for glass we have expressly investigated the possibility of thermical hysteresis on cooling to the lowest temperatures. In connection with what has been said in Comm. N°. 95*b* we fear that for the above treated difference an irregularity in the behaviour of the place of fusion of the glass points to the platinum bar has played a part, to prevent which further experiments ought to be made with still greater care. If what we now think probable, is verified, observations in which a difference as the one considered just now, manifests itself, should be rejected.

Besides the formula of the second degree for temperatures below 0°, we have also calculated a formula of the third degree

$$l_t = l_0 \left[(1 + \left\{ (a') \frac{t}{100} + (b') \left(\frac{t}{100}\right)^2 + (c') \left(\frac{t}{100}\right)^3 \right\} 10^{-6} \right]$$

for the expansion of platinum between —183° and +80° by the aid of BENOIT's observations from 0° to +80°, in which formula (a'), (b'), (c') refer to the length at the ordinary temperature immediately after the cooling.

The agreement of

Platinum	+ 80° — 183°	(a′)	**875.3**	BENOIT and KAMERLINGH ONNES and CLAY (1905)
		(b′)	**31.6**	
		(c′)	**—1.49**	
	+ 100° — 190°	(a′)	**874.9**	SCHEEL (1906)
		(b′)	**31.41**	
		(c′)	**—6.94**	

is pretty satisfactory. Substitution of SCHEEL's values for those of BENOIT would bring about only a slight change in the first group of coefficients.

Anatomy. — "*On the Development of the Corpus callosum in the human Brain.*" By Prof. J. W. LANGELAAN. (Communicated by Prof. T. PLACE).

The points that at this moment seem of interest in the history of the development of the corpus callosum have been clearly formulated by RETZIUS [1]) in the form of questions. Two of these are: 1. Where does the corpus callosum originate? 2. Of what

[1]) RETZIUS. Das Menschenhirn. Stockholm 1896. p. 6.

elements is it composed at its first appearance? The third question of RETZIUS has been amplified by ZUCKERKANDL [1]) and may be formulated as follows: what are the changes occurring in the mesial wall of the pallium in consequence of the development of the corpus callosum?

For the answering of the first question a human embryo of the beginning of the fourth month was at my disposal. The fronto-occipital diameter of the corpus callosum amounted to but 0 5 m.m. Figure I shows a frontal section through the more posterior part of the lamina terminalis.

The plane of section deviating a little from the frontal plane, that which is shown in the right part of the drawing is more frontally placed than that which is shown in the left part.

As appears from the drawing the corpus callosum lies in the *lamina terminalis*; especially on the left this is clearly evident, where the underborder of the pallium goes over into a taenia (*T*) which is bent in and passes over into the lamina terminalis (*L.t.*). The fact that the ependyma of the lamina terminalis, which is continued into the ependyma of the taenia, also spreads underneath the corpus callosum, obviates all doubt as to the existence of this relation If now the sections are examined more frontally, it will be seen, that the more frontal part of the corpus callosum no longer lies in the lamina terminalis. This part of the corpus callosum exceeds the limits of the lamina and is situated in the zone of union of the mesial walls of the pallium. This zone is built up of glia-tissue and in immediate continuity with the glia-layer covering the fore-side of the lamina terminalis.

On the ground of this observation I believe that the corpus callosum originates in the lamina terminalis, very soon, however, in consequence of the enlargement of the commissure, preponderantly in a frontal direction, it encroaches on the lamina and lies partially in the zone of union of the pallia.

Another embryo, of the middle of the fourth month, exhibits a corpus callosum with a maximum diameter of 2.5 m.m. Here the commissure is still entirely situated in front of the foramen Monroi. Figure II shows a frontal section through the more posterior part of the corpus callosum. In this section the corpus callosum (*C.c.*) lies most dorsally, laterally going over into the mesial wall of the pallium. In this wall, aside from the callosum, we find the fornix

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[1]) ZUCKERKANDL. Sitzb. K. Acad. der W. Math. Naturw. cl. Bd. CX. h. VIII. Wien 1901. p. 234.

(*F.*) which, in the mesial wall of the pallium, is not clearly distinguishable from the corpus callosum. Downwards, the fornix may be followed as far as the anterior commissure (*C.a.*). In the angle, where callosum and fornix meet, lies a bundle of fibres (*Ps.*) ventrally from the corpus callosum and coming from behind. This bundle crosses in the middle-line another bundle of the same kind coming from the opposite direction. This crossing-system is the fornix-commissure. More frontally this commissure is wanting and only the callosum and the fornix are present in the relation I just now described.

From the topographical relation of the corpus callosum to the fornix-commissure the deduction may be made that the more posterior part of the callosum is equivalent to the splenium. In the same way it follows from the relation of the callosum to the fornix-bundle that the more anterior part of the callosum corresponds with the genu of that structure. The origin of the corpus callosum therefore comprises the whole commissure, and consequently the growth of the corpus callosum does not take place by means of the apposition of new systems of fibres, but by an equable enlargement in correspondence with the growth of the pallium.

The most preponderant change in the structure of the mesial wall of the pallium at the place of origin of the callosum consists in the cortex-layer bending a little inward and ending with a sharp edge. The middle-layer of the wall of the pallium gets richer in nuclei; these nuclei surround the callosum and the fornix like a cap. Along the lower edge of the cortex-layer they penetrate into the marginal-zone of the wall of the pallium. By this process the marginal-zone disappears as a separate layer.

In the zone of union of the mesial walls of the pallium the changes in the structure of this wall are more considerable; the observation, that the most mesial bundles of the fornix pass through the glia-tissue of this zone of union, seems of importance here, as from this fact may be derived, that the re-constructed mesial wall of the pallium — the later septum lucidum — comprises more than the original mesial wall.

Fig. I.

Frontal section of the more posterior part of the lamina terminalis. Section 20 μ stained with haematoxylin and eosin. Enl. 16.5 diam.

C.a. Anterior commissure.
C.c. Corpus callosum.
C.ch. Corpus chorioideum.
L.t. Lamina terminalis.
L.tr. Lamina trapezoidea.
T. Taenia.

Prof. J. W. LANGELAAN. "On the Development of the Corpus callosum in the human Brain."

Fig. I.

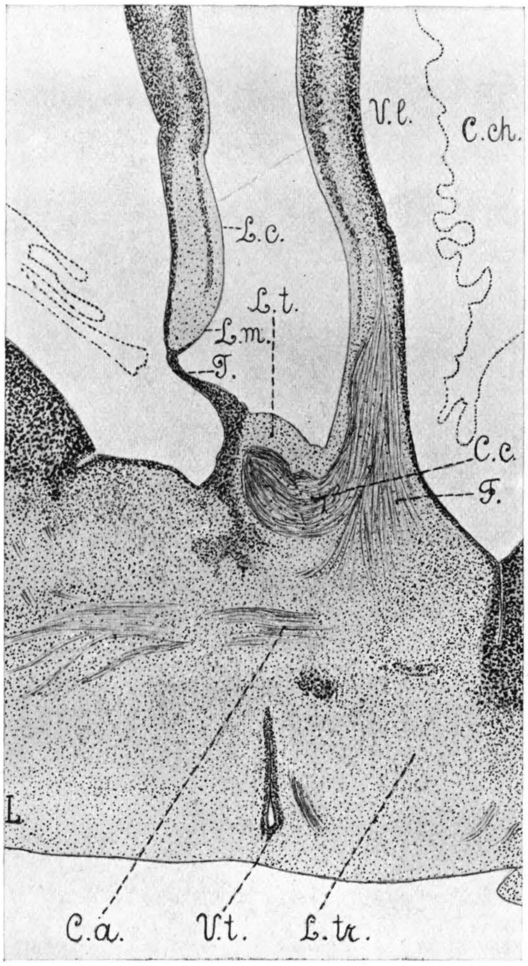
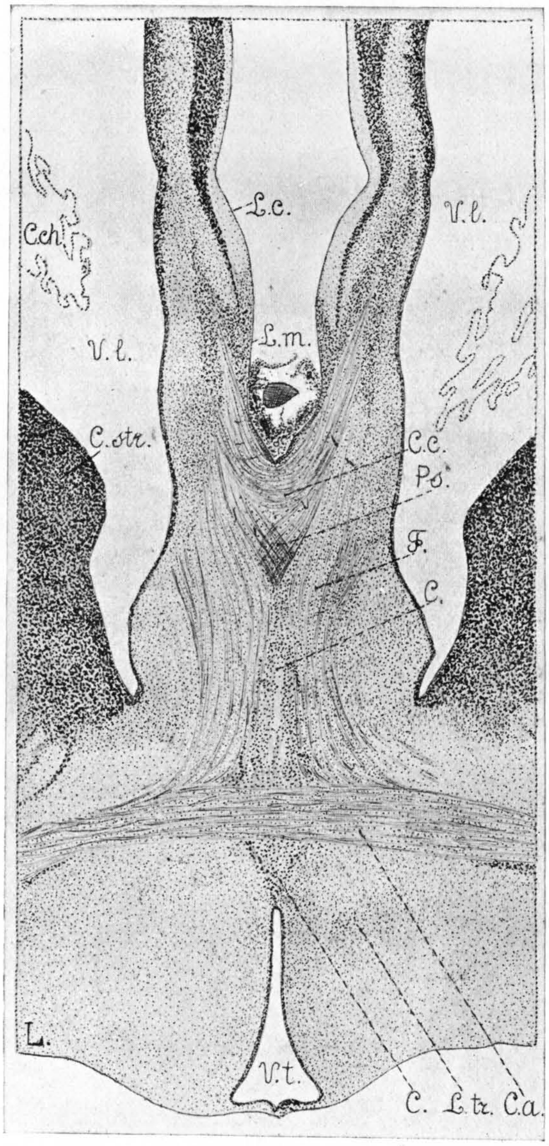


Fig. II.



Verslagen der Afdeeling Natuurk. Dl. XVI. A°. 1907/8.

F. Fornix.	*V.l.* Lateral ventricle.
L.c. Limbus corticalis.	*V.t.* Third ventricle.
L.m. Limbus medullaris.	

Fig. II.

Frontal section through the more posterior part of the corpus callosum. Section 15 μ stained with haematoxylin and eosin. Enl. 13 diam.

C. Zone of union of the pallia.	*L.c.* Limbus corticalis.
C.a. Anterior commissure.	*L.m.* Limbus medullaris.
C.c. Corpus callosum.	*L.tr.* Lamina trapezoidea.
C.ch. Corpus chorioideum.	*Ps.* Fornix commmissure.
C.str. Corpus striatum.	*V.l.* Lateral ventricle.
F. Fornix.	*V.t.* Third ventricle.

Mathematics. — "*On an infinite product, represented by a definite integral.*" By Prof. W. KAPTEYN.

The object of this paper is to write the infinite product

$$\prod_{s=0}^{\infty}\left(1+\frac{v^2}{(u+s)^2}\right)$$

in the form of a definite integral.

This product is connected with *mod.* $\Gamma(u+iv)$, for

$$mod.\quad \Gamma(u+iv)=\Gamma(u)\,.\,e^{-P(u,v)}\;(u>0)$$

where

$$P(u,v)=\frac{1}{2}\sum_{s=0}^{\infty} lg\left(1+\frac{v^2}{(u+s)^2}\right) \quad [1]$$

thus

$$mod.^2\quad \Gamma(u+iv)=\frac{\Gamma^2(u)}{\prod_{s=0}^{\infty}\left(1+\frac{v^2}{(u+s)^2}\right)}.$$

and

$$\prod_{s=0}^{\infty}\left(1+\frac{v^2}{(u+s)^2}\right)=\frac{\Gamma^2(u)}{mod^2\,\Gamma(u+iv)}.$$

To write the second member of this equation in the form of a definite integral, we start from WEIERSTRASS' definition

$$\frac{1}{\Gamma(z)}=\frac{1}{2\pi i}\int_W e^t\,t^{-z}\,dt$$

where the integral is taken along a curve W commencing at negative

[1]) Nielsen. Handbuch der Theorie der Gammafunctionen p. 23.