Randall (B. Alex)

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THE "HOHLSCHNITT" OF VON JAEGER IN THE EXTRACTION OF CATARACT.

As conversation with a number of ophthalmic surgeons, even men who had studied with von Jaeger, has shown many of them to be practically unacquainted with the advantages of his method of operation, and since the published account of that operation contains misprints that render it unlikely that its value will be appreciated by those who read it, it has seemed not amiss at this time and place to venture a word upon an important and neglected matter. Von Jaeger's paper, "Der Hohlschnitt, eine neue Staar-Extractions-Methode," Vienna, 1873, contains general discussions which rather encumber his subject-matter; claims which may seem unfounded; descriptions of instruments unessential to the operation and of doubtful value; and blunders as to the details of the operation, which as they stand, would deservedly condemn the whole. The cardinal point in the matter, which lies *not* in the "Hohlschnitt," but in the *Hohlschnitt knife*, is so obscured that I have known men to supply themselves with his whole set of instruments, only excepting the essentials, the knives.

Waving theoretical considerations, let us look for an instant at the usual modern incision for cataract-extraction—its aims, its methods, and its dangers—and see what advantages are offered for its performance with the knife of Jaeger.

If we accept v. Arlt's section of the normal eye and his description of the modified Graefe extraction as the bases of our consideration of the subject, we will find in the diagram (Fig. I.) a graphic presentation of what most men set before themselves as the ideal incision. Puncture and counter-puncture 12 mm. apart and 2 mm. below the upper margin of clear

cornea, and the emergence of the knife at that margin, give a wound not very far from linear, *i. e.* lying in a great circle of the cornea, and having an outside length of about 13 mm. Begun with the plane of the knife parallel to the plane of the iris, the incision must be curved forward by the rotation of the edge of the knife as the section is carried upward towards the

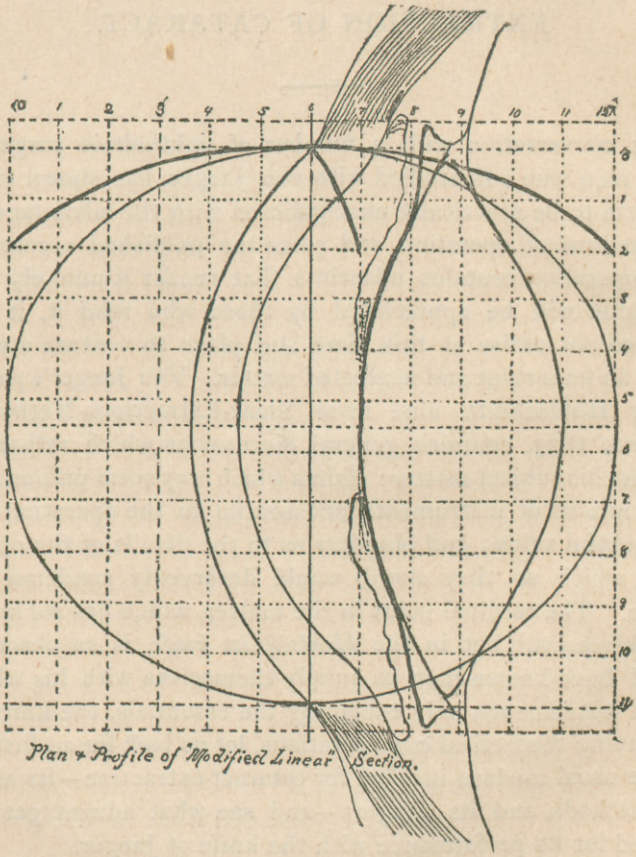

FIG. I.

corneo-scleral junction; and, viewed in profile, the resulting wound is curved with its concavity forward. While this curving forward of the cut is not always achieved by a distinct turning of the edge of the knife, it is practically universal,

since the upward drag of the knife-edge changes the relation of the eye and the plane of the iris to the plane of the knife. The "Hohlschnitt," *i. e.* the curved section, is therefore the usual incision.

The construction of the Graefe knife permits of puncture and counter-puncture without any loss of aqueous; but, with the first movement towards the division of the bridge of tissue which remains to be severed, begins the draining away of this fluid, the pressing forward of the iris, and the diminution of the tension of the eyeball. A skilful hand can generally keep the knife-edge free of the iris, and can mitigate the violence done to the eye as the sawing section drags upon the flaccid cornea, stretched between the fixation forceps below and the knife above. The zonula will stand a good deal, and only occasionally ruptures, and thus early in the operation permits loss of vitreous. But these are variations in degree, not in kind, and the most skilful operator will not always escape awkward complications. Could he complete his incision without loss of aqueous, not only would it be impossible for the iris to engage the properly placed knife-edge, but the tension of the eyeball, maintained by the retention of the humor and increased by the addition of the knife-blade to its normal contents, would permit a smoother, cleaner section, which, like that of a lance knife, may always be expected to heal more kindly than a rougher one. Further, could the fixation of the globe be made largely or exclusively at the points of puncture and counter-puncture, close to where the incision is being completed, the drag upon the eye would be reduced to that incidental to the friction of the knife in the wound.

It is needless to urge that these advantages cannot be gained with the Graefe knife, but it is important to call attention to the fact that they are all most readily attained with the knife of von Jaeger (Fig. II.). A triangular knife, narrower than that of Beer, and curved on the flat with its concavity forward, will fulfil all the indications laid down by Arlt, while meeting the requirements for the perfecting of the incision. Increasing in size from point to heel, it always fills the wound; curved on the flat, it cuts forward as well as upward as it advances; and

the incision, begun parallel to the plane of the iris and as far back as the operator may prefer, may be brought out at any desired point inside or outside of the limbus, without any of that rotation of the blade needed for the Graefe, but impossible with so broad a knife. Further, the knife is a wedge, and the upward pressure of its edge is met by the counter-pressure of its rounded back, resting in the angles of the wound; and fixation of the eye by forceps is needed only to meet the forward pressure of the knife. Jaeger himself released the hold of his forceps after making his counter-puncture, and completed his cut without other fixation than that afforded by the knife itself.

In this connection the photomicrograph (Fig. 3, Pl. I.) of a section of an eye thus operated on by von Jaeger himself, will doubtless be of interest. It was removed about a year after the extraction, and through the kindness of Dr. F. Dimmer I had the opportunity of cutting it in the Laboratory of Prof. von Arlt, in 1883. The smoothness of the incision is evidenced by the perfection of the healing.

The point, therefore, of these remarks is to show that the "Hohlschnitt" of von Jaeger as I saw him perform it, and as I have since done it, does not essentially differ in any appreciable degree from the modified von Graefe incision now usually adopted; but that made with his knife it can be more perfect than is possible with the Graefe knife, however modified, and with the avoidance of many of the dangers which no skill can wholly separate from the use of the narrower knife. That the manipulation of the Jaeger knife is confessedly rather more difficult and nice than that of the Graefe—that the incision must be rightly begun or it cannot possibly be carried through to a satisfactorily result (as the Graefe sometimes

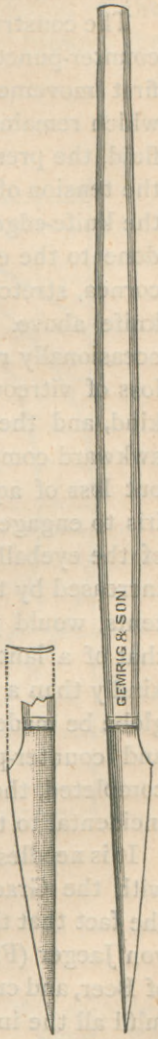

FIG. II.

may after a false start)—these points should surely militate most against an operator of small experience like myself, and be trivial to other members of this Society when weighed against great and manifest advantages.

CILIO-RETINAL OR ABERRANT VESSELS.

The importance of the fact that the retinal vessels constitute as a rule a separate and independent system without anastomoses—a terminal system—has been often urged in its bearing upon the nutrition of that membrane in derangements of its blood-channels; and the occurrence of exceptions to this rule has been noted, especially by Nettleship[1] and Schleich,[2] with delineations of a number of instances; while the suggestion of the value of such anastomosis in case of embolism or thrombosis of the central vessels has been realized in the case reported by Benson.[3] Few cases of such vessels have been examined microscopically;[4] and Loring,[5] while citing cases of aberrant vessels that seemed to communicate with the choroidal vessels, states that such a communication has never been reported as actually observed with the ophthalmoscope in the normal eye. Further, most writers agree in stating that cilio-retinal vessels are rare, are almost invariably of small size, without notable branching, and almost without exception pass only to the macular region. As sketches of a considerable

[1] Royal London Ophth. Hospital Reports, IX. 2, p. 161.
[2] Mittheilungen aus d. oph. Klinik in Tübingen, I. 1. p. 131.
[3] "On a case of embolism of the central artery of the retina, modified by the presence of a cilio-retinal artery." Ophth. Hosp. Reports, X. p. 336.
[4] H. Müller A. f. O. IV. 2, p. 10; Nettleship, Ophth. Hosp. Reports, IX. 2, p. 161; Birnbacher, Arch. of Ophth. Mar., '87, p. 32.
[5] Text Book of Ophthalmoscopy, p. 104.

number of aberrant vessels are in the writer's portfolio, many of them conflicting with the above statements, it seems worth while to bring some of the more notable to the attention of the Society.

It may at first be remarked that most of the two dozen sketches in hand show the anomaly in a marked form, only the instances of strikingly large or otherwise peculiar vessels having been noted; and that they represent but a small fraction of the cases observed, since about one eye in every five examined shows some form of the condition in question. Only the striking instances, therefore, can be said to be rare. The vessels are more often small; but instances are not wanting where they are as large as the temporal veins or arteries or replace them, and where they branch conspicuously like the central vessels; and they may not only belong to other regions than that of the macula, but may even give branches to two different quadrants. So too as to their origin. Most of them doubtless arise from the short ciliaries directly, and pass either through the choroid ring or around its edge, without communication with the choroidal network; but others can be traced directly into the choroidal circulation. Such vessels can generally be seen most conspicuously, but their deeper course rarely determined, in the broad absorbing crescent of myopia; and their almost invariable occurrence in cases of the congenital *underlying conus* has been noted; but the cases here given had almost invariably hypermetropic refraction, and the eyes rarely presented any other noteworthy anomaly.

In Fig. 1 is shown the left eye of James K., thirty years of age, the coachman of Dr. Risley, by whose kind permission the sketch is used. The upper temporal vein[1] is seen to pass down nearly to the centre of the disc, where it is joined by a large macular vein and turns directly out into the choroid, in which it can be followed for a half disc-diameter. Its direct communication with the choroidal vessels is not visible, and can

[1] My original sketch shows this as an artery; but a note written upon it later, that the vessel is a vein, induced me to alter the drawing. Dr. Risley has since seen the case, and verifies the original sketch—too late, however, to enable me to correct the blunder.

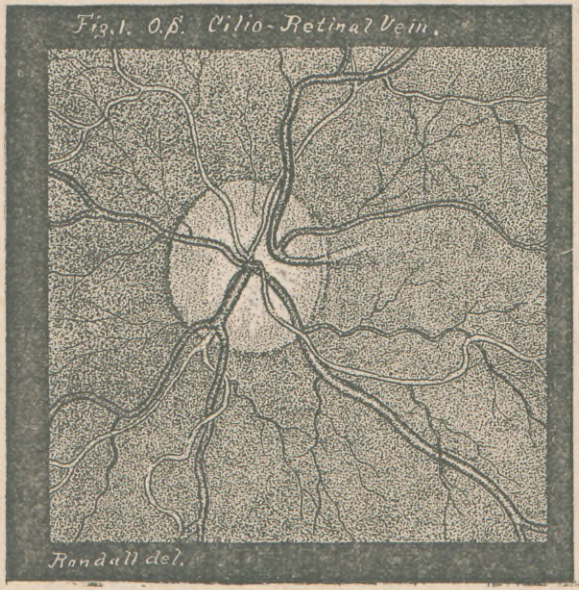
Fig. 1. O.S. Cilio-Retinal Vein.
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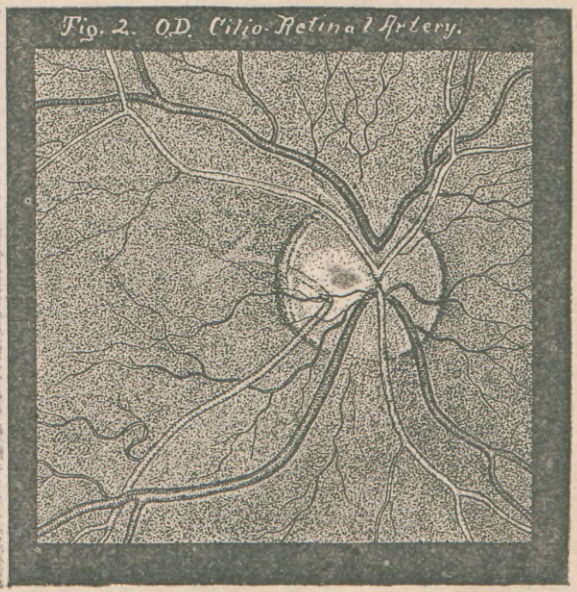
Fig. 2. O.D. Cilio-Retinal Artery.

only be inferred from its remaining upon their level as far as it can be traced. The refraction is hypermetropic astigmatism corrected by + 1 D. cyl. ax. 90°.

The other eye presented three small aberrant vessels rising through the edge of the disc.

In Fig. 2, representing the right eye of Emil A. M., aged thirty, with very low H. As., a large artery, springing from a choroidal vessel to the outer side of the disc, passes in through the head of the nerve and rises in the *porus* to become the lower temporal artery. The retina is striated and the smaller vessels tortuous; but there are no other notable abnormalities in either eye. The choroidal origin of this artery, though difficult to depict, is absolutely unmistakable.

Fig. 3 represents the right eye of Dr. T., aged sixty. The disc is rather small, round, and with absorbing crescents to both inner and outer sides; the retina is striated and the choroid disturbed in the periphery. H = .75. An artery as large as the upper temporal passes upon the disc from its temporal margin nearly to its centre, then curves downward and branching just before reaching the margin, gives one of its nearly equal branches to the upper macular region. The other passes down and out as the lower temporal artery, supplemented by a slightly smaller branch from the central artery.

In Fig. 4 is shown the right eye of Thos. S., aged twenty-five, where an aberrant artery of about the "third magnitude," after passing in upon the disc at its *nasal* side, bends outward with the usual curve, and branching just beyond the nerve margin goes to the lower and the upper median nasal sectors of the retina. The disc shows deep central excavation, and beyond the outer margin an irregular crescent of pigment absorption.

In Fig. 5, the left eye of Michael M., aged forty, is seen a large aberrant artery, arising at the lower outer margin of the disc at the edge of an *underlying conus*, and branching, after it has passed a half disc-diameter toward the macula, to be distributed to the upper and lower median retina. The lower branch is the larger, and after passing below the macula, again branches conspicuously. The disc presents a deep central

Fig. 3. Hohlschnitt Extraction done by V. Jaeger. x20.

Fig. 2. Cilio-Retinal Artery. x20.

Fig. 1. Sarcoma of Eyelid—vertical. x9 diam.

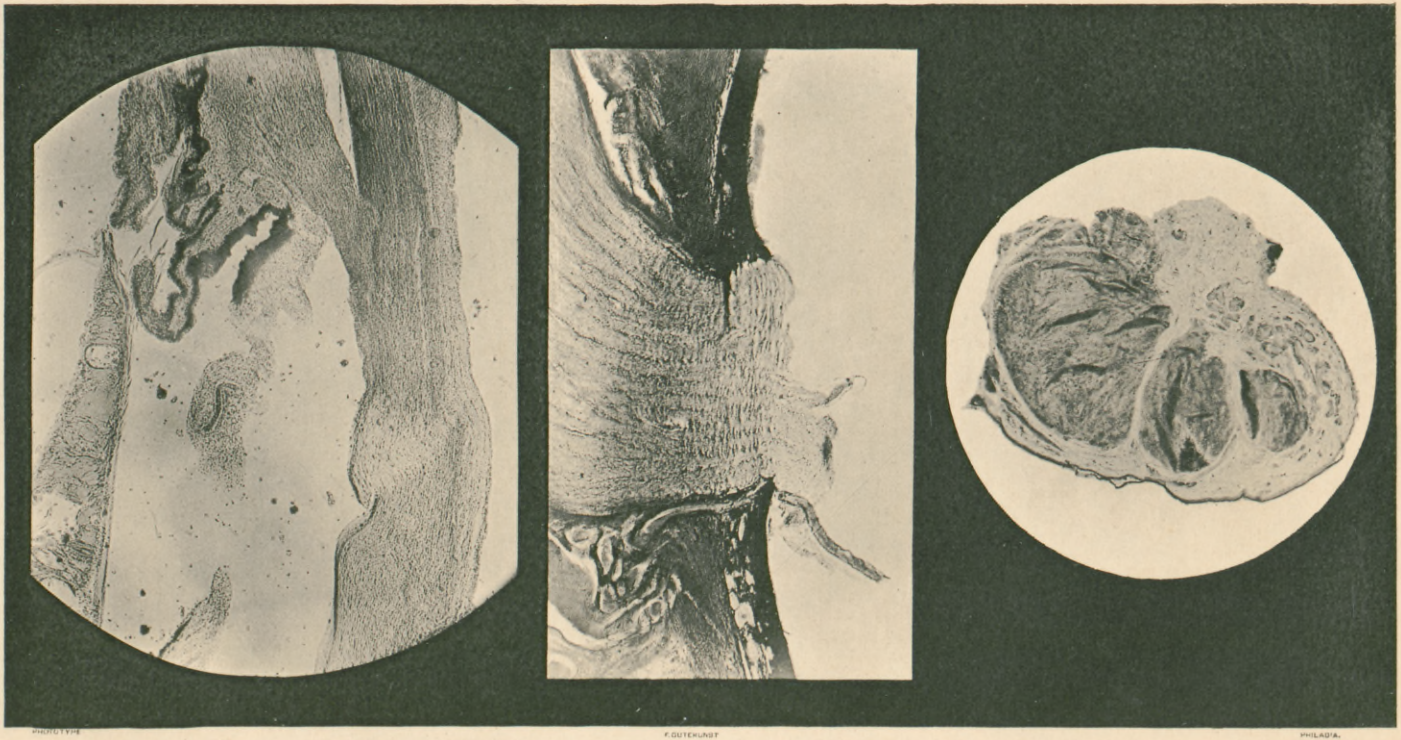

PLATE I.

PHOTOTYPE F. GUTEKUNST PHILAD'A.


Fig. 3. Right Eye
Fig. 4. Right Eye
Fig. 6. Right Eye.
Fig. 5. Left Eye.
Fig. 7. Right Eye.
Fig. 8. Left Eye.
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excavation, with the central vessels at its upper nasal edge, and is surrounded by a dark choroid ring, showing slight absorption out. The eye seems emmetropic.

Fig. 6, representing the right eye of John L., aged twenty, shows a large vein, apparently entering the choroid beyond the lower temporal margin of the disc, after passing in above the macula, from the upper temporal quadrant. There is a shelving excavation reaching nearly to the outer edge of the disc. The other eye presents an aberrant artery at the outer upper margin.

In Fig. 7, the right eye of Mrs. Kate K., aged thirty-two, an aberrant artery arises through the substance of the disc in the upper outer quadrant, to pass out above the macula. Below this a larger artery, which enters upon the disc from its outer margin, passes first down and then out with curious rectangular bends to become one of the lower temporal arteries. The disc is oval, its long axis at 75°, with a crescent out; and the refraction error was corrected by + 1. D. sph. ⌒ + .5 cyl. ax. 75°.

In Fig. 8, the left eye of Kate B., aged twenty-four, the optic disc is slightly horizontally oval, with a deep excavation shelving to its outer margin. There is a dark pigment crescent both to the inner and outer side, the latter showing some absorption. From beneath the centre of the outer crescent an aberrant artery arises, and apparently dividing just as it comes into view, abruptly sends one branch nearly directly outward; while the larger portion, winding in and then down and out through the excavation, passes to the lower temporal retina. In a closely similar case, not figured, the two vessels are in contact, and apparently united at the disc margin; but one curves up and the other downward to pass out into the retina widely separated.

A number of other less notable examples of aberrant vessels might be adduced;[1] but the foregoing seem abundant to prove that such vessels may occasionally be seen in direct com-

[1] Also cases, like that of Loring, where a large retinal vessel arises in the choroid and traverses the broad myopic crescent to gain the disc; or where in patches of choroiditis at a distance from the disc, direct communication is visible between retinal and choroidal vessels.

munication with the choroidal circulation; that they may arise at the nasal as well as at the temporal disc-margin; that they may branch as conspicuously as the central vessels; and that these branches may pass to widely separated areas of the retina.

Through the kindness of Prof. Norris I have the opportunity of placing upon record one more case of cilio-retinal vessel studied under the microscope; and in Fig. 2 of Pl. I. illustrate one of the sections in his collection. The vessel, which study of this and other cuts prove to be an artery, is seen to pass in from one of the short ciliaries close to the sheath of the nerve and to rise *through* the choroidal ring and enter the retina. Injection of the vessels had been attempted before the eyeball was removed and the choroidal network is filled. The nerve is evidently œdematous and infiltrated—in the earlier stages of optic neuritis; but the notes of the case have been mislaid. The point has been raised as to Nettleship's case, and has the same bearing here, that in view of the presence of neuritis the vessel cannot be held to have pre-existed—a criticism that would have more weight had such a vessel ever been observed to form in any one of the thousands of cases of choked disc which have been watched with the ophthalmoscope through all stages of their progress.

SARCOMA OF THE EYELID, SIMULATING A MEIBOMIAN CYST.

As a glance over ophthalmic literature shows few published cases having similarity to the following, and as its character was such that a mistake in diagnosis and treatment was very easy, it seems worth while to put this single case upon record, although its history is still incomplete.

John L., aged 41, visited the eye clinic of the Episcopal Hospital on July 22d, 1884, because of a small recurrent tumor near the margin of the right lower eye-lid, at the junction of the middle and outer thirds. It had been "removed"[1] by my predecessor in 1881, and again two years later at another Dispensary—each time being called "a cyst." It had now been present three or four months, increasing in size more rapidly of late. It was a smooth, rounded mass, as large as the half of a very large pea, situated in the substance of the lid, of yellow color, *obscurely fluctuating*, and presenting most of the characteristics of a Meibomian cyst. The conjunctiva was not involved; but the skin covering the growth was thinned, glazed, and not normally movable:[2] while one or two dark dilated veins were visible upon it, and a greyish tint, vaguely seen through the skin, arrested attention and suggested pigmentation. There was no glandular involvement or other suggestion of metastasis.

Thorough removal was advised; and was executed by a V-shaped incision through all the tissues of the lid. The wound margins were united by three deep silk sutures, leaving very little deformity in spite of the removal of full one centimetre of the lid-margin. The healing was kind; but with some nodular thickening not due to the sutures. He was informed of the nature of the growth at his visit one week after the operation, and directed to return in a month; but failed to do so.

The growth was cut with the freezing microtome, a few hours after its removal; and after staining in logwood, the sections were mounted and studied in glycerine. It was found to be solid, and to consist of four rounded nodules, sharply defined, and but little flattened by mutual pressure (Fig. 1, Pl. I.). The surrounding tissues seemed free from infiltration, except for small round cells only sparingly present and marking an encapsulation of the tumor; and the muscular bundles were merely pressed aside. The skin was thin, but not otherwise abnormal; the conjunctiva thick and

[1] Perhaps only incised and scraped.
[2] One if not both of the operations had been done through the skin.

with marked papillæ at the fornix. The tarsus was not involved, and in all sections examined showed normal Meibomian glands. The nodules themselves were composed of the large spindles of the typical large spindle-cell sarcoma. There was only one minute point of marked pigmentation, barely visible with the unaided eye; but some faint brownish pigment was scattered through the nodules. The growth extended from near the lid-margin downward through the entire extent of the sections, which showed little or no normal tissue below the lowest nodule, although the whole of this seems to have been removed.

The history given might suggest that we have here had to do with a sarcoma arising in a Meibomian cyst, as in a case reported by Samelson[1]; but the presence of a normal tarsus with healthy Meibomian glands in all the sections would indicate the contrary, and render it more probable that the tumor was sarcomatous from the first. In such a case it was noteworthy that a sarcoma, recurring after two removals, should be practically encapsuled, as was the case in the patient of v. Hippel,[2] and probably too in the successfully extirpated case reported by Aguilar.[3] As to the macroscopic appearances of the condition, it may be stated that the case had been set down as a recurrent chalazion by my assistants; and that only when the microscope had proved the correctness of my diagnosis, could I throw off the feeling that I had subjected the eyelid to an unnecessary mutilation—so little did the growth differ from an ordinary chalazion.

The patient returned on March 22d, 1887, with a recurrence which had been treated for months by a competent oculist with ung. hydrarg. ox. flav. The growth was now larger than before, and with a granulation mass on the conjunctival surface. The skin was thin and white over the conical outer portion of the tumor, but normally movable. Almost the entire outer half of the eye-lid was involved, but there was still no glandular complication. The growth was removed on

[1] British Medical Journal, II. p. 706.
[2] Bericht über d. Univ. Klinik zu Giessen, 1879–81.
[3] Recueil d'Ophthal., p. 620, 1882.

March 25th, by a V-shaped incision carried through tissues apparently perfectly healthy. The outer half of the lid was removed, and its place supplied by a quadrangular flap from beyond the outer canthus. The healing was prompt, but with some deformity. He was discharged from the hospital eight days after the operation, and has failed to return as promised. There was some fulness of the inner edge of the wound when last seen, that seemed to be increasing, and suggested a prompt recurrence. The second tumor proved a large spindle-cell sarcoma like the first, larger and less distinctly encapsuled.