

was not one in the first place that any one would have thought of enucleating. It was a case of neglect, not neglect on the part of the doctor, because he had no chance to see the case, as the patient did not come back.

I merely wanted to call attention in the paper to the fact that as it was said by our chairman, I believe many eyes are enucleated which might be saved, keeping in mind the serious dangers in cases like those Dr. Scott has mentioned. If a foreign body remains in the eye, the eye must come out sooner or later, but if we are sure the foreign body is out, then I believe we should wait a reasonable time unless the eye is injured to such an extent that it is hopeless. A paper by Dr. Geo. H. Powers, of San Francisco, entitled "Some Cases of Unusual Reflexes from Pathological Ocular Conditions," was then read by title and referred to the Publication Committee.

A paper by Dr. A. G. Hobbs, of Atlanta, Ga., entitled "The Use of Galvano-Cautery Knife in Pterygium Operations," was also read by title and referred to the Publication Committee.

## THE TREATMENT OF PTERYGIA WITH THE GALVANO-CAUTERY.

Read in the Section on Ophthalmology, at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5-8, 1894.

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I shall not presume that it is necessary in describing this method of operating on pterygia to even enumerate the many already in vogue. I should rather ask your forbearance for merely suggesting to you that yet another method is to be added to the list already, perhaps, too long; still it may be true that each of these operations has served its purpose in turn in the process of evolution. Since it is the cardinal point in making a pterygium operation to prevent two raw surfaces from remaining in apposition after the operation, which necessarily results in the relapses which we too frequently see, why not then convert each of the raw surfaces into an eschar at once to avoid such failures, provided we are able to demonstrate practically that this means will bring about that desired result?

For some years the galvano-cautery point has been resorted to in corneal ulcers, particularly in those indolent and intractable ulcers which have refused to yield to other methods of treatment. It was suggested to me a few years ago, after seeing some of the beautiful results of the cautery when applied to ulcers of the cornea that it could, at least, produce no bad results if properly applied to the neck of a pterygium for the purpose of cutting off the nutrition of its corneal apex. I hoped that it would prove a better means of severing the arterial supply to the apex as it crossed the sclero-corneal junction. This object is generally attained by the use of the knife and various methods have been resorted to, to accomplish the purpose. The failures in pterygium operations are usually due to the resulting reestablishment of the arterial circulation, and when this occurs the desired end of the operation fails in proportion to the number of the reestablished vessels. The great vascularity of a pterygium, with its vessels crossing over the sclero-corneal line to supply its apex on the cornea, renders it difficult to permanently sever all the arteries by a clean cut with the knife, hence perhaps a score of different methods of knife and scissors

operations have been resorted to by different operators to accomplish this end.

Each operator aims at one end primarily, and that is to completely cut off all the blood supply from the corneal apex. Secondly, his desire is to destroy as little conjunctiva as possible. When the first end is attained, the corneal part of the pterygium has lost its direct nutrition and can then only share with the cornea proper for its sustenance which is indirect, or by imbibition. As this meager supply proves insufficient atrophy results and the partial, or almost complete, obliteration after a time will depend upon the activity of the absorbents. For this reason the best results are obtained in younger subjects in which as a rule, the lymphatics are more active, as is also the contractibility of the arterial coats.

In many cases when the knife is resorted to a secondary pterygium results in which sufficient nutrition is reestablished to the apex to perpetuate the corneal haziness even beyond its apparent margin to greatly interfere with vision. When the cautery section is well made I have not seen these secondary results that are often so difficult to prevent by a clean cut with the knife or scissors. In some cases, however, it may be best to combine the methods of operating as I have done in two cases not included in this report. These two pterygia were extremely vascular and muscular, hence I first used the knife in the usual way and then seared the divided edges with the cautery blade to prevent the secondary results.

The fine-pointed cautery blade, heated with a battery that can be perfectly gauged and always relied on, is applied horizontally to the narrowest portion of the growth which is near the sclero-corneal line; the touch is made at the moment white heat is reached and should be almost instantaneous and re-applied as quickly, if the tissues are not at first completely severed. If the growth is not adherent to the sclera and corneal margin it is best to grasp it with small forceps and slightly raise it from the sclera. When the forceps are used it is easier to be certain that the cautery has made a complete section of all the hypertrophied and over vascular conjunctival tissue.

When the corneal head is large and protruding it is advisable to make a cautery application in the same manner as in applying it to a corneal ulcer. In both cases the resulting cicatrix is less—it is more transparent. This is not altogether an unknown fact but one that has seemed never to have been brought out as prominently as its importance would suggest. For this reason one may be tempted often to resort to the cautery to reduce a large pterygium apex or a corneal ulcer, for the purpose alone of attaining this corneal transparency. The resulting eschar so completely severs the vascular connection, leaving no raw surfaces in apposition that a reestablished circulation is practically impossible; this can not be said when the knife or scissors have been used. In case the redundancy of tissue at the point of section should seem to require reduction, the scleral end of the section may be turned under and a transverse suture introduced.

I have made this operation fourteen times, and would have made it half as many more times during the last two years but for that decided objection to the cautery which we so often meet with and are bound to respect. This operation is more quickly

performed; it is followed by no bleeding; it leaves no ecchymosis; the wound heals more rapidly; there is less pain during and after its performance; it requires no bandages and the corneal haziness around the apex is less.

A weak solution of cocain, about a 2 per cent. is first dropped into the conjunctival sac, then after about five minutes a stronger solution, about 10 per cent. is applied at intervals, locally, by means of a small cotton probe for five minutes more; in the meantime the lids are held open. By this means the toxic effects are avoided except in those subjects that are unusually susceptible to cocain. In using cocain in this latter strength I try to avoid as much as possible, by the position of the patient, its contact with the cornea. It is now a well-known fact that when used in this strength, or even when much weaker, that this drug is disastrous to an abraded cornea if long continued.

The kind of galvano-cautery apparatus, the ease of its manipulation, the size of the blade, the confidence of the hand that presses the button, the requisite degree of heat which should be gauged by the turn of the screw are some of the necessary factors in this seemingly simple, yet delicate little operation, whether it be made to a corneal ulcer or to the neck of a pterygium. The only galvano-cautery apparatus in my knowledge that I would now be willing to trust for this purpose is a little transformer of an alternating current of fifty-two volts.

I am now using, in my consultation rooms the first two little instruments ever made for this purpose. I described the varied uses and advantages in a paper read before the Pan-American Congress last fall. So far as I know, the galvano-cautery has not hitherto, been used as a means of cutting off the nutrition of the corneal apex of a pterygium.

## RELATIONSHIP OF OPTIC ATROPHY TO LOCOMOTOR ATAXY.

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I desire to point out the special features of the relationship of the optic atrophy to ataxy, and have a case to demonstrate my topic:

J. W. H., aged 37, native of the United States. Past history: He has suffered for the last five years from rheumatic pains in various parts of his body, and from nervous twitching, lightning pain in leg, trunk and arms. No history of syphilis. He has used tobacco and stimulants freely. About a year ago he was advised to go to Paso Robles Springs and use the mud baths for his rheumatic pains; no relief was obtained; a few weeks after his return he complained of defective vision, first of the left eye, then the right. Jan. 31, 1894, when he first came under my care, I found that he was totally blind and suffering from a rapid nystagmus, and lightning pain in both legs. Ophthalmic examination showed atrophy of both optic discs; owing to the rapid movement of the nystagmus it was very difficult to make a thorough examination of the fundus. Physically he is in perfect health. He has Westphal's symptom, absence of the knee reflex, but lacks the tabes gait; he tells me that his gait has always been normal. Many patients see no relation between their pains and their amaurosis or ataxy, especially if these pains come on, as in this case, years before. He has Argyle Robertsons symptoms. Under treatment he has made slight improvement. Nystagmus is less, he can see shadows in my office; for instance he pointed out a picture frame in my consulting room. To test him and to show that it was not visionary, I requested him to walk up to the picture and

place his hand on the left hand side of the picture, which he did. Treatment has been both local and constitutional. Locally, blisters to the cervico-dorsal region, leeches to the temple, cautery of the spine, galvanic and faradic currents. Internally, strychnia sulph. hypodermically, and by the stomach arsenite of strychnia, pilocarpin, iodid of potassium and proto-iodid of mercury.

There are few diseases which present such a multiplicity of symptoms as are found in locomotor ataxy. This patient was totally blind when he came to consult me, so I could not test his field of vision, which is a very significant symptom in cases of atrophy in tabes. There is an intimate correspondence between the development and functions of the brain and those of the optic nerve and retina; the connection is still increased by the communication which exists between the lymph spaces of the eye and those of the brain and spinal cord. These anatomic conditions not only account for the occurrence of neuro-retinitis and other ocular changes in disease and injury of the spinal cord, but a Polish physician has traced a connection between errors of refraction and curvature of the spine. The eye is not a separate autonomous organ, living as it were a life apart, nor is it a mere appendage or accessory, convenient and advantageous to the rest of the organism; on the contrary it is in closest relationship with the rest of the body, and participates in its moods. Erb tells us that a brisk cutaneous irritation causes the pupil to enlarge; pinching a comatose man will often enlarge the pupil, but the pupil in tabes is not affected by such procedure.

In all cases of atrophy of the optic nerve we should inquire for lightning pains, test the knee reflex, whether gait is normal or not. The pains are often the bridging symptoms betwixt so-called uncomplicated amaurosis and tabes. Charcot and others attribute the cause of optic atrophy to gray degeneration and to be parenchymatous. The eye-ball and its appendages draw their blood supply from two main sources, the internal and external carotid arteries. By means of the blood vessels and the fluid which circulates within them, foreign or other morbid material may be carried along the blood current into the eye.

The eye and its appendages receive the whole or part of six of the cranial nerves, as well as many fibers of the sympathetic nerves which influences the nutrition of the eye, controlling the size of the blood vessels, and regulating the size, equality and mobility of the pupil. That a certain portion of the spinal cord exercises a direct influence on the eyes has been incontestably established by experiments of modern physiologists. Brown-Séquard demonstrated that the filaments of the sympathetic that supply the eye take their origin from that part of the spinal cord which is contiguous to the origin of the first pair of dorsal nerves, and that portion of the spinal axis which extends from the fifth cervical to the tenth dorsal vertebra possesses a distinct influence on the organs of vision, and has been termed by physiologists, "cilio-spinal" and sometimes "oculo-spinal." The conclusion that must necessarily be deduced from these observations is that the portion of the spinal cord, "oculo-spinal axis," includes within itself both vasomotor and oculo papillary filaments; which are connected with the cervical portion of the sympathetic. It is not surprising, therefore, that the eye is very susceptible to all those influences, healthy and morbid, which affect the nervous system generally, or the special innervating apparatus of the eye,