Ophthalmological Contributions.

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BY

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A CASE OF EPITHELIAL CANCER OF THE CONJUNCTIVA.

By Dr. JAS. CHAPMAN, of Medina, N. Y., and Dr. H. KNAPP.*

(With Figs. 1–6, Tab. VIII.)

Nathan Bancroft, aged 70 years, in March, 1873, while chopping wood, received a blow from a chip or splinter of wood on the sclerotic, a line or two from the outer and upper margin of the cornea. This injury was followed by some inflammation, which subsided without treatment.

In November, 1873, I first examined the diseased eye. There appeared to be a thickening of the conjunctiva and subconjunctival tissue, these textures having a plicated appearance, the folds extending around the corneal margin, and encroaching a little upon its substance. Mr. Bancroft stated that he first discovered the growth in the month of September preceding, and that it was then situated on the sclerotic, about a line outside the outer and upper part of the circumference of the cornea. He wanted my opinion as to the nature of the disease, and as I told him I was in doubt in regard to its pathology, and my prescription was to let it alone for a time, he consulted another surgeon. In January, 1873, I saw him at a meeting of the Orleans County Medical Society, to which he was presented by his medical attendant. The disease had extended somewhat, and now half, or nearly half, of the cornea had become opaque. The medical gentlemen present, while suspecting cancer, agreed that they had never seen a case resembling it, and gave a very undecided opinion. During the months of February and March his eye became very painful. His sufferings were apparently increased by applications of sulphate of copper in substance to the growth, and he changed his medical attendant and treatment. Dr. T., who now took charge of him, confined himself to the administration of opiates and the instillation of sedative drops. The pain however increased, and became almost intolerable; and on the 24th of May, 1873, I was invited by Dr. T. to visit him in consultation. The cornea had become completely opaque to external appearance. He could, however, discern the light

* The history is by Dr. Ch., the description of the specimen by Dr. K.

from a window with the diseased eye. A tumor about eight or nine lines in length, and three or four in breadth, extended around the outer and upper quarter of the corneal circumference. This tumor was elevated at its centre, above the surface of the globe, about a line, or a line and a half, and its color was a rusty, yellowish white. The conjunctiva was deep red and thickened, especially at the outer canthus. The pain was most severe in the temporal region, but was also acute in the globe, head, face, and neck of the affected side. The patient complained of a feeling that there was a stick in the eye, and could scarcely be convinced that a splinter of wood had not lodged in the globe at the time of the injury. His strength and flesh were greatly reduced.

It was decided to remove the globe and the diseased conjunctiva reflexa, which, on the 26th day of May, 1873, I proceeded to do, in the presence of Drs. Thayer and Clark, of this place. Chloroform was administered, but with complete anæsthesia syncope came on, and the symptoms were so threatening that the anæsthetic was abandoned, restoratives applied, and he rallied so that the operation could be commenced. An incision was made through the outer canthus, then the conjunctiva was incised all round the globe, leaving only the conjunctival covering of the palpebral cartilages and the caruncle intact. The muscles were then drawn out with a strabismus hook, and divided; and, lastly, the optic-nerve was severed. The lachrymal gland was drawn out and removed, and any diseased tissue in the orbital cavity excised.

The whole operation being done with the scissors, except the first incision through the outer canthus. The relief from pain was immediate; and he declared he had the best night's sleep, the night after the operation, that he ever had in his life. The wound healed well. His appetite returned; and when I saw him this morning, May 13th, 1874, he told me that his health had steadily improved ever since his eye was removed, his weight being now one hundred and eighty pounds, while one year ago it was only one hundred and forty pounds. I also examined the cavity from which the eye was removed, and could see no signs of any return of the disease. He declares that he has no pain in the orbit whatever. The wound is cicatrized, the upper lid falling a little over the lower one.

Anatomical Examination of the Specimen.—A small part of the cornea only, about one-sixth of its area, was unaffected; the remainder was whitish-yellow (yellow, from the staining with Müller's fluid), and greatly swollen. The surrounding conjunctiva, to the width of five to eight millimeters, was converted into a moderately dense substance of an uneven, granular surface. A meridional

section showed the inner parts of the eye healthy, and the inner face of the cornea and sclerotic smooth and unchanged. The transverse section of the sclerotic (Tab. VIII., Fig. 1, *s*) and of the small unaffected part of the cornea (Fig. 1, *c*) mentioned above were likewise unaltered; but the remainder of the cornea (Fig. 1, *d*) was thickened in consequence of the infiltration of the pseudoplasm into its substance, its outer surface (Fig. 1, *o*) being smooth and moderately bright. That part of the growth (Fig. 1, *b*) which surrounded the cornea was in some places loosely (Fig. 1, *l*), in others firmly (Fig. 1, *i*) connected with the sclerotic, and here the extension of the growth into the corneal substance could be directly traced. Where the tumor was largest it had seven millimeters in thickness, as is seen in Fig. 2, which represents the tumor (*t*) in a somewhat oblique section through the sclero-corneal junction and its vicinity.

The pseudoplasm consisted in all its parts of well-marked epithelial cells, which lay closely together without any intervening substance. The cells were mostly large, with large nuclei and distinct nucleoli. The cell-body frequently presented a finely striped appearance, the stripes running in a radiating direction (Fig. 3, *a*). The contour of these cells appeared serrated (Fig. 3, *b*), thus the cell-wall had a furrowed surface like a ribbed-shell (Fig. 3, *c*). In many places the epithelial cells were arranged in cone-like figures, in others they were seen in a state of proliferation; a number of nuclei were embedded in dotted protoplasma, which had no definite boundary lines; or two and more cells, with single and double nuclei, lay in oblong or roundish spaces, with distinct, mostly serrated boundary lines. These figures bore some resemblance to capsulated cartilage cells. In its structure, therefore, the growth had no distinguishing feature from the usual epithelial cancer. The serrated condition of the epithelial cells, which was so plain in the majority of preparations when examined with higher magnifying powers (Hartnack, No. 9 dry, or 12 immersion), may, perhaps, not prove a rare condition if closer attention be paid to the outline of the cells. See: Waldeyer, Virch. Arch., vol. 41 p. 470, etc.

The *origin* of the growth was, as far as we could judge, in the epithelial layer of the conjunctiva. Here a dense accumulation of cells indicated the hyperplasia of the original elementary parts.

The *propagation* of the pseudoplasm was by uninterrupted extension of epithelioid cells into the neighboring tissue. The subconjunctival cellular tissue had in many places preserved its fibrous character, but rows of epithelioid cells stretched from the growth between the fibre-bundles, evidence of the propagation of the pseudoplasm into the vicinity by unbroken strings of cells. The same mode of propagation could with the greatest distinction be demonstrated *in the cornea.* At the corneo-scleral juncture the cells, penetrating into the corneal substance, followed the tracks of the corneal canals, which they expanded and filled in a way similar to what we see in suppurative keratitis (Fig. 4, *a.*) The infiltration of the foreign elements could be readily recognized by their color, which was yellow, whereas the normal elementary parts of the cornea were white. The anterior epithelium (Fig. 4, *e*), Bowman's lamella (*b*), and the regular arrangement of the corneal corpuscles were preserved. A greater magnifying power showed that the cells (Fig. 5), which infiltrated the cornea, were epithelial cells. They were seen in small (Fig. 5, *b*) and large (Fig. 5, *c*,) clusters, and in long rows (Fig. 5, *a*). In many places (Fig. 5, *d*) the corneal corpuscles were dilated and contained two or more epithelioid cells, recognizable by their size and color. A greater magnifying power (Hartnack, immersion No. 12) showed even in these small clusters (Fig. 6) the enclosed cells with all the characteristic qualities of epithelial formations. Some of these cells (Fig. 6, *a*) exhibited the stripes in the cell-body as plainly as was noticed in the episcleral tumor. The corneal tissue, apart from this infiltration, was healthy. The inner structures of the eye had been removed from the specimen, but Dr. Chapman stated that they presented nothing unusual.

The case under consideration presents some features worthy of note :

1. *Its origin from an injury.*—Though a number of instances are on record in which tumors of different description, cancers included, have been the result of injuries, yet the authenticity of the casual connection between the injury and the growth has been doubted. Those who believe that cancer is a primarily constitutional disease, cannot admit that a trauma may be the cause of a cancerous growth, and they assume in such cases that the patient, when receiving the injury, suffered already from can-

cerous diathesis. *The successful operation of malignant intra-ocular growths (sarcomatous and encephaloid) by early enucleation of the eyeball, of which a limited number of well-authenticated cases is now on the records of science, is, I should think, convincing proof that in the initial stage a malignant growth may be a local affection.* If irritations of different kinds may produce in a certain locality cells with infectious properties that will sooner or later manifest themselves at some distance from the original focus and poison the whole organism, why should not an injury as well as cold or other causes occasion such an irritation as is necessary to produce cellular elements with infectious properties? I am under the impression that these views are supported by the authority of Virchow. In the case under consideration the injury had struck the conjunctiva scleroticæ, a place which is only rarely the seat of primary cancer. It was followed by inflammatory reaction, which soon subsided. Six months later the patient had first noticed that a growth had developed at the place of the former injury, and from that time the increase of the tumor had been steady.

2. *It was an instance of primary epithelial cancer of the conjunctiva, which is a rare disease.* The history states that the growth, when first noticed, was situated on the sclerotic, about a line from the corneal margin. This is its ordinary seat. The disease has in its first stage the appearance of a broad, flat phlyctenula, for which, in some instances, it has been mistaken. The literature on this subject, with abstracts of the cases, is to be found in A. CLASSEN'S paper: Ueber ein Cancroid der Cornea u. Sclera. Virch. Arch. L., p. 56; and in F. HORNER'S paper: Tumoren in der Umgebung des Auges. Klin. Monatsbl. f. Augenh., 1871, p. 1, etc.

3. *The extension of the neoplasm by uninterrupted rows of epithelial cells* could, in the case under observation, unusually well be demonstrated in the cornea. In a case by H. ALTHOF (Graefe's Archiv, X.), and another by B. SOCIN (Sarcoma conjunctivæ. Virch. Arch. LII. p. 550), a similar condition is described, namely, club-like, polypoid excrescences, extended, like the roots of a tree, between the lamellæ of the corneal tissue. No structure in the human body is so well adapted as the cornea to study the intrusion of foreign elements, since the elementary

parts of the normal condition display a well-known picture of an exquisitely regular arrangement. The foreign elements in the case before us were found in long, unbroken strings of cells, emanating from the episcleral growth, and in smaller or larger clusters, which, on their part, followed likewise the course of the corneal (lymphatic) canals. It seems most plausible that young cells travelled through these channels, and, multiplying, first filled and expanded the lacunæ (corpuscles) of the cornea, and after that their intermediate offsets. The hypothesis appears forced, that disseminate, isolated clusters, primarily formed in the neighborhood of the original growth, and by subsequent coalescence, produced the long and uninterrupted rows of cells.

No blood-vessels were recognizable in the infiltrated portion of the cornea. I mention this particularly, since Classen (l. c.) found blood-vessels in the tissue of the cornea and lymphoid cells in their vicinity. He thinks that these lymphoid cells are white blood-corpuscles, transuded through the walls of the vessels, and are converted into epithelioid cells, the elementary parts of cancer.

4. *The young elementary parts in the corneal portion of the tumor had the characteristic of the original pseudoplasm.* They were not indifferent lymphoid cells which we frequently find in growing sarcomata and alveolar cancers, but true epithelial cells. In the cornea of this specimen, therefore, we found no conversion of connective-tissue elements into cancer, but the immediate continuation of the proliferating epithelial cells of the conjunctiva. In some places of the conjunctival tumor, small, round, lymphoid cells were distinct and abundant enough.

TWO CASES OF RETINAL GLIOMA.

By H. KNAPP, M.D.

(With Figs. 7 and 8, Tab. VIII.)

Dr. E. Williams, of Cincinnati, to whom I am indebted for many a valuable pathological specimen, recently sent me again the histories of two cases of glioma retinæ, together with the enucleated eyeballs, the description of which shows some features worthy of being placed on record.

Case I.—— Bischof, æt. 12 years, slender in form and sallow of complexion, but in good health, was brought to me Feb. 21, 1874. One week before a playmate at school noticed a peculiar reflection from her left eye, and on trial it was found blind. She had had no inconvenience from it, nor knowledge of its condition till then. Nothing in the history of the patient throws any light upon the occurrence, or fixes its date. The associated movements of the irides were intact, but exclusion of the good eye showed a large and fixed pupil. The fundus presented the characteristic metallic lustre, rather red, like the color of copper. Numerous vessels could he seen traversing the surface of the fundus, but not having the regular distribution of the retinal vessels. The eye was absolutely free from all pain, redness, or other external alteration, and the tension normal.

The eye was enucleated by my partner, Dr. Ayres, in the usual way, great pains being taken to divide the optic nerve far back. Recovery was prompt, and there has never been the slightest trouble or suspicion of reproduction up to the present time (Aug. 10, 1874). We advised against the use of an artificial eye, not wishing to increase the risk of reproduction by any local irritation. I shall keep the patient under observation, and report any thing that may take place hereafter.

E. Williams.

Anatomical Examination of the Eyeball.—The globe, hardened in Müller's fluid, had its natural size, and presented no external anomaly. A meridional section (see Fig. 7, Tab. viii.) showed the retina totally detached and corrugated, passing like a cord

from the optic nerve to the posterior surface of the lens capsule, where it expanded laterally, and was attached to the posterior edge of the ciliary body. The parietal (external) surface of the corrugated retina, especially on its anterior part, was beset with a number of roundish elevations. The section-surface of the retinal cord was partially granular, partially striated, white, with some black patches. The front part, which extended transversely through the globe, could be readily detached from the ciliary processes and crystalline body. The tissue of the retina was replaced by a dense accumulation of small round cells, embedded in a granular matrix. The black patches consisted of the same cells, the majority of which, however, were pigmented. In addition to them, irregular pigment cells and pigment granules were seen in these patches. The nodular elevations on the external surface showed the ordinary glioma structure. A great part of their cellular elements originated in the pars ciliaris retinæ, and may be considered as hyperplastic formations of the granules normally interspersed between the radiating fibres of that membrane.

Two conditions were unusual in this case: 1st, *the age of the patient* (12 years) is more advanced than we commonly find in glioma of the retina; 2d, the greatest development of the pseudoplasm in the *anterior and ciliary parts* of the retina is also against the rule. The pigment patches, too, are not frequently seen in so great an extent as in this specimen. The pigment, in all probability, was the result of hemorrhage.

The *prognosis* in this case appears favorable, as the pseudoplasm did not seem to possess a great tendency to proliferate, and was limited to the retina. The comparatively advanced age of the patient may also be considered a favorable condition concerning a permanent recovery.

Case II.—B. S., a boy, æt. 4½ years, of reddish complexion, well developed and bright in intellect, came under Dr. E. Williams' care on March 6th, 1874. About two years previously the parents noticed a "white spot in the pupil" of one eye, which gradually enlarged, but entirely without pain. The physician called it cataract, and sight had been abolished for a year. About five weeks previously exophthalmus was first noticed, which increased rapidly to such a degree that the globe was

completely luxated, and the lids contracted behind it. The eye was tender, and the boy felt a good deal of pain in his bowels. The cornea, as far as it could be distinguished from the swollen and very vascular globe, was of a dark reddish-brown color, looking like a dry coagulum of blood. The diagnosis was glioma, extending along the optic nerve. As an only hope, Dr. W. advised and performed an immediate enucleation. The conjunctiva, very much thickened, was cut a little in front of the equator, easily detached by the scissors, and the eye enucleated in the usual way. The optic nerve was felt very much enlarged, and the pressure of the finger backward caused the rupture of the cornea and the escape of some brain-like substance. To avoid the further collapse of the eye, the nerve was divided a short distance behind the globe. The stump of the nerve was then isolated and cut off close to the optic foramen, where it was still large and lardaceous. The recovery from the operation was rapid; and three days afterwards the boy was taken to his home in the country, greatly relieved. The prognosis, of course, was hopeless: rapid and fatal reproduction being anticipated in a few weeks or months at most. I could find no evidence of tumors elsewhere, although the abdominal pain was suspicious.

From letters afterwards received from Drs. Weaver and Kindell, the following is a condensed report of the progress of the case. The boy was lively and doing well till April 1, when he grew peevish and fretful, complaining of a pain in the head, and vomited frequently. He had dysuria and persistent constipation. After these symptoms had lasted for two weeks, they noticed a growth in the orbit, which increased rapidly, and soon projected between the lids. By the first of June the tumor was as large as a hen's egg, of a dark-red color, with blood constantly oozing out, when not controlled by astringents. He died June 15. No post mortem was allowed. The body was very much emaciated. On palpation a tumor could be felt in the abdominal cavity, the size of a man's wrist, deep-seated and extending from the transverse colon to the iliac fossa. Three weeks before death he became blind in the right eye, the disease having then, no doubt, invaded the optic chiasm. The orbital tumor, removed after death, is round, lobulated, and about two inches in diameter in all directions. Microscopically examined by Dr. A. D. Bender, of this city, it was pronounced "glioma-sarcoma."

Anatomical Examination.—The eyeball, of which the figure 8, Tab. viii., gives an illustration in natural size, had the shape of a goblet, and presented a number of roundish protrusions in the ciliary region, where the slcerotic was thinned, but not perforated. The cornea had sloughed away, and through the aperture protruded the soft, brain-like substance with which the whole globe was filled. On the posterior part of the sclerotic some soft tumors were seen, which partially surrounded the thickened optic nerve, but were in no connection with it. On careful dissection a place was found in which, by way of a short pedicle, the episcleral tumor communicated with the intra-ocular growth. On this place the sclerotic was thinned and macerated, yielding readily to a probe, but offering resistance enough to show that many fibres were preserved. The growth here made its exit from the globe by forcing its way through the interlamellar spaces of the sclerotic. The pseudoplasm had the structure of glioma in all its parts. The thickened optic nerve was densely filled with small cells, the nervous fibres being mostly replaced by the pseudoplasm.

This eyeball presented a marked specimen of the third stage of glioma in which the growth, enlarging and perforating the globe, extends into the orbit and the cranial cavity. Besides the usual place of perforation, there was one in the posterior part of the sclerotic, showing, even microscopically, the direct connection between the intra-ocular and orbital portions of the pseudoplasm. The ciliary staphylomata also were not without interest, demonstrating that not only an excess of fluid contents, as in hydrophthalmus, but a neoplasm when filling the globe, overcomes the resistance of the sclero-corneal capsule by preference in the ciliary region.

A CASE OF NEURO-RETINITIS RESULTING FROM A GUMMY TUMOR OF THE DURA MATER.

By H. KNAPP, M.D.

RETINITIS in syphilitic persons has mostly no peculiar features distinguishing it from retinitis produced by other causes than lues. Two conditions, however, may be mentioned as being, in the great majority of cases, of syphilitic origin: 1st, irregular white stripes radiating from the papilla optica in the course of the blood-vessels being sometimes flat, sometimes considerably raised over the level of the retina; 2d, small, roundish, white patches, of fatty appearance, dispersed in some cases over the whole retina, in others limited to certain places in which they are so densely crowded as to resemble a piece of mosaic work. In the region of the yellow spot and its surroundings I have seen striking pictures of this second condition, which is totally different from the well-known radiating figures so frequently witnessed in this region in cases of Bright's disease and neuro-retinitis, the consequence of morbid processes in the orbital or cranial cavities.

In the following case, which came under my care in Charity Hospital two weeks before the fatal issue, the retina showed the ordinary picture of neuro-retinitis passing into atrophy of the optic nerves. The arteries were small and straight, the veins thickened and somewhat tortuous, the optic discs whiter than usual, their choroidal borders irregular. No other abnormity was found in the fundus oculi, though the examination was made in remembrance of the distinct history of syphilis obtained from the patient. Her death occurred unexpectedly, and I am sorry that I was not informed of it in time to witness the autopsy and prevent the eyes from being buried. The brain, however, which was preserved for me intact, showed so conspicuous a lesion that its examination rendered the case both interesting and instructive. For the clinical history of the disease I am indebted to Dr A. M.

PIERCE, at the time resident physician to Charity Hospital, N. Y.

Eliza Ring, aged 32 years, native of Ireland, married, occupation domestic, has been in the hospital several times for treatment. Eleven years ago she had a sore on her vulva, which was followed in due course of time by the secondary and tertiary lesions of syphilis. Two and a half years ago a small tumor appeared on the centre of the frontal bone. It had reached the size of a hen's egg, and was hard and immovable when she came into the hospital, May 30th, 1873. It disappeared under the influence of iodide of potassium.

Nov. 5th.—Patient again admitted to the hospital. During the last four or five months she has had a *constant headache.* While in the hospital she had several *epileptiform convulsions* and notable *exophthalmus* with impairment of sight in both eyes. Under treatment she got better and was discharged.

Jan. 28th, 1874.—Patient again enters the hospital. The exophthalmus has nearly disappeared, but she still complains of dimness of vision and pain in her head, which is generally constant and worse at night.

The examination with the ophthalmoscope revealed the ordinary features of neuro-retinitis, with commencing atrophy of the optic nerve in both eyes. Two hours before her death, which occurred February 18th, she had an epileptiform convulsion, which was followed by coma, and in this condition she remained until death.

Sixteen hours after death the autopsy was made by Dr. Drake, who in substance entered the following notes into the post-mortem book :

Body medium size, well developed, and well nourished. Œdema of the legs.

Head. At the anterior portion of the anterior lobe of the left hemisphere was a large gummy tumor (see subsequent figure) of the dura mater extending into the brain substance. The brain substance (*m*) surrounding the tumor was softened, as far backward as the posterior lobe. At the most anterior portion it was almost fluid. The left ventricle was dilated, filled with fluid, and its floor softened. The veins on the left side were greatly distended.

Thorax. Heart hypertrophied and dilated. The aorta was atheromatous.

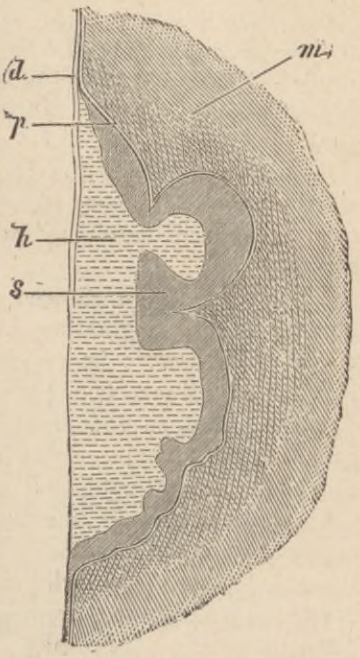
Lungs. Both lungs greatly congested and œdematous.

Abdomen: Liver enlarged, congested and slightly waxy, exhibiting the characteristic coloration with the iodine test.

Spleen soft.

Kidneys in the first stage of acute parenchymatous inflammation.

Minute examination of the Brain.—The right hemisphere, the posterior lobe of the left, the cerebellum and the medulla oblongata showed no abnormity, the middle lobe of the left hemisphere was softened and white, showing no other alteration than the simple decay of the brain-substance by maceration, most advanced in the vicinity of the pseudoplasm. The meninges were normal, except on the front part of the left anterior lobe where the parietal surface of the dura mater was rough and reddish in a space two inches in the antero-posterior diameter, and one inch and a half in the transverse. In the same place the dura was inseparably united to a tumor (see accompanying figure) which was nodular and penetrated into the brain-substance. On careful dissection the pia mater (*p* in the figure) was found unchanged; it lined the surface of the tumor, and could be detached from it. At the periphery it was united to the dura, but lay loose over the nodules of the pseudoplasm, and dipped into the depressions between its larger nodes. On incision the tumor was found in intimate connection with the dura (*d*). Its larger portion (*h*), which sprang from the dura, was yellowish-white, opaque and hardish like fibro-cartilage, whereas the peripheric portion (*s*) was transparent, hyaline, and softer than the central portion which it lined in a nearly uniform thickness of three millimeters.



The *microscope* revealed in the outer, gum-like layer, an accumulation of small cells embedded in a moderate quantity of homogeneous basis-substance. The majority of the cells were round, and had large nuclei surrounded by a thin, but conspicuous layer of protoplasm.

Some of the cells had one or two short offsets, others were elongated. There was in this layer a moderate amount of fat granules between the cells and within them, as well as a good supply of blood-vessels. The yellowish-white, hard portion consisted of the same kind of cells that were found in the softer layer, but, in addition, of a considerable quantity of spindle-shaped cells, which in some places lay densely together, in others were sparsely scattered through the round cells. Here and there was a net work of anastomosing stellate cells. The matrix of this harder portion of the tumor was likewise homogeneous or finely granular, but less abundant than in the soft layer. The cells and matrix of the hard portion were distinguished by a large quantity of granular fat. In some places the cells had disappeared to such a degree under the fatty degeneration as to make the structure of the tumor appear to be a granular, fatty, amorphous substance. There were many blood-vessels in this portion also.

The outer layers of the dura mater were unchanged, the inner were separated by rows of small cells which passed over into the pseudoplasm without the interposition of any other tissue-elements.

This examination showed clearly that the neoplasm was a gummy tumor originating in the visceral surface of the dura mater. It answers in every respect to the classical description R. Virchow gives of it in his work on morbid growths, vol. II., p. 449, etc. It is an uncommonly large specimen of its kind. The softening of the adjacent parts of the brain (*m* in the figure) is a usual concomitant symptom of gummy tumors of the meninges.

Ophthalmologically this case is of importance, adding another example to those in which a tumor, remote from the cavernous sinuses, produced the well-known picture of neuro-retinitis in both eyes. The substance, meninges, and nerves of the base of the brain, showed no abnormity. Though the left ventricle was distended and the veins of the left side were greatly dilated, the neuro-retinitis was of the same kind and degree on both sides. This is not always the case, as we frequently find that eye most affected which corresponds to the diseased hemisphere. The eyes having not been preserved, the case throws no light on the question as to whether neuro-retinitis owes its origin to increased

intracranial pressure, or to the propagation of fluid exudation through the subvaginal space of the optic nerve. The prominent clinical symptom was the constant headache. Upon it, the neuro-retinitis, the epileptiform seizures, and the pronounced history of tertiary syphilis, the diagnosis of gummy tumor in the cranium was based, a diagnosis which had been made prior to the patient's death.

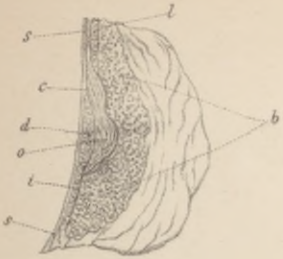


Fig. 1. 1/1.

Fig. 2. 1/1.

Fig. 3. 600/1

Fig. 7.

Fig. 6. 600/1

Fig. 4. 30/1

Fig. 5.
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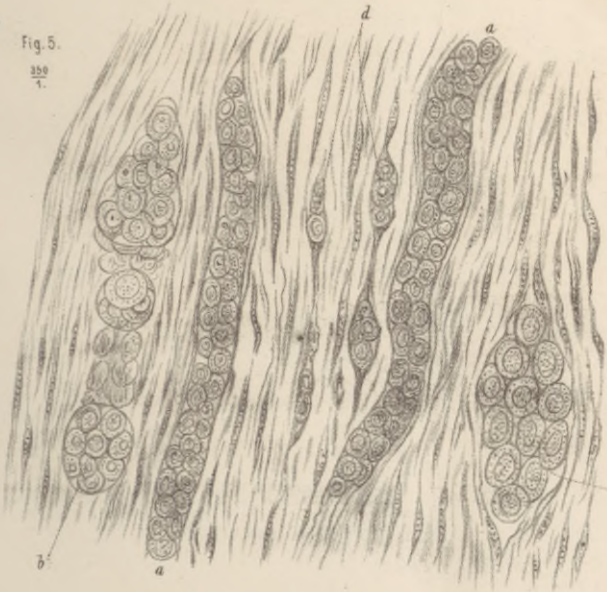
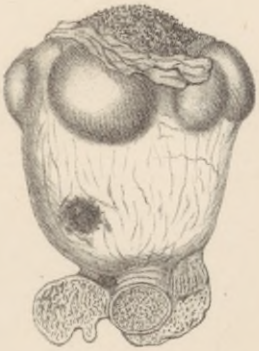


Fig. 8.



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