origin, of the nature of inflammation; that their subdivision into innocent and malignant tumours depends upon the specific infecting or non-infecting character of the inflammation; and that their mature structure develops entirely under the influence of the tissue first affected, so that the tumour is always an imperfect edition of the parent-tissue. Now it is supposed that, if the skin as a whole suffer a chronic irritation, such as that produced by soot or a clay pipe, in certain people the rete mucosum will take on an independent growth, resulting in an epithelioma; but that if the primary irritation affected only a sweat-gland, hair-follicle, or sebaceous gland, the growth would be a rodent ulcer. That an epithelioma commences in an irritation of a patch of skin or mucous membrane is undoubted; it remains, however, an open question whether rodent ulcer has a more limited origin.

In dealing with specimens of pre-cancerous formation in the skin, it is, of course, impossible to be certain as to the correctness of the diagnosis; but surgeons of large experience not unfrequently excise conditions of warty or other alterations in the skin which have become irritable, because, in their opinion, such a state may go on to the development of a carcinoma. It is very probable that, in such cases, the opinion is often correctly formed, and sometimes it is proved to be so by the earliest cancerous changes having actually commenced. I have had several times the opportunity of examining such portions of skin, and the microscopic changes present in them have been uniform and simple. There is an area of increased vascularity, over which a dense infiltration with inflammatory cells is seen, placed just beneath the epithelium. The latter is thickened, the superficial cells being piled up in warty form. The cells of the rete mucosum are evidently undergoing rapid multiplication, the lower layers being often crowded, and sometimes appearing as a mass of nuclei. It seems, at this stage, as though the epithelial cells ceased to be able to pass upwards in normal rotation; and one finds instead that, throughout the area of warty thickening, there are buds of rete mucosum penetrating below what is still easily recognisable as the old line of the basement-membrane into the dense inflammatory infiltration, and then it seems as though the epithelial cells, being really the reproductive layer of the rete mucosum, and being now surrounded by an embryonic tissue, become independent, and henceforward grow with the characters of malignancy.

On only two occasions have I had the opportunity of examining tissue which, it was supposed, might have become rodent ulcer; both were from the upper eyelid. One case was that of an old lady, in whom a small tract of warty growth appeared upon the upper eyelid, and was removed by Mr. Shadford Walker, because he considered it an early condition of rodent ulcer. It showed exactly the same pre-cancerous changes as have been described as occurring in epithelioma. The other occurred as a small papule on the edge of the upper eyelid of a gentleman, aged 47. It had been coming four years, and I snipped it off, as it was irritating the cornea, without excising a portion of the eyelid. The growth in this case was of the nature of a congenital mole; that is, the lymph-spaces of the connective tissue were full of epithelial-like cells, though he was not aware of its congenital origin. The base remains still in the eyelid, and will be excised and examined if independent growth at any time assert itself. The smallest rodent ulcers that I have examined, and some have been very small, even before ulceration had commenced, have yielded no evidence as to their minute origin, since, in all of them, the growth had gone entirely over to the cancerous stage. Under the head of minute origin, then, I have not much evidence to offer as to the primary changes in rodent ulcer; but, what there is, points in the direction of its probable origin in the skin, as a whole, and does not tend to associate it with any particular dermal appendage.

While one follows with the microscope the visible changes which accompany the first steps in the formation of a new growth, one seeks, and seeks in vain, for the presence of a motive power. Whether the excitant is engendered by a chronic irritation of the part, or whether it is only rendered locally active by it under certain constitutional conditions, are questions which remain at present unsolved. But the degree of evolution to which a new formation may attain, must plainly depend, to a large extent, upon the nature of this excitant. The more it resembles the normal stimulus to growth and development, the more perfect and limited will be the development of the new growth, as obtains in a fibroma or a papilloma. The more intense the excitant, the more embryonic and unlimited the growth, as in sarcoma and carcinoma. But if it may be that, in some cases, there are local or constitutional conditions, which can weaken the effect of the excitant, then it seems possible that what would otherwise have been an epithelioma, might become a rodent ulcer. For many reasons, I would have preferred to believe that rodent ulcer was a specific variety

of carcinoma, and there is much to be said in favour of its association with the glands of the skin; but I am not at all clear that we have any evidence to show that the carcinoma of any anatomical region is susceptible of specific subdivisions in its origin, although it certainly may attain to very different degrees of evolution. For the subjoined reasons, I incline to regard rodent ulcer as a form of chronic carcinoma of the skin, rather than as a carcinoma of any special dermal appendage.

1. Because its structure varies greatly, and because in normal development the rete Malpighii produces very various epithelial structures.

2. Because there are to be seen appearances in the minute structure of certain rodent ulcers, which resemble some points in the evolution of the several dermal appendages.

3. Because, also, there are points of resemblance between certain rodent ulcers and the innocent epithelial growths of the skin.

4. Because the general arrangement and type of the growth is like a slow growing epithelioma.

5. Because it passes insensibly into epithelioma.

6. Because its minute origin, so far as it can be surmised, is the same as in epithelioma.

THE EMPLOYMENT OF THE ELECTRO-MAGNET IN OPHTHALMIC SURGERY: ADDITIONAL CASES.

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THE value of the electro-magnet in ophthalmic surgery has been now practically tested, its merits have been demonstrated, and the subject occupies a recognised place in all recent text-books on diseases of the eye. This being the case, I do not propose to add much here to what I have said on previous occasions (*BRITISH MEDICAL JOURNAL*, 1881, vol. i, p. 843, and 1883, vol. ii, p. 957; and *The Electro-Magnet, and its Employment in Ophthalmic Surgery*, Churchill, 1883) as to the manner, etc., of using the electro-magnet, but rather to place on record additional cases, in which its employment has been of service.

A point, however, which it seems desirable to notice, on account of its great importance, is that, in most cases, to be used with the best success, and to be most favourable for the preservation of vision, the interval between the receipt of the injury and the operation for the removal of the foreign body must be short. In many of the cases coming under observation, the eyeball had been seriously disorganised, before an opportunity was afforded for using the electro-magnet. The instrument¹ used in all the cases is the same as previously described by me. Increased experience has rendered more positive the opinion before expressed, that it meets well the objects we have in view.

CASE I. Conjunctiva.—On January 25th, 1884, a young man applied at the Sheffield General Infirmary. A week previously, he had been struck, whilst at work, by a piece of steel on the left eye. On the outer side of the eyeball, at a little distance from the cornea, there was now noticed a dark mark under the conjunctiva. This was thought to be the chip of steel, over which the wound had closed. The electro-magnet, with a stout needle attached, was held over the situation of the fragment, touching the conjunctiva, and a few times withdrawn a little distance. After a short time, the piece of steel was found to be coming through the conjunctiva, at the old wound, and was withdrawn attached to the magnet. The patient did not appear again. Vision was perfect ($\frac{3}{8}$), and there was no deep wound. The fragment was a minute round piece, weighing $1\frac{1}{2}$ milligrammes (0.023 grain).

CASE II. Conjunctiva.—Thomas B., aged 25, a mill-wright, came to the Sheffield General Infirmary on May 2nd, 1884. He had been engaged "shafting a hammer," and, in knocking the shaft out, he struck the head of the hammer with his own hammer, and a splinter, flying off, had hit his left eye. On his applying at the infirmary, some effusion of blood was noticed on the outer side of the sclerotic; no foreign body was then detected. On May 6th, when seen by me, a small black speck was noticed deep under the conjunctiva. On applying the electro-magnet, it was observed to move. A small incision was made, and after a little difficulty the fragment, a narrow rod-shaped piece, was removed with the magnet. It was situ-

¹ Made by Cubley and Preston, High Street, Sheffield.

ated deeply underneath the conjunctiva, in proximity to the rectus tendon. The fragment weighed $8\frac{1}{2}$ milligrammes (0.132 grain).

CASE III. Sclerotic.—W. D., aged 43, an engineer, was engaged on September 25th, 1884, in straightening a pair of "cutters" with a wedge-hammer, and was hit in the right eye from a piece of steel flying off the hammer. A man at the works took some bits out, and he continued his work. The eye remained painful, but he supposed this was in consequence of the blow it had received.

On October 1st, he first came to me. On the outer side of the sclerotic, just beyond the cornea (ciliary region), was a small dark mark. The conjunctiva was separated over this, and the electro-magnet, both with a needle attached and without, was applied to the spot, but failed to bring away any fragment. It seemed evident that, if there were a piece of steel there, it was deeply placed and firmly fixed, and that it might possibly be thrust inwards in endeavouring to remove it. The next day, the presence of a piece of steel was rendered positive by the dipping of the suspended magnet when placed over the dark mark. After dissecting the conjunctiva away from the sclerotic wound, this latter was a little enlarged, and still the particle was so firmly fixed that the electro-magnet failed to extract it; and it was eventually removed by means of a fine pair of splinter-forceps. The fragment was a small oval piece, and weighed 2 milligrammes (0.03 grain).

CASE IV. Eye-lids: Orbit.—Simeon P., aged 39, was engaged on the afternoon of July 23rd, 1884, in "welding a head on the tension-bar," when a piece of metal was driven off the "swage," and struck his right eye. When seen in the evening, the eye-lid was swollen and rather ecchymosed; the ocular conjunctiva was in a similar condition. There were films of hæmorrhage in the vitreous humour, but a careful search revealed no foreign body inside the globe, nor indeed any point where it could have entered. In the upper eyelid, especially when the patient looked down, and closed the eye, a hard swelling about the size of a small pea was noticed. Supposing this to be a foreign body, no wound of the conjunctiva was detected on the inner side of the eyelid, nor at the retrotarsal fold; there was, however, a good deal of ecchymosis of the conjunctiva. The nature of the swelling was at once rendered evident by introducing one of the points attached to the electro-magnet under the eyelid, towards the retrotarsal fold; for, on withdrawing it, the "tumour" felt externally was seen distinctly to follow the magnet. The removal was effected from the external rather than from the internal surface, as the position of the foreign body made it more difficult to reach it in the latter direction. The piece of steel was found situated deeply, more in the orbit, almost, than in the eyelid, and by the side of, but deeper than, the elevator of the upper eyelid. It was presumed that the fragment of steel had impinged against the eyeball with sufficient force to cause hæmorrhage into its interior, and had then sped onwards under cover of the upper eyelid. The piece of steel was rather more than three-eighths of an inch long, and was tolerably thick as well; its weight was 225 milligrammes (3.933 grains).

CASE V. Orbit.—On January 16th, 1884, Walter A. was chipping a tyre at Messrs. Cammell's works, when his right eye was rendered immediately blind by a splinter from the tyre striking it. He applied at the infirmary without delay. A wound was found on the inner side of the sclerotic, and vitreous humour had escaped; there was hæmorrhage also into the eyeball. He was placed in bed with an ice-bag over the eye. On January 20th, the hæmorrhage had cleared up a little, but no view of the fundus could be obtained. A suspended magnet held over the eyeball was considered to "dip distinctly." The patient declined to give his consent to enucleation.

January 23.—The consent of the patient having been obtained, the original wound was reopened, and the electro-magnet introduced, but did not detect any fragment of metal. The globe was then excised, and, in dividing the optic nerve, a small piece of sclerotic was left attached to it. On removing this subsequently, something hard was felt, and, in introducing the electro-magnet, a "click" was audible, and the fragment was apparently loose, and easily removed. It was thought at the time that the fragment in reality lay loose in the orbit, just beyond the globe; and it may be that, in dividing the optic nerve, the scissors had slipped into the posterior wound in the eyeball (point of exit), and so a portion of sclerotic was left. The piece removed was a thick fragment, and weighed 745 milligrammes.

CASE VI. Cornea.—Mr. John T., aged 27, was driving some nails into a door, and was using a file instead of a punch, as the door had to be painted and grained. On striking the file, however, some pieces flew off the tip (broad end); one of these fragments hit him on the forehead, and the other in the right eye. This was on June 5th, 1883, and on the 6th he came to me. He fancied the piece was still in the eye. Near the sclero-corneal junction, a small piece of steel in the

cornea was seen with difficulty, and with focal illumination, better in some directions than others, and it was placed deeply, almost in the anterior chamber. Efforts were made to remove it, but resulted in opening the anterior chamber. It may be mentioned that no visible effect was produced on the fragment by the electro-magnet when in close contact with the cornea. Nor was there any deflection of a suspended magnet (sewing-needle magnetised), either before or after the fragment had been subjected to the influence of the electro-magnet. The next day, June 7th, the chip of steel was removed in the following manner. A narrow iridectomy-knife was passed through the cornea near the periphery, and, having the cornea in front of it containing the fragment, served as a base to work upon in its extraction, and avoided the danger of pushing it into the anterior chamber. With the iris-knife for a base in the manner mentioned, the corneal tissue was opened up by a broad needle in front of the piece of steel, and then it was immediately removed with the electro-magnet. The situation of the chip was so near the anterior chamber, that, in dissecting the cornea over it, the fragment moved about on the iridectomy-knife. The operation was followed by slight iritis, which, in the course of a few days, subsided. On June 30th, vision was $\frac{2}{3}$. The piece removed was very small, but was lost when sent to be weighed. The magnetic needle used in this case was not such a delicate suspended magnet as has been employed in other cases.

CASE VII. Lens.—Samuel H., aged 24, a roll-turner, was engaged on June 25th, 1884, centring the end of a roll with a chisel, and a piece of iron from the roll flew off, and hit his left eye. On his coming to the Sheffield General Infirmary, on June 27th, it was noticed that there was a wound of the cornea, corresponding to the upper border of the pupil. It was about one-eighth of an inch in length, and its long axis was almost horizontal. The lens was opaque, and, in the lower part, was a mere yellowish mark, divided at its outer part by a brownish line. The pupil acted fairly well to atropine. Vision was limited to shadows.

June 28th. The original wound was reopened and enlarged, the lens-capsule torn through, and the point of the electro-magnet introduced, and withdrawn with the fragment of metal attached; softened lens-matter was allowed to escape. Pain was at first entirely relieved; then it returned, and, ophthalmitis setting in, the globe was enucleated on August 4th, 1884. The weight of the fragment removed was 7 milligrammes (.108 grain).

CASE VIII. Vitreous Body.—Wm. W., aged 36, a boiler-maker, living at Rotherham, was employed on June 28th, 1883, in cutting rivets from a boiler, and, while thus occupied, a "chipping" had hit the right eye. He was rendered immediately blind. He was seen by a surgeon, who recommended his applying at the Sheffield Infirmary, whither he came on July 7th. He was then suffering acute pain, and vision was lost in the right eye. On the outer side of the sclerotic and below the cornea, there was an oblique wound; it invaded the ciliary region, and was now closed. There was iritis; and, though the pupil dilated somewhat to atropine, and the lens was clear, no foreign body could be detected in the interior of the eye; and the vitreous chamber was occupied with effusion.

The presence of a foreign body was suspected, though not visible; and, a few days later, he being then an in-patient, the particle, if any, having been well magnetised by the close proximity to the eyeball of the electro-magnet, a delicate magnet was held suspended over the eye. It gave most unmistakable evidences of the presence of a fragment of steel, the dipping being especially marked just over the wound.

On July 16th, the patient having been placed under ether, an incision was prolonged downwards from the old wound, and, the original one being reopened, made it somewhat T-shaped. Immediately the point of the electro-magnet was inserted, a click was heard, and it was evident that the fragment was situated in the vitreous body, just inside the wound. It was drawn by the electro-magnet into the wound, but appeared too large to be dragged out. The wound was, therefore, enlarged, and the piece seized with forceps, and extracted. It measured half an inch long, by one-eighth of an inch wide. On the 18th, the eyeball was excised. The weight of the fragment removed was 175 milligrammes (2.7102 grains).

CASE IX. Vitreous Body.—Joseph C., a collier, aged 22, was admitted into the Sheffield General Infirmary on September 28th, 1883. On the 8th of that month, whilst driving an iron wedge into the coal, in order to split off a large lump, a "flash" from the wedge entered his left eye. He continued his work, however, thinking that a "mite" had hit the eye and rebounded. Towards night, vision was noticed to be rather dull. The next day, being worse, he consulted a medical man, who, he alleged, removed a piece from the cornea. He continued at his employment until a fortnight later, when, in con-

sequence of the eye becoming worse, he consulted Mr. W. M. Jones of Wath, who, recognising the condition of affairs, sent him to me at this infirmary on the 23th. On examination, a small foreign body could be seen floating in the vitreous humour. On the cornea, a scar of a small wound was detected on the inner side, opposite the pupillary margin. The iris was adherent to the lens-capsule at a point corresponding to the corneal scar; and the piece of steel had evidently passed through the lens into the vitreous body; but it was only a little hazy, and that at the point of adherence to the iris.

September 29th. The conjunctiva was separated for a little distance, to form a sort of flap; and, after bleeding had ceased, the sclerotic was punctured with a Gräfe's knife at a point between the internal and inferior recti. The small point attached to the magnet was introduced, and immediately withdrawn, with the fragment attached. The conjunctiva was united over the sclerotic wound with a suture.

On October 4th, the suture was removed. Eye quite quiet. On October 13th, he was discharged. Vision was $\frac{3}{8}$ with +2.5 D. The weight of the chip removed was $\frac{3}{4}$ milligramme (.0046 grain).

CASE X. *Lens and Vitreous Body*.—Benjamin V., aged 28, was struck on the left eye on August 12th, 1882. He was cutting a steel bar, and it "rebounded" and hit the eye. On admission as a patient at the Sheffield General Infirmary, four weeks after the injury, there was a small wound in the cornea and reaching into the ciliary region (outer side), and that the lens was opaque. Projecting from the wound was an eyelash; this was removed. Atropine drops were used. The history of injury, as given by the patient, appeared to render improbable a piece of metal having entered the eye. Later, however, the iris was seen to be peculiarly pushed forwards at one point, and what looked something like a metallic body was detected. He resisted all endeavours for attempted removal, and ceased attending.

In October 1883, however, he returned in consequence of the eye being painful; vision was much reduced. The appearance in the iris, before mentioned, was more marked, and the point sticking through the iris was coated with exudation. Removal of the foreign body was advised, and performed on October 22nd. Through a corneal wound, the point of the electro-magnet was introduced, and immediately, by the attraction it exerted on the point in the iris, decided its character. By the aid of the magnet, the fragment was dragged about the wound from point to point, and very much loosened. The electro-magnet without a needle attached, was employed, and the fragment advanced well out at the corneal incision. Still it could not be altogether withdrawn, and required a good hard pull with forceps to extract it. A portion of iris, in which the piece of steel was entangled, was excised. The good eye showed some slight signs of irritation. The patient refused to become an in-patient. He declined enucleation, and when he disappeared, the globe was softened but painless. The chipping was a narrow piece about three-eighths of an inch in length, and its weight was 60 milligrammes (0.92 grain).

CASE XI. *Vitreous Body*.—Arthur S., a cutler, aged 21, was admitted as an in-patient on September 20th, 1883. On the 16th he was hit on the right eye by a chip, when engaged in striking. He was immediately rendered, as he says, blind, and ceased working. He was treated elsewhere, and when he came to the Infirmary on the 17th, his condition was as follows: the eyelids were oedematous; the lens was clear, but in the vitreous body were some floating hæmorrhagic films; no foreign was visible, nor was any wound detected; He could see fingers. Atropine drops were ordered. The following day, he was in about the same condition.

September 19th. He suffered a great deal of pain last night. The oedema of the lids was greater; sight was much reduced. On very careful examination with a magnifying glass, on the inner side of the sclerotic, a short distance from the cornea, a small horizontal line was noticed, as if representing the point of entrance of a foreign body. It was covered with oedematous conjunctiva and very indistinctly made out.

September 20th. The eye had been very painful; vitreous was cloudy, and there was a good deal of iritis. The conjunctiva was dissected up from the mark which had been noticed in the sclerotic, and as it appeared to be the wound closed, it was reopened and another incision prolonged from it (between the inner and lower recti) and making the wound somewhat T-shaped. The point of the magnet was introduced, and at once withdrawn with the particle of steel adhering to it. Pain was at once relieved, and he passed a good night. Subsequently the eyeball softened and was enucleated on January 4th, 1884. The fragment extracted was a sharp-edged triangular chipping, and it weighed 17 milligrammes (.2654 grain).

CASE XII. *Vitreous Body*.—John H., aged 40, residing at Barnsley, was admitted an in-patient at the Sheffield Infirmary on August 10th,

1884. On the 5th of the month, he had been struck on the left eye by a fragment of steel. He had been cutting a piece of steel to make a die, and a chip from the chisel had sprung off. He did not come to Sheffield until the 10th. Then the conjunctiva was rather swollen and inflamed. On the outer side of the cornea, at the lower part, was a small scar, marking, it was thought, the point of entrance of the foreign body. The iris was dirty looking; the lens was opaque, and rather yellowish. No piece of metal was visible, and a small magnet suspended over the eye gave no decided indications. He was suffering acute pain. It was decided to remove the cataractous lens, and to insert the point of the electro-magnet. A section with a Gräfe's knife was accordingly made through the cornea, above, towards the periphery; the lens-capsule was opened, and the point of the electro-magnet inserted, and pushed to the back part of the lens at its lower part, and immediately withdrawn with a splinter of steel attached. The softened lens-matter was let out, and there came also pus, apparently from the anterior part of the vitreous body, making it doubtful whether the foreign body had been located in the lens, or posterior to it. Probably it was in the front part of the vitreous chamber. He experienced immediate relief from pain, and left the infirmary of his own accord two days later. He afterwards returned, and the eyeball was enucleated on September 12th; the globe was very painful, and thoroughly disorganised. On section, the vitreous body was found to be suppurating. The piece of steel removed weighed 15 milligrammes (0.231 grain).

CASE XIII. *Retina: Vitreous Body*.—The next case possesses such features of interest that I purpose recording it more in full at another time, and now only give sufficient details for our immediate purpose. William A., aged 26, a mechanic, came to the Sheffield General Infirmary on August 10th, 1883. Three months before, he had been hit in the left eye with a chipping. On his admission, a small mark, in the sclero-corneal junction, on the inner side, at its middle, was detected. The pupil acted freely, both to light and to atropine. Refraction was hypermetropic.

With the ophthalmoscope, the media were found to be clear, and upwards and inwards (inverted image) from the optic disc was a black glistening body, surrounded with whitish effusion; this was believed to be the piece of steel. Vision was $\frac{3}{8}$. The field of vision, taken with a perimeter, showed a gap corresponding to the situation of the foreign body. In November, the fragment could no longer be seen, but still the whitish exudation was visible; the eye remained quiet, and vision was good.

February 22nd, 1884. He returned to-day with some amount of pain, and had iritis; Vision = $\frac{3}{8}$; no foreign body was visible in the fundus. By February 25th, Vision = $\frac{3}{8}$. The vitreous body was cloudy, and iritis was more intense. He consented to an attempt to extract the fragment of steel, which it was presumed had become loose, with the electro-magnet. Accordingly, after separating a conjunctival flap, the sclerotic was punctured between the inferior and external recti, with a Gräfe's knife, the direction being meridional, and the primary incision being joined by a second cut at its middle. After introducing the point of the electro-magnet, and withdrawing it, substituting a stouter extremity, and again passing it into the interior of the eye, the small fragment of steel was found entangled at the wound, and removed. The conjunctival wound was closed by two sutures. The pain subsided, as did also the iritis; the pupil has remained somewhat occluded, but he can count fingers, and promises, with the aid of an iridectomy, to see well again. The fragment had a whitish coating on one side, whilst the other was unaffected; it weighed 4 milligrammes.

The case is an interesting example, of which I have seen others, of preservation of vision with a foreign body embedded in the fundus oculi. The case suggests several questions. Where was the foreign body situated? Had it remained fixed in the retina, and become coated over with exudation, and in this way rendered difficult to detect with the ophthalmoscope, and, in this case, it had only recently fallen into the vitreous body? or had it separated from the retina as long ago as November, when the black shiny mark was no longer visible? The appearance of the fragment supports the former, but these questions I propose to discuss when I record, in more detail, this, as I take it to be, exceptionally interesting case.

At the time of writing this paper, the two following cases have occurred in the casual department of the infirmary.

CASE XIV.—A man, aged 40, applied with a piece of steel in the left cornea. The stoutest point of the electro-magnet was attached, and then, on being brought almost into contact with the cornea, was withdrawn with a minute particle adherent.

In other similar cases, the electro-magnet has proved also of service

but I have elsewhere pointed out how, from the nature of the particles embedded, it is not always equally applicable.

CASE XV.—A man, aged 34, was struck in the right eye by a piece of steel from a chisel with which he was cutting some iron. A dark mark was noticed under the conjunctiva, on the outer side of the globe, and, on applying the electro-magnet, it was noticed to move, and it was readily extracted through a small incision in the conjunctiva. The particle was about one-eighth of an inch long. In both these instances, the fragments of steel were removed by Mr. J. R. Turner, and to him and to Mr. P. Priestley, I am indebted for many of the notes of the cases here related.

The fifteen cases now recorded make, together with those previously published by me—nineteen in number—a total of thirty-four. Now, as previously, I make no record of the numerous instances in which wounds, in somewhat doubtful cases, have been “probed” by the electro-magnet; if these were calculated, the aggregate number would perhaps be doubled. Of the cases themselves, I would merely remark that they illustrate the wide applicability of the electro-magnet to the various parts of the eye; of course, they vary much in value and interest, but they form a complete series.

It will have been noticed that a delicate suspended magnet has been made use of in some instances as an aid to diagnosis, and that in some cases it afforded distinct indications. For example, in Case 3, the dipping of the needle rendered it certain that there was a fragment embedded in the sclerotic. Again, in Case 9, which was regarded as a “suspicious case,” when the suspended magnet was brought in front of the eye, the deflections were of the most distinct kind, and were particularly marked in the region of the sclerotic wound. In this latter case, it was thus inferred that a fragment of steel was situated inside the eye, and, moreover, that it was located near the point of entrance. The subsequent operation proved the correctness of these conclusions. The chip in this instance was, of course, of large size, but in others, comparatively small splinters, the suspended magnet has given indications of their presence.

ADDENDUM.—The three following cases, briefly related, and making a total of thirty-seven, have occurred since the paper was written.

CASE XVI. *Lens*.—In the early part of November 1884, Harry U., a lad aged 17, was struck on left eye with a chip from a punch. First seen, December 5th; lens opaque, and, at outer part, was a whitish patch of lymph. Cornea punctured with keratome on December 8th; needle of electro-magnet advanced to whitish patch, and withdrawn with pin of metal, weighing two milligrammes. Cataract removed April 3rd, 1885, with + 3 $\frac{1}{2}$, V = $\frac{1}{3}$.

CASE XVII. *Vitreous*.—Peter K., aged 23. Accident to left eye with a “wedging” of steel on December 4th, 1885. On December 29th, vitreous filled with exudation; lens clear; foreign body had penetrated below, just beyond corneal edge; a small horizontal scar is now visible. The sclerotic was incised, as in previous cases, between external and inferior recti, and point of magnet introduced; failure, however, to remove fragment resulted.

January 12th, 1885. Eyeball was enucleated, and small piece of steel, 12 $\frac{1}{2}$ milligrammes, was found embedded in the centre of a mass of organised lymph, in the vitreous cavity, some little distance behind the lens.

CASE XVIII.—Charles C., aged 34. Date of injury, March 10th, 1885. On the 16th, the condition was as follows; a small linear scar of cornea towards the inner side of middle, a corresponding one, also, in the anterior capsule, through which a little lens was protruding; in the posterior capsule (lens being not thoroughly opaque), a square mark was noticed, probably an opening. A small flap was made in the cornea below, and some of the lens allowed to escape, and the needle of electro-magnet introduced through the posterior capsule into vitreous, and a small fragment removed, weight 1 $\frac{1}{2}$ milligramme. The case has since progressed well.

BEQUESTS.—The late Mr. James Gorman, of Dublin, whose will was recently unsuccessfully contested in the Probate Court, has left by it a sum of £45,150 in charitable legacies, including the following bequests to Dublin hospitals: to St. Vincent's Hospital, £400; to the Convalescent Home attached to said Hospital of St. Vincent, and known as Linden, Blackrock, county Dublin, £50; to the Mater Misericordiae Hospital, £400; to St. Joseph's Hospital and Infirmary for Sick Children, £500; to the Hospital for Incurables, £500; to the Fever Hospital and House of Recovery, Cork Street, £500; to Our Lady's Hospice for the Dying, Harold's Cross, £500; to the Coombe Lying-in Hospital, £300; to St. Michael's Hospital, Kingstown, county Dublin, £500.

The Leicester branch of the St. John Ambulance Association has presented an ambulance-wagon to the Corporation of that town.

DEATHS FROM ANÆSTHETICS IN 1884.

By ERNEST H. JACOB, M.A., M.D.,
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THE following deaths occurring during anæsthesia for surgical purposes have been recorded in the journals, or have come to my knowledge, during the past year.

I.—Deaths under Chloroform.

Locality.	Sex.	Age.	Operation.	Mode of Death.	Remarks.
1. Portsmouth Hospital	M.	45	Papilloma of tongue	—	Face became livid, pulse ceased before operation was begun. No post mortem examination.
2. Manchester ..	M.	—	—	—	Heart malformed.
3. Carlisle Infirmary ..	M.	17	Disease of ankle	—	Syncope after vomiting. No post mortem examination.
4. Glasgow ..	M.	—	Adhesions in joints	—	Sudden syncope after very little chloroform had been taken.
5. Derby ..	M.	8	—	—	“Paralysis of heart” immediately after administration. Post mortem examination, organs healthy.
6. Nottingham ..	M.	33	Extraction of tooth	Syncope	Organs healthy, post mortem examination.
7. Manchester Work-house Infirmary	M.	71	—	Asphyxia	—
8. Glasgow Western Infirmary	M.	26	Fracture of leg	Syncope	—
9. Guildford ..	M.	—	Injury to hand	—	—

II.—Deaths from Mixtures of Chloroform and Ether.

Locality.	Sex.	Age.	Operation.	Remarks.
1. Sussex County Hospital	M.	26	Irreducible hernia	Chloroform given, followed by ether. There was albuminuria and a double aortic bruit. Death by asphyxia. No degeneration of cardiac muscle.
2. The New Hospital for Women	F.	32	Exploration of kidney	Sudden syncope. Post mortem examination, kidneys full of abscesses, heart pale. Patient previously much exhausted. The A.E.C. mixture was used.

III.—Deaths from Methylene.

1. London ..	F.	23	Uterine operation	Syncope in three minutes, after inhaling only 10 minims.
2. S. Devon Hospital ..	M.	19	Suture of nerve	Syncope. Post mortem examination, right lung congested, heart hypertrophied.
3. Bedminster ..	M.	—	Extraction of tooth	—

IV.—Deaths from Ether.

1. Gloucester Infirmary	M.	50	Cancer of mouth	Patient very ill and feeble. Face became pale about five minutes after beginning.
2. St. George's Hospital	F.	43	Sloughing fibroid of uterus	Patient much exhausted; large goitre; breathing ceased, no air admitted on artificial respiration. Tracheotomy performed.
3. Metropolitan Free Hospital	boy	—	Operation for bronchocele	Death by spasm of expiratory muscles epileptic. (?) Lungs could not be inflated.
4. Leeds Infirmary ..	F.	54	Ovariectomy	Patient very feeble, great displacement of organs. Took ether badly at first, breathing became shallow and ceased. Death occurred about twenty minutes after commencement, 3j of ether only having been administered.
5. Leeds Infirmary ..	F.	64	Ovariectomy	Patient much exhausted, but took ether well. Twelve hours after operation, began to have dyspnoea, and died with congestion of lungs, seventeen hours after operation.
6. Leeds ..	F.	38	Ovariectomy	Patient exhausted; breathing became feeble, and ceased.