CLINICAL LECTURE

ON

TRAUMATIC CATARACT, AND OTHER INJURIES OF THE EYE.

By J. R. WOLFE, M.D., F.R.C.S.E.,

Surgeon to the Glasgow Ophthalmic Institution; Lecturer on Ophthalmic Medicine and Surgery in Anderson's College.

GENTLEMEN,—Since the return of activity in our collieries, shipbuilding-yards, and workshops, we have admitted a large number of accidents, and at this moment we have under treatment a number of cases of injury of the eye, including four of traumatic cataract. I propose, therefore, to devote this lecture to the consideration of the management of accidents, and especially of traumatic cataract.

When we examine the standard works on diseases of the eye, which have appeared either in this country or abroad, we are astonished to find how little space is devoted to injuries of the eye. Even in books where we see "Injuries" figuring on the title-page, the subject receives a very cursory notice. The reason is obvious. The ocular muscles which rotate the eyeball perform also the function of retracting it into the orbit on the approach of danger; hence the comparative rarity of accidents or traumatic cataract even in large cities. Observe this patient—a child eight years of age—who was brought into the institution ten days ago, with serous chemosis of the upper and lower eyelids, the result of a stab with a fork, which entered behind the eyelid into the orbit. From the external appearances, you would have thought that one at least of the prongs had a chance of piercing the eyeball; but it is remarkable how the points have grazed round the sclerotic without cutting it. An orbital abscess has been the most we have had to deal with, and the patient has made a good recovery. Accidents like this; or a stroke with a penknife or prick with a needle; or cases such as we had on two occasions last year, where young children were trying to undo a shoestrings with a fork, which slipped and penetrated the eyeball—make up the ordinary run of cases which we meet with in civil practice. And these are of such unfrequent occurrence, that our eminent authorities have no opportunity of bringing them into regular systematic consideration. It is only in places like Glasgow, where there are collieries, iron-foundries, and shipbuilding-yards, and where pieces of iron or coal are flying about, that injuries become numerous, and we have any chance at all of classifying them and treating them systematically. They may be considered to bear the same relation to ordinary cases, that military bears to civil surgery. In August 1872, I had an opportunity of bringing before the notice of the International Ophthalmological Congress in London a list of eighty-two such cases, and classifying them; to my knowledge, the first attempt made to reduce them to a system.

Injuries to the eye, whether inflicted by hot metal or sharp instruments, which have not penetrated the eyeball, are generally comparatively simple in their treatment; but, as an exception to this, I may show you a very interesting case lately under my care. Jane L., aged 17, had her eye injured by a beard of barley on November 1st, 1879. She was brought to me on November 25th, with multiple abscesses of the cornea, giving it somewhat the appearance of punctative keratitis. The whole cornea was opaque, and the iris invisible; but the worst feature about the case was the absence of any cyclitis or reaction in the neighbouring parts: the inflammation seemed to be asthenic in its character. Pus exuded as it were from interrupted points throughout the whole substance; and it was the occurrence of these interrupted points which enabled me to pronounce the case not altogether hopeless. There was constriction at the ciliary border, and I determined to make a limited sclerotomy. I introduced a narrow lance to evacuate the aqueous humour, but very little issued. The course of treatment upon which I then determined was the direct application of hot steam to the eyeball; and under this it began to recover. The first appearance of improvement was the formation of blood-vessels proceeding from the periphery to the cornea proper, first at the inner segment, and then extending over the whole of the corneal circumference. Now, after two months' daily use of the vapour, the cornea has cleared up, and vision is nearly normal, and it is only by oblique illumination that we can bring into view the deep cicatrices of the cornea, showing the narrow escape which the eye has had.

The instrument for fumigation I first saw, three or four years ago, in the *clinique* of my friend Professor Landolt of Paris.* We have been

in the habit of using it for all rebellious cases of kerato-cyclitis, and Dr. Pickering reports very favourably of its efficacy; but I have never seen its effects so charmingly manifested as in the above case.

In explanation of the serious nature of wounds from beads of corn, I would say that I consider them analogous to the injuries caused by coal-dust, which generally prove so fatal to the cornea, the bad results of which I believe to be due to the mechanical irritation set up by the extremely pointed angles and sharp edges of the particles, which resemble shivers of glass. (*Report of International Ophthalmological Congress in London*, p. 81.) In this case, I would consider the cause to be also mechanical; the woody spicula penetrate and irritate the cornea, causing sloughing of its substance. The hot steam may act by washing out the part and assisting the disentanglement of these spicula, while at the same time it produces reaction in the neighbouring parts, thus favouring the formation of new blood-vessels to regenerate the lost tissue.

When a foreign body penetrates the cornea, and leaves a wound through which the iris protrudes, the case is more serious, and it then becomes necessary to remove the protruding part of the iris, and to set the rest afloat in the aqueous humour.

But the injury is still more complicated when the laceration involves the iris and ciliary margin, and produces hernia of that region; in which case, the iris which protrudes through the cornea should alone be removed, whilst the ciliary circle must on no account be interfered with, but the conjunctiva and subconjunctival tissue should be brought together with fine sutures to favour the return of the hernia. For, from my own practice, as well as from reports received from others, I have come to the conclusion that an excision of the tissues of the ciliary region is apt to terminate in suppuration of the globe.

Mr. D. M'C. was admitted January 1880, with a tear in the upper and outer margin of the cornea and ciliary region; the iris and ciliary muscle protruded, and the anterior chamber was filled with blood; the eyeball was soft, and there was no vision. I resected the iris at the margin of the cornea, but the rest I brought together with two silk ligatures (as shown in Fig. 1). I made at the same time a puncture in

Fig. 1. was taken before removal of ligatures.

the lower margin of the cornea, letting out the blood in the anterior chamber. Forty-eight hours after the operation, the patient was able to see well; and on the fourth day the ligatures were removed.

In cases where a foreign body is lodged deeply in the cornea, looking into the anterior chamber, and offering little surface to lay hold of, I follow the advice of M. Desmarres, to introduce a lance into the anterior chamber, and support the foreign body from behind; then to enlarge the point of entrance, and push it forwards. The best instrument for the prehension of a foreign body is the toothed forceps (Fig. 2),

Fig. 2.

for which we are indebted to von Gräfe; indeed, no oculist's case should be without this instrument. With it we may lay hold of a foreign body and extricate it from positions where, with any other forceps, it would be apt to slip out of sight.

It is astonishing to what an extent tears of the sclerotic, if not very coarse, with prolapse of the vitreous, sometimes heal without prejudice to the sight. I had, not long ago, under my care Mr. R., a large mill-owner, who, when superintending a new engine, was struck by a piece of iron, which made a horizontal section of the sclerotic of the left eye, to the extent of a quarter of an inch. I was immediately in attendance, and stitched up the wound, which healed without the least detriment to vision.

When a foreign body penetrates the sclerotic and lodges in the

* It is made by Collin, Rue de l'École de Médecine.

vitreous humour the eye is generally considered lost. When the body is small, there is some chance of its becoming encysted without doing immediate harm; but there is only a question of choice between instant enucleation and waiting the course of events. When the body is large, however, the risk of sympathetic inflammation is so great, that no other alternative but immediate removal remains. Lately, however, a most interesting paper on this subject has been published by Professor Hirschberg, written in unequalled style, furnished with beautiful figures and charts. In it he records a case where he removed a foreign body from the vitreous humour, by means of a galvanic magnet, with preservation of sight, except a scotoma at the place of incision. The credit of this procedure is due to Dr. McKeown of Belfast, who published a paper in the *BRITISH MEDICAL JOURNAL* for June 27th, 1874. He removed a piece of iron from the vitreous humour, by means of a bar-magnet eight inches long, one inch broad, and one line thick, which he tapered at both extremities to a blunt point. I have never availed myself of this suggestion, because, in reading his paper, it occurred to me that, when a permanent magnet is tapered to a point, so as to enter with facility into a small puncture of the sclerotic, the power of attraction must necessarily be very small, and, in order to make it of any strength, it would require a large magnetic surface, for which a large scleral opening is requisite. But, by means of the instrument introduced by Professor Hirschberg (Fig. 3), which is connected with a gal-

Fig. 3.

vanic apparatus, we can get a large power with a thin point. This is a valuable addition to our armoury, and will prevent the sacrifice of some eyes.

We shall next enter upon the consideration of traumatic cataract. These accidents are various in form and gravity, ranging from the most simple prick of the lens or lens-capsule to the most serious complications. I have elsewhere characterised our procedure in these last cases as "an endeavour to save vision from the *débris* of injured eyes". (*Loc. cit.*)

As an instance of the simpler form, I would direct your attention to

CASE I. *Partial Dislocation of the Lens forwards: Linear Extraction without Iridectomy: Sight Good.*—George A., aged 39, engineer, got a stroke on the eye with a piece of iron, which resulted in rupture of the suspensory ligament and partial dislocation of the lens forwards into the anterior chamber. He did not feel much inconvenience immediately after the accident, but by-and-by his sight became dim, and when he came here for advice the lens was entirely opaque. This was a case highly favourable for linear extraction, and accordingly I adopted that method (see Fig. 4). Separating the lids with a speculum, I intro-

duced a needle through the cornea, opened the capsule widely, and broke up the lens-substance; then, fixing the eye with forceps at the lower vertical meridian, I introduced the lance obliquely through the

Fig. 4 shows the place of the incision and the exact shape of the lance.

cornea into the anterior chamber, and behind the lens. The aqueous humour escaped, and the lens advanced forwards, and was pumped out by alternate pressure and relaxation of the forceps and depression of the lance. In this way, I got rid of nearly the whole of the lens-substance without interfering with the integrity of the pupil. Both eyes were closed in the usual way with small strips of adhesive plaister, and, on opening the eye in forty-eight hours, we found vision restored. There was a thin layer of the lens-substance lodging in the anterior chamber, which, however, did not obstruct the pupil, and disappeared after a few days. Three weeks after the operation, we found his sight good; he reads No. 8 of Jäger.

CASE II. *Traumatic Cataract with Laceration of the Cornea and Iris: Flap-Extraction with Iridectomy: Vision Good.*—And. A., aged 30, engineer, was struck by a chip of iron in the outer and lower part of the cornea, tearing the iris and injuring the lens, which was opaque when he presented himself. I made an iridectomy, and extracted the lens at the same time by a small flap. His vision was good; although the upper margin of the lens-substance was adherent to the iris; this I subsequently broke up with a needle and removed. He reads No. 10 Jäger.

CASE III. *Traumatic Cataract with a piece of iron in the lens.—Iridectomy: Subsequent Extraction by small Flap: Good sight.*—D. M'D., aged 28, riveter, was struck by a chip of iron, which passed from the inner side obliquely through the cornea, and lodged in the lens, behind the outer margin of the iris, causing traumatic cataract. I made an iridectomy downwards when he was admitted, and in three weeks' time I extracted as much as I could of the lens, with the piece of iron in it. Two days later, I found some cortical substance had become opaque: but, as it gave rise to no disturbance, I did not interfere with it until three weeks afterwards, when I removed it also. His sight is good; he reads No. 10 Jäger.

CASE IV. *Traumatic Cataract with Laceration of Cornea and Iris, and Hypopion: Iron embedded in Lens: Evacuation of Pus and Iridectomy: Extraction: Good Sight.*—W. G., aged 33, boiler-maker, presented himself with an injury of the eye. While he was engaged in cutting a piece of iron, a chip from the chisel flew up and struck him. On examining his eye, I found the cornea and iris lacerated, and the lens

Fig. 5.

opaque; there was also a little pus in the anterior chamber. I opened the cornea and let out the pus, and also removed a portion of the iris (Fig. 5). Watching the case for several days, I noticed what is un-

usual in such cases, that the little blood in the anterior chamber did not make any progress towards absorption; and this inactive condition caused me to suspect that there must be a foreign body lodged in the interior of the eye. Now the test for detecting the presence of a foreign body in the eye is touch. When the eyeball is gently touched in every direction, if the patient start as if pricked, you may assume with certainty that a foreign body is there; if he be passive, then it is possible that a foreign body may be embedded in the lens-substance, in such a manner as not to cause pain on pressure: this is likely to be the case when the tear in the cornea is small; but when the tear is large, marking the existence of a large surface, the possibility of such a substance lodging there quiescent must be excluded. Reasoning, therefore, from these premises, I came to the conclusion that a foreign body of sufficient size to inflict such a tear could not lodge in the lens-substance without indicating its existence by causing starting on pressure. Yet, when watching the behaviour of the anterior chamber, the dryness of the iris, and inactivity of the aqueous humour, I became suspicious that a foreign body must be lodged there. Indeed, by-and-by, when examining the eye by oblique illumination, I noticed a small black speck at the margin of the iris, which was at first taken to be a pigment-spot; but I came to the conclusion that this must be the offending body. I opened the cornea at the original wound with a needle, and touched the spot, which I found to be a foreign body. I drew it forwards, and, in withdrawing the instrument, I enlarged the corneal opening. I then, with the toothed forceps, seized and removed a piece of iron, of the shape and size represented in the figure (6), weighing $1\frac{1}{2}$ gr.; but to this

Fig. 6.—Piece of Iron.

moment I am perfectly at a loss to explain how such an angular body could be lodged in the lens without betraying its existence on pressure. Three weeks later, I extracted the lens; and you can satisfy yourselves that the patient enjoys good sight. He reads No. 10 of Jäger. From the form of his pupil, you would never suspect that the eye had such a narrow escape.

In cases like this, the line that divides the region of safety from the necessity of sacrificing the eye is so faint, that it requires great watchfulness on your part to lay hold of the phenomena, and judgment to balance the conflicting evidence on each side, in order to arrive at a satisfactory conclusion.

RESPIRATORY TROUBLES IN SYPHILITIC AFFECTIONS OF THE LARYNX.—In a paper reprinted from the *Annales des Maladies de l'Oreille et du Larynx*, 1879, Dr. Krishaber describes the following syphilitic accidents: 1. The consecutive and secondary lesions; 2. Those which result from the more profound changes which are produced later on, and known as tertiary. Both give rise to dyspnoea, hoarseness, and sometimes progressive or rapid asphyxia, calling for energetic interference. The narrowing of the larynx in the second period is due to oedema of the glottis; and this oedema is variously constituted, according as the lesion which has given rise to it itself occupies the vestibule of the larynx, the aryteno-epiglottic folds, or the vocal cords. In any case, the nearer these lesions are to the bronchi, the more serious they are. Lesions of the vocal cord are more serious than those of the vestibule, and those of the trachea are still more grave than those of the vocal cords. The narrowing of the larynx, and the symptoms of asphyxia to which it gives rise, may be so complete as to necessitate tracheotomy. Usually, however, it is less sudden and severe; and, when the specific nature of the lesions is ascertained, the immediate application of energetic antisyphilitic treatment may suddenly suppress the accidents and avoid tracheotomy. Mercurials and iodide of potassium are often very useful in such cases; and Dr. Krishaber thinks it useful to consider most non-tuberculous individuals attacked with acute oedema of the larynx as suspected of syphilis. Finally, it must be remembered that the so-called secondary lesions of laryngeal syphilis may be produced at a period relatively distant from the outset of the disease; and this consideration is the more important, as the respiratory symptoms of tardy laryngeal disease are very exceptionally determined by oedema of the glottis; and, on the other hand, the treatment which can be opposed to them, in spite of the slowness of the symptoms, must be much more radical. The ravages of the destructive processes at this period of profound syphilis leave after them gaps to be filled up; and their cicatrization, with the contraction to which it gives rise, is the only advantage which can be expected from the treatment. But, if this retraction have a tendency to obliteration of the larynx, that obliteration will take place, whatever may be done to prevent it. In such a case, it is necessary to open the trachea, and to keep the cannula in it indefinitely, under pain of serious relapse.

CLINICAL LECTURES ON NERVOUS DISEASES.

By A. HUGHES BENNETT, M.D., M.R.C.P.,
Physician to the Hospital for Epilepsy and Paralysis, Regent's Park; Assistant
Physician to the Westminster Hospital; etc.

LECTURE III (concluded from page 163).

ELECTRICITY AS A METHOD OF PHYSICAL DIAGNOSIS IN DISEASES OF THE NERVOUS SYSTEM.

III. The Employment of Faradism and Galvanism as Diagnostic Agents.—From a consideration of the action of electricity in health and disease, we may draw inferences which are sometimes valuable in forming a diagnosis; at the same time, it must be admitted that alone we cannot place exclusive dependence upon it. Like all other methods of physical research for investigating disease, its use must be combined with a careful consideration of the case in all its bearings; and although it may thus assist, and valuably assist, our reflections in estimating the nature of nervous affections, by itself it does not claim to demonstrate the existence of any individual lesion. On this account, its help is not to be despised, any more than that of the stethoscope or the thermometer, neither of which diagnoses any morbid state, but simply acts as an exact instrument for scientific research, for aiding and improving our senses, and for enabling us to measure and record physical conditions with accuracy. It has been said that electricity tells us nothing that cannot be ascertained by other means. This is only partially true, and the same argument equally applies to all other methods of clinical inquiry. For example, we feel that the skin is hot, but trusting to our unaided senses is uncertain and inexact, individuals having different notions as to the extent of the symptom. By the thermometer, we demonstrate and record with exactitude the precise degree of temperature, thus avoiding all vague statements and individual impressions. It is true that, in well marked instances, we can see muscular atrophy and guess at nervous degeneration, but by electricity we are enabled to prove and measure these with some degree of accuracy; and, although the science has not yet advanced sufficiently to permit us to do so with absolute precision, there is enough to warrant us in employing that agent for practical purposes. It is by the encouragement of such physical methods of inquiry that our hopes are to be realised of making medicine as much as possible an exact science.

What, then, does electricity actually prove? It demonstrates the functional activity of nerve and muscle, and in consequence their histological condition, a knowledge of which, in many nervous diseases, combined with the other circumstances of the case, often enables us to arrive at a diagnosis.

From the preceding observations on the effects of electricity on different morbid states, it will be seen that much useful information is gained, that we can definitely ascertain the extent of the excitability of nerve and muscle, and can infer with great accuracy the stage of histological degeneration which exists. A diagram, as it were, of such pathological changes is thus physically displayed. Although it is a general knowledge of the relations which the electrical reactions bear to the various anatomical changes in nerve and muscle which take place in disease that we depend upon to assist us in diagnosis, we shall mention a few of the special phenomena which appear to be of practical clinical value.

1. Normal Electrical Reactions in Disease.—In abnormal states, such as paralysis, the presence of healthy electrical reactions is by itself of diagnostic value. It may be stated that, as a general rule, in paralysis from brain-disease, the nerves and muscles are normal to both faradism and galvanism. In doubtful cases, such knowledge may prove of great assistance in determining whether a given palsy is due to disease of the brain, as opposed to lesion of the cord, nerve, or muscle. For example, if in chronic paralysis of the face, the electrical reactions be normal, the symptom is due to disease of the higher centre. The same applies to paresis of any other set of muscles in the body.

In many diseases of the spinal cord, especially when the posterior roots and the posterior and antero-lateral columns only are affected,