tions are taken, viz., keeping the parts perfectly at rest, and as far as is possible placing the divided ends of the tendon in juxtaposition. In slight cases proceeding slowly and cautiously with the after treatment, or the power of contraction, which is common to all cicatrices, from whatever cause they may originate, becomes destroyed, and a worse deformity is produced. This was the principle laid down by Delpech, the author of this operation, based as it now is upon scientific principles; and it is a principle which can in no case be departed from without incurring great risk.

Many years since, I was called in consultation upon a case which presented the appearance of talipes calcaneus. The os calcis was very nearly perpendicular; the foot flexed, everted, and contracted in that position. At that time I had not witnessed this condition but from one cause—viz., paralysis of the gastrocnemius. Upon examining this patient, I took occasion to point out to the medical gentlemen in attendance the nature of the deformity and the probable cause, directing them to examine the tendo Achillis, and satisfy themselves of the condition of the muscle, the outline of which is absent in these cases, the tendon lying loose and atrophied behind the joint. I had scarcely finished my remarks, when, to my surprise, the mother exclaimed, "Oh, sir, this has been made by a gentleman who operated upon my child two years ago." I learned that the child had suffered from slight contraction of the heel, for which the tendo Achillis had been divided, and the foot rapidly brought into the flexed position. By this proceeding, the uniting medium had been so weakened and attenuated by too rapid extension, that the power of contraction of the cicatrix, to which I have alluded, was altogether lost; and although the muscle was not paralysed, yet, from its greatly increased length, there was nothing upon which it could act before complete contraction upon itself had taken place.

The os calcis, by losing its support, was drawn down into the position mentioned by the muscles of the sole of the foot, and a deformity much worse than that for which the child was operated upon produced, with this disadvantage, that its present state cannot be remedied, beyond restoring the os calcis to the horizontal position; and, in all probability, the patient will be compelled to wear mechanical supports for life. Let this, therefore, be a caution to you; for I have since seen many similar cases.

I may here allude to some amusing experiments which have been made upon rabbits, with the view of illustrating the mode of union of tendons after operation. They require notice, from the fact that diagrams of the results have been published in the *Pathological and Medico-Chirurgical Transactions*. The rabbits, unfortunately, would not tolerate the confinement of the limb in splint and bandage after operation, but gnawed off these unwelcome appliances. Of necessity, the union was most imperfect, and no more illustrates the actual union of tendons where proper precautions are used, than the false union of bone after fracture under similar circumstances would illustrate the normal union of fractured bones.

The ligaments suffer from stretching on the convexity, and contraction on the concavity of a deformity. This also applies to those non-congenital deformities which have arisen without any affection of the joint itself. In rheumatic and some other diseases, they appear to become destroyed, and admit of dislocation taking place, as is witnessed in rheumatic disorganising of joints. They appear, however, to be merely passive agents.

The bones are not affected in their growth or development in early life, excepting the congenital rachitic condition. They become slightly altered in the articular surfaces, however, if the deformity is allowed to continue for a period of years, still retaining their natural forms. Hence, as you will more clearly perceive in the course of the lectures, the congenital deformities, contrary to what we should, *a priori*, have anticipated, are by far the most favourable for treatment, and the most satisfactory in their results.

[To be continued.]

THE HUNTER STATUE. At a last meeting of the John Hunter Statue Committee at the Royal College of Surgeons, on the 6th instant, it was decided that the execution of the marble statue should be entrusted to Mr. Henry Weekes, A.R.A.; and that when completed, it should be placed in the museum of the College. It is the intention of the Committee that Sir J. Reynolds' portrait of the great original should be followed as nearly as practicable by the sculptor.

Nettlesonian Lectures

ON

THE OPHTHALMOSCOPE AND ITS APPLICATION.

DELIVERED BEFORE THE MEDICAL SOCIETY OF LONDON.

By HAYNES WALTON, Esq., F.R.C.S., Surgeon to St. Mary's, and to the London Ophthalmic Hospitals, etc.

LECTURE I.

MR. PRESIDENT AND GENTLEMEN,—It will be doubtless satisfactory to you, and, I assure you, no less so to myself, to say why I appear in this responsible position, because I feel that the Society has a right, under ordinary circumstances, to expect from those who take the lectureship something more valuable and more acceptable than I fear I have to offer. Nor is this a mere vanity excuse, a kind of clap-trap to increase expected applause, but what I really feel.

The facts are these: most unexpectedly, and wholly without my knowledge or seeking, directly or indirectly, I was nominated to the office. My first impression was respectfully to decline, for my time is tolerably well occupied by my ordinary occupations, and I have had of late extraordinary demands on it. But recognising the duty which each individual member of a society owes to the body corporate, I resolved to contribute my quatum.

I could not readily decide on the subject that I should take; but ultimately determined to introduce the ophthalmoscope, on account of its novelty, its value, and, as I believe, the growing disposition on the part of the profession to be informed on this secret penetrating instrument. I hardly ever speak to a professional brother on an ophthalmic subject, without his asking me something about this new appliance, and requesting an opportunity to see it used.

I think that I shall best satisfy the great majority of my hearers by avoiding minute disquisition and deep detail, and rather giving a general idea of the ophthalmoscope, a sketchy outline, shewing what it is, what it can accomplish in the mystery of diagnosis, what guidance it affords for the treatment of disease, and generally introducing any practical matter with which I am acquainted.

Let me say a few words about the origin of the instrument. It seems to be generally agreed, and I believe truly, that the source of this discovery, which has revolutionised ophthalmic nosology, and rendered obsolete nearly everything that has been written or taught on the deep seated diseases of the eye, is to be traced in a communication in the twenty-ninth volume of the *Medico-Chirurgical Transactions*, by William Cumming, Esq., formerly house-surgeon to the London Hospital, "On a Luminous Appearance of the Human Eye and its Application to the Detection of Disease of the Retina and Posterior Part of the Eye."

It would appear that Mr. Cumming's attention was attracted to the subject from the description of cat's-eye amaurosis by several authors; the name being used to infer that the appearance was like the luminous glare of the eyes of some animals, by the reflection of the light from a brilliant tapetum. What was seen, they thought to be the appearance of disease; and Mr. Cumming started with his investigations under that supposition. None of the writers, he says, mention a reflection from the posterior part of the perfectly formed healthy eye of the human subject, nor had he heard of any one else who described such a condition; and he undertakes to show that the healthy human eye is equally, or nearly equally, luminous as the eye of the cat, or dog, or other animals, when observed under favourable circumstances.

It was not long before he discovered that the cat's-eye amaurosis, about which he found the statement of writers to be at variance on all points, was a matter of imagination. With our superior knowledge, we may justly infer that the mass of recorded cases of amaurosis were not diseases of the nervous apparatus of the eye.

The first case in which Mr. Cumming observed the natural brilliant reflection, he supposed to be one of cat's-eye amaurosis.

rosis, so accurately did it coincide with the description given by Mr. Tyrrell. Carrying his observation further, he found that it existed in all healthy eyes when the pupils were dilated.

"Most of the cases," he continues, "appear then to have been nought but the observance of the natural luminosity, and that it should be seen in amaurosis only is nowise strange; the more minute examination bestowed upon cases of this kind, and the probably dilated state of the pupil, are reasons why it should have been seen in it alone."

His simple process of examination is this:—"Let the person under examination sit or stand eight or ten feet from a gas-light, looking a little to the side; standing near the gas-light, we have only to approach as near as possible to the direct line between it and the eye to be viewed, at once to see the reflection. Or, in a dark room, a candle being placed four or five feet from the eye, if we approach the direct line between them, we shall be able at once to see it in many cases. If solar light be admitted through a newly closed shutter into a dark room, the luminosity may be seen when the pupil is tolerably dilated, the patient standing five or six feet from the aperture, and the observer occupying the position before indicated."

"These, then, are the circumstances necessary for seeing the luminosity. That the eye must be at some distance from the source of light, the distance being greater in proportion to the intensity; that the rays of light diffused around the patient (and sometimes around the eye itself) should be excluded; that the observer should occupy a position as near as possible to the direct line between the source of light and the eye examined: hence it is sometimes necessary for the observer to stand obliquely, that his eye may approach nearer to the direct line."

"The appearance of the reflection itself not only varies much in colour and intensity in different persons, but also from the circumstances under which it is seen; viz., the greater or less intensity of light, the position of the eye examined, and the distance at which it is viewed." Many other similar modes are given.

Three times I have seen the eye accidentally illuminated. The first time that I was called to a consultation in the country (an occurrence which a man is not likely to forget), I saw a beautiful illumination of the eyes of a gentleman who was sitting in the corner of the waiting-room of the old station of the Great Western Railway, a few feet behind a gas-lamp; and associated with it was this coincidence, that the gentleman, himself blind, who came to town with his servant to take me to one of his pupils, who had been wounded in his eye, was at the time telling me of his own blindness, and called it "cat's-eye amaurosis". After that, I witnessed the same thing in a lad, behind the gas-light, in a druggist's shop. I again saw it in my study by my microscope lamp.

Mr. Cumming's paper, with all its experiments and suggestions, and not less its originality and philosophy, bases all the application of the discovery in the mere illumination of the interior of the eye-ball; full illumination being taken as the indication of health, and the absence of it as indication of disease in the retina and posterior part of the eye; for instance, he writes:—

"The establishment of the fact of a similar reflection from the healthy human eye to that from the eyes of animals, appears to me chiefly important in its adaptation as a mode of examining the posterior part of the eye. The retina and choroid, hitherto concealed in the living eye, and little opportunity being afforded of examining their condition after life, in consequence of their diseases not terminating fatally, considerable uncertainty has attended the diseases ascribed to these structures; but the existence of this luminosity having been recognised, its non-existence or abnormal appearance may enable us to detect changes in these structures heretofore unknown, or satisfactorily to see those which we only suspected."

"If we dilate the pupil by atropine, we have a means afforded of seeing the condition of the retina and choroid in every case. The cases I have examined in this way have confirmed the general impression that the retina is not frequently the seat of change in amaurosis; for, out of several cases of amaurosis, in which the non-opacity of the cornea, lens, and humours, allowed this mode of examination, I found but two, in which the retina was so changed that the reflection was not seen."

Among the physiological conditions of the eye enunciated by Mr. Cumming, are these: that the choroid is the principal reflecting structure, the light returned from the retina and concavity of the hyaloid body doubtlessly increasing the effect; that the brilliancy is considerably augmented from the

concentrating influence of the concave shape of the retina, and the focal distance of the lens; that the luminosity of the healthy eye appears to be in proportion to the light colour of the pigment. The reflection from the albino is evident in ordinary day light. He further observes:—

"On placing a middle aged man, an albino, ten or twelve feet from a gas-light, the reflection was extremely vivid, and of a pinker colour than ordinary, while the light transmitted through the choroid and iris evidently increased the effect. On placing close to his eye a black card with an aperture a little larger than the pupil, the reflection was brighter than that from the eye of a fair person examined side by side, but was of a more decided pink colour."

"In persons of fair complexion and blue or grey irides, it is generally more brilliant and more readily seen than in those of dark skin and irides. In the mulatto, it is also dusky; but in them, as in persons of swarthy complexion, a silvery reflection is sometimes seen, and is most probably a reflection from the retina. In the albino, this reflection produced by the vascular choroid is most brilliant and lightest in tint. In proportion to the darkness of the pigment, its lustre is diminished and the colour becomes more dusky."

Perhaps there appears a contradiction here, but there is really no discrepancy. The choroid is found to reflect greatest where the pigment is wanting. The pigment has nothing to do with the reflection: on the contrary, it interferes with it, and therefore lessens the illuminating power. In man, the pigment is less abundant and less intense in colour than in many of the lower animals; it is brown, rather than black.

It was then the first grand principle, the comprehensive idea, that Mr. Cumming gave us. He did not see the optic disc, nor the retinal vessels. The perfecting of the discovery and the practical application, involving as they did the difficulty of inventing an instrument and the working out of much detail, were reserved for other labourers. These were found in Germany. It would be fruitless to trace the instrument through its stages of development. I will merely give the names of its several improvers, as far as I can ascertain, in the order of time: they are, Helmholtz, Ruete, Coccius, and Anagnostakis.

All who are acquainted with the current medical literature, know that the ophthalmoscope was received in England with much acclamation, certainly not more than was deserved. But, even when there is not exaggeration about the value of any discovery, or the benefit of any appliance, false expectations are apt to be found, not less of its intrinsic value than its adaptation; reaction ensues, and condemnation soon follows. But this is, of course, with the multitude, and not with the plodding few. When the profession was truthfully told that the Germans had devised a method of looking into the eye, whereby the minute parts could be intelligibly seen, and diseased states fully recognised, it was but natural, and certainly commendable, that many should embrace such desirable means, and possess themselves of the new wonder. It was therefore without astonishment that I learned from one surgical instrument maker that he had sold bushels of ophthalmoscopes, and from several opticians that they could not make them fast enough for sale. Hundreds of foreign instruments were imported. But dissatisfaction and disappointment quickly followed. It was early discovered that there was no more royal road here than in any branch of knowledge; that elements had to be mastered, mechanical niceties to be acquired; that considerable practice was demanded for the requisite familiarity; much study wherewith to detect, to understand, to compare, the several diseased states; and abundant opportunities, with time to work out a rational mode of treatment.

The ophthalmoscope at present in use is a portable little concave mirror, made of silvered glass, having a hole of sufficient dimensions in the centre, with a handle of about ten inches. The hole is usually too small; it should be of sufficient size to admit of distinct vision when the instrument is held with the requisite obliquity; the edges should be smooth and free from splinters. A double convex lens, of from two and a half to three inches focus, is needed as an appendage; but the power should be regulated by the usual range of the observer. It should be set in a frame with a stem of three or four inches long, which renders it more readily used. I know that mirrors of different curve and lenses of varying power compose the apparatus of some surgeons. That these varieties can be brought into requisition according to one's fancy, is undoubted; but I believe that they possess no utility, no decided practical advantage.

The ophthalmoscope demands an artificial light. Under an emergency, I have employed a candle, and with the faint illu-

mination have gathered some, although an imperfect, idea of the interior of the eye. A steady lamp-flame is needed for the full effect. Whenever I can command it, I employ gas, and use a small argand burner, at the bottom of which is an arrangement with glass collar that ensures a steady flame, that slides on a vertical rod with a pedestal. It is a gas-lamp much used by the artizans of the watchmaking district of Clerkenwell, and sold at a lamp-shop in Clerkenwell Green. A very light blue chimney whitens the light by reducing the predominant red rays, and the eye is then more naturally seen.

The examination should be made in a dark room.

As a rule, the eye should be prepared by having the pupil dilated by belladonna or some of its salts. Now and then persons are met with, especially fair young persons, whose naturally expanded pupils enable us to dispense with the artificial enlargement, particularly if it be not more than a mere glance within the eye that is needed; and above all, near-sighted eyes may be so examined; but generally, in adult age, and still more in old age with its discoloured lens, and in all cases where a thorough survey is called for, the natural pupil will not suffice. Vain discussions have been wasted on this question, which may be resolved into this common sense remark, that if the desired object can be accomplished without interfering with the pupil, all the better, as the sequel will show; if it cannot, dilatation must be resorted to.

The pupil is generally more contracted by the light of day, than by the light of the ophthalmoscope. Often when it has appeared too small to allow of any serviceable examination, it has dilated sufficiently when the room has been darkened, and remained of such capacity as to afford all that was desired.

Unnecessary dilatation should always be avoided, because this unnatural state produces positive discomfort from indistinct vision, the degree and duration of which, from days to weeks, is proportionate to the dilatation and the healthiness of the eye. Patients frequently leave the surgeon on account of this, even when they have been forewarned. In spite of all assurance to the contrary, they are likely to attribute the temporary annoyance to the use of the ophthalmoscope, and to declare how detrimental it has been to them. Any increase of disease is often set down to the same cause.

It is not generally known, indeed it is my own observation, that, when a strong solution of atropine is used to the one eye, the vision of the other is apt to be impaired for one, two, three, or even more days, and that without any apparent alteration in the pupil. The power of adjustment seems to suffer particularly. I shall not stop to discuss the physiology of this; I think it sufficient to mention the fact.

These are reasons why strong solutions should be avoided; and weak ones answer our purpose quite well. I have seen symptoms from the strong applications that leave me in no doubt that they were those of belladonna poisoning. In one instance I believe that death was so caused. The physician who was called to the young man mentioned his suspicions of such, without knowing that the drug had been used. A six-ounce bottle of lotion, containing thirty-six grains of the sulphate of atropine, was ordered as an eye-lotion, with directions for the wash to be constantly applied to the eye. These were fully carried out. The eye was kept saturated with wetted lint; several bottles were so used. What a large quantity must have passed into the throat through the lacrymal conduits!

Under very exceptional circumstances only therefore, and which the sagacity of the surgeon must determine, should a strong solution be used, and then only in small quantities. Half a grain of the sulphate to an ounce of water is what I ordinarily employ. A single drop, put on the conjunctiva, suffices. I depress the lower eyelid, and with a brush, my finger, or any convenient thing, apply the drop. Dilatation is much slower, but it passes away quickly, and the disagreeables incidental to the stronger form do not appear. Dr. Garrod has shown by his experiments that dilatation may be obtained by a grain in several ounces of water, but it must be remembered that healthy eyes are easier influenced than diseased ones.

It has been asserted that the retina is likely to become congested by the atropine. I have not been able to confirm this statement; and it is difficult to reconcile such a statement with the observation of my colleague, Mr. Taylor, that the eye is more tolerant to the ophthalmoscopic examination when atropine is used, than otherwise.

[To be continued.]

Illustrations

OF

HOSPITAL PRACTICE:

METROPOLITAN AND PROVINCIAL.

SOUTH LONDON OPHTHALMIC HOSPITAL.

ACUTE SCLEROTITIS AND IRITIS (?) OF FIVE WEEKS
STANDING: MORPHIA TREATMENT: CURE
WITHIN A WEEK.

Under the care of J. Z. LAURENCE, Esq.

ELIZABETH R., aged 26, was admitted to the South London Ophthalmic Hospital on January 25th, 1860, for double acute scleritis of five weeks duration. She had been previously under treatment at one of the metropolitan hospitals for pains in the head and eyes, and had been blistered on the temples, and had taken pills (mercurial?) three times a day for a fortnight. These measures relieved her head, but had no effect on her eyes. When she applied at the Ophthalmic Hospital, both eyes presented great vascularity, chiefly of a sclerotic character; excessive lacrymation; diminished transparency of the cornea; and some dilatation and perfect fixity of the pupils. These objective symptoms were accompanied by pain in the eyeballs, temples, brows, and cheek-bones, so intense as to entirely deprive the patient of sleep. Her vision was very much impaired; objects in the street appeared "misty" to her (seemed to her merely as "shadows"); and she was incapable of distinguishing colours.

January 25th. A third of a grain of hydrochlorate of morphia was ordered to be taken every three hours; the intervals of the doses to be increased as the pain abated. Warm fomentations (which she had previous to her application at the hospital been using with some benefit) were ordered to be applied to the eyes.

Jan. 28th. The vascularity, especially of the left eye, was greatly diminished. She had hardly any pain in the eyes.

Feb. 1st. The patient not having made her appearance at the hospital, she was found, on inquiry, to have so completely recovered as to have resumed her work.

REMARKS. The above case is an excellent illustration of the "morphia treatment" of the deep seated inflammations of the eye. The long previous duration and the rapid subsequent cure prove, as conclusively as can be the case in a science of the inexact nature of surgery, that the cure was really the result of the administration of the morphia. Mr. Laurence has now employed this simple plan of treatment (the first published case of which will be found in this JOURNAL for July 9th, 1859, and a paper on the same subject in the *Medical Times and Gazette* of the same year) in about twenty cases of scleritis and iritis; in about one-half, the cases have been cured; in about one-quarter, the results have been less satisfactory; while, in the remaining quarter, the treatment has proved useless. The unsuccessful cases have been generally either of a traumatic nature, or complicated with ulceration of the cornea: this latter continued local source of irritation appears to be peculiarly unfavourable to the influence of the morphia treatment. This is, most will admit, preferable to loss of blood, blistering, and mercurialisation; and, in this sense, is in all cases worthy of a fair trial in the first instance—in some, as in the present one, proving efficient, after the ordinary means of cure have failed.

We may state, that sometimes Mr. Laurence has found the administration of morphia followed by a good deal of sickness and depression. The doses given varied from a quarter to half a grain, repeated every third, fourth, or fifth hour, according to the influence on the pain. The questions of dose, of what class of cases is suitable, what unsuitable, to the proposed plan of treatment, and numerous minor details, can only be settled by extensive and accurate observations; and we hence hope to see Mr. Laurence's treatment tested by other surgeons, who will by the publication of their results tend to define the limits of utility of a remedy which certainly, in some cases, appears to exercise a very remarkable curative power over an often formidable and mostly obstinate series of ophthalmia.