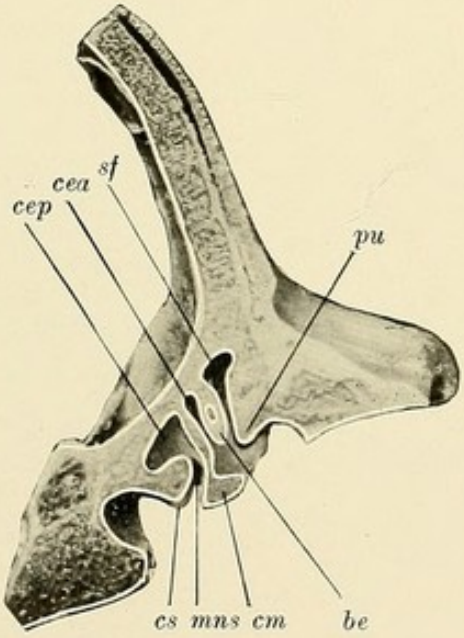
Plate 61.

Natural size. — Child of 15 months.

sf frontal sinus, *cea* anterior ethmoidal cell, *pu* uncinate process, *be* ethmoidal bulla, *cep* posterior ethmoidal cell, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Longitudinal vertical section through the head of a child aged 15 months, shewing the frontal sinus (*sf*), which measures 7 mm in height, 5 mm in length and 4 mm in width, opening into the anterior part of the semilunar hiatus, between the uncinate process (*pu*) and the ethmoidal bulla (*be*). The anterior ethmoidal cell (*cea*) with its opening into the middle meatus and the posterior ethmoidal cell (*cep*) with its opening into the upper meatus (*mns*) are also shewn.

Tafel 61.



Tafel 62.

Sagittalschnitt.

Natürliche Grösse. — 15 Monate altes Kind.

Planche 62.

Coupe sagittale.

Grandeur nature. — Enfant de 15 mois.

Plate 62.

Longitudinal vertical section.

Natural size. — Child of 15 months.

Tafel 62.

Natürliche Grösse. — 15 Monate altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *pu* processus uncinatus, *be* bulla ethmoidalis, *hs* hiatus semilunaris, *cep* cellula ethmoidalis posterior, *os* ostium sphenoidale, *mns* meatus narium superior, *mni* meatus narium inferior, *mnm* meatus narium medius, *ci* concha inferior, *cm* concha media, *cs* concha superior.

Der Sagittalschnitt eines 15 Monate alten Kopfes zeigt den unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasengang, die untere (*ci*), mittlere (*cm*) und obere (*cs*) Nasenmuschel, in der Reihenfolge von vorne nach hinten die Stirnhöhle (*sf*), die vordere Siebbeinzelle (*cea*), die hintere Siebbeinzelle (*cep*) und das ostium sphenoidale (*os*). Die Stirnhöhle (*sf*) ist 7 mm hoch, 5 mm lang und 4 mm breit, sie mündet am oberen vorderen Teile des hiatus semilunaris, welchen der processus uncinatus (*pu*) und die bulla ethmoidalis (*be*) begrenzt. Die vordere Siebbeinzellen (*cea*) sind 3 bis 4 mm lang, $3\frac{1}{2}$—$4\frac{1}{2}$ mm breit und 3—$4\frac{1}{2}$ mm hoch, eine vordere Siebbeinzelle (*cea*) setzt sich noch von der Schnittfläche 6 mm in den processus uncinatus (*pu*) fort. Die hintere Siebbeinzelle (*cep*) ist 6 mm lang, 5 mm hoch und 4 mm breit, ihre direkte Mündung in den oberen Nasengang (*mns*) ist zu übersehen. Das $1\frac{1}{2}$ mm weite ostium sphenoidale (*os*) führt in die 5 mm lange, $3\frac{1}{2}$ mm hohe und 3 mm breite Keilbeinhöhle.

Planche 62.

Grandeur nature. — Enfant de 15 mois.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *pu* processus uncinatus, *be* bulle ethmoïdale, *cep* cellule ethmoïdale postérieure, *os* ostium du sinus sphénoïdal, *hs* hiatus semilunaire, *mni* méat inférieur, *mnm* méat moyen, *mns* méat supérieur, *ci* cornet inférieur, *cm* cornet moyen, *cs* cornet supérieur.

Coupe sagittale d'une tête d'enfant de 15 mois montrant les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*). En allant d'avant en arrière, le sinus frontal (*sf*), la cellule ethmoïdale antérieure (*cea*), la cellule ethmoïdale postérieure (*cep*) et l'ostium du sinus sphénoïdal (*os*). Le sinus frontal (*sf*) a 7 millim. de haut, 5 millim. de long et 4 millim. de large; il s'ouvre à la partie antéro-supérieure de l'hiatus semilunaire, limité par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*). La cellule ethmoïdale antérieure a de 3 à 4 millim. de long, de $3\frac{1}{2}$ à $4\frac{1}{2}$ millim. de large et de 3 à $4\frac{1}{2}$ millim. de haut. Une cellule ethmoïdale antérieure (*cea*) se continue encore sur une longueur de 6 millim. dans le processus uncinatus (*pu*). La cellule ethmoïdale postérieure (*cep*) a 6 millim. de long, 5 millim. de haut et 4 millim. de large; on peut voir son ostium juste dans le méat supérieur (*mns*). L'ostium du sinus sphénoïdal (*os*) large de $\frac{1}{2}$ millim. conduit dans le sinus sphénoïdal long de 5 millim., haut de $3\frac{1}{2}$ millim. et large de 3 millim.

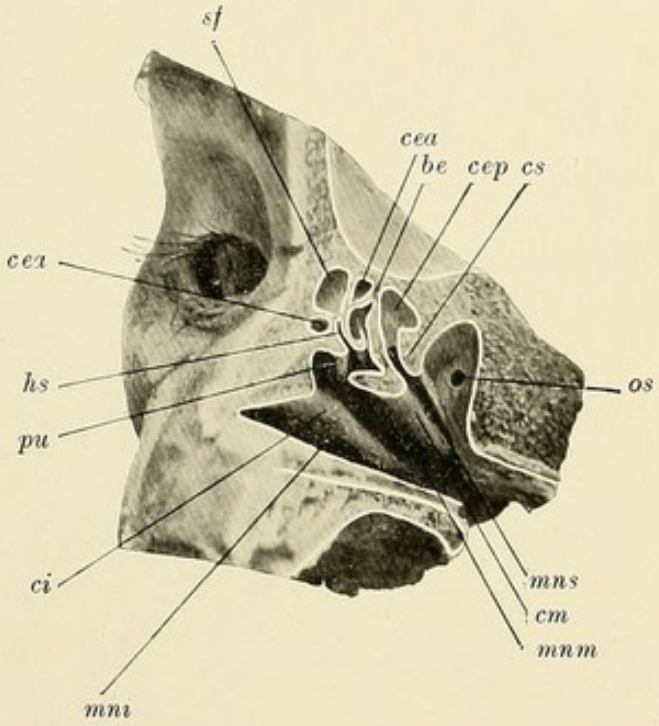
Plate 62.

Natural size. — Child of 15 months.

sf frontal sinus, *cea* anterior ethmoidal cell, *pu* uncinate process, *hs* semilunar hiatus, *be* ethmoidal bulla, *cep* posterior ethmoidal cell, *os* sphenoidal ostium, *mni* lower meatus, *mnm* middle meatus, *mns* upper meatus, *ci* lower concha, *cm* middle concha, *cs* upper concha.

Longitudinal vertical section through the head of a child aged 15 months, shewing the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and, from before backwards, the frontal sinus (*sf*), the anterior ethmoidal cells (*cea*), the posterior ethmoidal cell (*cep*) and the sphenoidal ostium (*os*). The frontal sinus (*sf*) is 7 mm high, 5 mm long and 4 mm wide; it opens into the anterior, upper portion of the semilunar hiatus which is enclosed between the uncinate process (*pu*) and the ethmoidal bulla (*be*). The anterior ethmoidal cells (*cea*) are 3 to 4 mm long, $3\frac{1}{2}$ to $4\frac{1}{2}$ mm wide and 3 to $4\frac{1}{2}$ mm high; one anterior ethmoidal cell (*cea*) extends from the plane of section into the uncinate process (*pu*) for a distance of 6 mm. The posterior ethmoidal cell (*cep*) is 6 mm long, 5 mm high and 4 mm wide; its opening into the upper meatus (*mns*) can be seen. The sphenoidal ostium (*os*), an aperture $1\frac{1}{2}$ mm in diameter, leads into the sphenoidal sinus which measures 5 mm in length, $3\frac{1}{2}$ mm in height and 3 mm in width.

Tafel 62.



Tafel 63.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 15 Monate alten Kindes.

Planche 63.

Radiogramme.

Grandeur natu:e. — Crâne d'enfant de 15 mois.

Plate 63.

Skiagram.

Natural size. — Skull of child 15 months old.

Tafel 63.

Natürliche Grösse. — Schädel eines 15 Monate alten Kindes.

sfs sinus frontalis sinister, *sfd* sinus frontalis dexter.

Die Figur zeigt eine Röntgenaufnahme der Stirnhöhlen eines 15 Monate alten Schädels. Die rechte Stirnhöhle (*sfd*) hat eine Ausdehnung in vertikaler Richtung von 3 mm und in horizontaler Richtung von 5 mm; die linke Stirnhöhle (*sfs*) hat eine Ausdehnung von $3\frac{1}{2}$ mm in vertikaler und von $5\frac{1}{2}$ mm in horizontaler Richtung.

Planche 63.

Grandeur nature. — Crâne d'enfant de 15 mois.

sfs sinus frontal gauche, *sfd* sinus frontal droit.

Figure montrant le radiogramme des sinus frontaux d'un crâne de 15 mois. Le sinus frontal droit (*sfd*) a une étendue de 3 millim. dans la direction verticale et de 5 millim. dans la direction horizontale; le sinus frontal gauche (*sfs*) a une étendue de $3\frac{1}{2}$ millim. dans la direction verticale et de $5\frac{1}{2}$ millim. dans la direction horizontale.

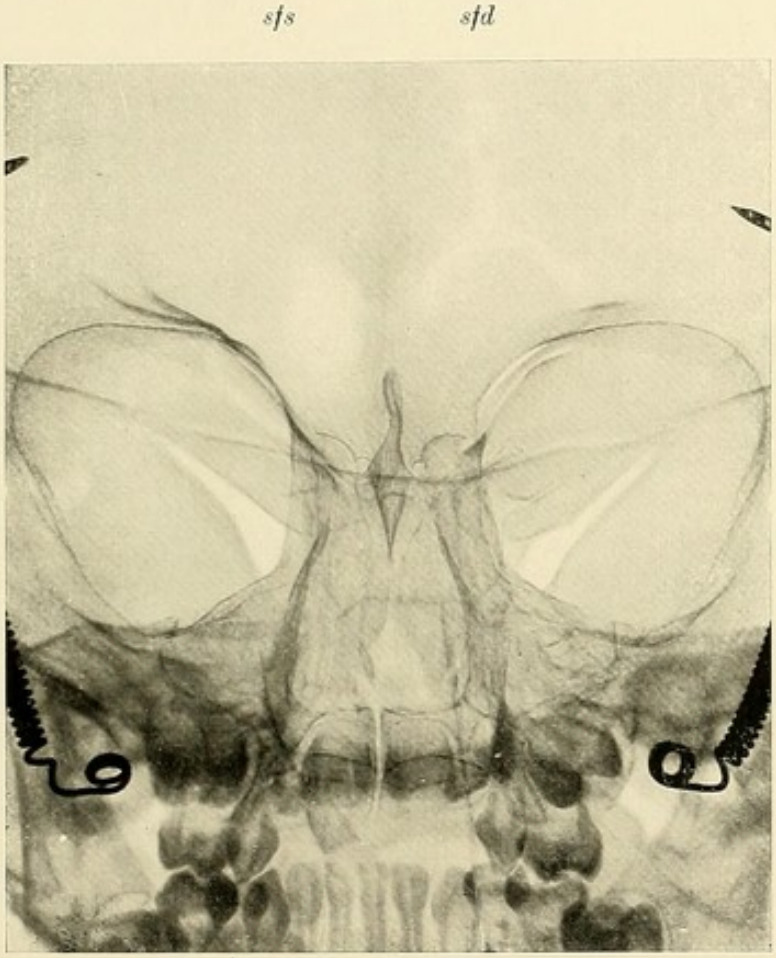
Plate 63.

Natural size. — Skull of child 15 months old.

sfs left frontal sinus, *sfd* right frontal sinus.

Skiagram shewing the frontal sinuses in the skull of a child aged 15 months. The right frontal sinus (*sfd*) measures 3 mm in the vertical and 5 mm in the horizontal direction; the left frontal sinus (*sfs*) measures $3\frac{1}{2}$ mm in the vertical and $5\frac{1}{2}$ mm in the horizontal direction.

Tafel 63.



Tafel 64.

Frontalschnitt.

Natürliche Grösse. — 1 1/2 Jahre altes Kind.

Planche 64.

Coupe frontale.

Grandeur nature. — Enfant de 1 an 1/2.

Plate 64.

Coronal section.

Natural size. — Child of 1 1/2 years.

Tafel 64.

Natürliche Grösse. — $1^1/_2$ Jahr altes Kind.

ci concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatus narium medius, *sm* sinus maxillaris, *ce* cellula ethmoidalis, *s* septum, *p* palatum, *d* Zahnanlage, *pu* processus uncinatus.

Der Frontalschnitt eines $1^1/_2$ Jahre alten Kopfes zeigt die in der Medianlinie geradverlaufende Nasenscheidewand (*s*), an der lateralen Nasenhöhlenwand die untere (*ci*) und mittlere (*cm*) Nasenmuschel, den unteren (*mni*) und den mittleren Nasengang (*mnm*), den Boden und das Dach der Nasenhöhle, ferner die Kieferhöhle (*sm*), die Siebbeinzelle (*ce*) und Zahnkeime (*d*). Die Kieferhöhle (*sm*) hat eine Ausdehnung von 10 mm Länge, 8 mm Höhe und 3 mm Breite. Auf der rechten Seite ist die Mündung der Kieferhöhle (*sm*) in den hiatus semilunaris zu übersehen, begrenzt vom processus uncinatus (*pu*). Die rechte Siebbeinzelle (*ce*) ist 6 mm lang, 5 mm hoch und 3 mm breit, die linke Siebbeinzelle (*ce*) ist 4 mm lang, 4 mm hoch und $1^1/_2$ mm breit.

Planche 64.

Grandeur nature. — Enfant de 1 an $^1/_2$.

ci cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *sm* sinus maxillaire, *ce* cellule ethmoïdale, *s* septum, *p* palais, *d* couche dentaire, *pu* processus uncinatus.

La coupe frontale d'une tête d'enfant de 1 an $^1/_2$ présente un septum (*s*) tout droit dans la ligne médiane. Sur la paroi latérale de la fosse nasale on voit les cornets inférieur (*ci*) et moyen (*cm*), les méats inférieur (*mni*) et moyen (*mnm*), le plancher et le toit de la fosse nasale, de plus le sinus maxillaire (*sm*), la cellule ethmoïdale (*ce*) et la couche dentaire (*d*). Le sinus maxillaire (*sm*) est long de 10 millim., haut de 8 millim. et large de 3 millim. On voit sur le côté droit l'ostium du sinus maxillaire donnant dans le hiatus semilunaire, couvert par le processus uncinatus (*pu*). La cellule ethmoïdale droite (*ce*) est longue de 6 millim., haute de 5 millim. et large de 3 millim. Les dimensions correspondantes de la cellule ethmoïdale gauche (*ce*) sont 4 millim., 4 millim. et $1^1/_2$ millim.

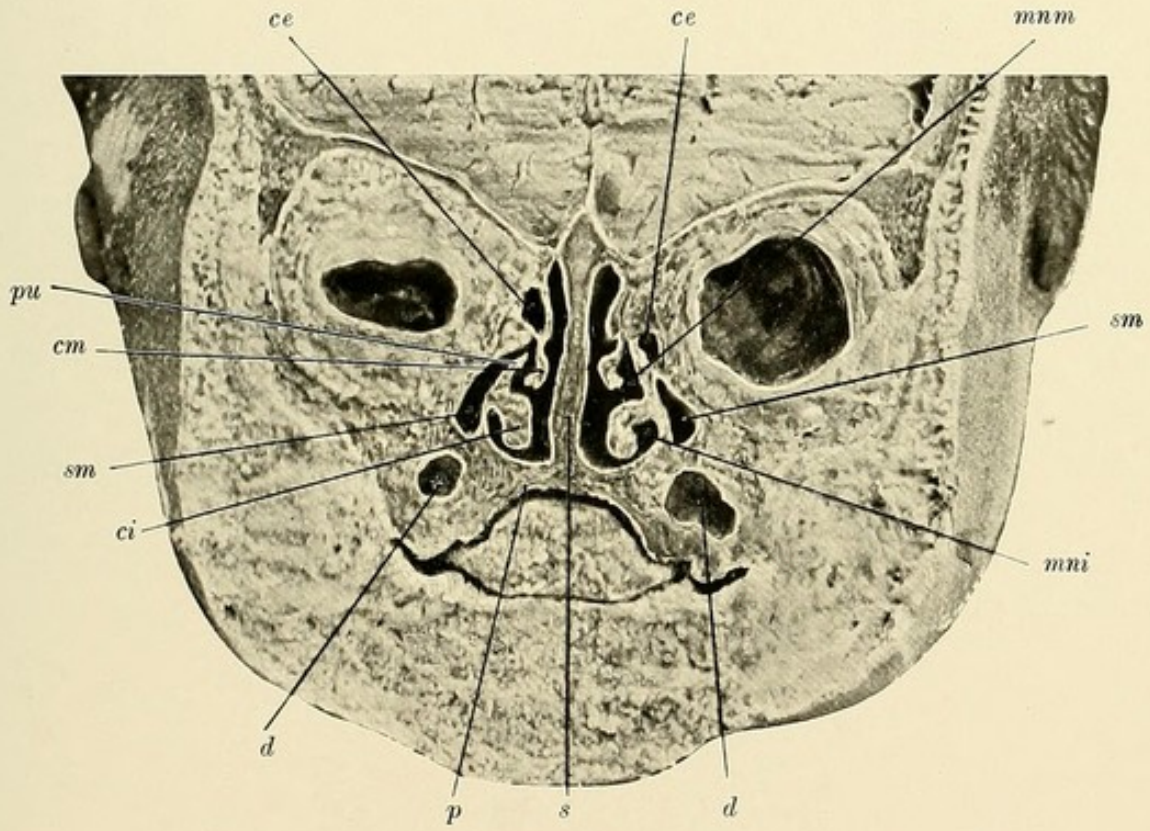
Plate 64.

Natural size. — Child of $1^1/_2$ years.

ci lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *sm* maxillary antrum, *ce* ethmoidal cell, *s* septum, *p* hard palate, *d* dental germ. *pu* uncinate process.

Coronal section through the head of a child aged $1^1/_2$ years, shewing the nasal septum (*s*) situated in the median plane, and in the lateral wall of each nasal fossa, the lower (*ci*) and middle (*cm*) concha, the lower (*mni*) and middle (*mnm*) meatus, also the floor and roof of the nasal fossae, the maxillary antrum (*sm*), ethmoidal cell (*ce*) and dental germs (*d*). The maxillary antrum (*sm*) is 10 mm long, 8 mm high, and 3 mm wide. On the right hand side, the opening of the maxillary antrum (*sm*) into the semilunar hiatus may be seen. This orifice is bounded by the uncinate process (*pu*). The right ethmoidal cell (*ce*) is 6 mm long, 5 mm high, and 3 mm wide; the left ethmoidal cell (*ce*) is 4 mm long, 4 mm high, and $1^1/_2$ mm wide.

Tafel 64.



Tafel 65.

Frontalschnitt.

Natürliche Grösse. — 1 1/2 Jahre altes Kind.

Planche 65.

Coupe frontale.

Grandeur nature. — Enfant de 1 an 1/2.

Plate 65.

Coronal section.

Natural size. — Child of 1 1/2 years.

Tafel 65.

Natürliche Grösse. — $1\frac{1}{2}$ Jahre altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *pu* processus uncinatus, *ci* concha inferior, *cm* concha media, *cs* concha superior.

Der Frontalschnitt des $1\frac{1}{2}$ Jahre alten Kopfes ist etwas schräg geführt und zeigt den 5 mm hohen, $3\frac{1}{2}$ mm breiten und 3 mm langen sinus frontalis (*sf*), er mündet oberhalb des hiatus semilunaris. Um die Stirnhöhle (*sf*) sind vordere Siebbeinzellen (*cea*) gelagert, eine hat eine Ausdehnung von 10 mm Höhe, $3\frac{1}{2}$ mm Breite und $2\frac{1}{2}$ mm Länge. Der Schnitt zeigt den processus uncinatus (*pu*), die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel.

Planche 65.

Grandeur nature. — Enfant de 1 an $\frac{1}{2}$.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *pu* processus uncinatus, *ci* cornet inférieur, *cm* cornet moyen, *cs* cornet supérieur.

Coupe frontale d'une tête d'un enfant de 1 an $\frac{1}{2}$, légèrement oblique, montre le sinus frontal (*sf*) haut de 5 millim., large de $3\frac{1}{2}$ millim. et long de 3 millim., qui se termine au-dessus de l'hiatus semilunaire; autour du sinus frontal (*sf*) se trouvent des cellules ethmoïdales antérieures (*cea*); l'une a les dimensions de 10 millim. de haut, $3\frac{1}{2}$ millim. de large et $2\frac{1}{2}$ millim. de long. La coupe montre le processus uncinatus (*pu*), les cornets inférieur (*ci*) moyen (*cm*) et supérieur (*cs*).

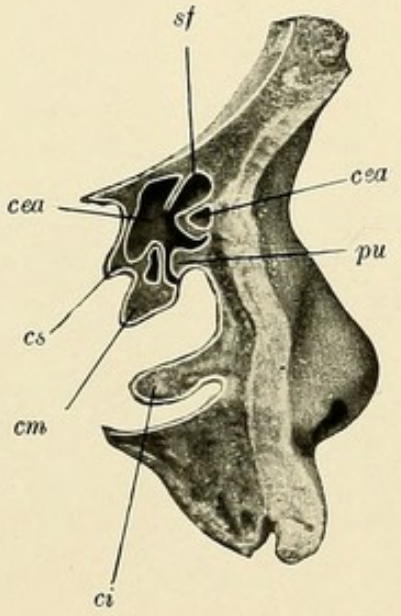
Plate 65.

Natural size. — Child of $1\frac{1}{2}$ years.

sf frontal sinus, *cea* anterior ethmoidal cell, *pu* uncinate process, *ci* lower concha, *cm* middle concha, *cs* upper concha.

Section through the head of a child aged $1\frac{1}{2}$ years, cut in a plane slightly oblique to the coronal; it shews the frontal sinus (*sf*), which is 5 mm high, $3\frac{1}{2}$ mm wide and 3 mm long, and opens above the semilunar hiatus. The frontal sinus (*sf*) is surrounded by anterior ethmoidal cells (*cea*), one of which is 10 mm high, $3\frac{1}{2}$ mm wide and $2\frac{1}{2}$ mm long. The section also shews the uncinate process (*pu*), the lower (*ci*), middle (*cm*) and upper (*cs*) concha.

Tafel 65.



Tafel 66.

Frontalschnitt.

Natürliche Grösse. — 1½ Jahre altes Kind.

Planche 66.

Coupe frontale.

Grandeur nature. — Enfant de 1 an ½.

Plate 66.

Coronal section.

Natural size. — Child of 1½ years.

Tafel 66.

Natürliche Grösse. — 1½ Jahre altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *hs* hiatus semilunaris, *pu* processus uncinatus, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior.

Der (zu Tafel 65) korrespondierende Frontalschnitt eines 1½ Jahre alten Kopfes zeigt die laterale Wand der Nasenhöhle, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang. Im mittleren Nasengang (*mnm*) ist der hiatus semilunaris (*hs*), der processus uncinatus (*pu*), oberhalb des hiatus semilunaris (*hs*) ist die Stirnhöhle (*sf*) umgeben von den vorderen Siebbeinzellen (*cea*), ferner im Bereiche der oberen Nasenmuschel die hintere Siebbeinzelle (*cep*) zu sehen.

Planche 66.

Grandeur nature. — Enfant de 1 an ½.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *hs* hiatus semilunaire, *pu* processus uncinatus, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur.

Coupe frontale d'une tête d'un enfant de 1 an ½ (correspondante à la planche 65) montre la paroi latérale de la fosse nasale, les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). Dans le méat moyen (*mnm*) on peut voir l'hiatus semilunaire (*hs*), le processus uncinatus (*pu*), au dessus de l'hiatus semilunaire (*hs*) le sinus frontal (*sf*), entouré des cellules ethmoïdales antérieures (*cea*) et de plus on peut voir la cellule ethmoïdale postérieure (*cep*) au niveau du cornet supérieur.

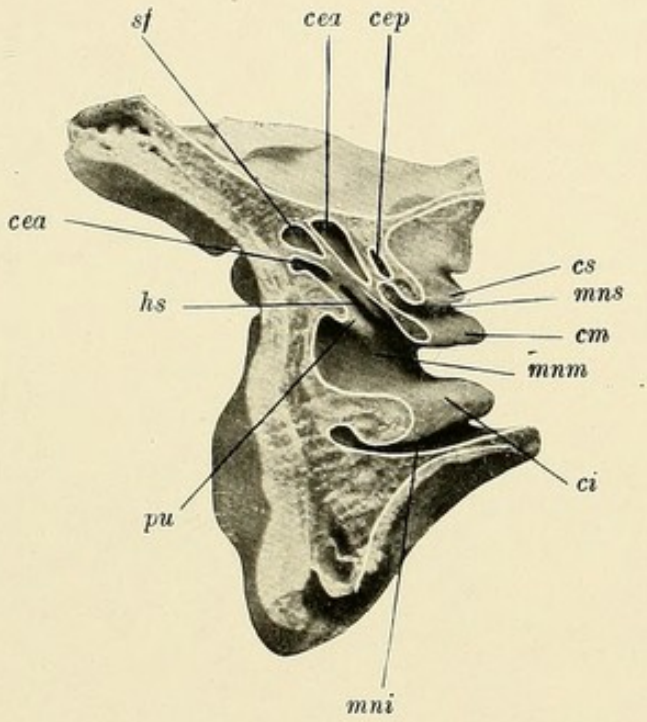
Plate 66.

Natural size. — Child of 1½ years.

sf frontal sinus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *hs* semilunar hiatus, *pu* uncinate process, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus.

Coronal section through the head of a child aged 1½ years, corresponding to the section figured on the previous plate. The lateral wall of the nasal fossa is shewn with the lower (*ci*), middle (*cm*) and upper (*cs*) concha and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. In the middle meatus (*mnm*) the semilunar hiatus (*hs*) and uncinate process (*pu*) are visible. Above the semilunar hiatus (*hs*) is the frontal sinus (*sf*) surrounded by anterior ethmoidal cells (*cea*), and in relation with the upper concha, the posterior ethmoidal cell (*cep*).

Tafel 66.



Tafel 67.

Frontalschnitt.

Natürliche Grösse. — 1½ Jahre altes Kind.

Planche 67.

Coupe frontale.

Grandeur nature. — Enfant de 1 an ½.

Plate 67.

Coronal section.

Natural size. — Child of ½ years.

Tafel 67.

Natürliche Grösse. — 1½ Jahre altes Kind.

sm sinus maxillaris, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior, *mnsr* meatus narium supremus, *csr* concha suprema, *os* ostium sphenoidale.

Der Frontalschnitt des 1½ Jahre alten Kopfes zeigt die äussere Wand der Nasenhöhle, die untere (*ci*), die mittlere (*cm*), die obere (*cs*) und die oberste (*csr*) Nasenmuschel, den unteren (*mni*), den mittleren (*mnm*), den oberen (*mns*) und den obersten (*mnsr*) Nasengang. Im Bereiche des unteren (*mni*) und des mittleren (*mnm*) Nasenganges ist die Kieferhöhle (*sm*), zwischen der obersten Nasenmuschel und dem Nasendache ist die Mündung der Keilbeinhöhle (*os*) zu sehen. Die Keilbeinhöhle ist 3 mm lang, 2 mm hoch und 2 mm breit, das runde ostium sphenoidale ist 1 mm weit.

Planche 67.

Grandeur nature. — Enfant de 1 an ½.

sm sinus maxillaire, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur *mnsr* méat suprême, *csr* quatrième cornet, *os* ostium du sinus sphénoïdal.

Coupe frontale d'une tête de 1 an ½ montrant la paroi latérale de la fosse nasale les cornets inférieur (*ci*), moyen (*cm*), supérieur (*cs*) et suprême (*csr*), les méats inférieur (*mni*), moyen (*mnm*), supérieur (*mns*) et suprême (*mnsr*). On peut voir au niveau des méats inférieur (*mni*) et moyen (*mnm*) le sinus maxillaire (*sm*) et entre se quatrième cornet et le toit de la fosse nasale l'ostium du sinus sphénoïdal (*os*). Le linus sphénoïdal est long de 3 millim., haut de 2 millim. et large de 2 millim.; son ostium rond a une largeur de 1 millim.

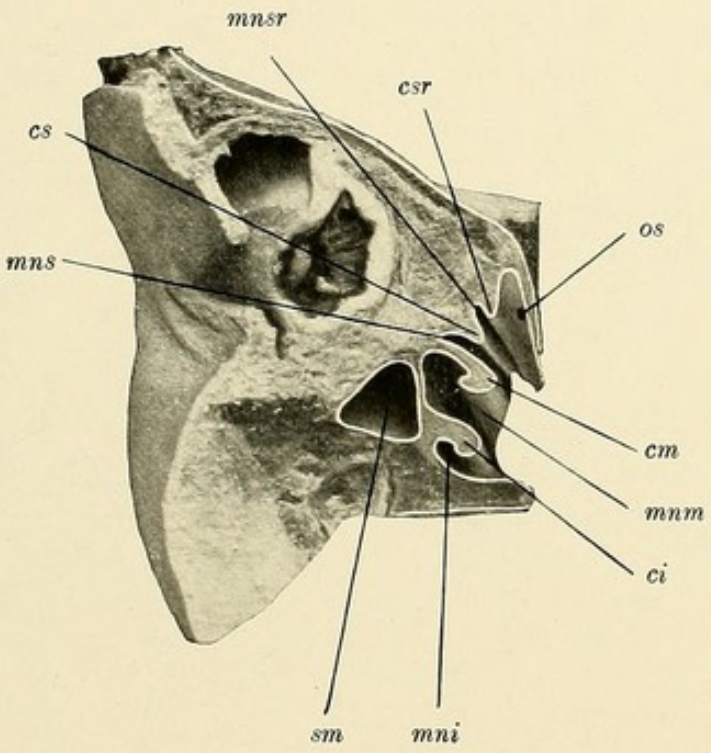
Plate 67.

Natural size. — Child of 1½ years.

sm maxillary antrum, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper choncha, *mnsr* meatus narium supremus, *csr* concha suprema, *os* sphenoidal ostium.

Coronal section through the head of a child aged 1½ years, shewing the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*), upper (*cs*) and uppermost (*csr*) concha, the lower (*mni*), middle (*mnm*), upper (*mns*) and uppermost (*mnsr*) meatus. Adjoining the lower (*mni*) and middle (*mnm*) meatus is the maxillary antrum (*sm*). Between the uppermost concha and the roof of the nasal fossa the sphenoidal ostium (*os*) may be noted. The sphenoidal sinus is 3 mm long, 2 mm high and 2 mm wide, the circular sphenoidal ostium is 1 mm in diameter.

Tafel 67.



Tafel 68.

Sagittalschnitt.

Natürliche Grösse. — 1 1/2 Jahre altes Kind.

Planche 68.

Coupe sagittale.

Grandeur nature. — Enfant de 1 an 1/2.

Plate 68.

Longitudinal vertical section.

Natural size. — Child of 1 1/2 years.

Tafel 68.

Natürliche Grösse. — 1½ Jahre altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *hs* hiatus semilunaris, *pu* processus uncinatus, *om* ostium maxillare, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Sagittalschnitt des 1½ Jahre alten Kopfes zeigt nach Entfernung der mittleren Nasenmuschel (*cm*) das Gebiet des hiatus semilunaris (*hs*) und die Stirnhöhlenmündung (*sf*). An der äusseren Wand der Nasenhöhle ist die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, der untere (*mni*), der mittlere (*mnm*) und der obere (*mns*) Nasengang zu sehen. Am hinteren Teile des kurzen und schmalen hiatus semilunaris (*hs*) mündet die Kieferhöhle mit einer ovalen Öffnung (*om*), oberhalb des vorderen Endes des hiatus semilunaris (*hs*) ist die 9 mm hohe, 7 mm breite und 4½ mm lange Stirnhöhle zu sehen.

Planche 68.

Grandeur nature. — Enfant de 1 an ½.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *hs* hiatus semilunaire, *pu* processus uncinatus *om* ostium du sinus maxillaire, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe sagittale d'une tête de 1 an ½ montrant après section du cornet moyen (*cm*) la région de l'hiatus semilunaire (*hs*) et l'ostium du sinus frontal (*sf*). Sur la paroi latérale de la fosse nasale on peut voir les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). A la partie postérieure du court et étroit hiatus semilunaire (*hs*) s'ouvre le sinus maxillaire par une ouverture ovale (*om*); au-dessus de la partie antérieure de l'hiatus semilunaire (*hs*) on peut voir le sinus frontal long de 9 millim. large de 7 millim. et haut de 4½ millim.

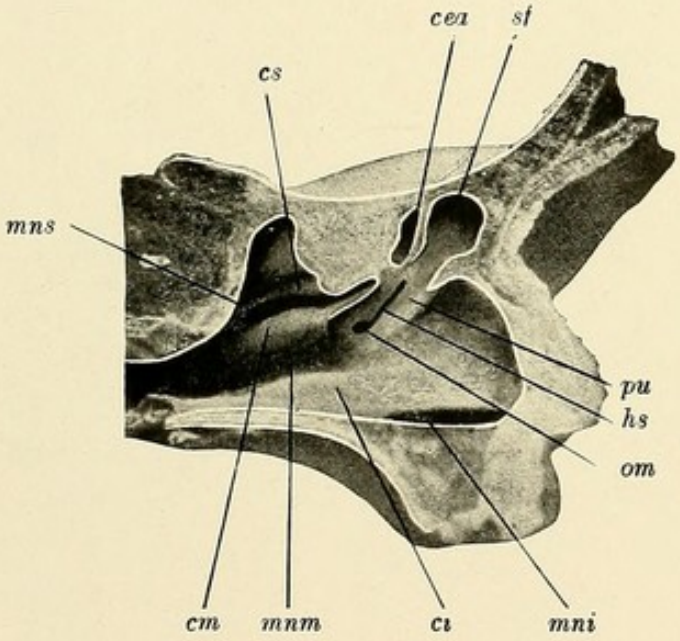
Plate 68.

Natural size. — Child of 1½ years.

sf frontal sinus, *cea* anterior ethmoidal cell, *hs* semilunar hiatus, *pu* uncinate process, *om* maxillary ostium, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Longitudinal vertical section through the head of a child aged 1½ years. The middle concha (*cm*) having been removed, the region of the semilunar hiatus (*hs*) with the opening of the frontal sinus (*sf*) is exposed. On the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus are visible. At the posterior extremity of the short and narrow semilunar hiatus (*hs*) is the oval aperture (*om*) of the maxillary antrum. Above the anterior end of the semilunar hiatus (*hs*) is the frontal sinus, measuring 9 mm in height, 7 mm in width and 4½ mm in length.

Tafel 68.



Tafel 69.

Frontalschnitt.

Natürliche Grösse. — 2 Jahre altes Kind.

Planche 69.

Coupe frontale.

Grandeur nature. — Enfant de 2 ans.

Plate 69.

Coronal section.

Natural size. — Child of 2 years.

Tafel 69.

Natürliche Grösse. — 2 Jahre altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *hs* hiatus semilunaris, *be* bulla ethmoidalis, *pu* processus uncinatus, *cs* concha superior, *mns* meatus narium superior, *cm* concha media, *mnm* meatus narium medius, *ci* concha inferior, *mni* meatus narium inferior.

Der Frontalschnitt eines 2 Jahre alten Kopfes zeigt den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), mittlere (*cm*) und obere (*cs*) Nasenmuschel. Im Gebiete des hiatus semilunaris (*hs*), welchen der processus uncinatus (*pu*) und die bulla ethmoidalis (*be*) begrenzt, ist die Stirnhöhle (*sf*) und die vordere Siebbeinzelle (*cea*) zu sehen. Die Stirnhöhle (*sf*) ist $5\frac{1}{2}$ mm hoch, 4 mm breit und 3 mm lang, sie mündet am vorderen oberen Ende des hiatus semilunaris (*hs*). Die vordere Siebbeinzelle (*cea*) ist 5 mm hoch, 4 mm breit und $3\frac{1}{2}$ mm lang, diese Zelle reicht von der Schnittfläche noch 10 mm in den processus uncinatus (*pu*).

Planche 69.

Grandeur nature. — Enfant de 2 ans.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *hs* hiatus semilunaire, *be* bulle ethmoïdale, *pu* processus uncinatus, *cs* cornet supérieur, *mns* méat supérieur, *cm* cornet moyen, *mnm* méat moyen, *ci* cornet inférieur, *mni* méat inférieur.

Coupe frontale d'une tête de 2 ans montrant les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*). Dans la région de l'hiatus semilunaire (*hs*), qui est limitée par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*) on peut voir le sinus frontal (*sf*) et la cellule ethmoïdale antérieure. Le sinus frontal (*sf*) a $5\frac{1}{2}$ millim. de haut, 4 millim. de large et 3 millim. de long; il s'ouvre à l'extremité antéro-supérieure de l'hiatus semilunaire (*hs*). La cellule ethmoïdale antérieure (*cea*) a 5 millim. de haut, 4 millim. de large et $3\frac{1}{2}$ millim. de long. Cette cellule s'étend depuis le plan de la section encore 10 millim. dans le processus uncinatus (*pu*).

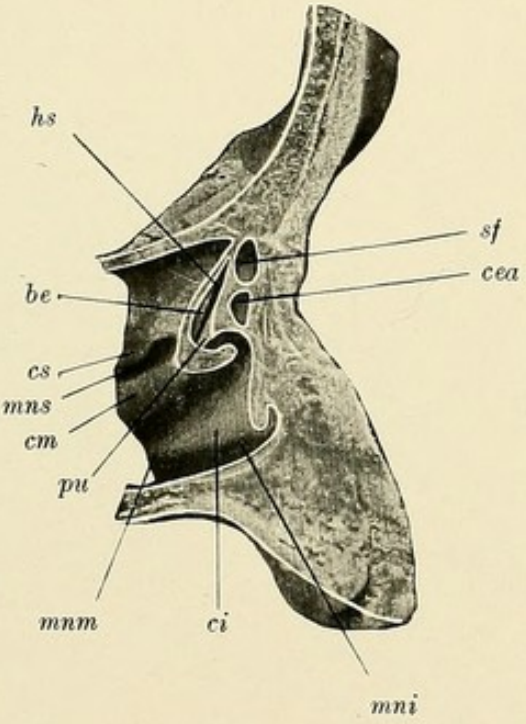
Plate 69.

Natural size. — Child of 2 years.

sf frontal sinus, *cea* anterior ethmoidal cell, *hs* semilunar hiatus, *be* ethmoidal bulla, *pu* uncinate process, *cs* upper concha, *mns* upper meatus, *cm* middle concha, *mnm* middle meatus, *ci* lower concha, *mni* lower meatus.

Coronal section through the head of a child aged 2 years, shewing the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, and the lower (*ci*) middle (*cm*) and upper (*cs*) concha. The semilunar hiatus (*hs*) may be seen enclosed between the uncinate process (*pu*) and the ethmoidal bulla (*be*) and adjoining it, the frontal sinus (*sf*) and the anterior ethmoidal cell (*cea*). The frontal sinus (*sf*) is $5\frac{1}{2}$ mm high, 4 mm wide and 3 mm long; it opens at the upper anterior extremity of the semilunar hiatus (*hs*). The anterior ethmoidal cell (*cea*) is 5 mm high, 4 mm wide and $3\frac{1}{2}$ mm long. This cell extends into the uncinate process (*pu*) for a distance of 10 mm below the plane of the section.

Tafel 69.



Tafel 70.

Frontalschnitt.

Natürliche Grösse. — 2 Jahre altes Kind.

Planche 70.

Coupe frontale.

Grandeur nature. — Enfant de 2 ans.

Plate 70.

Coronal section.

Natural size. — Child of 2 years.

Tafel 70.

Natürliche Grösse. — 2 Jahre altes Kind.

sm sinus maxillaris, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *be* bulla ethmoidalis, *pu* processus uncinatus, *mns* meatus narium superior, *cs* concha superior, *mnm* meatus narium medius, *cm* concha media, *ci* concha inferior, *mni* meatus narium inferior.

Der Frontalschnitt des 2 Jahre alten Kopfes zeigt die laterale Wand der Nasenhöhle, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Muschel, den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang. Im Bereiche der unteren Muschel (*ci*) und des mittleren Nasenganges (*mnm*) ist die Kieferhöhle (*sm*) zu sehen mit ihrer Mündung in den mittleren Nasengang (*mnm*) im hiatus semilunaris, welchen der processus uncinatus (*pu*) und die bulla ethmoidalis (*be*) begrenzt. Die Kieferhöhle (*sm*) ist 12 mm lang, 9 mm hoch und 7 mm breit. Im Bereiche des mittleren Nasenganges (*mnm*) sind die vorderen Siebbeinzellen (*cea*), im Bereiche des oberen Nasenganges (*mns*) ist die hintere Siebbeinzelle (*cep*) zu sehen.

Planche 70.

Grandeur nature. — Enfant de 2 ans.

sm sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *be* bulle ethmoïdale, *pu* processus uncinatus, *mns* méat supérieur, *cs* cornet supérieur, *mnm* méat moyen, *cm* cornet moyen, *ci* cornet inférieur, *mni* méat inférieur.

Coupe frontale d'une tête de 2 ans montrant la paroi latérale de la fosse nasale, les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*). Au niveau du cornet inférieur (*ci*) et du méat moyen (*mnm*) on peut voir le sinus maxillaire (*sm*) avec son ostium dans le méat moyen (*mnm*) au niveau de l'hiatus semilunaire, qui est limité par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*). Le sinus maxillaire (*sm*) a 12 millim. de long, 9 millim. de haut et 7 millim. de large. Au niveau du méat moyen (*mnm*) on peut voir les cellules ethmoïdales antérieures (*cea*) et au niveau du méat supérieur (*mns*) la cellule ethmoidale postérieure (*cep*).

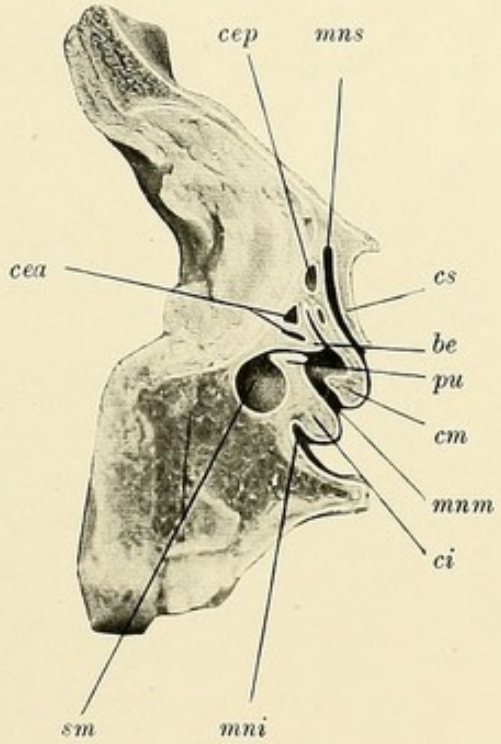
Plate 70.

Natural size. — Child of 2 years.

sm maxillary antrum, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *be* ethmoidal bulla, *pu* uncinate process, *mns* upper meatus, *cs* upper concha, *mnm* middle meatus, *cm* middle concha, *ci* lower concha, *mni* lower meatus.

Coronal section through the head of a child aged two years, shewing the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus. Adjoining the lower concha (*ci*) and the middle meatus (*mnm*) is the maxillary antrum (*sm*); this may be seen opening into the middle meatus (*mnm*) at the semilunar hiatus, which is enclosed between the uncinate process (*pu*) and the ethmoidal bulla (*be*). The maxillary antrum (*sm*) is 12 mm long, 9 mm high and 7 mm wide. Near the middle meatus (*mnm*) the anterior ethmoidal cells (*cea*), near the upper meatus (*mns*) the posterior ethmoidal cell (*cep*) are shewn.

Tafel 70.



Tafel 71.

Frontalschnitt.

Natürliche Grösse. — 2 Jahre altes Kind.

Planche 71.

Coupe frontale.

Grandeur nature. — Enfant de 2 ans,

Plate 71.

Coronal section.

Natural size. — Child of 2 years.

Tafel 71.

Natürliche Grösse. — 2 Jahre altes Kind.

sm sinus maxillaris, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *os* ostium sphenoidale, *cs* concha superior, *mns* meatus narium superior, *cm* concha media, *mnm* meatus narium medius, *ci* concha inferior, *mni* meatus narium inferior.

Der Frontalschnitt eines 2 Jahre alten Kopfes zeigt die laterale Wand der Nasenhöhle, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang, die Kieferhöhle (*sm*), die vordere (*cea*) und die hintere (*cep*) Siebbeinzelle. Zwischen der oberen Nasenmuschel (*cs*) und dem Nasendache ist das 1 mm weite ostium sphenoidale (*os*) zu sehen. Es führt in die 7 mm breite, 6 mm hohe und 5 mm lange Keilbeinhöhle

Planche 71.

Grandeur nature. — Enfant de 2 ans.

sm sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *os* ostium du sinus sphénoïdal, *cs* cornet supérieur, *mns* méat supérieur, *cm* cornet moyen, *mnm* méat moyen, *ci* cornet inférieur, *mni* méat inférieur.

Coupe frontale d'une tête de 2 ans montrant la paroi latérale de la fosse nasale, les cornets inférieur (*ci*) moyen (*cm*) et supérieur (*cs*), les méats inférieur (*mni*) moyen (*mnm*) et supérieur (*mns*), le sinus maxillaire (*sm*), la cellule ethmoïdale antérieure (*cea*) et la cellule ethmoïdale postérieure (*cep*). Entre le cornet supérieur (*cs*)et le toit de la fosse nasale on peut voir l'ostium du sinus sphénoïdal (*os*) large de 1 millim. Il conduit dans le sinus sphénoïdal large de 7 millim., haut de 6 millim. et long de 5 millim.

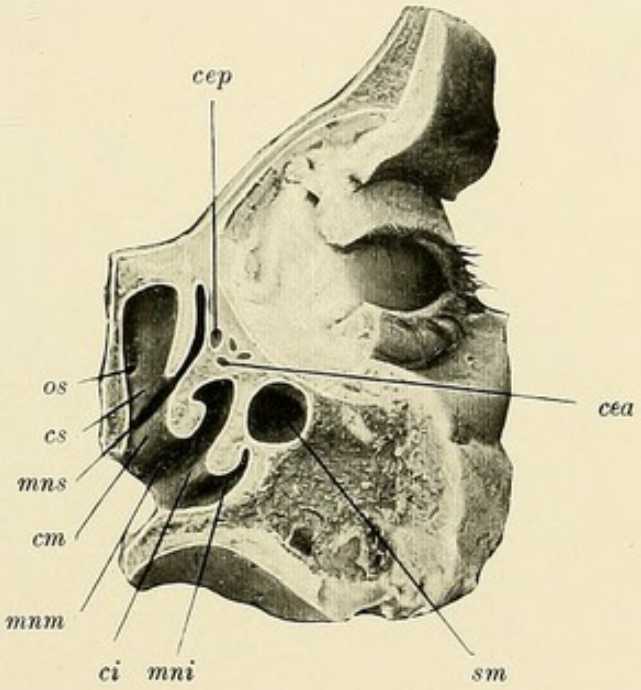
Plate 71.

Natural size. — Child of 2 years.

sm maxillary antrum, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *os* sphenoidal ostium, *cs* upper concha, *mns* upper meatus, *cm* middle concha, *mnm* middle meatus, *ci* lower concha, *mni* lower meatus.

Coronal section through the head of a child aged 2 years, shewing the lateral wall of the nasal fossa, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, and the lower (*mni*), middle (*mnm*) and upper meatus, the maxillary antrum (*sm*), anterior (*cea*) and posterior (*cep*) ethmoidal cells. Between the upper concha (*cs*) and the roof of the nasal fossa the sphenoidal ostium (*os*) may be seen. It is 1 mm wide and leads into the sphenoidal sinus which is 7 mm wide, 6 mm high and 5 mm long.

Tafel 71.



Tafel 72.

Sagittalschnitt.

Natürliche Grösse. — 2 Jahre altes Kind.

Planche 72.

Coupe sagittale.

Grandeur nature. — Enfant de 2 ans.

Plate 72.

Longitudinal vertical section.

Natural size. — Child of 2 years.

Tafel 72.

Natürliche Grösse. — 2 Jahre altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *os* ostium sphenoidale, *ss* sinus sphenoidalis, *hs* hiatus semilunaris, *be* bulla ethmoidalis, *pu* processus uncinatus, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Sagittalschnitt eines 2 Jahre alten Kopfes zeigt die äussere Wand der Nasenhöhle, den unteren (*mni*), mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel. Durch den weggefallenen Teil der mittleren Muschel (*cm*) ist das Gebiet des hiatus semilunaris (*hs*) freigelegt, den hiatus semilunaris (*hs*) begrenzt die bulla ethmoidalis (*be*) und der processus uncinatus (*pu*). In der Reihenfolge von vorne nach hinten ist die Stirnhöhle (*sf*), die vordere Siebbeinzelle (*cea*), die hintere Siebbeinzelle (*cep*) und die Keilbeinhöhle (*ss*) in ihrer Lage und Ausbreitung zu sehen. Die Stirnhöhle (*sf*) ist 7½ mm hoch, 5½ mm lang und 3 mm breit, sie mündet am Dache des hiatus semilunaris (*hs*). Die vordere Siebbeinzelle (*cea*) ist 4½ mm lang, 5 mm hoch und 3½ mm breit. Die hintere Siebbeinzelle ist 4 mm lang, 5 mm hoch und 3 mm breit. Die Keilbeinhöhle (*ss*) ist 6½ mm breit, 4 mm hoch und 4½ mm lang. Das ostium sphenoidale ist 1 mm weit.

Planche 72.

Grandeur nature. Enfant de 2 ans.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *os* ostium du sinus sphénoïdal, *ss* sinus sphénoïdal, *hs* hiatus semilunaire, *be* bulle ethmoïdale, *pu* processus uncinatus, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe sagittale d'une téte de 2 ans montrant la paroi latérale de la fosse nasale, les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*). Par l'ablation d'une partie du cornet moyen (*cm*) la région de l'hiatus semilunaire (*hs*) est mise à nu; l'hiatus semilunaire (*hs*) est limité par la bulle ethmoïdale (*be*) et le processus uncinatus (*pu*). En allant d'en avant en arrière on peut voir le sinus frontal (*sf*), la cellule ethmoïdale antérieure (*cea*), la cellule ethmoïdale postérieure (*cep*) et le sinus sphénoïdal. Le sinus frontal (*sf*) a une hauteur de 7½ millim., une longueur de 5½ millim. et une largeur de 3 millim., il s'ouvre au toit de l'hiatus semilunaire (*hs*). La cellule ethmoïdale antérieure (*cea*) a 4½ millim. de long, 5 millim. de haut et 3½ millim. de large. La cellule ethmoïdale postérieure a 4 millim. de long, 5 millim. de haut et 3 millim. de large. Le sinus sphénoïdal (*ss*) a 6½ millim. de large, 4 millim. de haut, 4½ millim. de long. Son ostium a 1 millim. de large.

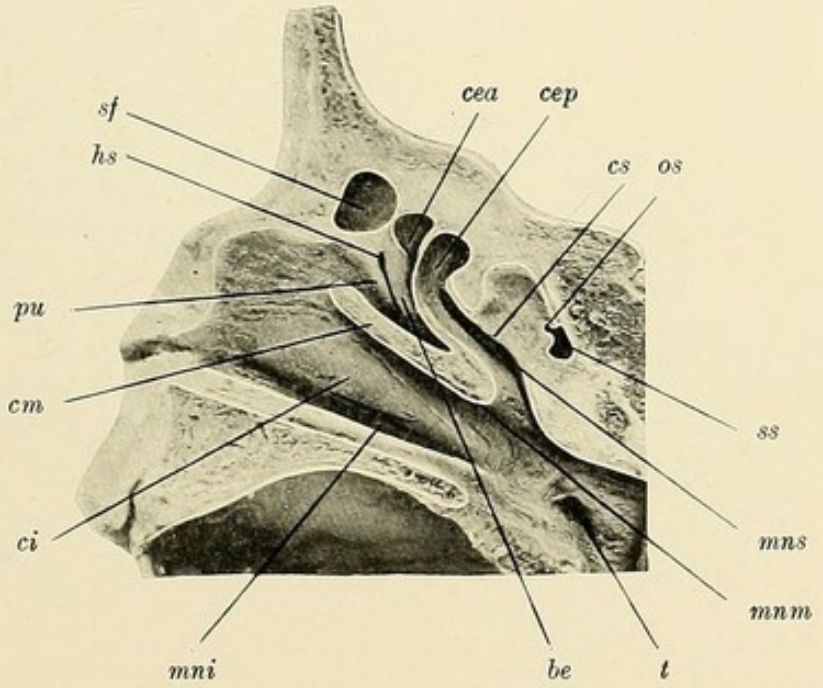
Plate 72.

Natural size. — Child of 2 years.

sf frontal sinus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *os* sphenoidal ostium, *ss* sphenoidal sinus, *hs* semilunar hiatus, *be* ethmoidal bulla, *pu* uncinate process, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Longitudinal vertical section through the head of a child aged 2 years, shewing the lateral wall of the nasal fossa, the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, and the lower (*ci*), middle (*cm*) and upper (*cs*) concha. Through the removal of part of the middle concha (*cm*), the region of the semilunar hiatus (*hs*) has been exposed; the semilunar hiatus (*hs*) is enclosed between the ethmoidal bulla (*be*) and the uncinate process (*pu*). From before backwards may be seen in their full extent the frontal sinus (*sf*), the anterior (*cea*) and posterior (*cep*) ethmoidal cell and the sphenoidal sinus (*ss*). The frontal sinus (*sf*) is 7½ mm high, 5½ mm long and 3 mm wide; it opens into the roof of the semilunar hiatus (*hs*). The anterior ethmoidal cell (*cea*) is 4½ mm long, 5 mm high and 3½ mm wide. The posterior ethmoidal cell (*cep*) is 4 mm long, 5 mm high and 3 mm wide. The sphenoidal sinus (*ss*) is 6½ mm wide, 4 mm high and 4½ mm long. The sphenoidal ostium (*os*) is 1 mm wide.

Tafel 72.



Tafel 73.

Sagittalschnitt.

Natürliche Grösse. — 3 Jahre altes Kind.

Planche 73.

Coupe sagittale.

Grandeur nature. — Enfant de 3 ans.

Plate 73.

Longitudinal vertical section.

Natural size. — Child of 3 years.

Tafel 73.

Natürliche Grösse. — 3 Jahre altes Kind.

sf sinus frontalis, *of* ostium frontale, *hs* hiatus semilunaris, *pu* processus uncinatus, *be* bulla ethmoidalis, *cm* concha media, *mnm* meatus narium medius, *ci* concha inferior, *mni* meatus narium inferior, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *cs* concha superior, *mns* meatus narium superior, *ss* sinus sphenoidalis.

Der Sagittalschnitt eines 3 Jahre alten Kopfes zeigt die Nasenhöhle und die Nebenhöhlen von innen eröffnet. Die untere Nasenmuschel (*ci*) ist ganz erhalten, die mittlere (*cm*) und die obere (*cs*) Nasenmuschel ist zum Teil weggefallen, unter den Muscheln ist der untere (*mni*), der mittlere (*mnm*) und der obere (*mns*) Nasengang zu übersehen. Durch den Wegfall eines Teiles der mittleren Muschel (*cm*) ist das Gebiet des hiatus semilunaris (*hs*) freigelegt, welcher oben von der bulla ethmoidalis (*be*), unten vom processus uncinatus (*pu*) begrenzt ist. Die rechte Stirnhöhle (*sf*) ist 11 mm lang, 14 mm hoch und 5 mm breit, sie mündet mit einer $2^1/_2$ mm länglich ovalen Öffnung (*of*) am vordersten Ende des hiatus semilunaris (*hs*). Der oberste Teil der Stirnhöhle (*sf*) erstreckt sich im unteren Schuppenteile des Stirnbeines. Die vorderen (*cea*) und die hinteren (*cep*) Siebbeinzellen sind 6—7 mm lang und hoch, 3—4 mm breit. Die Mündung einer hinteren Siebbeinzelle (*cep*) in den oberen Nasengang (*mns*), ferner die Mündung der Keilbeinhöhle (*ss*) und ihre Ausbreitung im Keilbeinkörper ist gut zu übersehen. Die rechte Keilbeinhöhle (*ss*) ist 9 mm breit, 6 mm lang und 6 mm hoch, das ostium sphenoidale ist 2 mm weit.

Planche 73.

Grandeur nature. — Enfant de 3 ans.

sf sinus frontal, *of* ostium du sinus frontal, *hs* hiatus semilunaire, *pu* processus uncinatus, *be* bulle ethmoïdale, *cm* cornet moyen, *mnm* méat moyen, *ci* cornet inférieur, *mni* méat inférieur, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *cs* cornet supérieur, *mns* méat supérieur, *ss* sinus sphénoïdal.

Coupe sagittale de la tête d'un enfant de 3 ans montrant la fosse nasale et les sinus ouverts. Le cornet inférieur (*ci*) est complètement conservé, les cornets moyen (*cm*) et supérieur (*cs*) sont en partie enlevés. Au dessous des cornets on voit les trois méats: le méat inférieur (*mni*), le méat moyen (*mnm*) le méat supérieur (*mns*). Par la section d'une partie du cornet moyen (*cm*) la région de l'hiatus semilunaire est devenue visible, limitée en haut par la bulle ethmoïdale et en bas par le processus uncinatus. Le sinus frontal droit (*sf*) est long de 11 millim. haut de 14 millim. et large de 5 millim. Son orifice (*of*) long de $2^1/_2$ millim. se trouve à la partie la plus avancée de l'hiatus semilunaire (*hs*). La partie la plus haute du sinus frontal (*sf*) se trouve dans la partie inférieure de la squame de l'os frontal. Les cellules ethmoïdales antérieures (*cea*) et postérieures (*cep*) sont longues de 6 à 7 millim. et larges de 3 à 4 millim. On voit distinctement l'ouverture d'une cellule ethmoïdale postérieure (*cep*) dans le méat supérieur (*mns*) et l'ouverture du sinus sphénoïdal (*ss*) et son développement dans l'os sphénoïdal. Le sinus sphénoïdal droit (*ss*) est large de 9 millim., haut de 6 millim. long de 6 millim. L'ostium sphénoïdal a 2 millim. de largeur.

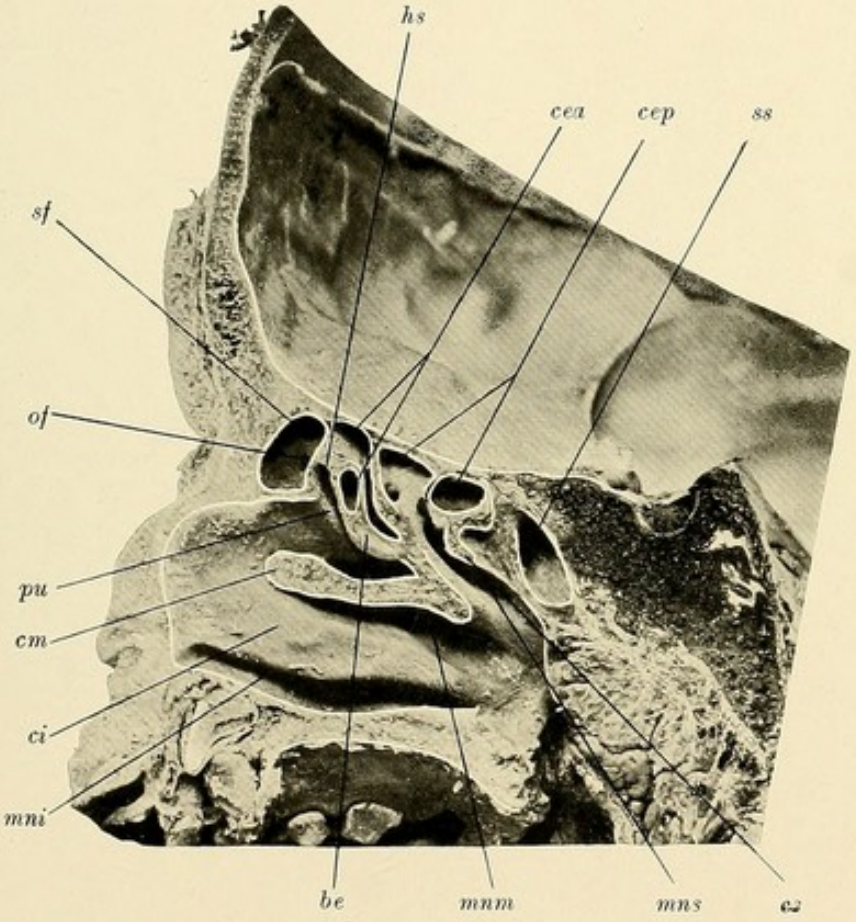
Plate 73.

Natural size. — Child of 3 years.

sf frontal sinus, *of* frontal ostium, *hs* semilunar hiatus, *pu* uncinate process, *be* ethmoidal bulla, *cm* middle concha, *mnm* middle meatus, *ci* lower concha, *mni* lower meatus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *cs* upper concha, *mns* upper meatus, *ss* sphenoidal sinus.

Longitudinal vertical section through the head of a child aged 3 years, shewing the nasal fossa and accessory sinuses which have been opened up from their mesial surface. The lower concha (*ci*) has been preserved, but parts of the middle (*cm*) and upper (*cs*) conchae have been removed; below the conchae the lower (*mni*), middle (*mnm*), and upper (*mns*) meatus are seen. By the removal of part of the middle concha (*cm*) the region of the semilunar hiatus (*hs*) has been exposed; it is bounded above by the ethmoidal bulla (*be*), below by the uncinate process (*pu*). The right frontal sinus (*sf*) is 11 mm long, 14 mm high, and 5 mm wide; it communicates by an elongated oval opening (*of*) $2^1/_2$ mm wide with the anterior part of the semilunar hiatus (*hs*). The upper part of the frontal sinus (*sf*) extends into the lower squamous portion of the frontal bone. The anterior (*cea*) and posterior (*cep*) ethmoidal cells are 6 to 7 mm in length and in height, 3 to 4 mm in width. The opening of a posterior ethmoidal cell (*cep*) into the upper meatus (*mns*), the orifice of the sphenoidal sinus (*ss*), and the situation of this sinus in the body of the sphenoid bone are clearly visible. The right sphenoidal sinus (*ss*) is 9 mm wide, 6 mm long and 6 mm high; the sphenoidal ostium is 2 mm in diameter.

Tafel 73.



Tafel 74.

Sagittalschnitt.

Natürliche Grösse. — 3 Jahre altes Kind.

Planche 74.

Coupe sagittale.

Grandeur nature. — Enfant de 3 ans.

Plate 74.

Longitudinal vertical section.

Natural size. — Child of 3 years.

Tafel 74.

Natürliche Grösse. — 3 Jahre altes Kind.

sf sinus frontalis, *cm* concha media, *mnm* meatus narium medius, *cea* cellula ethmoidalis anterior, *cs* concha superior, *mns* meatus narium superior, *cep* cellula ethmoidalis posterior, *ss* sinus sphenoidalis, *os* ostium sphenoidale.

Der Sagittalschnitt eines 3 Jahre alten Kopfes stellt den korrespondierenden Schnitt der Tafel 73 dar. Man sieht den von der mittleren Nasenmuschel (*cm*) bedeckten vordersten Teil des mittleren Nasenganges (*mnm*) und in demselben einen streifenartigen Teil der Lamelle der bulla ethmoidalis. Ganz vorne oben ist ein kleiner Teil der Stirnhöhle (*sf*) zu sehen, hinter ihr liegt eine vordere Siebbeinzelle (*cea*), welche direkt im recessus bullaris mündet, welcher in der Tafel deutlich ausgeprägt erscheint, dann folgen zwei hintere Siebbeinzellen (*cep*), eine mündet direkt breit im oberen Nasengang (*mns*). Im Körper des Keilbeines ist die Keilbeinhöhle (*ss*) mit ihrer Mündung, das ostium sphenoidale (*os*) zu übersehen. Die Maasse der Nebenhöhlen sind in der Tafel 73 erwähnt.

Planche 74.

Grandeur nature. — Enfant de 3 ans.

sf sinus frontal, *cm* cornet moyen, *mnm* méat moyen, *cea* cellule ethmoïdale antérieure, *cs* cornet supérieur, *mns* méat supérieur, *cep* cellule ethmoïdale postérieure, *ss* sinus sphénoïdal, *os* ostium du sinus sphénoïdal.

Coupe sagittale d'une tête d'un enfant de 3 ans correspond à la coupe de la planche 73. On voit la partie antérieure du méat moyen (*mnm*) recouverte par le cornet moyen (*cm*), et dans ce méat une partie de la lame de la bulle ethmoïdale. Tout à fait en avant et en haut on voit encore une petite partie du sinus frontal (*sf*). Derrière le sinus se trouve une cellule ethmoïdale antérieure (*cea*) qui s'ouvre directement dans le recessus bullaris très marqué sur la planche. Suivent ensuite deux cellules ethmoïdales postérieures (*cep*), dont une s'ouvre directement dans le méat nasal supérieur (*mns*). Dans le corps de l'os sphénoïdal on voit le sinus sphénoïdal (*ss*) avec son orifice (*os*). Les mesures des sinus sont mentionnées sur la planche 73.

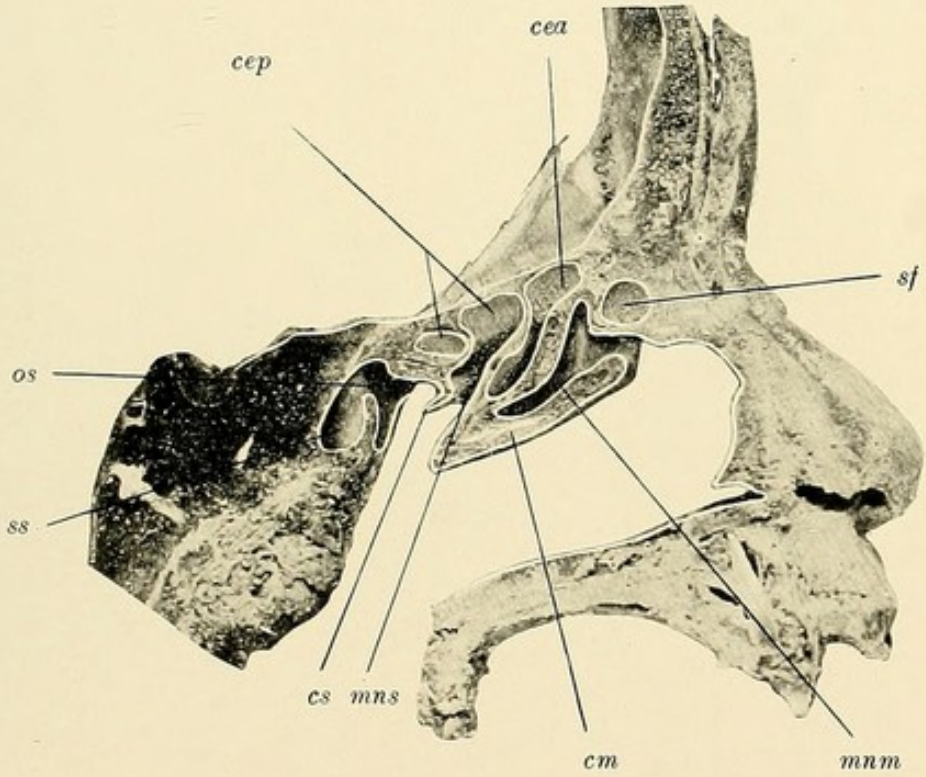
Plate 74.

Natural size. — Child of 3 years.

sf frontal sinus, *cm* middle concha, *mnm* middle meatus, *cea* anterior ethmoidal cell, *cs* upper concha, *mns* upper meatus, *cep* posterior ethmoidal cell, *ss* sphenoidal sinus, *os* sphenoidal ostium.

This section, a longitudinal vertical section through the head of a child aged 3 years, corresponds to the one figured on Plate 73. The anterior portion of the middle meatus (*mnm*) is shewn, overhung by the middle concha (*cm*); in the meatus a narrow strip of the lamina of the ethmoidal bulla is visible. At the upper anterior extremity of the nasal fossa a small part of the frontal sinus (*sf*) may be recognised; behind this is an anterior ethmoidal cell (*cea*) which communicates freely with the well-marked bullar recess; still further backwards are two posterior ethmoidal cells (*cep*), one of which opens directly into the upper meatus (*mns*). Within the body of the sphenoid bone lies the sphenoidal sinus (*ss*) with its orifice, the sphenoidal ostium (*os*). The measurements of the sinuses are given in the description of Plate 73.

Tafel 74.



Tafel 75.

Frontalschnitt.

Natürliche Grösse. — 3 Jahre altes Kind.

Planche 75.

Coupe frontale.

Grandeur nature. — Enfant de 3 ans.

Plate 75.

Coronal section.

Natural size. — Child of 3 years,

Tafel 75.

Natürliche Grösse. — 3 Jahre altes Kind.

sf sinus frontalis, *cea* cellula ethmoidalis anterior, *hs* hiatus semilunaris, *be* bulla ethmoidalis, *pu* processus uncinatus, *dnl* ductus nasolacrimalis, *ci* concha inferior, *mni* meatus narium inferior.

Der Frontalschnitt eines 3 Jahre alten Kopfes hat den vorderen Teil der Stirnhöhle (*sf*) vor dem hiatus semilunaris (*hs*) getroffen. Die linke Stirnhöhle (*sf*) ist 6 mm breit, 16 mm lang und 18 mm hoch, sie mündet mit einer $2\frac{1}{2}$ mm länglich ovalen Öffnung am obersten Teile des hiatus semilunaris, welcher von der bulla ethmoidalis (*be*) und vom processus uncinatus (*pu*) begrenzt ist. Die unterhalb der Stirnhöhle (*sf*) sichtbare vordere Siebbeinzelle (*cea*) erstreckt sich 7 mm weit in den processus uncinatus (*pu*). Nahe dem Gebiete des mittleren Nasenganges ist in einer Länge von 10 mm der ductus nasolacrimalis (*dnl*) zu sehen.

Planche 75.

Grandeur nature. — Enfant de 3 ans.

sf sinus frontal, *cea* cellule ethmoïdale antérieure, *hs* hiatus semilunaire, *be* bulle ethmoïdale, *pu* processus uncinatus, *dnl* conduit nasolacrymal, *ci* cornet inférieur, *mni* méat inférieur.

Coupe frontale de la tête d'un enfant de 3 ans, passant par la partie antérieure du sinus frontal (*sf*) au-devant de l'hiatus semilunaire (*hs*). Le sinus frontal gauche (*sf*) est large de 6 millim. long de 16 millim. et haut de 18 millim. Le sinus s'ouvre par un orifice ovalaire de $2\frac{1}{2}$ millim. de long dans la partie supérieure de l'hiatus semilunaire, qui est limitée par la bulle ethmoïdale (*be*) et le processus uncinatus (*pu*). Au-dessus du sinus frontal (*sf*) on voit une cellule ethmoïdale antérieure (*cea*), qui, sur une longueur de 7 millim., avance dans le processus uncinatus (*pu*). Près du méat moyen le conduit nasolacrymal (*dnl*) est ouvert sur une longueur de 10 millim.

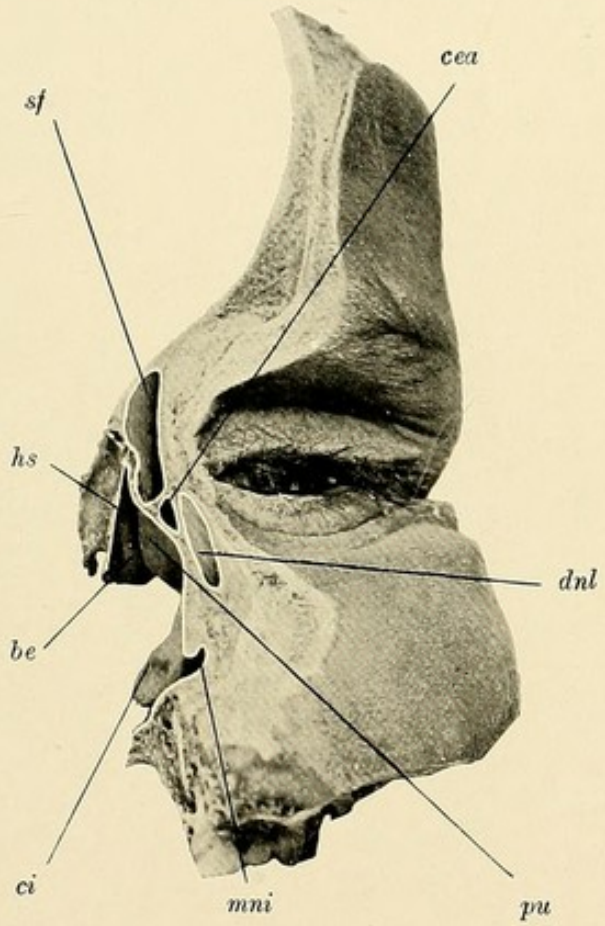
Plate 75.

Natural size. — Child of 3 years.

sf frontal sinus, *cea* anterior ethmoidal cell, *hs* semilunar hiatus, *be* ethmoidal bulla, *pu* uncinate process, *dnl* nasal duct, *ci* lower concha, *mni* lower meatus.

Coronal section through the head of a child aged 3 years, traversing the anterior part of the frontal sinus (*sf*) in front of the semilunar hiatus (*hs*). The left frontal sinus (*sf*) is 6 mm wide, 16 mm long, and 18 mm high. It opens into the top of the semilunar hiatus by an elongated oval orifice, $2\frac{1}{2}$ mm wide. The semilunar hiatus is enclosed between the ethmoidal bulla (*be*) and the uncinate process (*pu*). Below the frontal sinus (*sf*) is an anterior ethmoidal cell (*cea*) which extends into the uncinate process (*pu*) for a distance of 7 mm. Adjoining the middle meatus a part of the nasal duct (*dnl*), 10 mm long, is visible.

Tafel 75.



Tafel 76.

Frontalschnitt.

Natürliche Grösse. — 3 Jahre altes Kind.

Planche 76.

Coupe frontale.

Grandeur nature. — Enfant de 3 ans.

Plate 76.

Coronal section.

Natural size. — Child of 3 years.

Tafel 76.

Natürliche Grösse. — 3 Jahre altes Kind.

ci concha inferior, *mni* meatus narium inferior, *sm* sinus maxillaris, *cm* concha media, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior.

Der Frontalschnitt eines 3 Jahre alten Kopfes zeigt die laterale Nasenhöhlenwand mit dem unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasengang, mit der unteren (*ci*), mittleren (*cm*) und oberen (*cs*) Nasenmuschel. An dem Schnitte sind die vorderen (*cea*) und hinteren (*cep*) Siebbeinzellen und die Kieferhöhle (*sm*) getroffen. Die linke Kieferhöhle (*sm*) ist 23 mm lang, 13 mm breit und 13 mm hoch, mündet im hinteren Teile des hiatus semilunaris.

Planche 76.

Grandeur nature. — Enfant de 3 ans.

ci cornet inférieur, *mni* méat inférieur, *sm* sinus maxillaire, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure.

Coupe frontale d'une tête de 3 ans montrant la paroi latérale de la fosse nasale avec les méats inférieur (*mni*), moyen (*mnm*), supérieur (*mns*) et les cornets inférieur (*ci*), moyen (*cm*), supérieur (*cs*). On voit sur la coupe les cellules ethmoïdales antérieures (*cea*) et postérieures (*cep*) et le sinus maxillaire (*sm*). Le sinus maxillaire gauche (*sm*) est haut de 13 millim., large de 13 millim. et long de 23 millim. Il s'ouvre dans la partie postérieure de l'hiatus semilunaire.

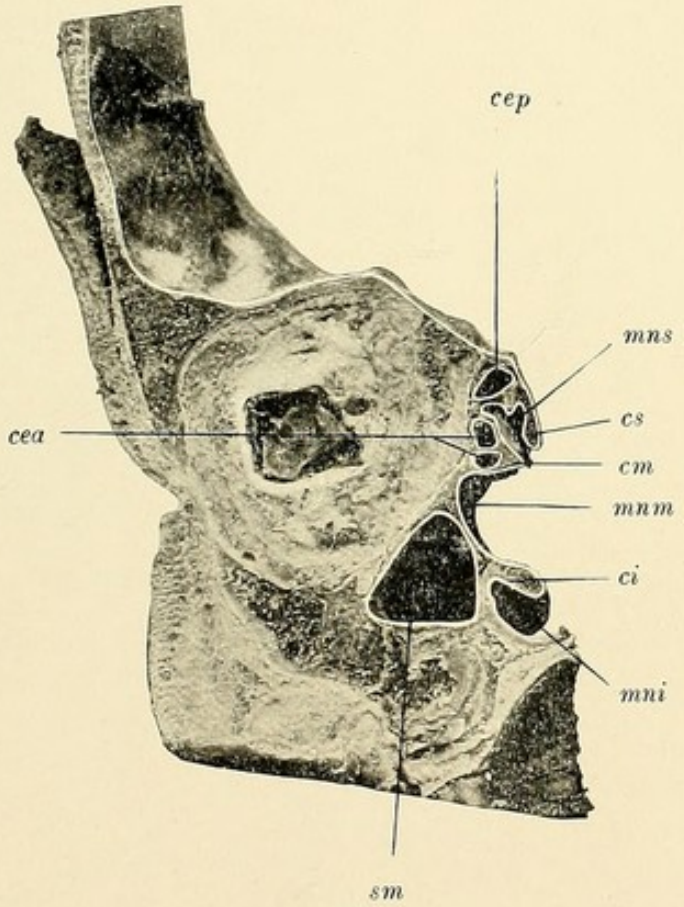
Plate 76.

Natural size. — Child of 3 years.

ci lower concha, *mni* lower meatus, *sm* maxillary antrum, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell.

Coronal section through the head of a child aged 3 years, shewing the lateral wall of the nasal fossa, with the lower (*mni*) middle (*mnm*), and upper (*mns*) meatus, and the lower (*ci*), middle (*cm*), and upper (*cs*) concha. The section has opened up the anterior (*cea*) and posterior (*cep*) ethmoidal cells and the maxillary antrum (*sm*). The left maxillary antrum (*sm*) is 23 mm long, 13 mm wide, and 13 mm high. It opens into the posterior portion of the semilunar hiatus.

Tafel 76.



Tafel 77.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines $3^1/_2$ jähr. Kindes.

Planche 77.

Radiogramme.

Grandeur nature. – Crâne d'un enfant de 3 ans $^1/_2$.

Plate 77.

Skiagram.

Natural size. — Skull of child $3^1/_2$ years old.

Tafel 77.

Natürliche Grösse. — Schädel eines 3½ jähr. Kindes.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur illustriert die Röntgenaufnahme der Stirnhöhlen eines 3½ Jahre alten Schädels. Beide Stirnhöhlen (*sfd*, *sfs*) erstrecken sich in einer Ausdehnung von 6 mm in der horizontalen und in der vertikalen Richtung im Schuppenteile des Stirnbeines

Planche 77.

Grandeur nature. — Crâne d'un enfant de 3 ans ½.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

La figure montre le radiogramme des sinus frontaux d'un crâne de 3 ans ½. Les deux sinus (*sfd*, *sfs*) ont une étendue de 6 millim. dans la direction horizontale et verticale de la squame de l'os frontal.

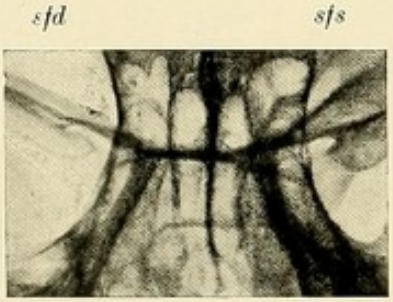
Plate 77.

Natural size. — Skull of child 3½ years old.

sfd right frontal sinus, *sfs* left frontal sinus.

Skiagram shewing the frontal sinuses of the skull at 3½ years of age. Both frontal sinuses (*sfd*, *sfs*) extend into the squamous part of the frontal bone for a distance of 6 mm in the horizontal and vertical direction.

Tafel 77.



Tafel 78.

Frontalschnitt.

Natürliche Grösse. — $3^1/_2$ Jahre altes Kind.

Planche 78.

Coupe frontale.

Grandeur nature. — Enfant de 3 an $^1/_2$.

Plate 78.

Coronal section.

Natural size. — Child of $3^1/_2$ years.

Tafel 78.

Natürliche Grösse. — 3½ Jahre altes Kind.

sf sinus frontalis, *rf* recessus frontalis, *of* ostium frontale, *hs* hiatus semilunaris, *pu* processus uncinatus, *cea* cellula ethmoidalis anterior, *ci* concha inferior, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Frontalschnitt des 3½ Jahre alten Kopfes ist etwas schräg geführt und zeigt das freigelegte Gebiet des hiatus semilunaris (*hs*), begrenzt vom processus uncinatus (*pu*), die durchschnittenen Teile der unteren (*ci*), mittleren (*cm*) und der oberen (*cs*) Nasenmuschel, einen Teil des unteren, mittleren und oberen (*mns*) Nasenganges, die Stirnhöhle (*sf*) und die vordere Siebbeinzelle (*cea*). Oberhalb des hiatus semilunaris (*hs*) ist der schmale recessus frontalis (*rf*) zu sehen, wo die Stirnhöhle mit einer länglich ovalen Öffnung (*of*) mündet. Die Stirnhöhle (*sf*) ist 6 mm lang, 6½ mm hoch und 5 mm breit. Die vordere Siebbeinzelle (*cea*) ist 8 mm lang, 6 mm hoch und 4 mm breit und erstreckt sich in den processus uncinatus (*pu*).

Planche 78.

Grandeur nature. — Enfant de 3 ans ½.

sf sinus frontal, *rf* recessus frontal, *of* ostium du sinus frontal, *hs* hiatus semilunaire, *pu* processus uncinatus, *cea* cellule ethmoïdale antérieure, *ci* cornet inférieur, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe frontale d'une tête de 3 ans ½, légèrement oblique et montrant la région mise à nu de l'hiatus semilunaire (*hs*), limitée par le processus uncinatus (*pu*), la partie sectionnée des cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), une partie des méats inférieur, moyen et supérieur (*mns*), le sinus frontal et la cellule ethmoïdale antérieure (*cea*). Au-dessus de l'hiatus semilunaire (*hs*) on peut voir l'étroit recessus frontal (*rf*) ou s'ouvre le sinus frontal par un ostium ovalaire allongé (*of*). Le sinus frontal a 6 millim. de long, 6½ millim. de haut et 5 millim. de large. La cellule ethmoïdale antérieure (*cea*) a 8 millim. de long, 6 millim. de haut et 4 millim. de large; elle s'étend jusque dans le processus uncinatus (*pu*).

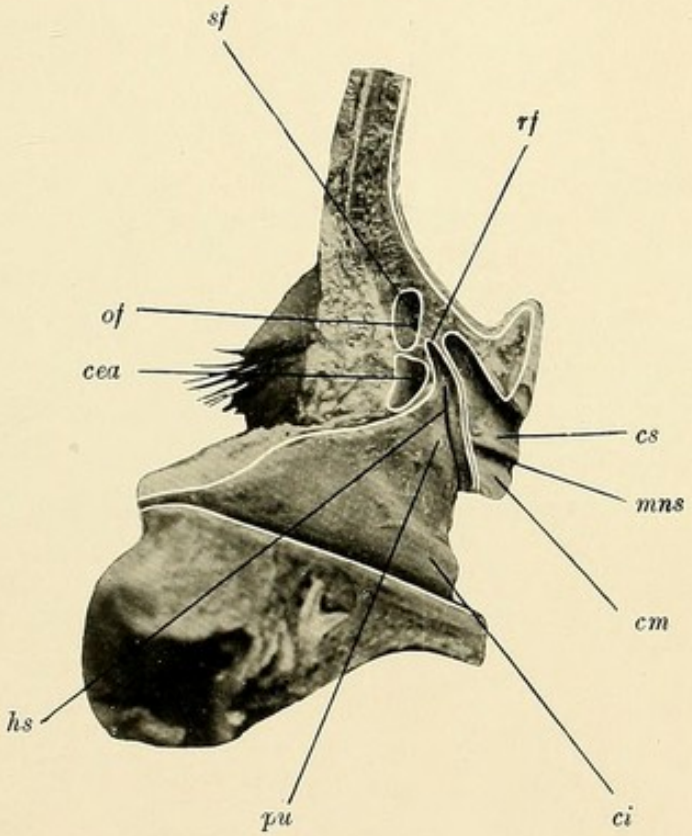
Plate 78.

Natural size. — Child of 3½ years.

sf frontal sinus, *rf* frontal recess, *of* frontal ostium, *hs* semilunar hiatus, *pu* uncinate process, *cea* anterior ethmoidal cell, *ci* lower concha, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Section through the head of a child aged 3½ years, cut in a plane slightly oblique to the coronal. The section shews the region of the semilunar hiatus (*hs*), bounded by the uncinate process (*pu*), the cut surfaces of the lower (*ci*), middle (*cm*) and upper (*cs*) conchae, part of the lower, middle and upper (*mns*) meatus, the frontal sinus (*sf*) and anterior ethmoidal cell (*cea*). Above the semilunar hiatus (*hs*) the narrow frontal recess (*rf*) is visible, together with the elongated oval aperture (*of*) of the frontal sinus. The frontal sinus (*sf*) is 6 mm long, 6½ mm high and 5 mm wide. The anterior ethmoidal cell (*cea*) is 8 mm long, 6 mm high and 4 mm wide, and extends into the uncinate process (*pu*).

Tafel 78.



Tafel 79.

Frontalschnitt.

Natürliche Grösse. — 3½ Jahre altes Kind.

Planche 79.

Coupe frontale.

Grandeur nature. — Enfant de 3 ans ½.

Plate 79.

Coronal section.

Natural size. — Child of 3½ years.

Tafel 79.

Natürliche Grösse. — $3\frac{1}{2}$ Jahre altes Kind.

sm sinus maxillaris, *om* ostium maxillare, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *pu* processus uncinatus, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Frontalschnitt des $3\frac{1}{2}$ Jahre alten Kopfes zeigt die laterale Wand der Nasenhöhle, den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), die mittlere (*cm*) und die obere (*cs*) Nasenmuschel, die Kieferhöhle (*sm*), die vordere (*cea*) und die hintere (*cep*) Siebbeinzelle. Im mittleren Nasengange (*mnm*) ist der processus uncinatus (*pu*) und der hintere Teil des hiatus semilunaris zu sehen, wo die Kieferhöhle (*sm*) mündet. Durch das ostium maxillare (*om*) ist eine Borste gezogen. Die Kieferhöhle (*sm*) ist 26 mm lang, 13 mm hoch und 12 mm breit.

Planche 79.

Grandeur nature. — Enfant de 3 ans $\frac{1}{2}$.

sm sinus maxillaire, *om* ostium du sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *pu* processus uncinatus, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe frontale d'une tête de 3 ans $\frac{1}{2}$ montrant la paroi latérale de la fosse nasale, les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), le sinus maxillaire (*sm*), les cellules ethmoïdales antérieure (*cea*) et postérieure (*cep*). Dans le méat moyen (*mnm*) on peut voir le processus uncinatus (*pu*) et la partie postérieure de l'hiatus semilunaire, ou s'ouvre le sinus maxillaire (*sm*). A travers l'ostium du sinus maxillaire (*om*) est passé un crin. Le sinus maxillaire (*sm*) a 26 millim. de long, 13 millim. de haut et 12 millim de large.

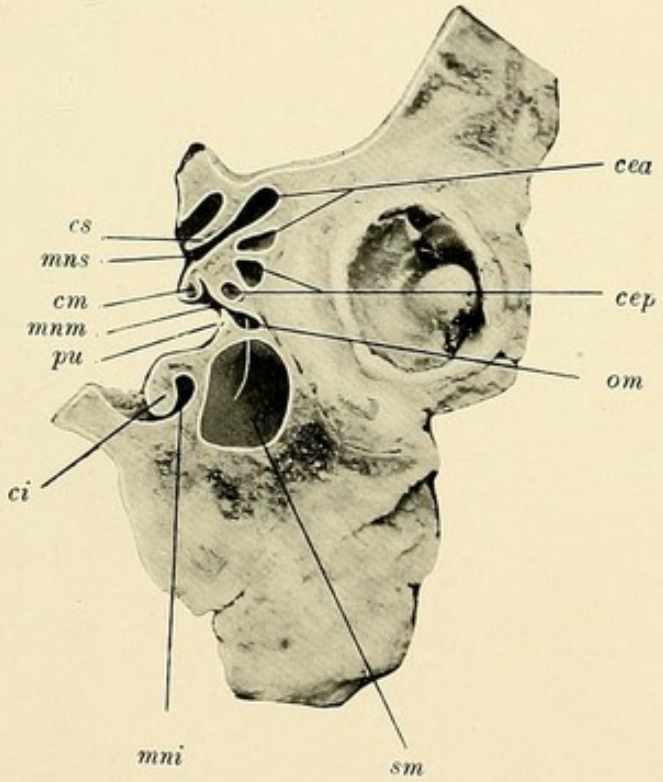
Plate 79.

Natural size. — Child of $3\frac{1}{2}$ years.

sm maxillary antrum, *om* maxillary ostium, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *pu* uncinate process, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Coronal section through the head of a child aged $3\frac{1}{2}$ years, shewing the lateral wall of the nasal fossa, the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, the maxillary antrum (*sm*), anterior (*cea*) and posterior (*cep*) ethmoidal cells. In the middle meatus (*mnm*) the uncinate process (*pu*) and the back part of the semilunar hiatus with the opening of the maxillary antrum (*sm*) can be seen. A bristle has been passed through the maxillary ostium (*om*). The maxillary antrum (*sm*) is 26 mm long, 13 mm high and 12 mm wide.

Tafel 79.



Tafel 80.

Frontalschnitt.

Natürliche Grösse. — 3½ Jahre altes Kind.

Planche 80.

Coupe frontale.

Grandeur nature. — Enfant de 3 ans $^1/_2$.

Plate 80.

Coronal section.

Natural size. – Child of $3^1/_2$ years.

Tafel 80.

Natürliche Grösse. — $3\frac{1}{2}$ Jahre altes Kind.

sm sinus maxillaris, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *os* ostium sphenoidale, *mni* meatus narium inferior, *ci* concha inferior, *mnm* meatus narium medius, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Frontalschnitt des $3\frac{1}{2}$ Jahre alten Kopfes zeigt die laterale Wand der Nasenhöhle, den unteren (*mni*), den mittleren (*mnm*) und den oberen (*mns*) Nasengang, die untere (*ci*), mittlere (*cm*) und die obere (*cs*) Nasenmuschel, die Kieferhöhle (*sm*), die vorderen (*cea*) und hinteren (*cep*) Siebbeinzellen und das ostium sphenoidale (*os*). Im Bereiche des unteren (*mni*) und mittleren (*mnm*) Nasenganges ist der hintere Teil der Kieferhöhle (*sm*) sichtbar. Die vorderen Siebbeinzellen (*cea*) sind 6—8 mm lang, $3\frac{1}{2}$—5 mm hoch und 3—4 mm breit. Die hinteren Siebbeinzellen (*cep*) sind 6—11 mm lang, 5—6 mm hoch und $3\frac{1}{2}$—4 mm breit. In der Höhe des oberen Nasenganges (*mns*) ist das $\frac{1}{2}$ mm weite ostium sphenoidale (*os*) zu sehen, welches in die 7 mm breite, 6 mm hohe und 5 mm lange Keilbeinhöhle führt.

Planche 80.

Grandeur nature. — Enfant de 3 ans $\frac{1}{2}$.

sm sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *os* ostium du sinus sphénoïdal, *mni* méat inférieur, *ci* cornet inférieur, *mnm* méat moyen, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe frontale d'une tête de 3 ans $\frac{1}{2}$ montrant la paroi latérale de la fosse nasale, les méats inférieur (*mni*), moyen (*mnm*) et supérieur (*mns*), les cornets inférieur (*ci*), moyen (*cm*) et supérieur (*cs*), le sinus maxillaire (*sm*), les cellules ethmoïdales antérieures (*cea*) et postérieures (*cep*) et l'ostium du sinus sphénoïdal (*os*). Au niveau des méats inférieur (*mni*) et moyen (*mnm*) la partie postérieure du sinus maxillaire (*sm*) est visible. Les cellules ethmoïdales antérieures (*cea*) ont de 6 à 8 millim. de long, de $3\frac{1}{2}$ à 5 millim. de haut et de 3 à 4 millim. de large. Les cellules ethmoïdales postérieures (*cep*) ont de 6 à 11 millim. de long, de 5 à 6 millim. de haut et de $3\frac{1}{2}$ à 4 millim. de large. Au niveau du méat supérieur (*mns*) on peut voir l'ostium du sinus sphénoïdal large de $\frac{1}{2}$ millim. (*os*), qui conduit dans le sinus sphénoïdal large de 7 millim. haut de 6 millim. et long de 5 millim.

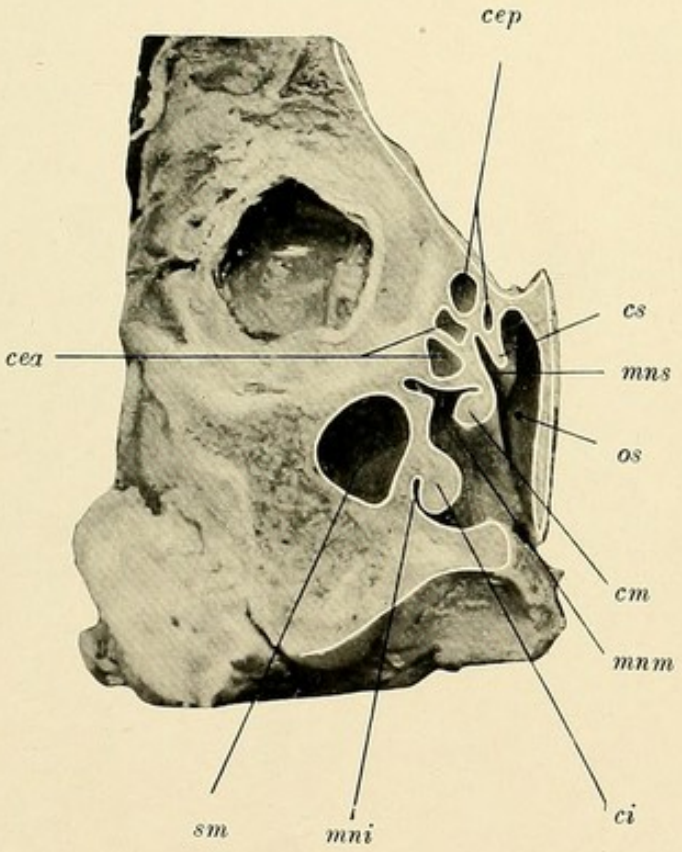
Plate 80.

Natural size. — Child of $3\frac{1}{2}$ years.

sm maxillary antrum, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *os* sphenoidal ostium, *mni* lower meatus, *ci* lower concha, *mnm* middle meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Coronal section through the head of a child aged $3\frac{1}{2}$ years, shewing the lateral wall of the nasal fossa, the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, the lower (*ci*), middle (*cm*) and upper (*cs*) concha, the maxillary antrum (*sm*), anterior (*cea*) and posterior (*cep*) ethmoidal cells and sphenoidal ostium (*os*). Adjoining the lower (*mni*) and middle meatus (*mnm*) the back part of the maxillary antrum (*sm*) is visible. The anterior ethmoidal cells (*cea*) are 6 to 8 mm long, $3\frac{1}{2}$ to 5 mm high and 3 to 4 mm wide. The posterior ethmoidal cells (*cep*) are 6 to 11 mm long, 5 to 6 mm high and $3\frac{1}{2}$ to 4 mm wide. On a level with the upper meatus (*mns*) can be seen the sphenoidal ostium (*os*), an aperture $\frac{1}{2}$ mm wide; it leads into the sphenoidal sinus, which is 7 mm wide, 6 mm high and 5 mm long.

Tafel 80.



Tafel 81.

Sagittalschnitt.

Natürliche Grösse. — Schädel eines $3^1/_2$ jähr. Kindes.

Planche 81.

Coupe sagittale.

Grandeur nature. – Crâne d'un enfant de 3 ans $^1/_2$.

Plate 81.

Longitudinal vertical section.

Natural size. — Skull of child $3^1/_2$ years old.

Tafel 81.

Natürliche Grösse. — $3\frac{1}{2}$ Jahre altes Kind

rf sinus frontalis, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *hs* hiatus semilunaris, *pu* processus uncinatus, *os* ostium sphenoidale, *ss* sinus sphenoidalis, *cm* concha media, *mnm* meatus narium medius, *mns* meatus narium superior.

Der Sagittalschnitt des $3\frac{1}{2}$ Jahre alten Kopfes zeigt den 7 mm hohen, 5 mm langen und 4 mm breiten recessus frontalis (*rf*), welcher mit seinem weiten unteren Teil vor dem hiatus semilunaris (*hs*) liegt, begrenzt von dem processus uncinatus (*pu*) und den vorderen Siebbeinzellen (*cea*). Am Schnitte ist die verschieden grosse Ausbreitung der einzelnen Siebbeinzellen, die kleine Keilbeinhöhle (*ss*), die mittlere (*cm*) Muschel, der mittlere (*mnm*) und der obere (*mns*) Nasengang zu sehen. Die vorderen Siebbeinzellen (*cea*) sind 5—11 mm hoch, $3\frac{1}{2}$—7 mm breit und 3—6 mm lang. Die hinteren Siebbeinzellen (*cep*) sind $3\frac{1}{2}$—9 mm lang, $3\frac{1}{2}$—10 mm hoch und 3—11 mm breit. Die Keilbeinhöhle (*ss*) ist 7 mm breit, $4\frac{1}{2}$ mm hoch und $3\frac{1}{2}$ mm lang, sie mündet mit einer $1\frac{1}{2}$ mm weiten Öffnung (*os*), dem ostium sphenoidale.

Planche 81.

Grandeur nature. — Enfant de 3 ans $\frac{1}{2}$.

rf recessus frontal, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *hs* hiatus semilunaire, *pu* processus uncinatus, *os* ostium du sinus sphénoïdal, *ss* sinus sphénoïdal, *cm* cornet moyen, *mnm* méat moyen, *mns* méat supérieur.

Coupe sagittale d'une tête de 3 ans $\frac{1}{2}$ montrant le recessus frontal (*rf*) haut de 7 millim., long de 5 millim. et large de 4 millim., dont la large partie inférieure se trouve au-devant de l'hiatus semilunaire (*hs*) limité par le processus uncinatus (*pu*) et les cellules ethmoïdales antérieures. Sur la coupe on peut voir les différentes dimensions de chaque cellule ethmoïdale, le petit sinus sphénoïdal (*ss*), le cornet moyen (*cm*), les méats moyen (*mnm*) et supérieur (*mns*). Les cellules ethmoïdales antérieures (*cea*) ont de 5 à 11 millim. de haut, de $3\frac{1}{2}$ à 7 millim. de large et de 3 à 6 millim. de long. Les cellules ethmoïdales postérieures (*cep*) ont de $3\frac{1}{2}$ à 9 millim. de long, de $3\frac{1}{2}$ à 10 millim. de haut et de 3 à 11 millim. de large. Le sinus sphénoïdal (*ss*) a 7 millim. de large, $4\frac{1}{2}$ millim. de haut et $3\frac{1}{2}$ millim. de long, il s'ouvre par un ostium large de $1\frac{1}{2}$ millim. (*os*).

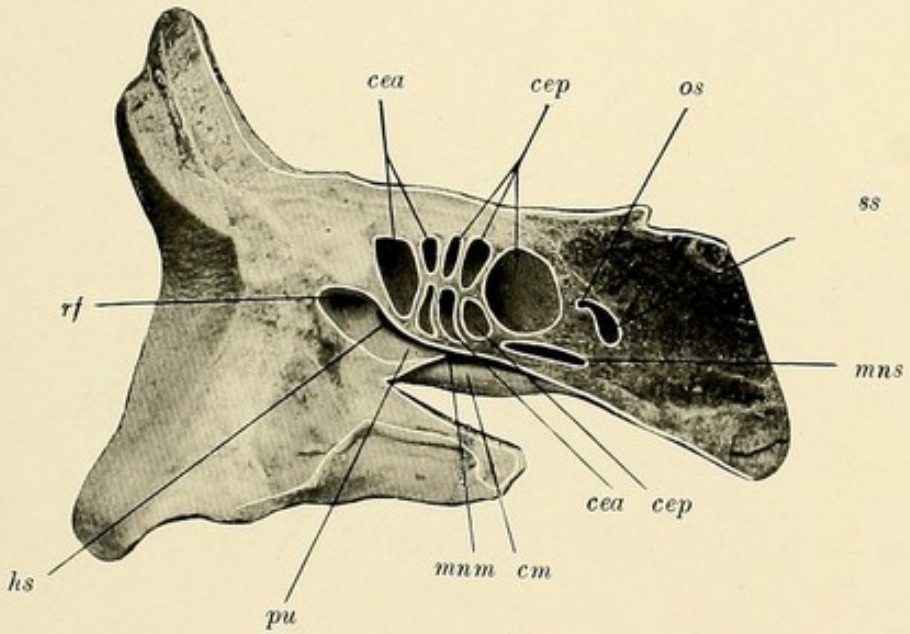
Plate 81.

Natural size. — Child of $3\frac{1}{2}$ years.

rf frontal recess, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *hs* semilunar hiatus, *pu* uncinate process, *os* sphenoidal ostium, *ss* sphenoidal sinus, *cm* middle concha, *mnm* middle meatus, *mns* upper meatus.

Longitudinal vertical section through the head of a child aged $3\frac{1}{2}$ years, shewing the frontal recess (*rf*), which is 7 mm high, 5 mm long and 4 mm wide. Its wieder inferior portion lies in front the semilunar hiatus (*hs*) and is enclosed between the uncinate process (*pu*) and the anterior ethmoidal cells (*cea*). The section illustrates the variations in size of the individual ethmoidal cells, the small sphenoidal sinus (*ss*), the middle concha (*cm*) and the middle (*mnm*) and upper (*mns*) meatus. The anterior ethmoidal cells (*cep*) are 5 to 11 mm high, $3\frac{1}{2}$ to 7 mm wide and 3 to 6 mm long. The posterior ethmoidal cells (*cep*) are $3\frac{1}{2}$ to 9 mm long, $3\frac{1}{2}$ to 10 mm high and 3 to 11 mm wide. The spenoidal sinus (*ss*) is 7 mm wide, $4\frac{1}{2}$ mm high and $3\frac{1}{2}$ mm long. Its opening, the sphhenoidal ostium (*os*), is $1\frac{1}{2}$ mm wide.

Tafel 81.



Tafel 82.

Sagittalschnitt.

Natürliche Grösse. — 6 Jahre altes Kind.

Planche 82.

Coupe sagittale.

Grandeur nature. — Enfant de 6 ans.

Plate 82.

Longitudinal vertical section.

Natural size. — Child of 6 years.

Tafel 82.

Natürliche Grösse. — 6 Jahre altes Kind.

sf sinus frontalis, *of* ostium frontale, *hs* hiatus semilunaris, *pu* processus uncinatus, *cea* cellula ethmoidalis anterior, *sl* saccus lacrimalis.

Der Sagittalschnitt eines 6 Jahre alten Kopfes zeigt die Stirnhöhle (*sf*), die vorderen Siebbeinzellen (*cea*), einen Teil des Tränensackes (*sl*), den hiatus semilunaris (*hs*) und den processus uncinatus (*pu*). Die linke Stirnhöhle (*sf*) ist 13 mm lang, 18 mm hoch und 12 mm breit, ihre Mündung (*of*) liegt am vordersten Ende des hiatus semilunaris (*hs*), welche der processus uncinatus (*pu*) begrenzt. Vor dem untersten Teile der Stirnhöhle (*sf*) ist ein Teil des Tränensackes (*sl*) zu sehen. Die vorderen Siebbeinzellen zeigen eine Ausbreitung von 8—11 mm Höhe, 5—6 mm Länge und 6 mm Breite.

Planche 82.

Grandeur nature. — Enfant de 6 ans.

sf sinus frontal, *of* ostium du sinus frontal, *hs* hiatus semilunaire, *pu* processus uncinatus, *cea* cellule ethmoïdale antérieure, *sl* sac lacrymal.

Coupe sagittale d'une tête de 6 ans montrant le sinus frontal (*sf*) les cellules ethmoïdales antérieures (*cea*), une partie du sac lacrymal (*sl*), l'hiatus semilunaire (*hs*) et le processus uncinatus (*pu*). Le sinus frontal gauche (*sf*) est long de 13 millim., haut de 18 millim., large de 12 millim. Son ouverture (*of*) se trouve dans la partie antérieure de l'hiatus semilunaire (*hs*) limitée par le processus uncinatus (*pu*). Au-dessous du sinus frontal (*sf*) on voit une partie du sac lacrymal (*sl*). Les cellules ethmoïdales antérieures ont une hauteur qui varie entre 8 et 11 millim., une longueur de 5 à 6 millim. et une largeur de 6 millim.

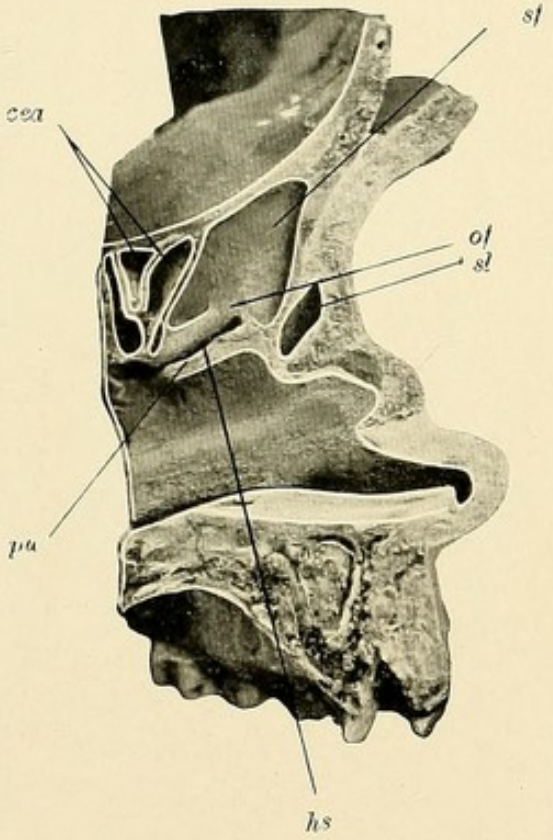
Plate 82.

Natural size. — Child of 6 years.

sf frontal sinus, *of* frontal ostium, *hs* semilunar hiatus, *pu* uncinate process, *cea* anterior ethmoidal cell, *sl* lachrymal sac.

Longitudinal vertical section through the skull of a child aged 6 years, shewing the frontal sinus (*sf*), the anterior ethmoidal cells (*cea*), part of the lachrymal sac (*sl*), the semilunar hiatus (*hs*) and the uncinate process (*pu*). The left frontal sinus (*sf*) is 13 mm long, 18 mm high, and 12 mm wide. Its orifice (*of*) opens into the anterior end of the semilunar hiatus (*hs*), which is bordered by the uncinate process (*pu*). In front of the lower portion of the frontal sinus (*sf*) part of the lachrymal sac (*sl*) is visible. The anterior ethmoidal cells measure 8 to 11 mm in height, 5 to 6 mm in length and 6 mm in width.

Tafel 82.



Tafel 83.

Sagittalschnitt.

Natürliche Grösse. — 6 Jahre altes Kind.

Planche 83.

Coupe sagittale.

Grandeur nature. — Enfant de 6 ans.

Plate 83.

Longitudinal vertical section.

Natural size. — Child of 6 years.

Tafel 83.

Natürliche Grösse. — 6 Jahre altes Kind.

sf sinus frontalis, *of* ostium frontale, *cei* cellula ethmoidalis anterior, *hs* hiatus semilunaris, *pu* processus uncinatus, *mnm* meatus narium medius, *cm* concha media.

Der Sagittalschnitt eines 6 Jahre alten Kopfes stellt den korrespondierenden Schnitt der Tafel 82 dar. Das Bild zeigt die längliche ovale Mündung (*of*) der linken Stirnhöhle, welche direkt in den hiatus semilunaris (*hs*) übergeht. Der vorderste Teil der mittleren Nasenmuschel (*cm*) und des mittleren Nasenganges (*mnm*) und das von der Nasenhöhle aus bedeckte Mündungsgebiet der Stirnhöhle (*of*, *hs*, *pu*) ist gut zu übersehen. Die Maasse der Stirnhöhle und der vorderen Siebbeinzellen sind in der Tafel 82 angegeben.

Planche 83.

Grandeur nature. — Enfant de 6 ans.

sf sinus frontal, *of* ostium du sinus frontal, *cei* cellule ethmoïdale antérieure, *hs* hiatus semilunaire, *pu* processus uncinatus, *mnm* méat moyen, *cm* cornet moyen.

Coupe sagittale de la tête d'un enfant de 6 ans correspondant à la coupe représentée sur la planche 82. La figure représente l'ouverture ovalaire allongée du sinus frontal gauche (*of*) qui se continue directement dans l'hiatus semilunaire (*hs*). On voit très distinctement la partie antérieure du cornet moyen (*cm*) et du méat moyen (*mnm*) et toute la région autour de l'ouverture du sinus frontal (*of*, *hs*, *pu*). Les mesures du sinus frontal et des cellules ethmoïdales antérieures sont indiquées sur la planche 82.

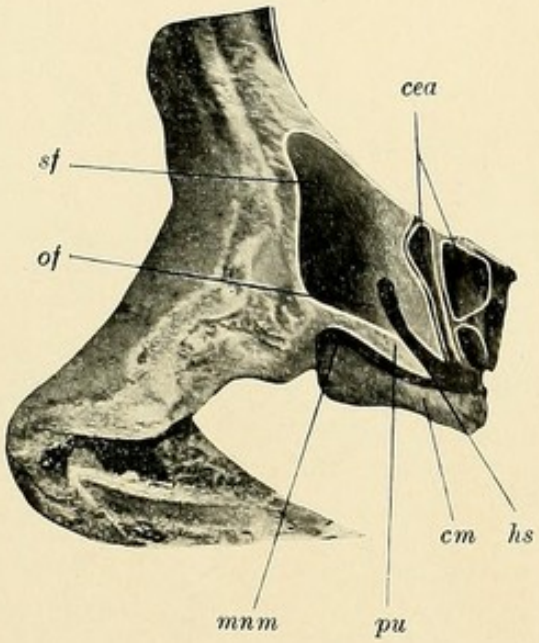
Plate 83.

Natural size. — Child of 6 years.

sf frontal sinus, *of* frontal ostium, *cei* anterior ethmoidal cell, *hs* semilunar hiatus, *pu* uncinate process, *mnm* middle meatus, *cm* middle concha.

Longitudinal vertical section through the head of a child aged 6 years, shewing the section corresponding to that illustrated in Plate 82. The elongated oval opening (*of*) of the left frontal sinus is seen merging into the semilunar hiatus (*hs*). A good view is obtained of the middle concha (*cm*), the middle meatus (*mnm*), and the region of the frontal ostium (*of*, *hs*, *pu*) which would otherwise be hidden by the lateral wall of the nasal fossa. The measurements of the frontal sinus and anterior ethmoidal cells are given in the description of Plate 82.

Tafel 83.



Tafel 84.

Sagittalschnitt.

Natürliche Grösse. — 6 Jahre altes Kind.

Planche 84.

Coupe sagittale.

Grandeur nature. — Enfant de 6 ans.

Plate 84.

Longitudinal vertical section.

Natural size. — Child of 6 years.

Tafel 84.

Natürliche Grösse. — 6 Jahre altes Kind.

sf sinus frontalis, *of* ostium frontale, *cea* cellula ethmoidalis anterior, *pu* processus uncinatus, *hs* hiatus semilunaris, *ci* concha inferior, *mni* meatus narium inferior.

Der Sagittalschnitt des 6 Jahre alten Kopfes zeigt die Stirnhöhle (*sf*), die Mündung der Stirnhöhle (*of*), die vorderen Siebbeinzellen (*cea*), den hiatus semilunaris (*hs*) und den processus uncinatus (*pu*). Die rechte Stirnhöhle (*sf*) ist 17 mm hoch, 10 mm lang und 11 mm breit. Die Mündung der Stirnhöhle (*of*) fliesst direkt mit dem hiatus semilunaris (*hs*) zusammen. Die vorderen Siebbeinzellen (*cea*) zeigen eine Ausdehnung von 10—13 mm Höhe, 5—6 mm Länge und 7 mm Breite.

Planche 84.

Grandeur nature. — Enfant de 6 ans.

sf sinus frontal, *of* ostium du sinus frontal, *cea* cellule ethmoïdale antérieure, *pu* processus uncinatus, *hs* hiatus semilunaire, *ci* cornet inférieur, *mni* méat inférieur.

Coupe sagittale d'une tête de 6 ans présente le sinus frontal (*sf*) et son ouverture (*of*), les cellules ethmoïdales antérieures (*cea*), l'hiatus semilunaire (*hs*) et le processus uncinatus (*pu*). Le sinus frontal droit (*sf*) est haut de 17 millim., long de 10 millim., large de 11 millim. L'ouverture du sinus frontal (*of*) se continue directement avec l'hiatus semilunaire. Les cellules ethmoïdales antérieures (*cea*) ont les dimensions suivantes: hauteur 10 à 13 millim., longueur 5 à 6 millim., largeur 7 millim.

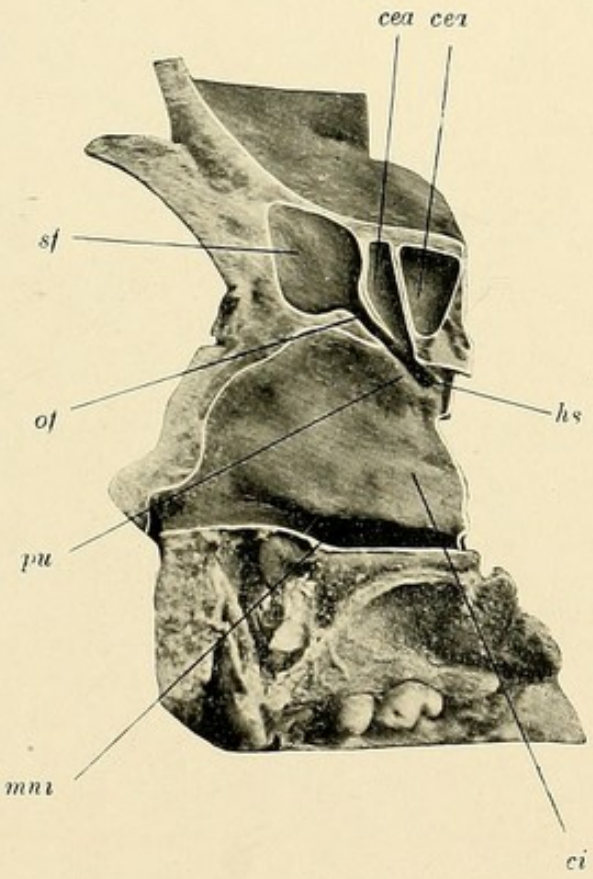
Plate 84.

Natural size. — Child of 6 years.

sf frontal sinus, *of* frontal ostium, *cea* anterior ethmoidal cell, *pu* uncinate process, *hs* semilunar hiatus, *ci* lower concha, *mni* lower meatus.

Longitudinal vertical section through the head of a child aged 6 years, shewing the frontal sinus (*sf*), the orifice of the frontal sinus (*of*), the anterior ethmoidal cells (*cea*), the semilunar hiatus (*hs*) and the uncinate process (*pu*). The right frontal sinus (*sf*) is 17 mm high, 10 mm long and 11 mm wide. The outlet of the frontal sinus (*of*) merges uninterruptedly into the semilunar hiatus (*hs*). The anterior ethmoidal cells (*cea*) measure 10 to 13 mm in height, 5 to 6 mm in length and 7 mm in width.

Tafel 84.



Tafel 85.

Sagittalschnitt.

Natürliche Grösse. — 6 Jahre altes Kind.

Planche 85.

Coupe sagittale.

Grandeur nature. — Enfant de 6 ans.

Plate 85.

Longitudinal vertical section.

Natural size. — Child of 6 years.

Tafel 85.

Natürliche Grösse. — 6 Jahre altes Kind.

sf sinus frontalis, *of* ostium frontale, *hs* hiatus semilunaris, *pu* processus uncinatus, *cea* cellula, ethmoidalis anterior.

Der Sagittalschnitt eines 6 Jahre alten Kopfes stellt den korrespondierenden Schnitt der Tafel 84 dar. Das Bild zeigt die rechte Stirnhöhle (*sf*) und die benachbarten vorderen Siebbeinzellen (*cea*). Die Mündung der Stirnhöhle (*of*) ist gut zu übersehen, sie übergeht direkt in den hiatus semilunaris (*hs*), welchen der processus uncinatus (*pu*) begrenzt. Die Maasse der Stirnhöhle und der vorderen Siebbeinzellen sind in der Tafel 84 angegeben.

Planche 85.

Grandeur nature. — Enfant de 6 ans.

sf sinus frontal, *of* ostium du sinus frontal, *hs* hiatus semilunaire, *pu* processus uncinatus, *cea* cellule ethmoïdale antérieure.

Coupe sagittale d'une tête de 6 ans représentant la coupe correspondant à la planche 84. La figure montre le sinus frontal droit (*sf*) et les cellules ethmoïdales antérieures avoisinantes (*cea*). L'orifice du sinus frontal (*of*) est bien visible et se continue directement avec l'hiatus semilunaire, (*hs*) limité par le processus uncinatus (*pu*). Les mesures du sinus frontal et des cellules ethmoïdales antérieures sont indiquées sur la planche 84.

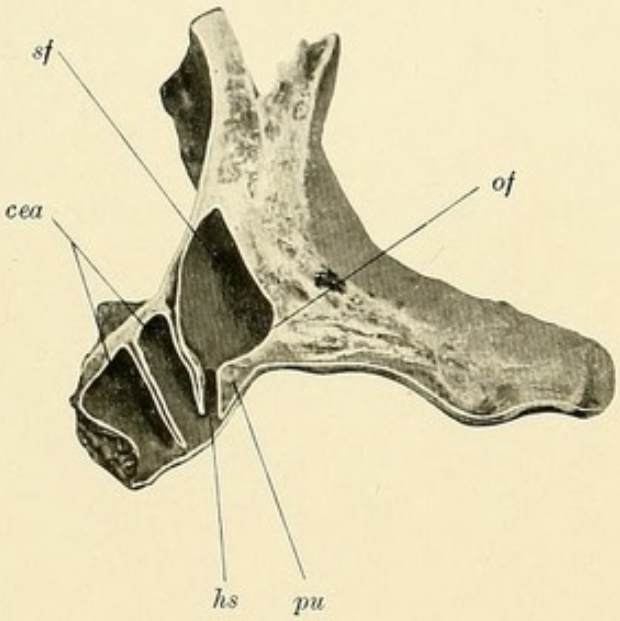
Plate 85.

Natural size. — Child of 6 years.

sf frontal sinus, *of* frontal ostium, *hs* semilunar hiatus, *pu* uncinate process, *cea* anterior ethmoidal cell.

Longitudinal vertical section through the head of a child aged 6 years, shewing the section corresponding to that illustrated in Plate 84. The right frontal sinus (*sf*) and the adjoining anterior ethmoidal cells (*cea*) are shewn. The opening of the frontal sinus (*of*) is clearly visible. It merges into the semilunar hiatus (*hs*) which is bordered by the uncinate process (*pu*). The measurements of the frontal sinus and anterior ethmoidal cells are given in the description of Plate 84.

Tafel 85.



Tafel 86.

Sagittalschnitt.

Natürliche Grösse. — 6 Jahre altes Kind.

Planche 86.

Coupe sagittale.

Grandeur nature. — Enfant de 6 ans.

Plate 86.

Longitudinal vertical section.

Natural size. — Child of 6 years.

Tafel 86.

Natürliche Grösse. — 6 Jahre altes Kind.

os ostium sphenoidale, *t* Nasenhöhlendach, *cs* concha superior, *mns* meatus narium superior, *cm* concha media.

Der Sagittalschnitt eines 6 Jahre alten Kopfes zeigt die 1½ mm runde Mündung der Keilbeinhöhle, das ostium sphenoidale (*os*), nahe dem Dach der Nasenhöhle (*t*). Die linke Keilbeinhöhle ist 10 mm hoch, 7 mm lang und 12 mm breit. Die rechte Keilbeinhöhle ist 10 mm hoch, 6 mm lang und 12 mm breit.

Planche 86.

Grandeur nature. — Enfant de 6 ans.

os ostium du sinus sphénoïdal, *t* toit de la fosse nasale, *cs* cornet supérieur, *mns* méat supérieur, *cm* cornet moyen.

Coupe sagittale d'une tête de 6 ans montrant l'ostium du sinus sphénoïdal large de 1½ millim. Cet ostium sphénoidal (*os*) se trouve près du toit de la fosse nasale (*t*) Le sinus sphénoïdal gauche est haut de 10 millim., long de 7 millim., large de 12 millim. Le sinus sphénoïdal droit est haut de 10 millim., long de 6 millim., large de 12 millim.

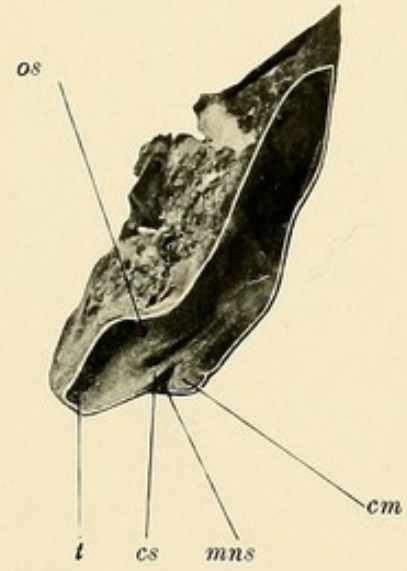
Plate 86.

Natural size. — Child of 6 years.

os sphenoidal ostium, *t* roof of nasal fossa, *cs* upper concha, *mns* upper meatus, *cm* middle concha.

Longitudinal vertical section through the head of a child aged 6 years, shewing the circular orifice, 1½ mm wide, of the sphenoidal sinus and the sphenoidal ostium (*os*), situated near the roof of the nasal fossa (*t*). The left sphenoidal sinus is 10 mm high, 7 mm long and 12 mm wide, the right sphenoidal sinus is 10 mm high, 6 mm long and 12 mm wide.

Tafel 86.



Tafel 87.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 6 jähr. Kindes.

Planche 87.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 6 ans.

Plate 87.

Skiagram.

Natural size. — Skull of child 6 years old.

Tafel 87.

Natürliche Grösse. — Schädel eines 6jähr. Kindes.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur zeigt eine Röntgenaufnahme der Stirnhöhlen eines 6jähr. Kindes. Die rechte Stirnhöhle (*sfd*) hat eine Ausdehnung in der vertikalen Richtung von $8\frac{1}{2}$ mm und in der horizontalen Richtung von $8\frac{1}{2}$ mm. Die linke Stirnhöhle (*sfs*) hat eine Ausbreitung in der vertikalen Richtung von 6 mm und in der horizontalen Richtung von 6 mm.

Planche 87.

Grandeur nature. — Crâne d'un enfant de 6 ans.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

Figure montrant le radiogramme des sinus frontaux d'un crâne d'un enfant de 6 ans. Le sinus frontal droit (*sfd*) a une étendue de $8\frac{1}{2}$ millim. dans la direction verticale et de $8\frac{1}{2}$ millim. dans la direction horizontale. Le sinus frontal gauche (*sfs*) a une étendue de 6 millim. dans la direction verticale et de 6 millim. dans la direction horizontale.

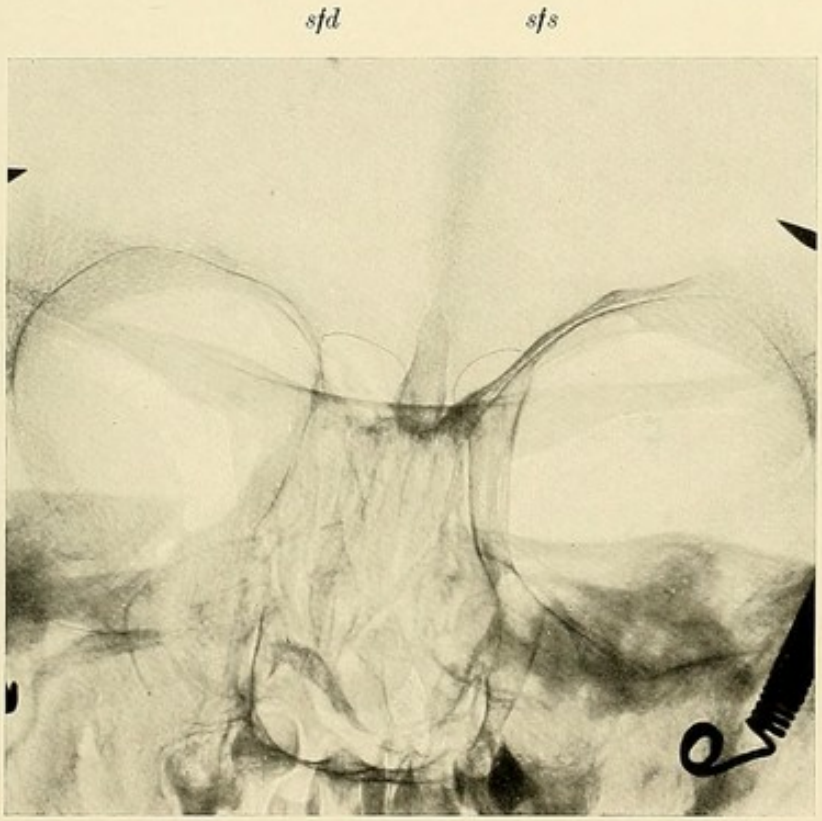
Plate 87.

Natural size. — Skull of child 6 years old.

sfd right frontal sinus, *sfs* left frontal sinus.

Skiagram shewing the frontal sinuses of the skull of a child 6 years old. The right frontal sinus (*sfd*) measures $8\frac{1}{2}$ mm in the vertical and $8\frac{1}{2}$ mm in the horizontal direction. The left frontal sinus (*sfs*) measures 6 mm in the vertical and 6 mm in the horizontal direction.

Tafel 87.



Tafel 88.

Sagittalschnitt.

Natürliche Grösse. — $7^1/_2$ Jahre altes Kind.

Planche 88.

Coupe sagittale.

Grandeur nature. — Enfant de 7 ans $^1/_2$.

Plate 88.

Longitudinal vertical section.

Natural size. — Child of $7^1/_2$ years.

Tafel 88.

Natürliche Grösse. — 7½ Jahre altes Kind.

sf sinus frontalis, *pu* processus uncinatus, *be* bulla ethmoidalis, *hs* hiatus semilunaris, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *ss* sinus sphenoidalis, *rse* recessus sphenoethmoidalis, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mns* meatus narium superior, *cs* concha superior.

Der Sagittalschnitt eines 7½ Jahre alten Kopfes illustriert die gut ausgebildeten Nebenhöhlen. Die rechte Stirnhöhle (*sf*) ist 17 mm hoch, 11 mm lang und 7 mm breit, ihre Mündung fliesst mit dem obersten vordersten Teil des hiatus semilunaris (*hs*) zusammen, welcher vom processus uncinatus (*pu*) und von der bulla ethmoidalis (*be*) begrenzt, mit einer kuppelförmigen Erweiterung in der Stirnhöhle (*sf*) zu enden scheint. Durch die Entfernung der mittleren Nasenmuschel (*cm*) ist das erwähnte Gebiet gut zu übersehen. Die vordere Siebbeinzelle (*cea*) ist 13 mm hoch, 7 mm breit und 5 mm lang. Die hintere Siebbeinzelle (*cep*) ist 17 mm lang, 10 mm hoch und 9 mm breit, sie mündet mit einer länglich ovalen Öffnung in den oberen Nasengang (*mns*). Die Keilbeinhöhle (*ss*) ist 12 mm lang, 13 mm hoch und 9 mm breit, das ostium sphenoidale mündet mit einer 2 mm weiten runden Öffnung in den recessus sphenoethmoidalis.

Planche 88.

Grandeur nature. — Enfant de 7 ans ½.

sf sinus frontal, *pu* processus uncinatus, *be* bulle ethmoïdale, *hs* hiatus semilunaire, *cea* cellule ethmoïdale antérieure, cep cellule ethmoïdale postérieure, *ss* sinus sphénoïdal, *rse* recessus sphénoethmoïdal, *ci* cornet inférieur, *mni* méat inféricur, *cm* cornet moyen, *mns* méat supérieur, *cs* cornet supérieur.

Coupe sagittale d'une tête de 7 ans ½ montrant les sinus bien développés. Le sinus frontal droit (*sf*) est haut de 17 millim., long de 11 millim., large de 7 millim. Son ouverture se confond avec la partie antérieure de l'hiatus semilunaire (*hs*), limitée par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*), et paraissant se terminer par une dilatation cupuliforme dans le sinus frontal (*sf*). On voit très bien cette région par suite de la section du cornet moyen (*cm*). La cellule ethmoïdale antérieure (*cea*) a une hauteur de 13 millim., une largeur de 7 millim. et une longueur de 5 millim. La cellule ethmoïdale postérieure (*cep*) est longue de 17 millim., haute de 10 millim. et large de 9 millim. Elle se termine par une ouverture ovalaire allongée dans le méat supérieur (*mns*). Le sinus sphénoïdal (*ss*) a 12 millim. de longueur, 13 de hauteur et 9 de largeur. L'ostium sphénoïdal est large de 2 millim. et donne dans le recessus sphéno-ethmoïdal.

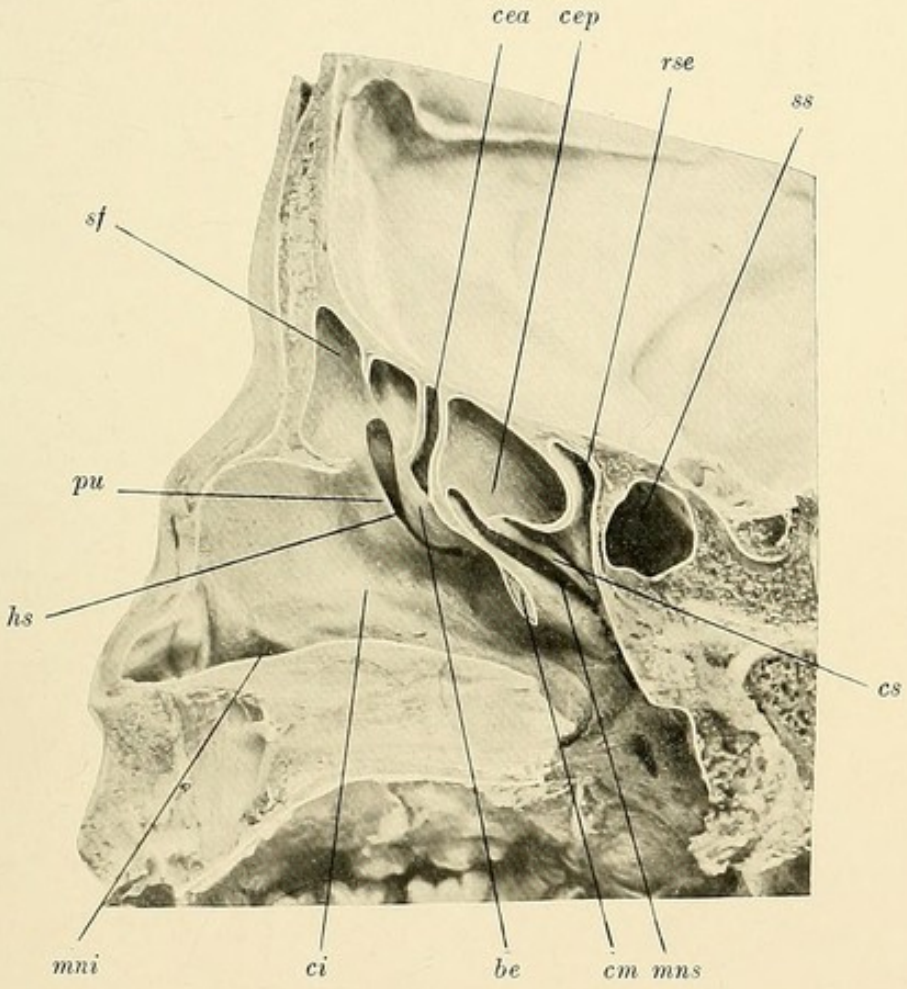
Plate 88.

Natural size. — Child of 7½ years.

sf frontal sinus, *pu* uncinate process, *be* ethmoidal bulla, *hs* semilunar hiatus, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *ss* sphenoidal sinus, *rse* spheno-ethmoidal recess, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mns* upper meatus, *cs* upper concha.

Longitudinal vertical section through the head of a child aged 7½ years, shewing the well developed sinuses. The right frontal sinus (*sf*) is 17 mm high, 11 mm long and 7 mm wide. Its aperture merges into the upper anterior portion of the semilunar hiatus (*hs*), which is enclosed between the uncinate process (*pu*) and the ethmoidal bulla (*be*) and appears to terminate at the frontal sinus (*sf*) in a dome-shaped enlargement. In consequence of the removal of the middle concha (*cm*) this region has been rendered well visible. The anterior ethmoidal cell (*cea*) is 13 mm high, 7 mm wide and 5 mm long. The posterior ethmoidal cell (*cep*) is 17 mm long, 10 mm high and 9 mm wide; it communicates with the upper meatus (*mns*) by an elongated oval orifice. The sphenoidal sinus (*ss*) is 12 mm long, 13 mm high, and 9 mm wide; the sphenoidal ostium opens into the spheno-ethmoidal recess by a circular aperture, 2 mm wide.

Tafel 88.



Tafel 89.

Frontalschnitt.

Natürliche Grösse. — $7^1/_2$ Jahre altes Kind.

Planche 89.

Coupe frontale.

Grandeur nature. — Enfant de 7 ans $^1/_2$.

Plate 89.

Coronal section.

Natural size. — Child of $7^1/_2$ years.

Tafel 89.

Natürliche Grösse. — 7½ Jahre altes Kind.

sf sinus frontalis, *of* ostium frontale, *hs* hiatus semilunaris, *pu* processus uncinatus, *be* bulla ethmoidalis, *sm* sinus maxillaris, *cea* cellula ethmoidalis anterior, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media.

Der Frontalschnitt eines 7½ Jahre alten Kopfes ist etwas schräg geführt und zeigt das Mündungsgebiet der Stirnhöhle (*sf*) und der vorderen Siebbeinzellen (*cea*), den hiatus semilunaris (*hs*), welchen der processus uncinatus (*pu*) und die bulla ethmoidalis (*be*) begrenzt. Oberhalb der bulla ethmoidalis (*be*), im recessus bullaris ist die ovale Öffnung einer vorderen Siebbeinzelle (*cea*) zu sehen. Die Stirnhöhle (*sf*) ist 14 mm hoch, 9 mm breit und 4 mm lang, sie mündet mit einer länglich ovalen Öffnung (*of*) knapp am vordersten Ende des hiatus semilunaris (*hs*). Unterhalb der Stirnhöhlenmündung (*of*) und vor dem vorderen Ende des hiatus semilunaris (*hs*) ist die ovale Öffnung einer vorderen Siebbeinzelle (*cea*) zu sehen; dieselbe ist 11 mm lang, 8 mm hoch und 7 mm breit. Im Bereiche des unteren Nasenganges (*mni*) ist der vordere Teil der Kieferhöhle (*sm*) zu übersehen.

Planche 89.

Grandeur nature. — Enfant de 7 ans ½.

sf sinus frontal, *of* ostium du sinus frontal, *hs* hiatus semilunaire, *pu* processus uncinatus, *be* bulle ethmoïdale, *sm* sinus maxillaire, *cea* cellule ethmoïdale antérieure, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen.

La coupe frontale de la tête d'un enfant de 7 ans ½ est légèrement oblique et montre la région autour de l'ouverture du sinus frontal (*sf*) et des cellules ethmoïdales antérieures (*cea*), l'hiatus semilunaire (*hs*) limité par le processus uncinatus (*pu*) et la bulle ethmoïdale (*be*). Au dessus de la bulle ethmoïdale (*be*) dans le recessus bullaire on peut voir l'ouverture ovale d'une cellule ethmoïdale antérieure (*cea*). Le sinus frontal (*sf*) a une hauteur de 14 millim., une largeur de 9 millim. et une longueur de 4 millim. Il se termine par une ouverture (*of*) ovalaire allongée juste à la partie antérieure de l'hiatus semilunaire (*hs*). Au-dessous de l'ostium du sinus frontal (*of*) et devant la partie antérieure de l'hiatus semilunaire (*hs*) on peut voir l'ouverture ovale d'une cellule ethmoïdale antérieure (*cea*); celle-ci est longue de 11 millim. haute de 8 millim. et large de 7 millim. Au niveau du méat inférieur (*mni*) on voit la partie antérieure du sinus maxillaire (*sm*).

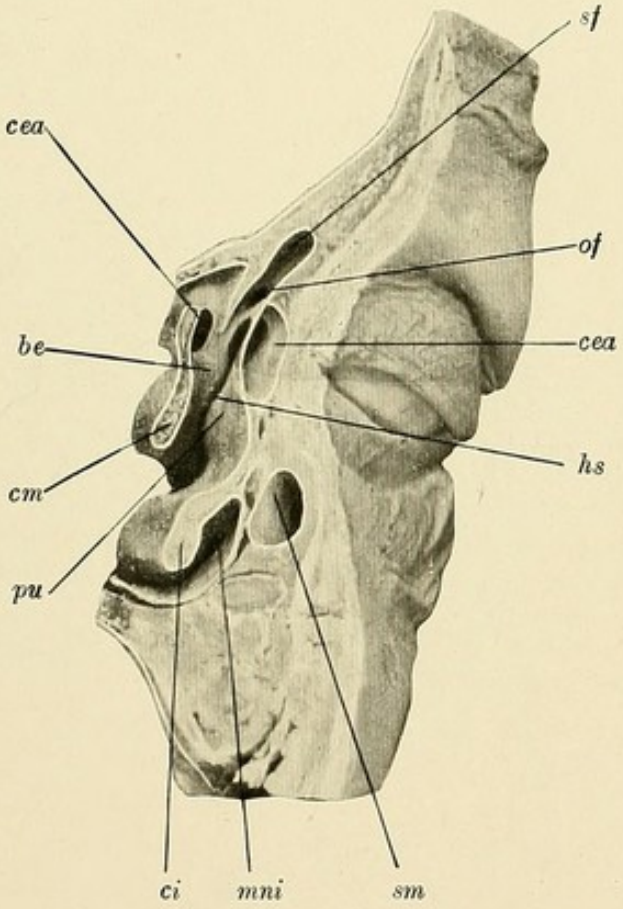
Plate 89.

Natural size. — Child of 7½ years.

sf frontal sinus, *of* frontal ostium, *hs* semilunar hiatus, *pu* uncinate process, *be* ethmoidal bulla, *sm* maxillary antrum, *cea* anterior ethmoidal cell, *ci* lower concha, *mni* lower meatus, *cm* middle concha.

Section through the head of a child of 7½ years, cut in a transverse but slightly oblique direction, so as to shew the region of the orifices of the frontal sinus (*sf*) and anterior ethmoidal cells (*cea*), the semilunar hiatus, which is enclosed between the uncinate process (*pu*) and the ethmoidal bulla (*be*). Above the ethmoidal bulla (*be*), in the bullar recess, is the oval aperture of an anterior ethmoidal cell (*cea*). The frontal sinus (*sf*) is 14 mm high, 9 mm wide, and 4 mm long; it opens by an elongated oval aperture (*of*) close to the anterior extremity of the semilunar hiatus (*hs*). Below the frontal ostium (*of*) and in front of the anterior extremity of the semilunar hiatus (*hs*) the oval orifice of an anterior ethmoidal cell (*cea*) is visible. This cell is 11 mm long, 8 mm high and 7 mm wide. Close to the lower meatus (*mni*) the anterior portion of the maxillary antrum (*sm*) is shewn.

Tafel 89.



Tafel 90.

Frontalschnitt.

Natürliche Grösse. — 7½ Jahre altes Kind.

Planche 90.

Coupe frontale.

Grandeur nature. — Enfant de 7 ans ½.

Plate 90.

Coronal section.

Natural size. — Child of 7½ years.

Tafel 90.

Natürliche Grösse. — 7½ Jahre altes Kind.

sm sinus maxillaris, *cea* cellula ethmoidalis anterior, *cep* cellula ethmoidalis posterior, *os* ostium sphenoidale, *ci* concha inferior, *mni* meatus narium inferior, *cm* concha media, *mnm* meatus narium medius, *cs* concha superior, *mns* meatus narium superior.

Der Frontalschnitt eines 7½ Jahre alten Kopfes zeigt die Kieferhöhle (*sm*), die Siebbeinzellen (*cea* und *cep*), die untere (*ci*), mittlere (*cm*) und obere (*cs*) Nasenmuschel, den unteren (*mni*), mittleren (*mnm*) und oberen (*mns*) Nasengang und die Mündung der Keilbeinhöhle (*os*). Die Kieferhöhle (*sm*) ist im Bereiche des unteren (*mni*) und des mittleren (*mnm*) Nasenganges zu übersehen, sie ist 38 mm lang, 23 mm hoch und 20 mm breit. Die oberhalb des oberen Nasenganges (*mns*) liegende hintere Siebbeinzelle (*cep*) ist 11 mm lang, 10 mm hoch und 6 mm breit. Die linke Keilbeinhöhle ist 12 mm hoch, 11 mm breit und 8 mm lang, sie mündet unterhalb des Nasendaches mit einer 4 mm länglich ovalen Öffnung (*os*).

Planche 90.

Grandeur nature. — Enfant de 7 ans ½.

sm sinus maxillaire, *cea* cellule ethmoïdale antérieure, *cep* cellule ethmoïdale postérieure, *os* ostium du sinus sphénoïdal, *ci* cornet inférieur, *mni* méat inférieur, *cm* cornet moyen, *mnm* méat moyen, *cs* cornet supérieur, *mns* méat supérieur.

La coupe frontale de la tête d'un enfant de 7 ans ½ montre le sinus maxillaire (*sm*), les cellules ethmoïdales (*cea* et *cep*), les cornets inférieur (*ci*), moyen (*cm*), supérieur (*cs*), les méats inférieur (*mni*) moyen (*mnm*) et supérieur (*mns*) et l'ostium du sinus sphénoïdal (*os*). On peut voir le sinus maxillaire (*sm*) au niveau des méats inférieur (*mni*) et moyen (*mnm*), il est long de 38 millim., haut de 23 millim. et large de 20 millim. La cellule ethmoïdale postérieure (*cep*), située au-dessus du méat supérieur, est longue de 11 millim., haute de 10 millim. et large de 6 millim. Le sinus sphénoïdal gauche est haut de 12 millim., large de 11 millim. et long de 8 millim. Il se termine sous le toit de la fosse nasale par une ouverture ovale de 4 millim. de longueur (*os*).

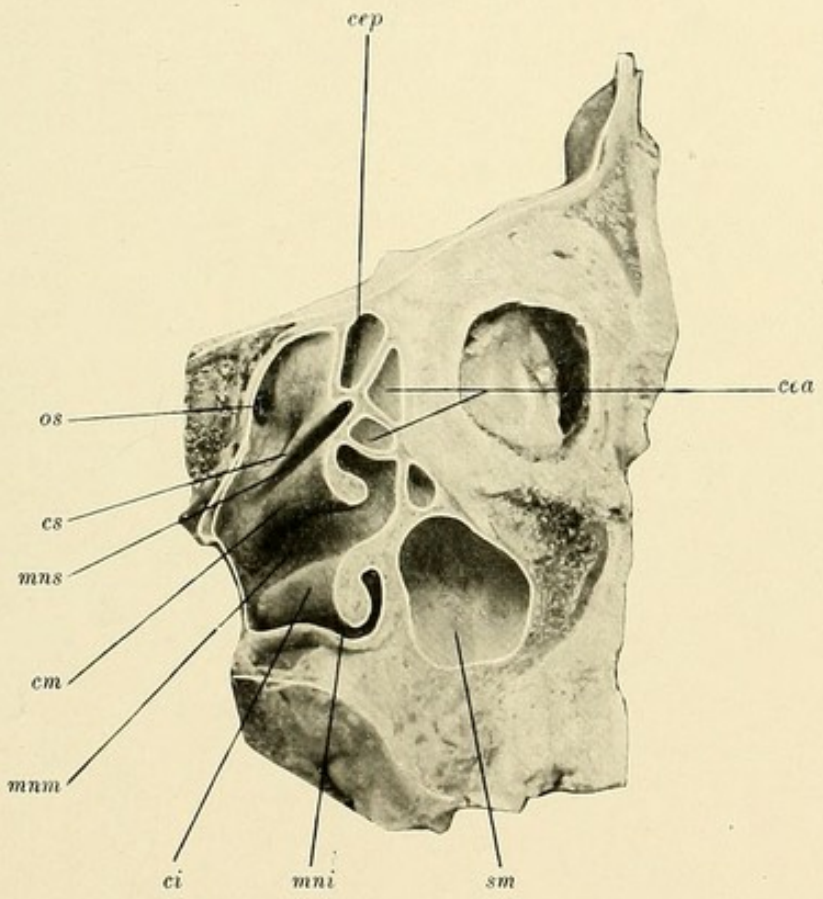
Plate 90.

Natural size. — Child of 7½ years.

sm maxillary antrum, *cea* anterior ethmoidal cell, *cep* posterior ethmoidal cell, *os* sphenoidal ostium, *ci* lower concha, *mni* lower meatus, *cm* middle concha, *mnm* middle meatus, *cs* upper concha, *mns* upper meatus.

Coronal section through the head of a child aged 7½ years, shewing the maxillary antrum (*sm*), the ethmoidal cells (*cea* and *cep*), the lower (*ci*), middle (*cm*) and upper (*cs*) concha, the lower (*mni*), middle (*mnm*) and upper (*mns*) meatus, and the ostium of the sphenoidal sinus (*os*). The maxillary antrum (*sm*) can be seen in its relations with the lower (*mni*) and middle (*mnm*) meatus. It is 38 mm long, 23 mm high and 20 mm wide. The posterior ethmoidal cell (*cep*) situated above the upper meatus (*mns*) is 11 mm long, 10 mm high and 6 mm wide. The left sphenoidal sinus is 12 mm high, 11 mm wide and 8 mm long; its outlet, an elongated oval opening (*os*), 4 mm wide, lies underneath the roof of the nasal fossa.

Tafel 90.



Tafel 91.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 8½ jähr. Kindes.

Planche 91.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 8 ans ½.

Plate 91.

Skiagram.

Natural size. — Skull of child 8½ years old.

Tafel 91.

Natürliche Grösse. — Schädel eines 8½ jähr. Kindes.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur zeigt die Röntgenaufnahme der Stirnhöhlen eines 8½ jähr. Kindes. Die rechte Stirnhöhle (*sfd*) hat eine Ausbreitung in vertikaler Richtung von 21 mm und in horizontaler Richtung von 29 mm. Die linke Stirnhöhle (*sfs*) hat eine Ausdehnung in vertikaler Richtung von 21 mm und in horizontaler Richtung von 19 mm.

Planche 91.

Grandeur nature. — Crâne d'un enfant de 8 ans ½.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

Figure montrant le radiogramme des sinus frontaux d'un crâne de 8 ans ½. Le sinus frontal droit (*sfd*) a une étendue de 21 millim. dans la direction verticale et de 29 millim. dans la direction horizontale. Le sinus frontal gauche (*sfs*) a une étendue de 21 millim. dans la direction verticale et de 19 millim. dans la direction horizontale.

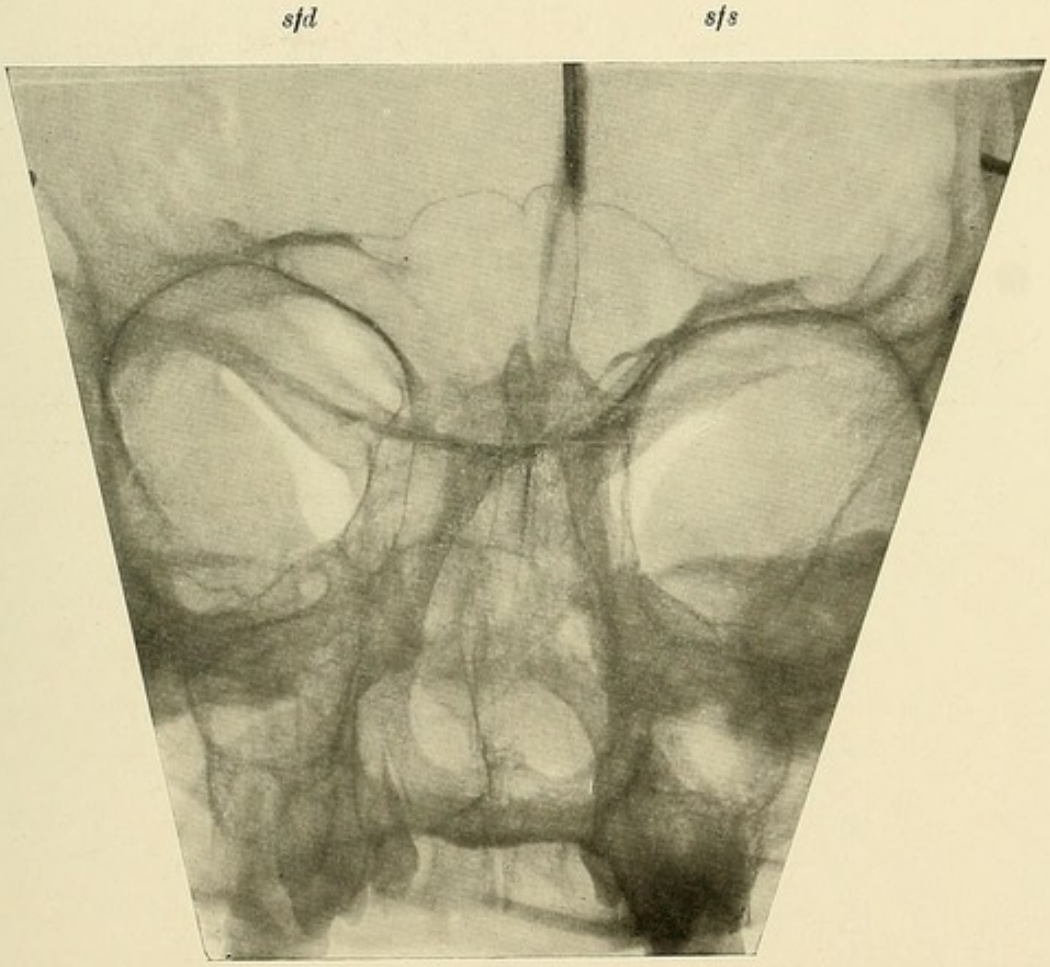
Plate 91.

Natural size. — Skull of child 8½ years old.

sfd right frontal sinus, *sfs* left frontal sinus.

The figure shews a skiagram of the frontal sinuses of a skull 8½ years old. The right frontal sinus (*sfd*) measures 21 mm in the vertical and 29 mm in the horizontal direction. The left frontal sinus (*sfs*) measures 21 mm in the vertical and 19 mm in the horizontal direction.

Tafel 91.



Tafel 92.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 8½ jähr. Kindes.

Planche 92.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 8 ans ½.

Plate 92.

Skiagram.

Natural size. — Skull of child 8½ years old.

Tafel 92.

Natürliche Grösse. — Schädel eines 8 1/2 jähr. Kindes.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur illustriert die Röntgenaufnahme der Stirnhöhlen eines 8 1/2 jähr. Kindes. Die rechte Stirnhöhle (*sfd*) zeigt eine Ausdehnung von 22 mm in der horizontalen und vertikalen Richtung, während die linke Stirnhöhle (*sfs*) mit 10 mm eine kleinere Ausdehnung zeigt.

Planche 92.

Grandeur nature. — Crâne d'un enfant de 8 ans ½.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

La figure présente le radiogramme des sinus frontaux d'un crâne de 8 ans ½. Le sinus frontal droit (*sfd*) a un diamètre horizontal et vertical de 22 millim. tandis que le sinus frontal gauche (*sfs*), plus petit, n'a qu'un diamètre de 10 millim.

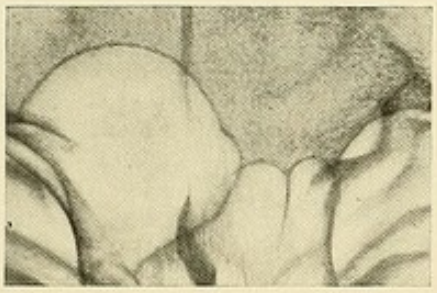
Plate 92.

Natural size. — Skull of child 8½ years old.

sfd right frontal sinus, *sfs* left frontal sinus.

Skiagram, shewing the frontal sinuses in the skull of a child aged 8½ years. The right frontal sinus (*sfd*) measures 22 mm in the vertical and horizontal directions, whilst the left frontal sinus (*sfs*) measures only 10 mm.

Tafel 92.



Tafel 93.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 9 jähr. Kindes.

Planche 93.

Radiogramme.

Grandeur Nature. — Crâne d'un enfant de 9 ans.

Plate 93.

Skiagram.

Natural size. — Skull of child 9 years old.

Tafel 93.

Natürliche Grösse. — Schädel eines 9 jähr. Kindes.

sfd sinus frontalis dexter., *sfs* sinus frontalis sinister.

Die Figur illustriert die Röntgenaufnahme der Stirnhöhlen eines 9 jähr. Kindes. Die Stirnhöhlen (*sfd*, *sfs*) zeigen auf beiden Seiten im unteren Teile des Stirnbeines eine Ausdehnung von 10 mm.

Planche 93.

Grandeur nature. — Crâne d'un enfant de 9 ans.

sfd sinus frontal droit, *sfs* s nus frontal gauche.

La figure montre le radiogramme des deux sinus frontaux d'un enfant de 9 ans. Les deux sinus (*sfd*, *sfs*), ont, dans la partie inférieure de l'os frontal, une étendue de 10 millim. de chaque côté.

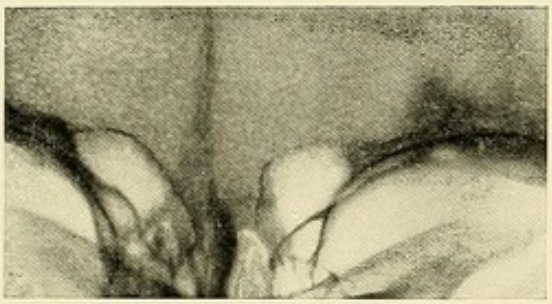
Plate 93.

Natural size. — Skull of child 9 years old.

sfd right frontal sinus, *sfs* left frontal sinus.

Skiagram shewing the frontal sinuses of the skull at 9 years of age. Each frontal sinus (*sfd*, *sfs*) is 10 mm in width at the lower edge of the frontal bone.

Tafel 93.



Tafel 94.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 12 jähr. Kindes.

Planche 94.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 12 ans.

Plate 94.

Skiagram.

Natural size. — Skull of child 12 years old.

Tafel 94.

Natürliche Grösse. — Schädel eines 12jähr. Kindes.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur illustriert die Röntgenaufnahme der Stirnhöhlen eines 12jähr. Kinderschädels. Beide Stirnhöhlen (*sfd*, *sfs*) zeigen eine gut ausgeprägte Form im Schuppenteile des Stirnbeines. Ihre Ausdehnung beträgt in der horizontalen Richtung 20 mm und in der vertikalen Richtung 17 mm.

Planche 94.

Grandeur nature. — Crâne d'un enfant de 12 ans.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

La figure représente le radiogramme des sinus frontaux d'un enfant de 12 ans. Les deux sinus frontaux (*sfs*, *sfd*) sont bien développés dans la squame du sinus frontal. Leurs dimensions sont horizontalement de 20 millim. et verticalement de 17 millim.

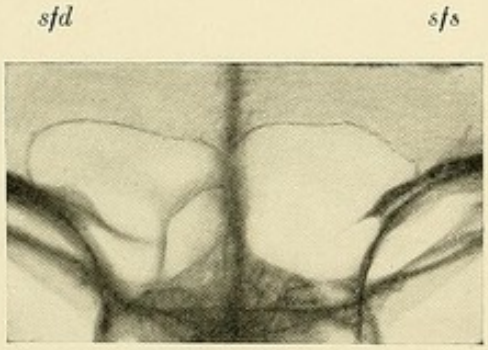
Plate 94.

Natural size. — Skull of child 12 years old.

sfd right frontal sinus, *sfs* left frontal sinus.

Skiagram shewing the frontal sinuses of the skull at 12 years of age. The outlines of both frontal sinuses (*sfd*, *sfs*) in the squamous part of the frontal bone are clearly defined. They measure 20 mm in the horizontal and 17 mm in the vertical direction.

Tafel 94.



Tafel 95.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 13jähr. Kindes.

Planche 95.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 13 ans.

Plate 95.

Skiagram.

Natural size. — Skull of child 13 years old.

Tafel 95.

Natürliche Grösse. — Schädel eines 13 jähr. Kindes.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur zeigt die Röntgenaufnahme eines 13 jähr. Kinderschädels. Die rechte Stirnhöhle (*sfd*) hat eine Ausbreitung in vertikaler Richtung von 14 mm und in horizontaler Richtung von 20 mm. Die linke Stirnhöhle (*sfs*) hat eine Ausdehnung in vertikaler Richtung von 14 mm und in horizontaler Richtung von 22 mm.

Planche 95.

Grandeur nature. — Crâne d'un enfant de 13 ans.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

Figure montrant le radiogramme d'un crâne d'un enfant de 13 ans. Le sinus frontal droit (*sfd*) a une étendue de 14 millim. dans la direction verticale et de 20 millim. dans la direction horizontale. Le sinus frontal gauche (*sfs*) a une étendue de 14 millim. dans la direction verticale et de 22 millim. dans la direction horizontale.

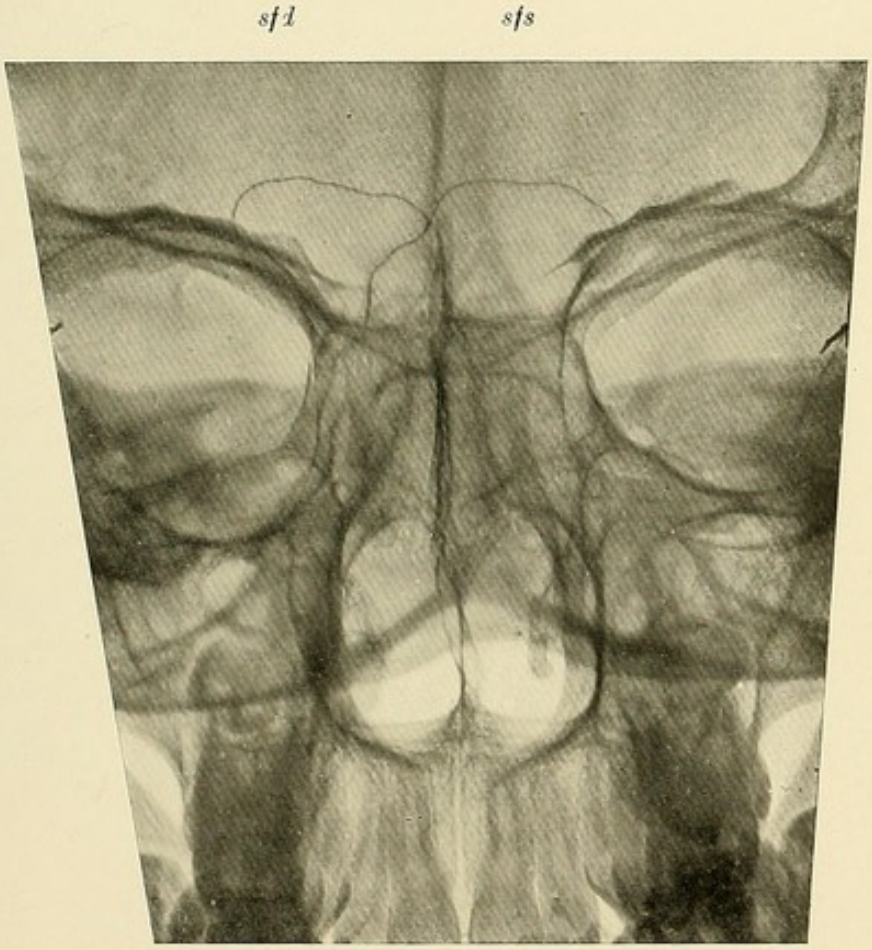
Plate 95.

Natural size. — Skull of child 13 years old.

sfd right frontal sinus, *sfs* left frontal sinus.

The figure shews a skiagram of a skull of child 13 years old. The right frontal sinus (*sfd*) measures 14 mm in the vertical and 20 mm in the horizontal direction. The left frontal sinus (*sfs*) measures 14 mm in the vertical and 22 mm in the horizontal direction.

Tafel 95.



Tafel 96.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 13 jähr. Kindes.

Planche 96.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 13 ans.

Plate 96.

Skiagram.

Natural size. — Skull of child 13 years old.

Tafel 96.

Natürliche Grösse. — Schädel eines 13 jähr. Kindes.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur zeigt die Röntgenaufnhme eines 13 jähr. Kinderschädels Die rechte Stirnhöhle (*sfd*) hat eine Ausbreitung in der vertikalen Richtung von 13 mm und in der horizontalen Richtung von 17 mm. Die linke Stirnhöhle (*sfs*) hat eine Ausdehnung in der vertikalen Richtung von 12 mm und in der horizontalen Richtung von 18 mm.

Planche 96.

Grandeur nature. — Crâne d'un enfant de 13 ans.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

Figure montrant le radiogramme d'un crâne d'un enfant de 13 ans. Le sinus frontal droit (*sfd*) a une étendue de 13 millim. dans la direction verticale et de 17 millim. dans la direction horizontale. Le sinus frontal gauche (*sfs*) a une étendue de 12 millim. dans la direction verticale et de 18 millim. dans la direction horizontale.

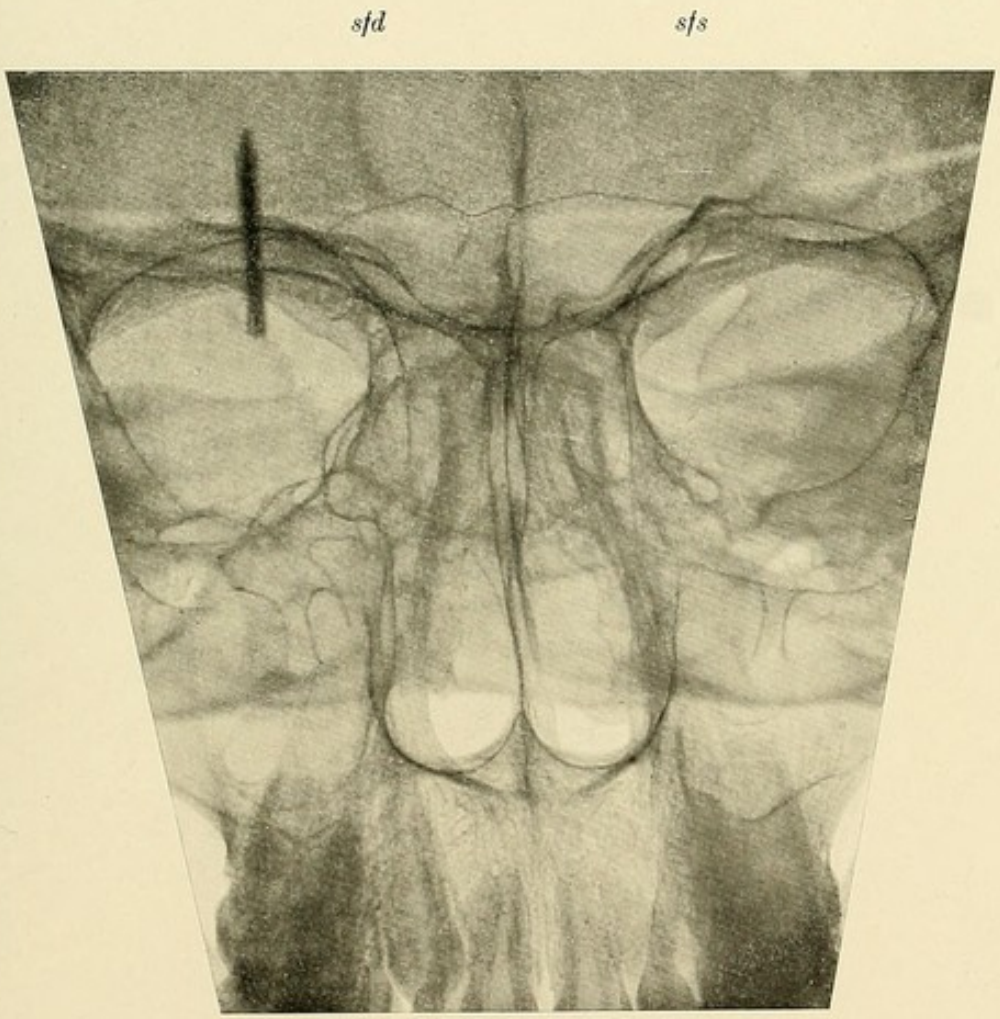
Plate 96.

Natural size. — Skull of child 13 years old.

sfd right frontal sinus, *sfs* left frontal sinus.

The figure shews a skiagram of a skull of child 13 years old. The right frontal sinus (*sfd*) measures 13 mm in the vertical and 17 mm in the horizontal direction. The left frontal sinus (*sfs*) measures 12 mm in the vertical and 18 mm in the horizontal direction.

Tafel 96.



Tafel 97.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 13jähr. Kindes.

Planche 97.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 13 ans.

Plate 97.

Skiagram.

Natural size. — Skull of child 13 years old.

Tafel 97.

Natürliche Grösse. — Schädel eines 13jähr. Kindes.

sfd sinus frontalis dexter.

Das Bild zeigt die Röntgenaufnahme eines 13 jähr. Kinderschädels. Die rechte Stirnhöhle (*sfd*) hat eine Ausdehnung in vertikaler Richtung von 10 mm und in horizontaler Richtung von 16 mm. Die linke Stirnhöhle fehlt.

Planche 97.

Grandeur nature. — Crâne d'un enfant de 13 ans.

sfd sinus frontal droit.

L'image représente le radiogramme d'un crâne d'un enfant de 13 ans. Le sinus frontal droit (*sfd*) a une étendue de 10 millim. dans la direction verticale et de 16 millim. dans la direction horizontale. Le sinus frontal gauche manque.

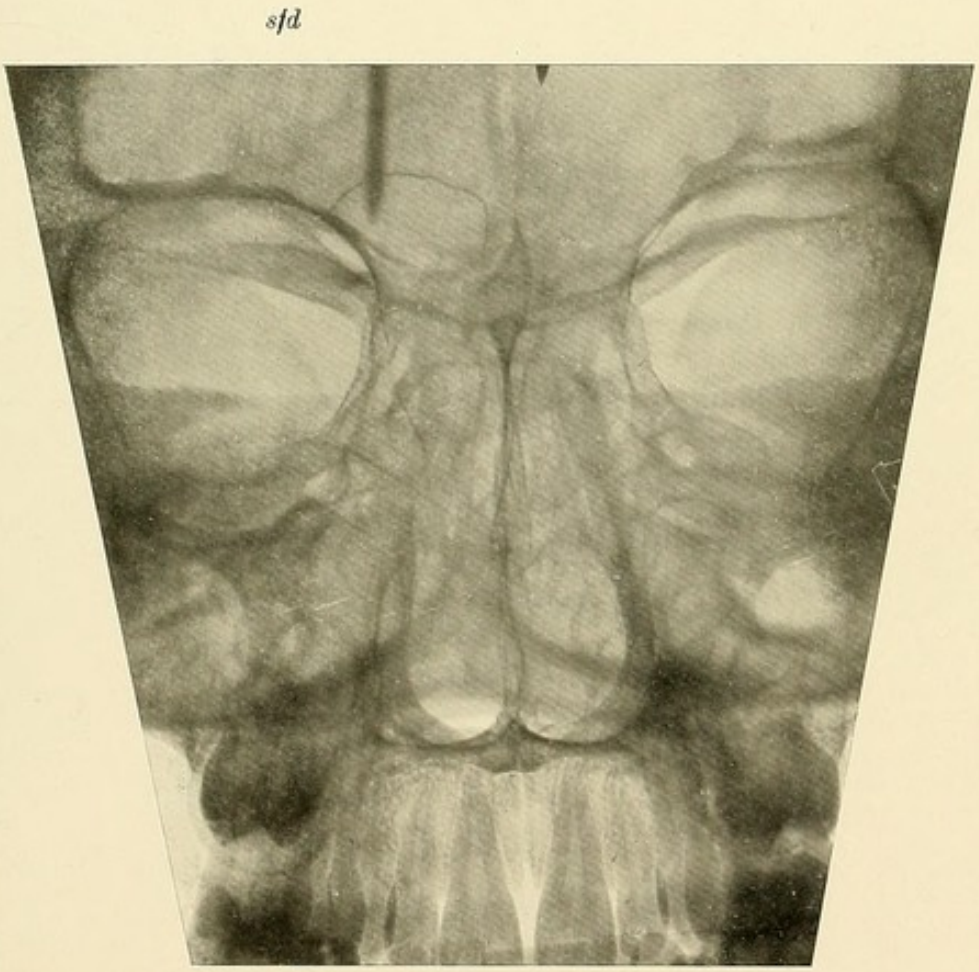
Plate 97.

Natural size. — Skull of child 13 years old.

sfd right frontal sinus.

The figure shews a skiagram of a skull 13 years old. The right frontal sinus (*sfd*) measures 10 mm in the vertical and 16 mm in the horizontal direction. The left frontal sinus is not developed.

Tafel 97.



Tafel 98.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines $13^1/_2$ jähr. Kindes.

Planche 98.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 13 ans $^1/_2$.

Plate 98.

Skiagram.

Natural size. — Skull of child $13^1/_2$ years old.

Tafel 98.

Natürliche Grösse. — Schädel eines 13½ jähr. Kindes.

sfd sinus frontalis dexter.

Die Figur zeigt die Röntgenaufnahme eines 13½ Jahre alten Kinderschädels. Die rechte Stirnhöhle (*sfd*) hat eine Ausdehnung in der vertikalen Richtung von 18 mm und in der horizontalen Richtung von 21 mm. Die linke Stirnhöhle fehlt.

Planche 98.

Grandeur nature. — Crâne d'un enfant de 13 ans ½.

sfd sinus frontal droit.

Figure montrant le radiogramme d'un crâne de 13 ans ½. Le sinus frontal droit (*sfd*) a une étendue de 18 millim. dans la direction verticale et de 21 millim. dans la direction horizontale. Le sinus frontal gauche manque.

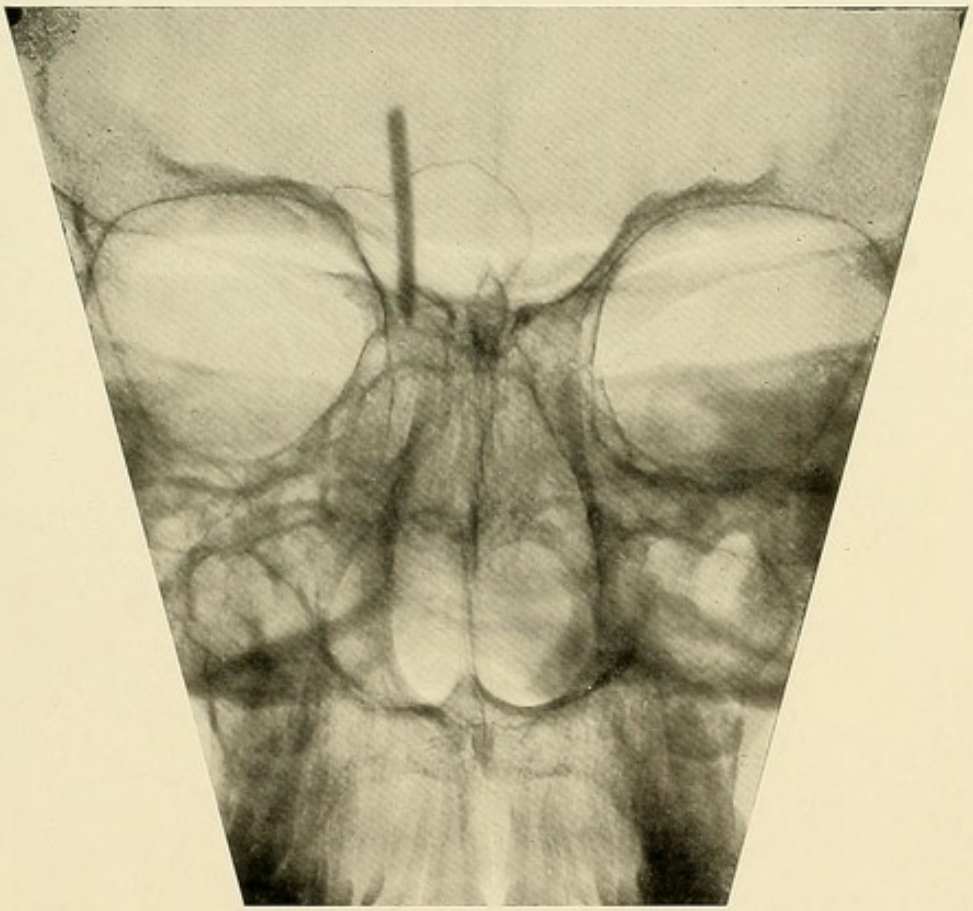
Plate 98.

Natural size. — Skull of child 13½ years old.

sfd right frontal sinus.

The figure shews a skiagram of a skull 13½ years old. The right frontal sinus (*sfd*) measures 18 mm in the vertical and 21 mm in the horizontal direction. The left frontal sinus is not developed.

Tafel 98.



Tafel 99.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 14 jähr. Kindes.

Planche 99.

Radiogramme.

Grandeur nature. – Crâne d'un enfant de 14 ans.

Plate 99.

Skiagram.

Natural size. — Skull of child 14 years old.

Tafel 99.

Natürliche Grösse. — Schädel eines 14 jähr. Kindes.

sfs sinus frontalis sinister.

Die Figur illustriert die Röntgenaufnahme der Stirnhöhlen eines 14 Jahre alten Kinderschädels. Auf der rechten Seite fehlt die Stirnhöhle, auf der linken Seite zeigt die linke Stirnhöhle (*sfs*) eine Ausdehnung von 10 mm im Schuppenteile des Stirnbeines.

Planche 99.

Grandeur nature. — Crâne d'un enfant de 14 ans.

sfs sinus frontal gauche.

La figure montre le radiogramme d'un crâne d'un enfant de 14 ans. Le sinus frontal manque du côté droit. Du côté gauche, le sinus frontal (*sfs*) a une étendue de 10 millim. dans la squame de l'os frontal.

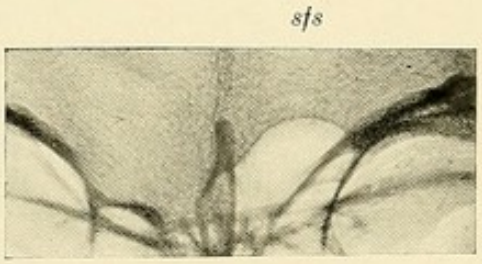
Plate 99.

Natural size. — Skull of child 14 years old.

sfs left frontal sinus.

Skiagram shewing the frontal sinus of a skull 14 years old. The right frontal sinus is not developed, the left sinus (*sfs*) extends into the squamous part of the frontal bone for a distance of 10 mm.

Tafel 99.



Tafel 100.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 15 jähr. Kindes.

Planche 100.

Radiogramme.

Grandeur nature. — Crâne d'un enfant de 15 ans.

Plate 100.

Skiagram.

Natural size. — Skull of child 15 years old.

Tafel 100.

Natürliche Grösse. — Schädel eines 15 jähr. Kindes.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur zeigt die Röntgenaufnahme der Stirnhöhlen eines 15 Jahre alten Kinderschädels. Die rechte Stirnhöhle (*sfd*) hat eine Ausdehnung in der vertikalen Richtung von 5 mm und in der horizontalen Richtung von 5 mm. Die linke Stirnhöhle (*sfs*) hat eine Ausbreitung in der vertikalen Richtung von 11 mm und in der horizontalen Richtung von 8 mm.

Planche 100.

Grandeur nature. — Crâne d'un enfant de 15 ans.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

Figure montrant le radiogramme des sinus frontaux d'un crâne d'un enfant de 15 ans. Le sinus frontal droit (*sfd*) a une étendue de 5 millim. dans la direction verticale et de 5 millim. dans la direction horizontale. Le sinus frontal gauche (*sfs*) a une étendue de 11 millim dans la direction verticale et de 8 millim. dans la direction horizontale.

Plate 100.

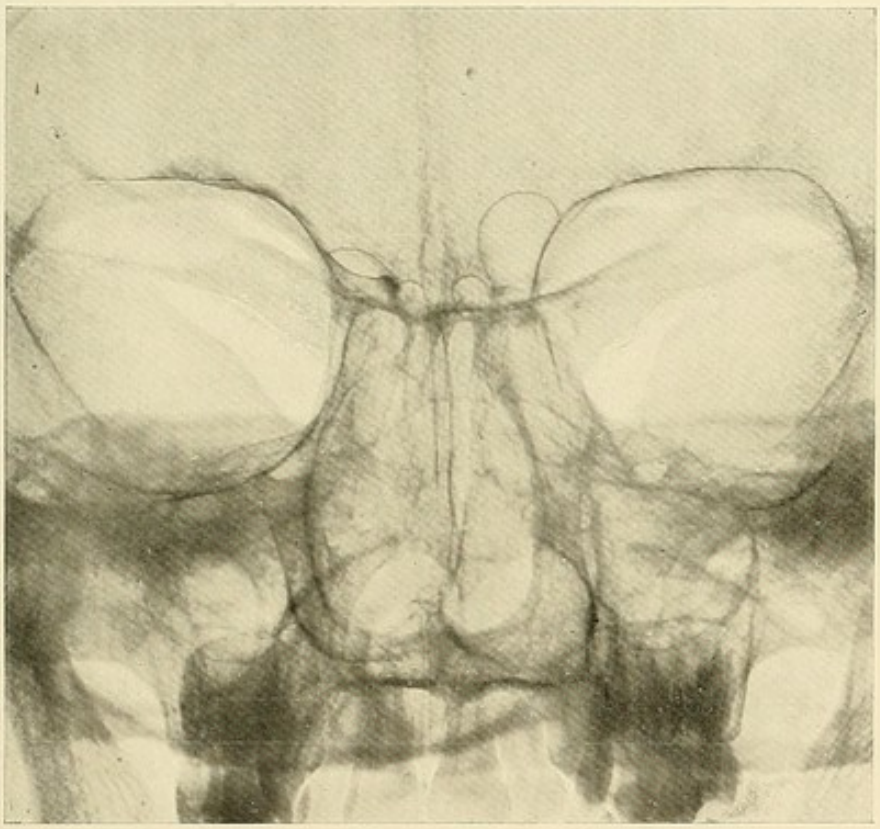
Natural size. — Skull of child 15 years old.

sfd right frontal sinus, *sfs* left frontal sinus.

Skiagram shewing the frontal sinuses in the skull of a child aged 15 years. The right frontal sinus (*sfd*) measures 5 mm in the vertical and 5 mm in the horizontal direction. The left frontal sinus (*sfs*) measures 11 mm in the vertical and 8 mm in the horizontal direction.

Tafel 100.

sfd *sfs*



Tafel 101.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 18 Jährigen.

Planche 101.

Radiogramme.

Grandeur nature. — Crâne de 18 ans.

Plate 101.

Skiagram.

Natural size. — Adult 18 years of age.

Tafel 101.

Natürliche Grösse. — Schädel eines 18 Jährigen.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur zeigt eine Röntgenaufnahme eines 18 Jahre alten Schädels. Die rechte Stirnhöhle (*sfd*) zeigt eine Ausbreitung in vertikaler Richtung von 15 mm und in horizontaler Richtung von 26 mm. Die linke Stirnhöhle (*sfs*) hat eine Ausdehnung in vertikaler Richtung von 6 mm und in horizontaler Richtung von 13 mm.

Planche 101.

Grandeur nature. — Crâne de 18 ans.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

Figure montrant le radiogramme d'un crâne de 18 ans. Le sinus frontal droit (*sfd*) a une étendue de 15 millim. dans la direction verticale et de 26 millim. dans la direction horizontale. Le sinus frontal gauche (*sfs*) a une étendue de 6 millim. dans la direction verticale et de 13 millim. dans la direction horizontale.

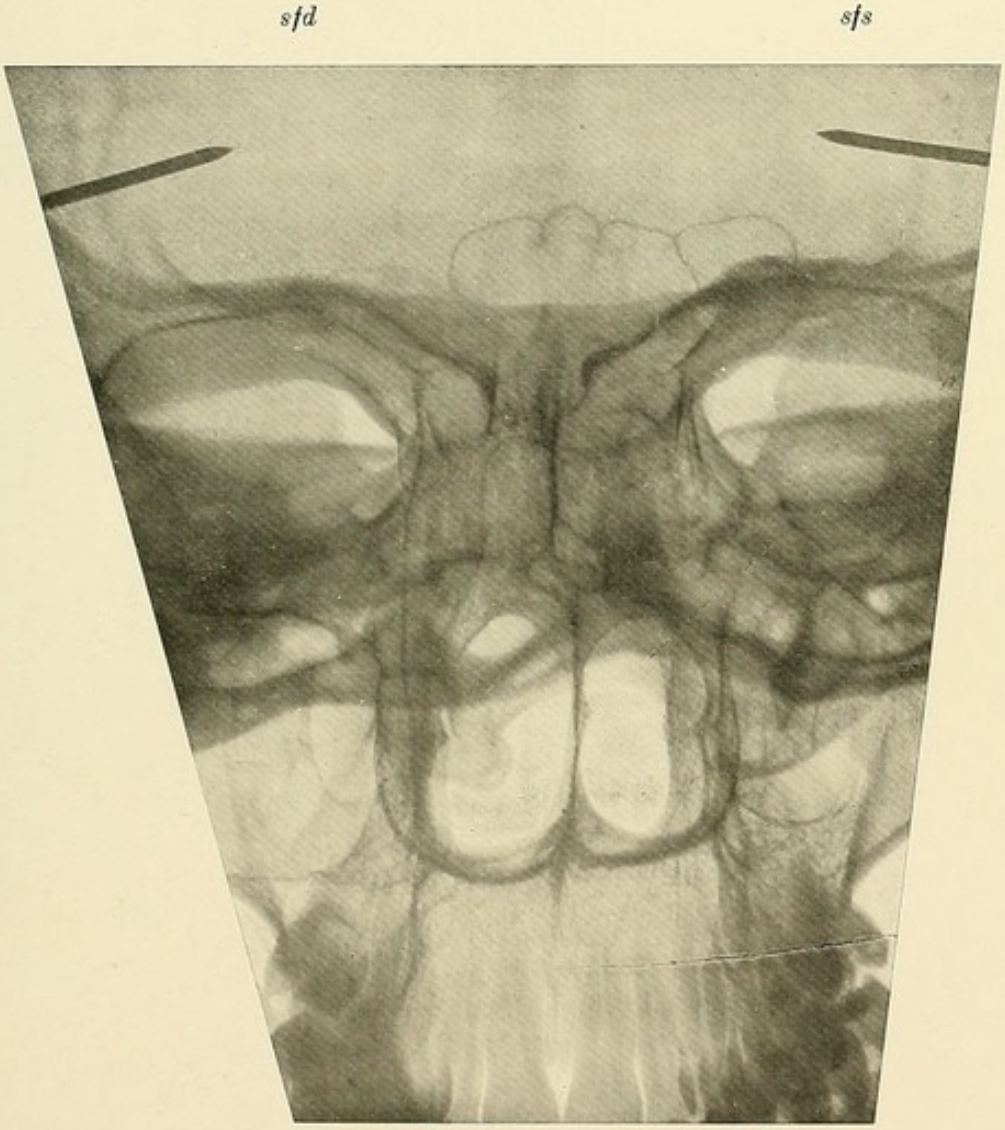
Plate 101.

Natural size. — Adult 18 years of age.

sfd right frontal sinus, *sfs* left frontal sinus.

The figure shews a skiagram of a skull at the age of 18. The right frontal sinus (*sfd*) measures 15 mm in the vertical and 26 mm in the horizontal direction. The left frontal sinus (*sfs*) measures 6 mm in the vertical and 13 mm in the horizontal direction.

Tafel 101.



Tafel 102.

Röntgenaufnahme.

Natürliche Grösse. — Schädel eines 19 Jährigen.

Planche 102.

Radiogramme.

Grandeur nature. — Crâne de 19 ans.

Plate 102.

Skiagram.

Natural size. — Adult 19 years of age.

Tafel 102.

Natürliche Grösse. — Schädel eines 19 Jährigen.

sfd sinus frontalis dexter, *sfs* sinus frontalis sinister.

Die Figur zeigt eine Röntgenaufnahme eines 19 Jahre alten Schädels. Die rechte Stirnhöhle (*sfd*) hat eine Ausbreitung in der vertikalen Richtung von 21 mm und in der horizontalen Richtung von 21 mm. Die linke Stirnhöhle (*sfs*) hat eine Ausdehnung in der vertikalen Richtung von 16 mm und in der horizontalen Richtung von 24 mm.

Planche 102.

Grandeur nature. — Crâne de 19 ans.

sfd sinus frontal droit, *sfs* sinus frontal gauche.

Figure montrant le radiogramme d'un crâne de 19 ans. Le sinus frontal droit (*sfd*) a une étendue de 21 millim. dans la direction verticale et de 21 millim. dans la direction horizontale. Le sinus frontal gauche (*sfs*) a une étendue de 16 millim. dans la direction verticale et de 24 millim. dans la direction horizontale.

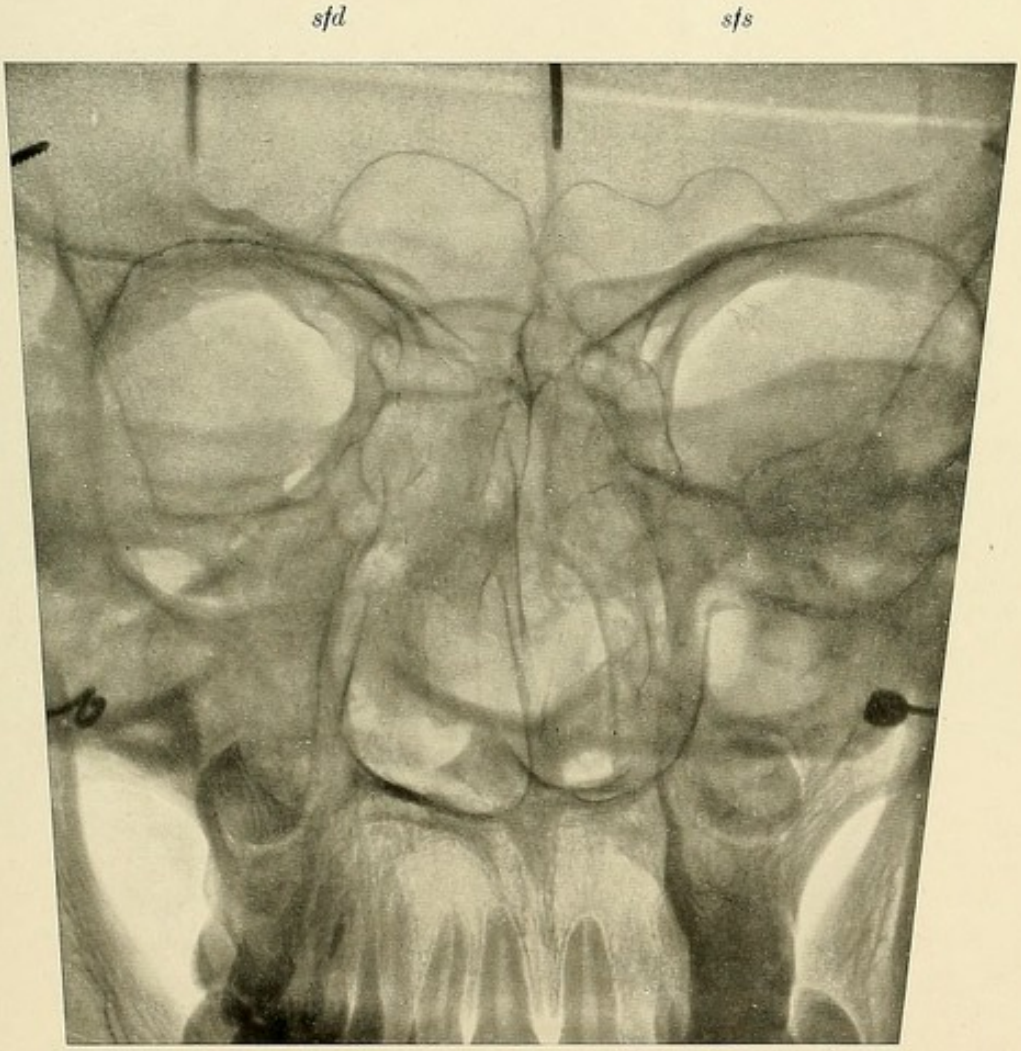
Plate 102.

Natural size. — Adult 19 years of age.

sfd right frontal sinus, *sfs* left frontal sinus.

The figure shews a skiagram of a skull at the age of 19. The right frontal sinus (*sfd*) measures 21 mm in the vertical and 21 mm in the horizontal direction. The left frontal sinus (*sfs*) measures 16 mm in the vertical and 24 mm in the horizontal direction.

Tafel 102.



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