cases, the control hairs which had not been in contact with the ointment had developed trichophyton freely.

Clinical experience makes it very interesting to note the effect on the spores of trichophyton of contact with croton oil.

TABLE XIII.—*Croton Oil.*

Time of Contact with the Medium before being Sown on Nutrient Gelatine.		Result.				
7 days	...	...	...	...	...	Growth
29 hours	...	...	...	...	...	"

The two experiments recorded in Table XIII are not the only ones I have made with croton oil. Before these cultivations were carried out I had made several others, and although I had acquired from them the conviction that croton oil had no injurious effect on the spores, yet as I could not be certain from the profuse growth that there was no admixture of adventitious fungi, I waited until I could get results in which the question of mixture with outside fungi could be entirely excluded, as was the case in the experiments recorded in this table. It will be seen that after hairs had been plunged for seven days in croton oil the vitality of trichophyton was in no way injured.

It will, no doubt, have struck the reader that these experiments might have been more exhaustive in character. It will seem to him, for example, that it would have been so easy to determine the point at which the action of common water sterilises trichophyton, or to find out the exact length of time that was required by a given strength of sulphur or mercurial ointment or any other of the common applications in ringworm of the scalp in order to effect sterilisation; that I might have waited, before publishing, until I could get more exact information on these points; but, easy as these experiments are, particularly to those who are familiar with the process, they still require a considerable amount of time. The experiments that I have now recorded were mostly finished in the summer of 1887; and, as I have since not been able materially to extend them, I have thought it better to publish them as they stand, hoping, I trust not in vain, that other workers, who have perhaps more time at their disposal, may see what a rich field there is here for experiments which are so interesting from the clinical side, and may take up the thread which for the time being I have let fall.

Something may be learned from these experiments that may be useful to us in practice. We may gather, for example, that the action of soap and water on the scalp, unless prolonged to a much greater extent than is at all likely, will not destroy the power of growth of such spores as may happen to be living amongst the scales on the surface. Secondly, we now know with definite certainty, what was fairly well understood before on clinical grounds, that the action of simple fat is not sufficient to destroy the vitality of the spores. Although the scalp were smeared thickly with fat or vaseline, the vitality of all those spores that were lying in the epidemic scales or in the mouths of the follicles would remain uninjured, although I have little doubt that they would cease to grow until the fat had been removed. On the other hand, we learn that an ointment which contains a comparatively small proportion of the ordinary antiseptic preparations that are used in the treatment of ringworm is destructive to all the spores that come in contact with it if the contact is prolonged for a comparatively short time. If the scalp, for example, is smeared in a weak strength of sulphur ointment, there is no doubt that all the spores are destroyed except those that are deeper in the hair-follicle than the ointment can penetrate.

The distinct antiparasitic effect of weak strengths of white precipitate and citrine ointments, notably of the latter, is also experimentally shown to be certain.

But very interesting it is indeed to note the result of the plunging of ringworm hairs in croton oil. Croton oil (as most readers who have given any attention to the literature of the subject are aware) has been greatly lauded in the treatment of ringworm. The method has not been generally adopted in France, where it was originally suggested, and I hardly think that the support which it has found in this country has led to its being much used. I have nothing to add to what I have expressed on this subject in my book on *Ringworm*. That it is a powerful, although not a certain, remedy in ringworm of the scalp is certain; but the inflammation that it produces and the impossibility of being certain that baldness will not follow its use are drawbacks which,

in my opinion, are sufficient to prevent its being used at all by practitioners who are careful that neither the health of the patient nor the permanent vitality of the hairs of the scalp should be injured. However, the fact remains that in a certain number of cases ringworm of the scalp can be removed by croton oil. What, then, is the action of croton oil? Certainly not that of a parasiticide. Spores that have been soaked in croton oil grow luxuriantly as soon as they are placed in a proper medium. The curative effect of croton oil, then, must depend on the inflammation that it produces, and we are led back to the doctrine which I have maintained for a considerable number of years, that the remedies which cure ringworm of the scalp do so, not in virtue of their parasitic effect, but in virtue of the inflammation which they produce. It is the products of inflammation that cure ringworm of the scalp. The wise practitioner is he who chooses the methods suitable for each individual case—such methods as will produce a certain amount of congestion and no more, a congestion that, if steadily maintained for a sufficient length of time, will gradually lead to the destruction of the vitality of the spores, but which is never allowed to reach a point that will either injure the skin superficially or destroy the hair-follicle.

I may be pardoned for reiterating the expression of my opinion that there is no fixed formula to produce these results. The practitioner must, in accordance with the peculiarities of each individual case, select both his remedies and the strength of his remedies, and, above all things, take care that, whether the disease lasts a longer or shorter time, neither the health nor the scalp of his patient shall be allowed to suffer.

ON THE

OPERATION OF OPENING THE SHEATH OF THE OPTIC NERVE FOR THE RELIEF OF PRESSURE.

*Read in the Section of Ophthalmology at the Annual Meeting
of the British Medical Association held in Glasgow,
August, 1888.*

By R. BRUDENELL CARTER, F.R.C.S.,

Ophthalmic Surgeon to St. George's Hospital, and to the National Hospital for the Paralysed and Epileptic, Queen Square.

MR. PRESIDENT.—It may possibly be within the knowledge of some of my audience that, on March 21st, 1887, I read before the Medical Society of London a detailed account of a case in which I had incised the sheath of the left optic nerve, behind the eyeball, for the relief of great swelling of the disc—swelling which, in that case, was monocular only. The patient made a good recovery, and my paper was printed *in extenso* in the number of *Brain* for July of last year, and also in the tenth volume of the *Proceedings of the Medical Society*. I have since performed the same operation in three other cases, the histories of which I am desirous briefly to relate.

The first of these was that of a man about 45 years old, who was under the care of Dr. Ferrier in the National Hospital for the Paralysed and Epileptic. In addition to some obscure symptoms of intracranial disease, there had been swelling of both optic discs, which was apparently passing into atrophy. The vision had for some time been failing. In the right eye it amounted to $\frac{1}{3}$ ths; in the left it was recorded by Dr. Hull, the house-physician, as being bare perception of light. I opened the nerve-sheath of the left eye; and, in testing vision a few days afterwards, I thought at first that perception of light existed, but, on careful blocking up of the right eye, I found that it did not. I could not feel quite sure whether Dr. Hull had been deceived, as I was myself for a time, or whether perception of light had been lost subsequently to the operation, either by the natural progress of atrophic change, or by some injury inflicted upon the nerve. I did not think the latter explanation could possibly be the true one; although, from the shape of the orbit and other circumstances, the operation had been difficult of performance. In consequence of the doubt, I decided not to touch the other eye unless its vision

should fail under my own observation; but, after a few days, it began to improve. It rose from $\frac{2}{3}$ ths to $\frac{3}{4}$ ths, and the patient was soon afterwards discharged from the hospital. As far as my point of view was concerned, I regarded the result as negative; but subsequent experience induces me to believe that the improvement in the sight of the right eye was probably due to the operation.

My second case was that of B. H., a single woman, aged 21, who was admitted into the National Hospital, under the care of Dr. Charlton Bastian, on May 25th, 1888. Five months before admission, she began to suffer from severe pain in the back of the head and neck, which became worse at night, from vomiting, and from failure of sight. She attended as an out-patient at the Central London Ophthalmic Hospital, and she told me that her eyes were frequently examined with the ophthalmoscope, and that her condition excited a good deal of attention, so that she was examined by a good many people. The failure of vision of the right eye increased more rapidly than that of the left, and she was for a time very deaf, but her deafness passed away. After a while, she began to stagger in walking, and all her other symptoms increased in severity. When she came to the National Hospital she had been unable to walk for two months.

On admission, she had an almost constant internal squint of the right eye. The movements of the left were normal, and there was no nystagmus. The right pupil was insensitive to light, the left pupil reacted to it. The right eye had no perception of light, the left eye could barely count fingers at six inches distance. Both optic discs were much swollen, their margins obscured, and the smaller vessels of the disc surfaces were completely concealed from view. Dr. Bastian regarded the case as one of cerebellar tumour.

My attention was called to her on June 8th, a fortnight after her admission. She was perfectly intelligent, and told me that the small remaining sight of her left eye was steadily passing away. She had been taking iodide of potassium in ten-grain doses. There was still much headache, and frequent vomiting, so that a porringer was kept by her bedside; but Dr. Hull said that there was a beginning of improvement in both these symptoms.

On June 14th, I incised the sheath of the left optic nerve, slitting it up from its insertion into the sclerotic nearly to the apex of the orbit. On the following day she was much as usual, but on the 16th there was very decided improvement as regards headache and vomiting. In both these respects the improvement has been continued, so that she has now little or no pain, and is sick only occasionally, two or three days passing without a single attack of vomiting.

As soon as the bandages were removed, it became evident that her sight had improved, and this improvement has been steadily progressive. I will not detain the meeting with details, but will give Dr. Hull's report for August 4th: "Tested at a distance, the left eye is always right at ten feet with letters of 200, and generally with letters of 100. It can spell out the letters of large primer (No. 16 of Pickard and Curry's tables) at four inches. The right eye has regained perception of light, so that it can count the windows on the opposite side of the ward, and can tell when fingers, or any light-coloured objects, are moved in front of it at a distance of six inches. The ocular movements are perfect, the right pupil reacts slightly to light, the left one fairly well." I may add to this that the patient easily recognises people who come into the ward, and that she has been able to write letters to her friends.

I made an ophthalmoscopic examination on August 3rd. The swelling of the left disc had wholly disappeared, and all the small vessels were visible. The general colour of the surface was pale. The right disc was still somewhat swollen, but much less so than before the operation. About July 20th, at my request, Dr. Charlton Bastian added some perchloride of mercury to the iodide of potassium; and, while I fully admit that the internal treatment may have been of contributory efficacy, I think that the greater improvement of the eye which was operated upon affords direct evidence of the benefit derived from the incision of the nerve-sheath.

My third case is that of M. A. B., aged 70, who was admitted into St. George's Hospital on Thursday, July 12th. She had had good health and good sight until July 2nd, ten days before admission, when she was seized with violent headache, almost entirely confined to the frontal region. This headache continued in undiminished intensity; and on Wednesday, July 4th, her sight began to fail. The failure increased, and by Saturday, the 7th,

she was, in her own words, "quite blind." The frontal headache continued without abatement up to the time of her admission.

The patient was a stout, florid, well-nourished woman, intensely anxious and depressed, complaining of severe frontal pain. She was quite blind and helpless. It was doubtful whether she had perception of light, for she was sometimes right and sometimes wrong as to the position of a white handkerchief waved close in front of her. The eyes were of normal tension, the pupils insensible to light, both optic discs white and swollen, their margins and small surface vessels completely lost, their larger veins distended and tortuous. The blurring of the disc margin was, if anything, more conspicuous in the left eye than in the right. There were a few striae of opacity in each lens.

At my request, Dr. Dickinson made a careful general examination of the patient, and found nothing to contra-indicate an operation. There were slight bronchial *râles* at the bases of both lungs, the heart-sounds were normal; the urine was acid, clear, with no albumen or sugar. I ordered a brisk purgative and ten grains of iodide of sodium three times a day.

On the 14th, there being then absolutely no perception of light in either eye, I freely incised the left optic nerve-sheath, under chloroform, and in the presence of Dr. Knapp, of New York. On the following day the headache was greatly relieved, and the patient expressed herself as feeling much better. On the 18th, the right eye could see the movement of a passing hand. On the 20th, it could distinguish between light and dark coloured objects. The bandage was then removed from the left eye, and the patient exclaimed that she could see a nurse standing at the foot of her bed. Her head was quite free from pain. On the 22nd, the left eye counted fingers at eight inches. The patient was permitted to get up; and, on the 25th, she could see her way without difficulty about the ward.

On August 3rd, the swelling of the left disc had entirely disappeared, its margins were well defined, and the small vessels on its surface were distinct. The swelling of the right disc was also much diminished, but not quite so much as that of the left. Vision was one-tenth of the normal, and 16 Jaeger could be read with either eye, at a distance of five inches, with the aid of a convex lens of six dioptries.

I think, Sir, I may claim for the two last cases that they completely establish what I ventured, on the strength of my first operation, to maintain before the Medical Society. They show that incision of the optic nerve-sheath is an operation which can be performed with certainty, and without risk to the eye; and that, in any case of compression of the nerve, it affords a mechanical means by which such compression may be relieved. It would also seem, from the abatement of sickness and headache, that the relief of pressure must extend to the cranial cavity—presumably because the incision establishes effectual drainage of the sub-arachnoid space. I should be prepared to advise and to perform the operation in every case of swollen disc, however arising, in which sight was suffering progressive impairment notwithstanding treatment, even although the impairment had already made considerable progress, as well as in an early stage of every case of true neuritis, as distinguished from swollen disc, in which the inflamed nerve might be injuriously compressed by its unyielding sheath. I believe the operation will be likely to preserve vision in many cases in which it is now constantly lost—as, for example, in true neuritis, in cases of swollen disc dependent upon tumours or other slow progressive changes within the cranium; and also in the cases in which, during the course of some acute disease, meningeal effusion makes its way into the nerve-sheath. In all these instances, as we are too well aware, it is not uncommon for the patient to recover, but, at the same time, to be left totally blind; and I feel much hope that the last-named calamity need no longer be suffered to occur.

In the paper already referred to, I fully described the method of performing the operation, and also discussed the grounds of its utility. I therefore will not occupy the time of the Section in referring to these matters on the present occasion; but I have brought with me the instruments which I designed for the proceeding, and shall be glad to reply to any inquiries which may be put to me. I may perhaps be permitted to add that I would not advise any surgeon to undertake the operation until he has either witnessed it or has performed it himself upon the dead subject.

Dr. WOLFE: At the Ophthalmological International Congress, held in London in 1872, Dr. de Wecker proposed the operation for incising the sheath of the optic nerve in cases of swelling of the

nerve. As I have never heard that Dr. de Wecker followed up his suggestion, I took it to be one of those operations of which we hear only once, and never a second time. We are, therefore, indebted to Mr. Carter for having systematised the operation. The results in two of the cases recorded by Mr. Carter are certainly highly encouraging, and it is to be hoped that we shall hear some more of it. I shall certainly give it a fair trial.—Mr. BRUDENELL CARTER, in reply, said that he had fully described Dr. de Wecker's suggestion in his paper read before the Medical Society. Dr. de Wecker attempted to incise the nerve-sheath, without bringing it into view, by means of a special *bistouri caché* which he designed for the purpose. Mr. Carter thought the action of this instrument very uncertain and dangerous, and was not content to divide the sheath without the aid of sight. He then expressed the opinion that the majority of cases of swollen disc were primarily dropsical and not inflammatory; and that the "neuritis" was often only a secondary effect of the swelling.

Note.—February 19th, 1889. The time which has elapsed since the reading of the foregoing paper renders it desirable to say that the patient, B. H., is still in the National Hospital. Her symptoms, due to the cerebellar tumour, have varied in intensity from time to time, and are now severe, but she retains vision, although both her optic discs are very pale. The patient, M. A. B., has continued well and with good sight since her discharge from St. George's in August.

ABSTRACT OF LECTURES

ON

EVOLUTION IN PATHOLOGY.

Delivered at the Royal College of Surgeons, February 18th, 1889.

By J. BLAND SUTTON, F.R.C.S.,

Hunterian Professor; Assistant-Surgeon to the Middlesex Hospital.

LECTURE I.—DERMOIDS.

A DERMOID should be defined as a cyst or tumour furnished with skin or mucous membrane, occurring in situations where skin and mucous membrane are not found normally. In its simplest form a dermoid cyst is lined with skin, the epidermis of which is usually very thin; from the skin sprout hairs furnished with sebaceous glands, often of very large size. The cavity of the cyst is occupied by a mixture of sebum, cholesterine, and shed hairs; in the more complex forms we find bone, teeth, sweat-glands, mammae, and even a rudimentary eye. The simplest forms of dermoid cysts occur at the angles of the orbit and in the upper eyelid (Fig. 1); the more complex in the ovary.

Fig. 1.—A dermoid cyst from the angle of the orbit.

Dermoid tumours are solid, pedunculated, and often pear-shaped tumours, covered externally with skin, often furnished with tufts of long hair, and sometimes teeth. Internally they are made up of connective tissue, which not infrequently contains cartilage. Dermoid tumours are most common in the pharynx, hanging from the soft palate or roof of the pharynx, and in the rectum (Fig. 2). Tumours containing organs other than those belonging to the skin and mucous membrane are not dermoids, but teratomata.

Very little has been attempted towards framing a classification of dermoids; they may be conveniently arranged in three groups: 1, sequestration dermoids; 2, tubulo-dermoids; 3, ovarian dermoids.

1. *Sequestration Dermoids.*—These arise in detached or sequestered portions of the surface epiblast, chiefly in situations where, during embryonic life, coalescence takes place between two surfaces possessing an epiblastic covering—such situations being the

mid-line of the back, abdomen, thorax, and neck. They are also common in the lines of secondary coalescence, such as the orbital and branchial fissures, and in the scrotum, where they are often mistaken for testicular dermoids. In addition to the lines of coalescence, dermoids may occur on the scalp and limbs. In the former situation they may be mistaken for meningoceles, especially when situated over the anterior fontanelle, a not unusual place. Most of these tumours connected with the scalp also have pedicles of attachment to the dura mater, and there is quite a number of cases

Fig. 2.—A dermoid tumour of the rectum (after Danzel). B B the attached portion of the tooth; T, tooth.

on record of dermoid tumours connected with the dura mater projecting into, and leading to injurious pressure upon, the brain. Such tumours and cysts are explained when we remember that in early embryonic life the dura mater and skin are in contact over the greater portion of the head; the separation of skin and dura mater by the development of the membrane bones of the vault is a secondary process. Should abnormal adhesions take place between the skin and dura mater, the adherent piece of skin might become the source of a cranial dermoid.

Fig. 3.—A dermoid of the finger (natural size).

Dermoids of the limbs serve to throw an interesting light on this view of the origin of dermoids belonging to this group. Of late years many cases of cysts connected with the digits have been recorded. These cysts vary considerably in size; some are as small as a split pea, others as large as an apple. In many instances they have been described as dermal or sebaceous cysts, but, when examined microscopically, they exhibit an appearance as though a

Fig. 4.—A dermoid tumour from a cow's back (Hunterian). piece of the skin had been inverted. In nearly all cases a clear history of antecedent injury was obtained. A specimen kindly placed at my disposal by Mr. Shattock is represented, of natural size, in Fig. 3.

These dermoids of the limbs, produced by implantation, are interesting, because they offer an explanation of some dermoids removed from near the shoulders of cows and sheep, and preserved