

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

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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

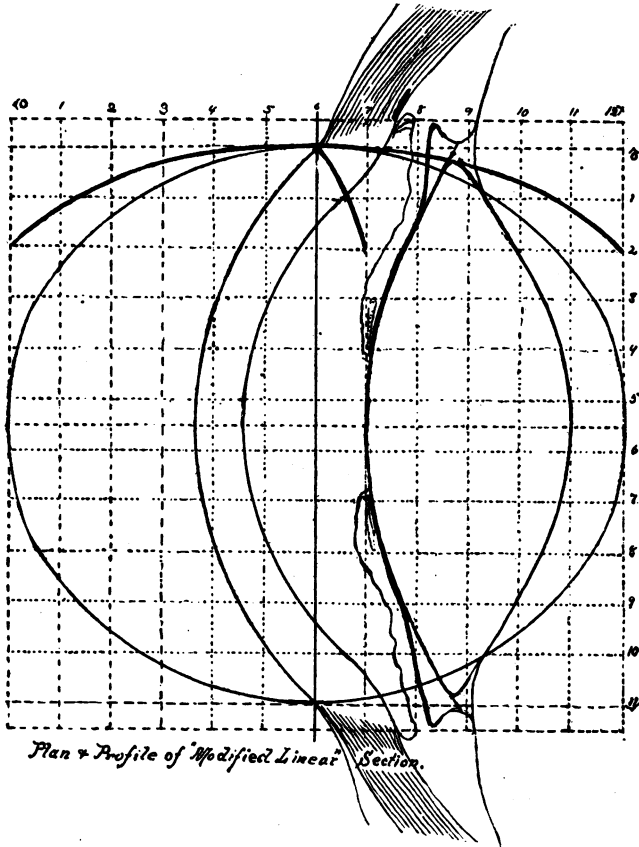


FIG. I.

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 satisfactory result (as the Graefe sometimes

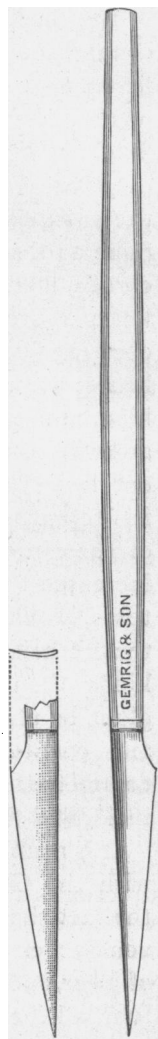


FIG. II.

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.

DISCUSSION.

DR. KNAPP.—I have used Jaeger's knife, but I have not found in it the advantage which the doctor claims for it. The speaker says that it retains the aqueous humor better, and makes the whole section in cutting forward. It does so when guided to perfection; but, as far as my experience goes, it is more difficult to pass the larger knife through the anterior chamber than the small Graefe knife. The latter keeps back the iris better. With the Graefe knife it is possible to complete the section in one onward movement, but I do not consider this necessary.

Looking at the mechanism, we see that the broader the knife and the more lance-shaped it is, the more it approaches a chisel. Extraction with a Weber knife is very unpleasant. If the knife is not very sharp, the part where you cut is pressed in before the point reaches the opposite margin. The action is, as I have said, more like that of a chisel than that of a knife.

DR. H. D. NOYES.—I agree with what has been said with reference to the facility of going through the anterior chamber with a narrow knife as compared with a triangular knife. The narrow Graefe knife gives far better control of the movements necessary in making a proper section than a knife of a greater width. I have adopted a little manœuvre in the use of the Graefe knife, and after practising this method for years, I find that the same thing is done by Prof. Panas, at Hotel Dieu, in Paris. The knife is entered, and after reaching the counter-opening, instead of being pushed forward in the same direction, the emerging part of the blade cuts the inner third of the wound, while the heel remains fixed at the place of entrance. The section is continued by elevating the handle and withdrawing the knife, and a central portion remains to be divided. Since I have adopted this manœuvre, I have never been troubled with rolling over of the iris upon the edge of the knife. I should not be willing to resort to a broad knife in preference to a narrow one in making the section for cataract.

DR. THEOBALD.—The facility of making the incision with a narrow knife has been referred to, but it has not been pointed out why it is easier to use the narrow knife than the triangular knife. When using the latter instrument, we are trying to do two things at once. We are not only passing the knife across the anterior chamber, but we are at the same time completing the corneal incision. This is a complicated manœuvre. With the Graefe knife, we pass it across the anterior chamber, and having selected the point of counter-puncture and transfixed the cornea, we then make the section, directing our whole attention to this point.

DR. RISLEY.—The difficulty which I have experienced in the use of this knife has been in making the counter-puncture; but the counter-puncture once made, there is a sense of security and ease in perfecting the section, which I have never experienced in the use of any other knife.

DR. RANDALL.—I have not found the knife very difficult to handle, being careful in laying out my incision to make the puncture where I wished, and to get the knife in the proper plane to begin with; which has to be done with a certain amount of care. I would again insist upon the perfect smoothness of the incision made in this way. It is as clear as that made with the lance knife. I think that if we examine the sections made with the Graefe knife, we shall not find them so smooth. As to the correction of a mistake, it is confessedly more difficult; but it can generally be avoided by laying out the incision properly in the first place. The point is this, that if the puncture is correctly made, the counter-puncture will be correct, however much the patient may move. I recently operated in a case in which the lens had been completely detached, falling back into the vitreous. It was a traumatic case, and the lens was quite freely moveable. I made the incision downward and outward, as the iris was there torn from its ciliary attachment. I got a perfectly smooth cut, and lost no vitreous whatever until with the loop I had brought out the lens. I could not have done this with the Graefe knife. In the hands of most men, I think that this knife will enable them, with a certain amount of skill in placing the incision, to make a perfect incision, where it would require a far more skilled and experienced operator to make it with the Graefe knife.

DR. GRUENING.—I see no reason why there should be any greater difficulty in making the counter-puncture than there is in making the puncture. The trouble is that the exact point of counter-puncture is not distinctly seen. Myopic opera-

tors have no difficulty in making either the puncture or the counter-puncture. The iris falls on the knife generally when the attempt is made to correct a misplaced counter-puncture. In my operations I use a pair of strong convex glasses, make myself myopic, and have no difficulty at present in placing the counter-puncture correctly.

CILIO-RETINAL OR ABERRANT VESSELS.

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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 Nettleship¹ 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.