

**A piece of steel in the ciliary body located by means of Roentgen's x-rays : extraction with the elctro-magnet and preservation of good vision after two similar operative procedures, without the use of the rays, had been unsuccessful / by G. E. de Schweinitz.**

### **Contributors**

De Schweinitz, G. E. 1858-1938.  
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### **Publication/Creation**

[Place of publication not identified] : [publisher not identified], [1897]

### **Persistent URL**

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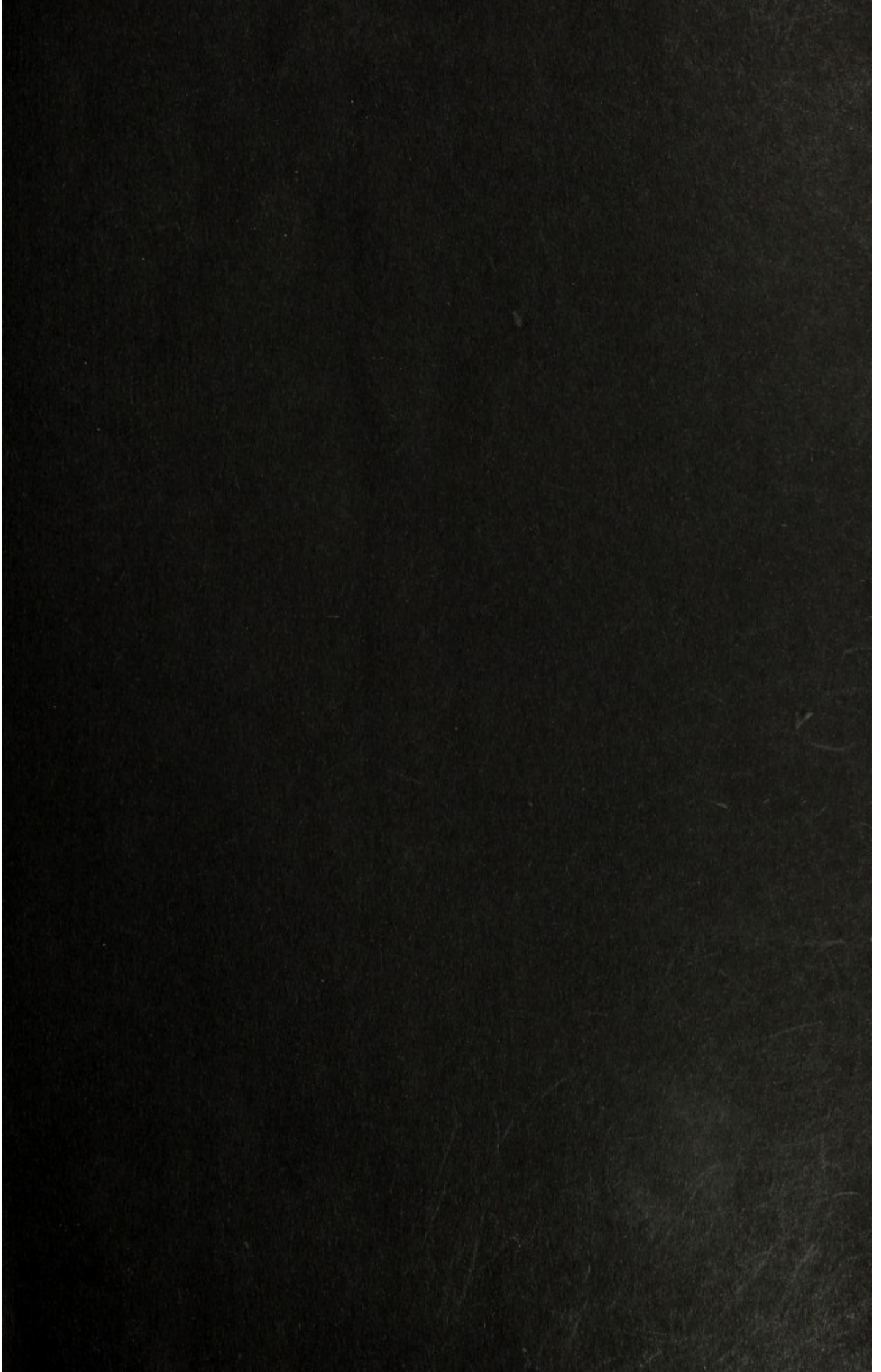
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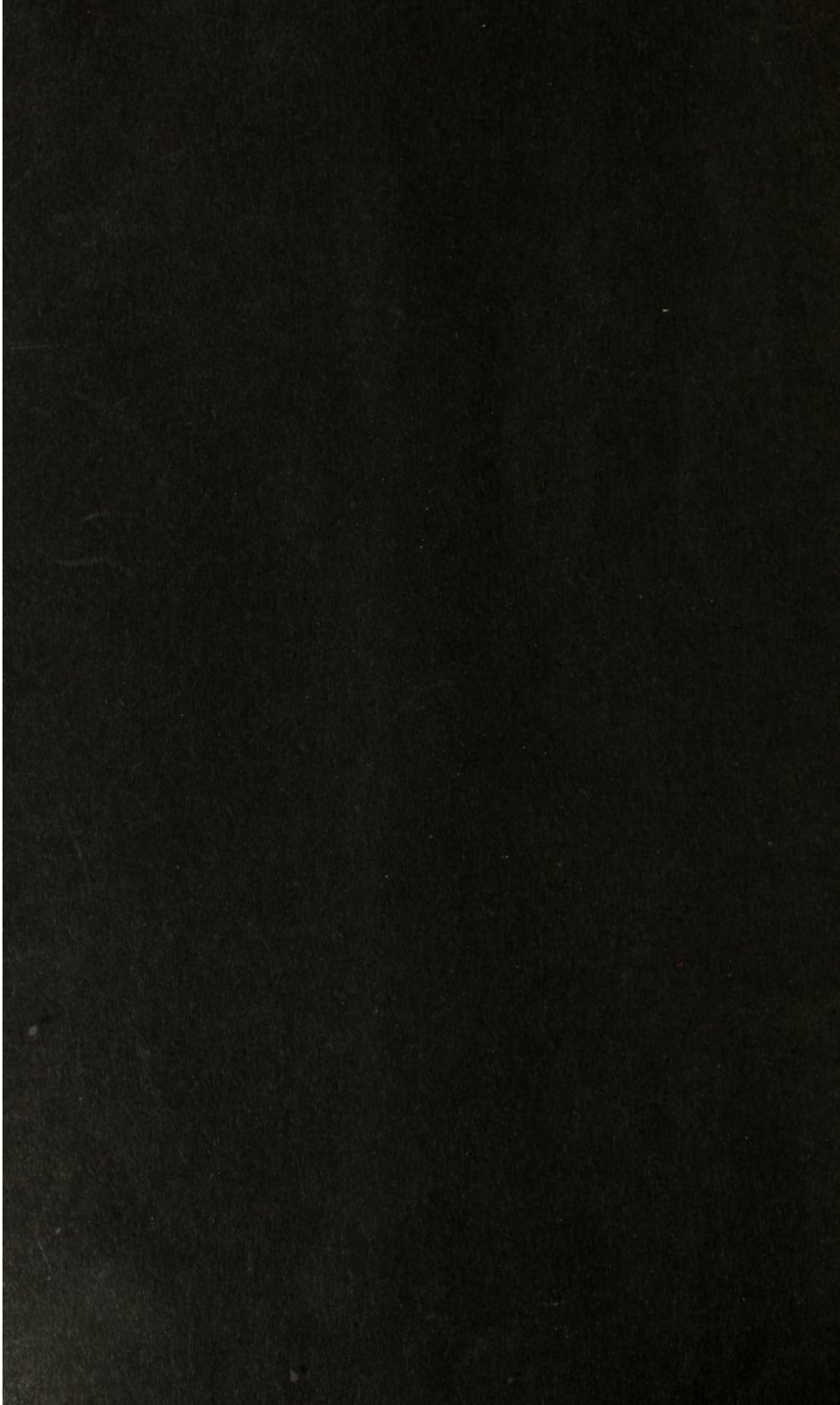
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A PIECE OF STEEL IN THE CILIARY BODY LOCATED BY  
MEANS OF ROENTGEN'S X-RAYS.

EXTRACTION WITH THE ELECTRO-MAGNET AND PRESERVATION OF GOOD  
VISION AFTER TWO SIMILAR OPERATIVE PROCEDURES,  
WITHOUT THE USE OF THE RAYS, HAD  
BEEN UNSUCCESSFUL.<sup>1</sup>

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SINCE the report of the interesting case of extraction of a bit of copper from the vitreous (where X-rays helped to locate the metal) by Charles H. Williams,<sup>2</sup> of Boston, the equally interesting record of the localization by the same aid of a minute fragment of steel, and its successful extraction from the vitreous with the electro-magnet, published by Dr. C. F. Clark,<sup>3</sup> of Columbus, Ohio, as well as the cases of Dr. Howard F. Hansell<sup>4</sup> and Dr. G. Oram Ring,<sup>5</sup> already reported to this Section, all doubt as to the value of radiography to the needs of the ophthalmic surgeon has passed away.<sup>6</sup> How largely we are indebted to the faithful labors and skilled technique of Dr. Max J. Stern, of the Philadelphia Polyclinic, has already been referred to and commented upon by Dr. Hansell in his several communications on this subject. To this series of cases I desire to add the report of another recently under my care, which, in addition to the interesting features surrounding the use of the Roentgen ray, presents other points of clinical importance.

Frank McD., aged nineteen years, single, machinist, consulted me on January 13, 1897, on account of an injury to his left eye.

*History:* Twenty seven hours before his visit, while working around an engine and sledging upon some portion of the machinery, he was struck in the left eye with a chip of steel which flew from the piece of metal on which he was striking, the blow having been delivered in an upward direction. The foreign body entered through the sclera at the

<sup>1</sup> Read before the Section of Ophthalmology of the College of Physicians of Philadelphia, February 16, 1897.

<sup>2</sup> Transactions of the American Ophthalmological Society, 1894-'96, vol. vii. p. 708.

<sup>3</sup> Ibid., p. 711.

<sup>4</sup> Two cases reported to the Section of Ophthalmology of the College of Physicians of Philadelphia.

<sup>5</sup> Codex Medicus, February, 1897.

<sup>6</sup> I have not included reports on this subject from foreign journals. Interesting papers will be found by Van Duyse, Archives d'Ophthalmologie, February, 1896, and by H. Lewkowitsch in London Lancet, August 15, 1896.



lower and inner quadrant of the eye. The patient was immediately taken to a neighboring hospital, where an electro-magnet was twice introduced through the wound of entrance, without, however, removing the foreign body. The physician in charge of the operation stated that he thought he had moved the body, but that his magnet was not strong enough to withdraw it. The patient, by the advice of Dr. John Fay, then came to Philadelphia with the hope of obtaining relief.

*Examination:* Vision of R. E., 6/6, full accommodative power, practically normal fundus, H. equals 1 D. Vision of L. E., 5/60, with difficulty. The pupil was dilated widely, probably from the effects of atropine, the tension was diminished, the bulbar and tarsal conjunctivæ were flushed, and a small bead of vitreous protruded from a linear wound 3 mm. in length, situated  $\frac{1}{2}$  centimetre from the corneal border, downward and inward, between the insertion of the internal and inferior rectus.

Ophthalmoscopic examination was unsatisfactory, on account of the haze in the vitreous, which prevented accurate observation of the details of the fundus. As far as could be made out, however, these included a vertically oval disk, enormously distended and tortuous veins, a patch of white tissue upon the nasal side of the disk, a fringe of hemorrhage downward and outward from the papilla, and far forward in the upper portion of the eyeground an indistinct spot of dark color, vaguely resembling a blood-clot, but very difficult to study. The lower half of the vitreous was filled with large blood-clots, through which could be seen dimly the rent in the coats of the eye.

The next day, January 14th, an electro-magnet was introduced twice, unsuccessfully, through the wound of entrance. Thinking that the small, dark spot in the upper portion of the eye might indicate the position of the foreign body, the fine, straight point of a Hirschberg magnet was inserted through a small wound made for this purpose in the upper ciliary region. Once a bystander thought he heard the click of metal on metal, but on withdrawal of the point no foreign body was attached. The incision was small—not much larger than was necessary to admit the point of the electro-magnet; therefore it is possible that the foreign body could not have passed between the lips of the wound without being detached from the magnet. I am inclined to think, however, even if the point of the instrument did touch the piece of steel, that the magnetic attraction was not sufficiently strong to dislodge it, because the mouth of the wound was carefully watched by Dr. Veasey and its sides separated by small retractors. Further operative interference at that time was not deemed justifiable.

No immediate reaction followed this operation. The boy was kept under observation for ten days, seven of which he spent in the hospital. Small doses of calomel and iodide of sodium were administered and mydriasis was maintained with atropine. This treatment was instituted in the hope that some absorption of the vitreous exudations and blood-clots would take place and enable a more perfect ophthalmoscopic examination to be made. In this hope I was disappointed, because the vitreous haze deepened, and on the seventh day the signs of beginning cyclitis were well marked.

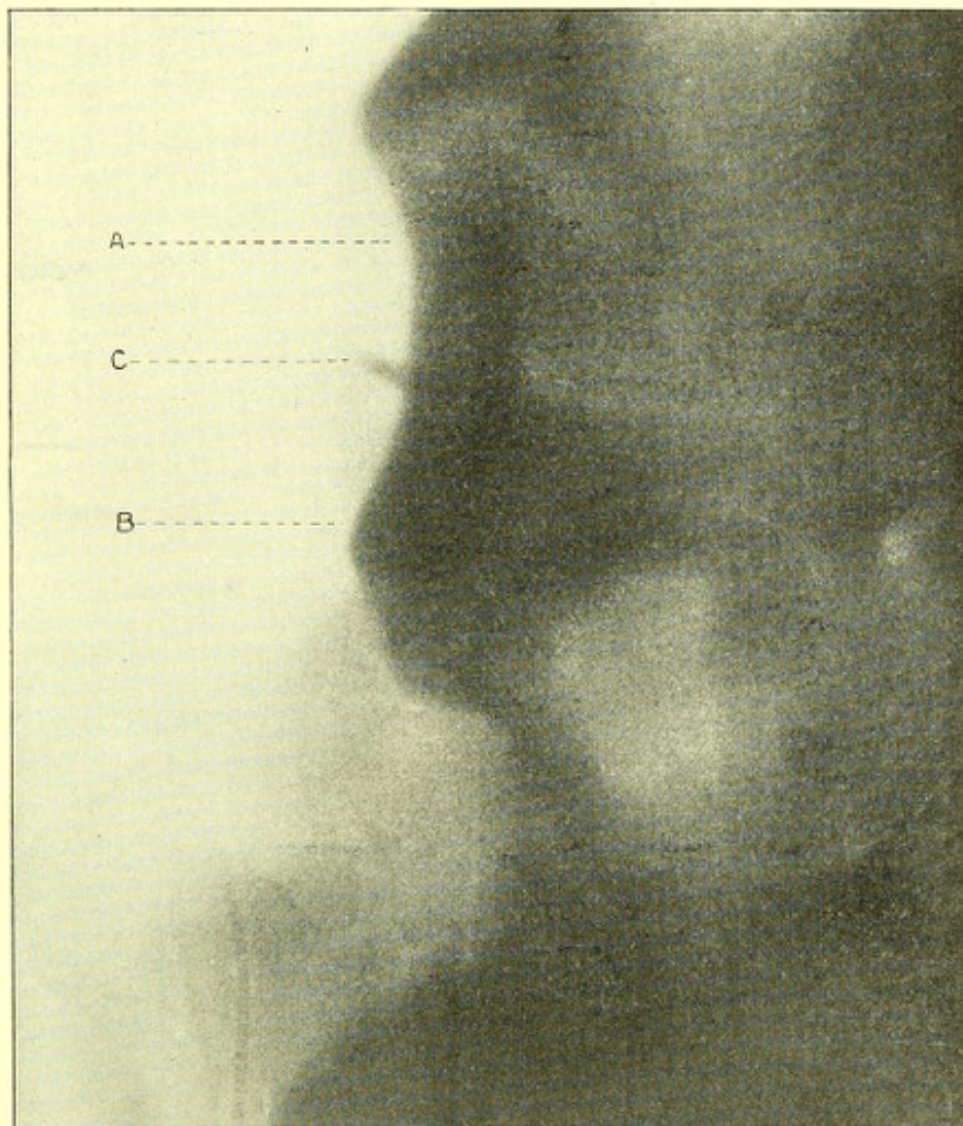
In the meantime, however, and as soon as possible, through the kindness of Dr. Max J. Stern, an excellent skiagraph was obtained, which is herewith exhibited, chiefly interesting because, in spite of the fact that the current gave out and the exposure was only four minutes, the



points are well shown—namely, the malar bone, the outer edge of the orbit, the shadow which represents the position of the eye within the orbit, and the linear foreign body in its upper portion.

The radiograph indicated that the position of my first magnet-operation in the upper ciliary region was correct, and that had I proceeded further, or had the magnet been more powerful, I probably would have

FIG. 1.



A-B, outer margin of orbit C, foreign body. The plate was placed against the left temple the light was directed into the eye obliquely from the nasal side. In the negative the lens can be dimly seen below C, but this does not show well in the reproduction or in the print. Exposure four minutes.

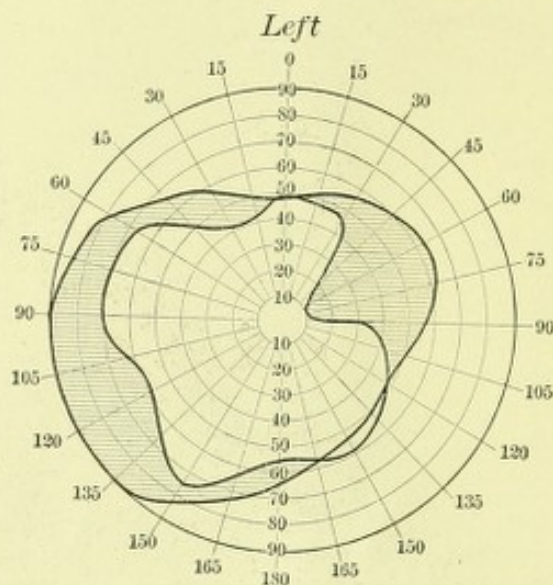
secured the body; therefore a triangular flap of conjunctiva was raised and a curved incision, 8 mm. in length, was made through the sclera in the upper ciliary region, about midway between the insertion of the superior rectus and the corneal margin. The flat point of a large electro-magnet, kindly loaned for the purpose by Dr. Sweet, as it was more powerful than my own instrument, was introduced and almost im-



mediately the foreign body was withdrawn—a body which is 4 mm. in length, 2 mm. in breadth, and weighs  $\frac{7}{18}$  grain.

After thorough cleansing of the eye the conjunctival wound was closed with three interrupted silk sutures. No stitches were passed through the sclera. A light antiseptic dressing was applied, which was kept cold by means of iced compresses for four days; internally, calomel was administered. No signs of irritation occurred. The symptoms of iritis and cyclitis rapidly subsided, and on February 6th, or twelve days after the operation, the patient returned home, his vision with his correcting cylinder + 1 axis V = 6/12 =.

FIG. 2.



The eccentric continuous line indicates the average normal field; the inner continuous line is the boundary of the patient's field measured with a 1 centimetre square of white; the shading shows where vision is lost.

At this time there were fine, web-like opacities through the vitreous, a small pear-shaped streak of lenticular opacity up and in, and a large rent in the choroid downward and inward, representing the original wound of entrance and the position of the two previous operations. The iris was slightly discolored, the disk-edges were hazy, the veins were full and tortuous, but all hemorrhages had been absorbed and the macula was normal. The field of vision is given in Fig. 2. The right eye was sound in all respects.<sup>1</sup>

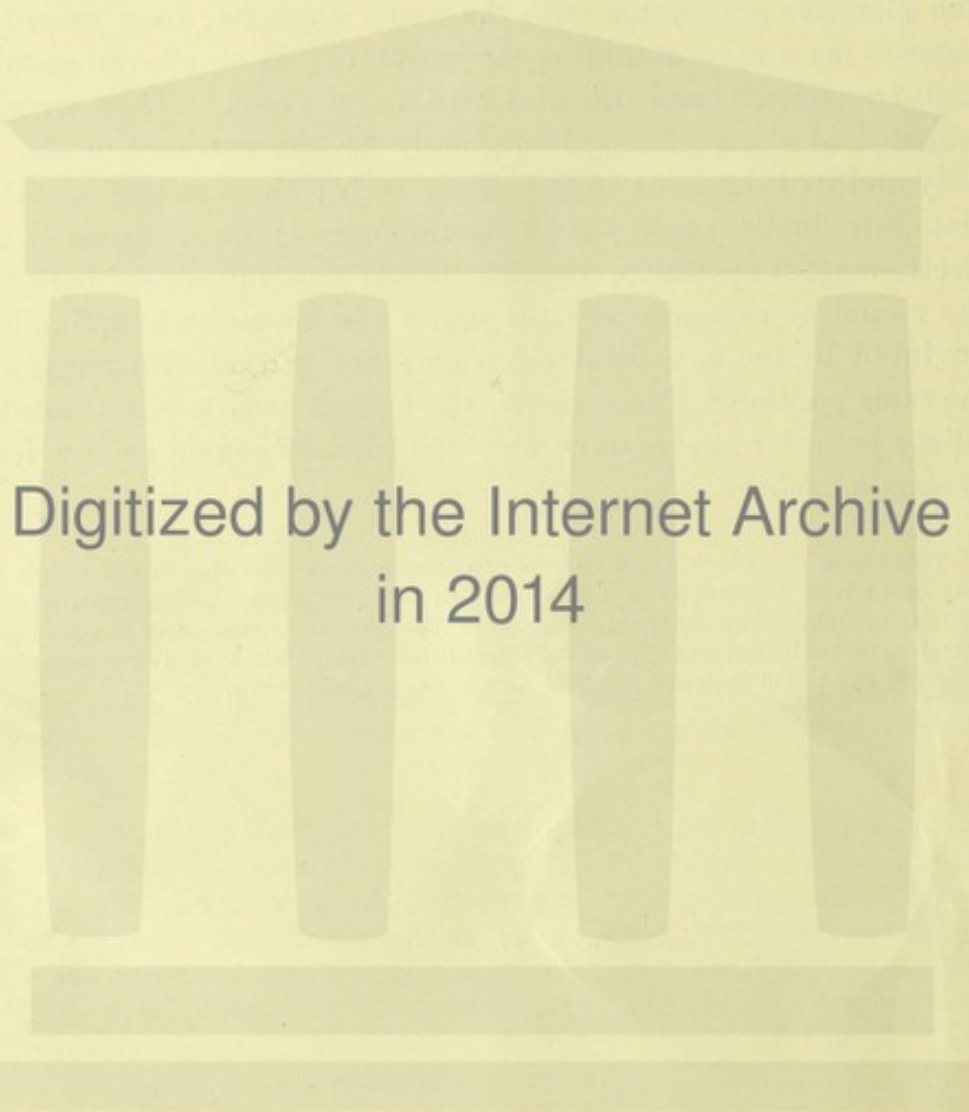
Commenting on this case, it may be said that it is evident that the dark spot seen dimly through the haze in the vitreous and located in the upper ciliary region was the foreign body, and that had the second electro-magnet operation, which was planted exactly in this position, been a little more persistent, or, rather, had the magnet been more

<sup>1</sup> Since writing this sentence the patient has been again examined (March 11, 1897). Vision is still 6/12, and the chief ophthalmoscopic change is the beginning formation of shining, whitish bands, which pass from the area of former hemorrhage beneath the disk to the region of the original wound. The case in this respect beautifully illustrates the development of these connective-tissue bands as the result of the metamorphosis of intraocular hemorrhage.

powerful, the foreign body might have been extracted. It was, however, because of the uncertainty of this localization that operative procedures were discontinued, in the hope that treatment, as Dr. E. Jackson has well shown in a recent paper, might clear the vitreous sufficiently to permit accurate ophthalmoscopic examination and accurate localization. The confirmation by means of the radiograph of the situation of the foreign body, corresponding exactly to the position inferred from previous examinations, destroyed all hesitancy as to extensive operative procedures, with the result which has been recorded. It seems to me a very interesting circumstance that an eye can sustain such great traumatisms and still heal with useful vision.<sup>1</sup> These traumatisms consisted of those produced originally by the entrance of the foreign body and its lodgement in the ciliary body; those caused by the immediate introduction, twice, of an electro-magnet; those caused at my first electro-magnet operation, when the points were introduced both through the wound of entrance and through a new opening; and, finally, those produced by the successful electro-magnet extraction through a cut in the same position. Furthermore, the foreign body was imbedded in the ciliary body for twelve days, and had already caused enough irritation to start a cyclitis.

<sup>1</sup> This vision still obtains two months after the operation. Later, loss of vision, however, may occur from hyalitis, as in a somewhat similar case which I have reported (*American Journal of Ophthalmology*, February, 1896). The primary vision after the reaction of the operation had subsided was 6/9, and the vitreous was clear. One month later punctate hyalitis appeared and vision sank to 6/15. The patient was not again seen.





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