

distension has been strongly, if not precisely, confirmed by extended observation. While as yet unprepared, however, to fully substantiate this view of its significance, I desire to bring forward here some facts with regard to it and again to ask for it the careful study of ophthalmic colleagues.

The question of the frequency of the observation of this phenomenon must receive a slightly different answer since my more frequent employment of a strongly concave mirror in studying and seeking it; for like the other retinal reflexes, it is made much more conspicuous by this means. Examining in the autumn of 1891, 365 boys in a Philadelphia school, I noted it in but 40 eyes, and found it the next year in 124 eyes or 16 per cent. It was doubtless overlooked or unrecorded in some cases on each occasion, as the conditions of a hasty examination in which it constituted but a side issue were not favorable to an exhaustive search for it, but it was found in 11 per cent. of H and 26 per cent. of M: yet it seems certain that the eyes in that school will show no such percentage as the 38 per cent. of Weiss' average finding in a Manheim gymnasium, with 69 per cent. among the myopic.

As to its significance, no positive statement can yet be made. It has certainly been conspicuous in a group of cases of progressive distension of the eye-balls and consequent increase in refraction; and I have regarded it as so probably of unfavorable prognosis that I have employed redoubled precaution in all patients presenting it, in the effort to obviate or minimize such a change. Hence I could report a number of instances where there has not yet been any change in the refraction. On the other hand, one or two cases of progression have been met where it was absent—first and last. It may be hardly necessary to say again what I have previously stated in this section, that in my experience the tendency of myopia to progress is not the rule, as sometimes stated, but is the great exception. Hence my opportunities for observing these cases are not very large, and it seems better to try to enlist others in the study; for I think those who have sought this phenomenon have found it with rather increasing frequency and have reason to regard it as a warning that deserves consideration.

The primary claim of Weiss, that the curvilinear reflex is frequently quite difficult to see and is hardly, if at all, discoverable even in some cases where it is to be expected, has been abundantly corroborated. At the focus of the retinal level it is often inconspicuous in the most marked cases; and as the macular region generally shows a deeper level than the nasal border where it is formed, overlooking of its presence is most natural. The narrow pupil interferes somewhat with its ready investigation, but the flood of light admitted through a wide pupil tends to make less conspicuous all reflexes. The numerous shifting reflexes along the vessels, especially in young eyes, can confuse the picture, since the Weiss reflex, unless marked and typical, may seem but one of them. Indeed, until a striking case is encountered, even the ophthalmoscopist who has looked for the curvilinear reflex may remain skeptical as to its occurrence. Once well seen, it can hardly fail to interest the observer and raise questions as to how often he has failed to recognize it in the past.

Whatever the precise causes, efficient and sec-

ondary, of myopic distension, (and under this head I include all increases in the axial refraction), visible changes about the optic nerve entrance are the rule, and the posterior pole of the globe generally shows a measurable depression. Concomitant with this there is apt to be a prominence of the nasal margin of the nerve, giving rise to the curved surface from which the reflection proceeds. The view of Hasner, which Weiss advocates, that distortion is caused by the pull of a too short nerve, has certainly some show of probability and should lead us to seek carefully for evidence of this prominence of the nerve margin in all cases. The result of such a study will certainly be that many instances of it are noted, that changes in it will be observed in certain cases followed sufficiently long, and that an additional series of interesting and probably important studies will be contributed toward the advancement of our specialty.

The number of instances of this phenomenon which I have thus far observed, and the short periods of their study, do not permit of my drawing any sweeping conclusions. I can only say that I have seen more tendency to increase of refraction in these than in any other group of cases, and am forced to regard the presence of Weiss' reflex as calling for special precaution and guarded prognosis, with regular periodical examination of the vision and refraction.

A CASE OF PERSISTENT SPASM OF THE ACCOMMODATION, RELIEVED TEMPORARILY BY TENOTOMY OF THE EXTERNAL RECTI.

Read in the Section on Ophthalmology, at the Forty-fourth Annual Meeting of the American Medical Association.

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Miss P., aged 39, at the age of 33 began to suffer from headache, pain in eyes when reading. In a few months was obliged to give up reading and using the eyes altogether. Was treated by various physicians for nervous prostration, neuralgia, etc. Finally advised to seek a change of climate. A residence of several years in the West proving of no benefit she returned East for treatment.

In May, 1892, she came under my care. Family history good and her own health had always been good until the present trouble. She is fairly well nourished, appetite good, bowels regular, sleeps well and no menstrual trouble or other difficulty. Says she would be well if she could get relief from constant headache and pain in eyes when using them. Headaches mostly occipital but much pain referred to temples and vertex.

Upon examination, I found vision right eye 20-20, not improved with + lenses or cylinders; left eye 20-70 improved to 20-50 with + 1 D C axis 75, and an insufficiency of the internal recti of about four degrees for distance. I ordered a pair of prisms 2 degrees each eye combined with cylinder for left eye, confidently expecting marked relief from headache. Was much disappointed in finding that they were of no service. I then resorted to the use of atropia and found a rather high degree of latent hypermetropia, and a slight astigmatism in right eye, vision under atropia uncorrected. Right eye 20-70 with + 1.25 D S. C 25 C axis 90, increased to 20-20. Left eye 20-100 with + 1.75 C + 1.25 axis 75, increased to 20-50. I prescribed right eye + 1.25 axis 90 C prisms base 2 in., and left eye + 1.25 S C + 1.25 C axis 75 C prism 2 base in. and congratulated myself that I had made a very important discovery under the atropia and that all the difficulties would be at an end, but I was doomed to disappointment, and my patient with the expensively ground lenses was only able to see 20-100 with right eye, and 20-200 with left, and notwithstanding a long, painful trial on the part of my patient the vision would not improve.

I will not weary you in detailing all the changes

I made in these lenses, discarding the prisms, reducing the strength of the spherical lenses, bandaging one eye, systematically exercising the muscles with prisms, the persistent use of atropia at one time for three months without at any time relaxing the persistent spasm of the ciliary muscle. Dubosin, homatropin and the whole list of constitutional remedies including iron, arsenic, strychnia, zinc, phosphorus, anodynes, anti-spasmodics, coal tar preparations, etc., were used without benefit. It is not often that an intelligent patient will endure all the local and constitutional treatment I heaped upon her and being no better at the end of a year's treatment be willing to continue.

Although I have been performing tenotomy graduated and otherwise during the past nine or ten years, I still remain skeptical as to its relieving a case like the one under consideration, but after consulting with my friend Dr. Millikin, I determined to give it a trial. So I made a tenotomy of the left external rectus on April 1, and was greatly delighted on the following day to note that the patient could read 20-20 with right eye with $+75 \div 25$ axis 90 and 20-50 with $+1. D \div +1.$ axis 75 with left eye; the first time there was any relaxing of the ciliary spasm since the case came under my care, excepting when under the influence of mydriatics. This continued for four or five days; patient was almost free from headaches. She was happy and so was I, and it was during this period of mutual congratulations that I sent the title of this paper to our secretary.

But our happy frame of mind was of short duration; the headaches gradually returned, the vision for distant objects became blurred with the spectacles. For a time she could see clearly in the mornings through the lenses, but later in the day everything became hazy and the old fashioned headache returned and at the end of two or three weeks was nearly as bad as ever. In the meantime a slight insufficiency of the internal recti of about two degrees again developed. A tenotomy of the right external rectus was made with no apparent benefit either to headache or vision. At present, the muscles are perfectly balanced for distance, a slight tendency to deviate outward for near vision. The headaches are as severe as ever. Mydriatics give slight relief from headaches as before the operation. It is altogether probable that in a few years with increasing presbyopia the patient will be relieved of her distressing symptoms of asthenopia, but I should not be surprised if she should suffer from some other reflex neuroses fully as painful.

I believe that nearly all the troubles we have with the muscles of the eyeball are due to, and are the direct outgrowth of the errors of refraction. This is generally recognized in cases of hypermetropia as a cause of strabismus. In most cases of muscular asthenopia we have the same excessive nervous stimuli sent to one pair of muscles that we do in strabismus, and those patients who have not sacrificed binocular vision, consequently suffer from pain and other nervous disturbances, due to the conflicting efforts at accommodation on the one hand; and those of convergence on the other. It has been my experience not infrequently in cases of errors of refractions, after correcting the ametropia to find that while I had relieved the pain due to the efforts at accommodation, I had disturbed the equilibrium that had become established between the efforts of

accommodation and those necessary for perfect binocular vision, and thus set up a train of symptoms almost, if not quite as annoying as those from which the patient suffered before. And on the other hand, after performing a tenotomy of one or more of the recti muscles, I have relieved these patients of one kind of distressing symptoms, only to be followed by others fully as bad, so that I am skeptical as to the possibility of benefiting any case of asthenopia by a tenotomy in which prisms or the closing of one eye does not give temporary relief.

A pertinent question might be raised as to the frequency of persistent spasm of the accommodation. We oculists so frequently use atropia, prescribe spectacles, and if the patient returns complaining of a blurring of sight for distance tell him to continue the use of his glasses and the sight will clear up in time. Are we sure it does always clear up? Do not many of our patients discard our spectacles and return to their family physician or to the use of some popular headache cure to get relief? Or in these later days seek the advice of some of the specialists—oculists who make graduated tenotomies on every case in which there is a slight deviation of the eyes revealed by one of the many equilibrium tests. I think it was our genial ex-president Dr. Connor, who reported a patient upon whom thirty-two graduated tenotomies had been performed, without any marked relief of the asthenopia. I have seen several cases in which nearly as many have been done. I have a deviation outward revealed by this test of about four degrees in my own eyes, yet it causes me no inconvenience, and I should not allow any one to divide my external recti even partially.

These cases are all susceptible to mental impressions. They prove a fruitful field for quacks and charlatans in and out of the profession. They present the most brilliant cures effected by the faith healers and Christian scientists. The mental impressions of having had an operation performed will effect a temporary cure at least. Especially if the surgeon has enough of that peculiar attribute that inspires implicit confidence in the mind of his patient that the operation *will* cure.

A good illustration of this mania for operations is that presented by the "orificial" surgeons. Several of our Cleveland hospitals are filled with these patients so that it is difficult to find room for a patient needing a legitimate operation. It is the fashion now among certain classes of the community to have their rectum, their vagina, their urethra, and I am even informed in some cases, their umbilicus stretched by these "orificial" surgeons.

It has been my practice in these cases of asthenopia to first correct the error of refraction. If the asthenopia is not cured then resort to the use of prisms and the systematic exercise of the muscles. If the prisms, muscular exercise or the suppression of the image in one eye gives even partial relief I then propose a tenotomy, with considerable assurance that it will be of permanent benefit. But, in all cases in which no perceptible improvement can be obtained by the use of prisms, muscular exercise or closing one eye, I give a very guarded prognosis as to the result of a tenotomy, because in my experience the operative treatment of these cases has usually proved unsatisfactory. The disease, as I believe, frequently being the expression of a general neurosis and not amenable to ocular treatment.