Report on ophthalmology and otology : delivered before the Illinois State Medical Society, at its Thirty-Second Anniversary Meeting, held at Quincy, May, 1882 / by A.E. Prince.

REPORT

ON

OPHTHALMOLOGY AND OTOLOGY,

DELIVERED BEFORE THE

ILLINOIS STATE MEDICAL SOCIETY.

AT ITS

Thirty-second Anniversary Meeting, held at Quincy, May,

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By A. E. Prince, M. D.,

JACKSONVILLE, ILL.

CHICAGO:

Chas. J. Johnson, 140-146 Monroe Street.

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By A. E. Prince, M. D., Jacksonville.

Mr. President and Gentlemen:

In place of the preparation of a systematic report to be read on this occasion, I have selected for presentation here, two conditions, concerning the first of which, *paracentesis membrani tympani*, I claim no originality, but feel that its importance has not been sufficiently emphasized, in such a manner as to bring it prominently before the general practitioner; and secondly, I desire to make a contribution to the management of a very obstinate, and heretofore unsuccessfully treated condition of the eye, viz: *asthenopia-atonica.*

The operation of paracentesis is sufficiently common among specialists, but these, unfortunately, are the very ones who see the cases when the damage to the drum has already been committed, and then the fact is realized that if a puncture had been made by the physician in attendance, a life-long trouble might have been averted. By far the larger portion of the cases of acute purulent inflammation of the middle ear occur in the course of fevers, while the individual is under the direct attendance of the general practitioner. A definite realization

of the signal benefit of a timely performed paracentesis of the drum membrane, when one considers the destructive tendency, and the sometimes fatal termination of this condition, if interference is not resorted to, must make every physician feel his responsibility in determining the question, whether he will do what it is universally admitted will give the patient the greatest security and almost certainly avert the disastrous consequences of the extension of the pus in either one of the three directions — outward, which is synonymous with perforation or destruction of the drum membrane; backward, into the mastoid cells; or upward, involving meningitis and causing death! It is undisputed that a portion of the fatal cases of scarletina and diphtheria are lost from this last cause. The inflammation passes up along the continuous mucous membrane from the pharyngeal to the tympanic region, and because the membrana-tympani is too strong and resisting to be demolished by the hydrostatic pressure of the accumulating serum or pus, it breaks the thin intervening wall between the tympanic and cranial cavities, and death is the result. When, fortunately or otherwise, the external is the weaker of the two walls, by its perforation or destruction the patient is left, either with total deafness or impaired hearing. In the former case, the more frequently paracentesis is performed, the greater will be the reduction of the 20 per cent. of deaf-mutism, due to this cause; and in the latter, a host of individuals will be rescued from a life made miserable by inability to hear with distinctness conversation going on about them.

The first proposition which I desire to emphasize is that the operation of puncturing the drum membrane with a sharp cutting instrument is unattended by danger either to life or the hearing, and that the wound heals in the vast majority of cases per primam, and in a few hours the point of incision is scarcely

discoverable. Indeed, where it was desirable to maintain the opening in some cases of impermeability of the Eustachian tube, the greatest difficulty has been experienced in preventing the wound from healing and the opening from becoming closed; and this was the futile task of the aurist, for nature, in her efforts to close an opening in the drum made for therapeutic purposes, has proved herself so powerful that its maintenance has practically been given up as a hopeless task. There was a time when it was the fashion to make this operation in all cases of deafness in which there was supposed to be obstruction of the Eustachian tube, and at the time of Sir Astley Cooper no operation in surgery was more common; and yet a report of a case in which the operation has been attended by serious trouble is of the greatest rarity. The operation was then abandoned — not from any danger attending its performance, but from the fact that it proved to be ineffectual in combatting the condition for which it was designed; but, for the relief of the incomparable pain of an intense otalgia, it will always be the sheet anchor of the aurist, for by it the agonies of a suffering child are instantly relieved, and the calamitous course of inflammation arrested. The sooner the public, medical and general, appreciates the importance and security of the operation and the simplicity of its performance, the better it will be for humanity.

The sphynx which has heretofore confronted the practitioner and prevented the general adoption of the operation, is the fear of doing violence to the ear by failing to make the puncture in the proper place, or of injuring some delicate organ within, and thus destroying the hearing entirely.

This morbid anticipation of danger is magnified by the usual description of the operation, in which are emphasized the importance of a good light, a mirror, speculum, and appropriate instruments. The feeling that these are essential is enough to

rob the operation of half its power to benefit mankind. In the first place, the physician is not provided with the instruments ; in the second place, if he had the instruments, the patient is remote from the office, and the instruments are not at hand when the operation should be performed ; and in the third place, the patient may be a crying, restless child, with perhaps a narrow or swollen meatus, and the conditions would be unfavorable for the use of light and specula if they were at hand. Hence, with the belief that these are essential in performing the operation, it is in but a small minority of the cases that the physician could avail himself of its beneficent effects. We here need an Œdipus to assist us in solving the riddle, by presenting the relations of the four essential parts concerned in the mechanical execution of the operation.

This will enable us to see what parts are vulnerable and what are impregnable.

These four parts concerned are : 1st, the drum membrane with the manubrium reaching from above down to about its centre; 2d, the chorda-tympani nerve which skirts the tympanic cavity opposite the upper fifth of the membrana-tympani ; 3d, the fenestra-ovalis, occupied by the base of the stapes, which lies so high in the tympanic cavity that if we conceive the external auditory-meatus to be continued directly inwards, it would be entirely below the location of this foramen ; 4th, the fenestra-rotunda looking backwards and outwards, and lying behind the promontory, and so protected by it, that if an instrument were to be passed into the middle ear, following the direction of the external meatus, its situation would protect it from the possibility of injury. It therefore appears that nature has so disposed the essential parts of the organ of hearing (as is amply illustrated in the general disposition of those structures in other regions, which are most tender and delicate and liable to injury)

that they are guarded from violence, and we see that the only two points where the internal ear is exposed are so situated that a knife may be unhesitatingly passed into the tympanum without danger of the evacuation of the liquids of the labyrinthine space. Should the point of the lance cut the tympanic membrane above the middle, the point might be arrested by the handle of the malleus, but that would only defeat the operation, and no serious consequences would result. If the point should pass still higher, it might wound or sever the chorda-tympani, the consequence of which would be that the taste would be impaired for a few days until the cut ends should re-unite. The remainder of the internal wall of the tympanum is of dense osseous tissue covered by mucous membrane. Upon this the point of the knife can impinge without doing harm. Hence it follows that the operation is one in which the least knowledge is essential, and it is found that the results of no operation are more satisfactory. The only instrument required for the operation is the narrow-bladed tenotomy knife which finds a place in almost every pocket-case. Much ingenuity has been expended in the construction of concealed trocars, but I have found the most satisfactory instrument to be a narrow Graefe cataract knife, the cutting edge of which is kept from doing mischief by wrapping it with a thin strip of isinglass plaster from about a twelfth of an inch from the point. Thus an instrument is obtained that is so sharp that it will cut the membrane with the least possible amount of pain, and relief is instantly afforded.

I would not be understood as disparaging the performance of the operation in the most classical manner, under the best possible illumination, and at a point where the membrane is most prominent, but will consider my object accomplished if I make it understood that the operation *may be* performed in a manner productive of equally good results, and at the same

time compatible with the circumstances under which these cases occur.

The one law that I would lay down as a guide to the operator is, after determining the direction of the canal by the use of the probe, keep the handle of the knife high. The manubrium and chorda-tympani will thus be avoided, and the puncture will also be made most favorable to drainage.

With this commendation of the operation and attempt to make it available to the general practitioner, I will pass to my second topic:

Asthenopia-atonica.

At the risk of being censured for employing this term, which I have not met in my perusal of the literature of the subject of asthenopia, I have come to the conclusion that no other term defines so accurately as this the condition which it is my pleasure to consider. The knowledge of the pathological condition of an eye subject to asthenopia must have been in a very chaotic state when the discrimination and scientific precision of Donders, operating like the miller's bolting-cloth, differentiated it into its different forms. To him we are indebted for the recognition of the different errors of refraction as the cause of most cases of asthenopia, and for assigning the cases of this condition to different classes, grouping one set as accommodative and another as muscular, dividing the accommodative again into hypermetropic, myopic, and astigmatic asthenopia, according to the optical defect which caused the eye to operate under abnormal relations, giving rise to premature fatigue. In like manner the class of muscular asthenopia would naturally be divided, inasmuch as one or another of the recti muscles or the oblique were the source from which the defect in harmony of action of the associate muscles arose. But after we have considered all these various forms

we still have a condition of weakness which is not covered by any of the above conditions, and the treatment of which has proved most difficult and unsatisfactory, principally because there seemed to be no tangible cause, the correction of which would remove the asthenopic symptoms. In these cases, there being no error of refraction or muscular insufficiency, we must look on them as due to inefficiency of one or more of the parts of the eye to do the normal amount of work. The condition has been called ciliary exhaustion, for it is under accommodation that they fail, and this is not a particularly objectionable title, except in so far as it is not sufficiently comprehensive. By another author it has been called retinal asthenopia, and by still others congestive asthenopia. Because all the structures of the eye are liable to be below their normal degree of activity, I have chosen the name of *atonic asthenopia* as being more general and more accurately defining the condition.

We find this condition in individuals who have used their eyes to an inordinate degree, and who, after the eyes have begun to be wearied, and have given evidence of the fact by causing the individual to suffer more or less with symptoms of pain, uneasiness, itching, heat, or a sensation of roughness due to conjunctival congestion, have not heeded this warning of nature, that the limits of the power of the eye have been reached, but have put the eyes to continued use in this unnatural and congested state. Zealous students, who think they are obliged to work all day and at night besides, are not infrequently subject to this condition. They use their eyes as they would ride a mule: and as it is said that when this animal is once broken down he seldom recovers, the simile holds good as regards the eye, for there is nothing more persistent than the weakness of an eye abused and exhausted in this way.

A fertile source of origin of these troubles is the prolonged use of the eyes at needle work, after they have reached their limit of endurance. The temptation to finish some piece of embroidery, although the eyes are painful, causes a number of these cases to come under observation every year. An individual whose eyes are already weak becomes absorbed in a fascinating novel, and does not heed the warnings of nature to lay it aside until they are rested, but continues on, chapter after chapter, and at last pays the penalty by not being able to read more than a few minutes at a time by daylight, and perhaps not at all by gaslight.

This will be sufficient to make clear the class of cases to which I refer, and in the memory of any physician, who has much to do with diseased eyes, there will be no dearth of cases in which he has been unable to find any marked error of refraction, and which have the symptoms of asthenopia. Temporary or clonic accommodation, so to speak, is not defective, but the failure lies in the power of endurance.

Taking pattern after the treatment of an inflamed joint, the eye has been put at rest for a prolonged period of time by the repeated instillation of atropia. In some of the cases this has worked well, but it is by no means satisfactory. Every one knows of the method of ciliary gymnastics which was proposed by Dr. Dyer of Pittsburg, and which consists of periodic exercises in reading, increasing from one to five minutes each day, until the person is enabled to read a sufficient length of time to discharge his duties. But the length of time over which such a treatment must extend, and the impossibility of controlling the cases during this tedious course of ocular exercises, combined with the fact that it is but a limited portion of the cases in which the treatment is fairly carried out, furnish reasons why so few entirely recover the unlimited use of

their eyes. Any process, therefore, which both speedily and permanently liberates the individual from this condition of loss of command over his eyes will fill a partial blank in ocular therapeutics. *What we want in these cases is to enable the individual to work without demanding of him the full amount of tension which is required of the normal eye.* In other words, we desire to keep the eye at work, while at the same time its muscular structures are exerting but fifty per cent. of the tension required of the normal eye for the same labor. The same principle is here employed as when we encourage moderate, while we discourage severe exercise in the case of other weakened muscles.

Let us see how this can be accomplished. For the normal eye in reading at fifteen inches distance, the tension is equal to $2\frac{1}{2}$ units of accommodation. If a glass of thirty inches focus (1.25 units) be placed before the eyes while the individual is reading at the distance of fifteen inches, the *ciliary muscle* will be rested just fifty per cent.; but such a glass is found to be uncomfortable and will not be tolerated at all, and in the relief of this discomfort we must look, for the solution of our problem. From the time a child learns to look till the age of forty or forty-five, when the hardening of the crystaline lens has begun to disturb the relations existing between the *recti* and *ciliary muscles*, an equivalent amount of force is expended by each of these in all efforts of vision at whatever distance. When an individual looks at an object at the distance of a metre (39.37 inches), the ciliary muscle is obliged to accommodate to a definite degree, in order to focus the image of that object on the retina, and the power required is assumed as the unit, by international common consent among all oculists. This unit has received the name "Dioptric." Now when the eyes are directed to an object at a distance of one metre, hence,

under an accommodation of one D. (Dioptric), the optical axes are converged by an associated action of the internal recti muscles by an equivalent force which is expressed in degrees, and for each D. and fraction of a D. of accommodation, there is an equivalent force expended in the convergence of the optical axes, to produce bi-nocular vision for that point. This is what may be termed the law of *recto-ciliary relationship.* When we place before the normal eye a convex glass of one D., we violate that law just three degrees, and it will require a prism of 3°, with its base inwards, in connection with that glass of plus one D. to preserve that law of recto-ciliary relationship. With such a glass as this, any normal eye will be able to see with absolute comfort, an object at the distance of a metre, with all the muscles of the eye at rest; at the distance of half a metre, with fifty per cent. of rest; at one-third of a metre with thirty-three and one-third per cent. of rest, and so on.

Now this is just what I recommend in all cases of *atonic-asthenopia*, due to whatever cause; and having been myself relieved by such a combination, after having followed in vain the advice of some of our best oculists, and having the records of numerous similar cases, I take pleasure in recommending them to any of the profession who may see fit to give them a trial. The combination which I most frequently use is + 1.25 D. ($= + \frac{1}{30}$), combined with a prism of four degrees with its base inwards, and this glass I have ground by A. S. Aloe, of St. Louis, who grinds a dozen pair at a time for a sum proportionately much less than a single pair would cost. In this way the expense is reduced to a minimum which is within the bounds of everyone. In the prescription of these glasses there is one difficulty, which unless borne in mind, will

be liable to give rise to trouble, and that arises from the defective setting of the glass. If the axis of the prism is not perfectly perpendicular, there will be a vertical prismatic action, than which nothing is more fatiguing to the eye. This defect can be very easily detected by holding the glasses eighteen inches before the eyes and directing vision to some remote object, which will of course appear double, when if the glass is correct the two images will appear in a horizontal plane. If there is half a degree of vertical prismatic action, it will be detected by one image appearing higher or lower than the other. A slight defect can easily be corrected by rotating the glasses in the frames. Dr. Brudenell Carter, of St. George's Hospital, London, speaks of these glasses in his book "Defects of Vision," and some years ago recommended them in cases of presbyopia, but as that is the very condition in which they are not appropriate, as will be readily conceived, he has abandoned them on both theoretical and practical grounds, and does not seem to have realized their importance in the class of cases now in question.

Dr. Sheffler, in his work "Die Theorie der Augenpfehler und der Brille," recommends them as a substitute for common spherical lenses. Such other works on the eye as I have access to give the subject no consideration.

The following combinations satisfying the recto-ciliary relationship may be of use, from ~~which I take in practice 30°~~, the prisms of which I deduct, in practice, 30′, since in the majority of cases of asthenopia, there is ~~a tendency~~ to hypermetropia:

.25 to .5 A.

DIOPTRICS.	DEGREES.
Plus 0.5 D.	1°.30′
Plus 1.	3°
Plus 1.25 D.	4°.30′
Plus 1.75 D.	6°
Plus 2. D.	7.30″
Plus 2.5 D.	9°

In many cases of asthenopia not relieved by correcting hypermetropia and astigmatism, I have a reading glass made with such a combination added to the glasses, which correct the error of the individual case, and such glasses have done well in every case.

The following will serve to illustrate the application of the above:

To the general practitioner for whom the first section of this report was arranged, a little piece of personal history will be of more value than a report of any cases of paracentesis which I have myself performed. About three months before the meeting of this society I had the pleasure of a visit from Dr. Ledlie, of Pittsfield, to whom I took the opportunity of explaining the relations of the parts concerned in this operation, as above described, and the opportunity was afforded him of studying these relations on a large papier-mache model and also on a preparation of the temporal bone. The doctor had never realized that it was so simple a proceedure and resolved on his return home, when opportunity should offer, to put it in parctice.

Yesterday I met him here at the society and he expressed his gratitude for the advantage his visit had been to him, for in as many weeks he had had three cases of acute otitis media attended

with great pain and in one case the condition was suppurative, and in each case the puncture had been followed by immediate relief, and the cases all healed without difficulty followed by no unpleasant consequences. Hearing in all, after an interval of two weeks, was found to be perfect. In but one of these cases could speculum or light have been used to advantage had they been in his possession. I mention the experience of this one man, that it may have its influence in dispelling the morbid sense of fear and hesitation which is altogether too prevalent in the medical profession, concerning the performance of the operation.

CASES.

1. Miss Annie B., 19 years of age. Eyes have been strong enough for all purposes until her last winter in school, when it was found that night reading gave her trouble after more than an hour's continuous application. No error of refraction was found and she was advised to give up night work, which she did for a time and the eyes became well. Last September she commenced to teach and at the same time to carry on a course of German study. As a result of her attempt to read German at night her eyes became sensitive and she, being very ambitious to continue her work, read night after night until a condition of hyperæsthesia was produced which necessitated the discontinuance of her work. She was unable to read ten minutes consecutively without pain, and there was an extreme degree of photophobia. On this occasion a more careful examination under atropia revealed Hypermetropia not to exceed a sixtieth. No muscular insufficiency was present in the case. The abuse to which she had subjected her eyes will not be recovered from for a long period of time, and a glass of adequate strength to give the eye the requisite amount of rest, it is well known, would not be tolerated; $+\frac{1}{30} = 1.25$ D. on a prism of four

degrees with the base inwards was given and she was enjoined not to use the eyes for any close application without them, to hold her book while reading at a distance of fifteen inches, and to stop when she commenced to experience discomfort. It will be seen that at that distance this glass rests both ciliary and recti muscles 50 per cent. They were comfortable from the commencment, and under their use the eye rapidly improved and she was able to resume her school. By the use of these glasses she is now able to do continuous work. It will be years before her ciliary muscle will be as strong as it was, but during these years she will not be deprived of the use of her eyes.

2. Miss Emma M., 25 years of age. For five years previous to the year 1879 when I first saw her, had had a great deal of trouble both local and constitutional, and finally, according to her own account, was pronounced to have atrophy of the optic nerve. At this time I made an examination of her refraction and found her to have hypermetropia equal to $+\frac{1}{3}\frac{1}{6}=1$ D., I prescribed for her a glass of this strength and all her troubles left her, and she remained well for a period of two years. During this time she wore her glasses constantly without suffering from headache or general prostration which had previously resulted from the condition of an uncorrected hypermetropia.

One year ago she had a mild attack of spinal meningitis, from which she recovered with an extreme degree of asthenopia. She was advised to be patient, and it was predicted that the eyes would become stronger with the lapse of time. As she was a music teacher of limited means, she waited with great reluctance, and after three months I was consulted a second time about her eyes. Applying the general principle, as above stated that rest should be associated with exercise, since the eyes were unable to do full duty in their present condition I recommended +1.25 D. prism 4°, base inwards to be added to the

correction of her error. This gave her a glass of + 2.25 D. = $\frac{1}{17}$ with the proper prism to preserve the muscular relationship, and at a distance of fifteen inches with this glass the relief was just one half in all respects. Under these relations she commenced to devote herself to her work and has continued since that time to use the glasses for reading with a great degree of comfort.

3. Miss D. is a seamstress, 23 years old, and dependent on her needle for her bread. She has no more than the normal amount of astigmatism, no manifest hypermetropia, and only $\frac{1}{48}$ = + .75 D. of concealed H., which is rendered manifest by the use of atropia. Working early and late she developed a condition of irritation, congestion, hyperæmia of the retina, attended by photophobia, and other symptoms of exhaustion of the eyes. Rest for a while, and the constant use of + $\frac{1}{48}$ was advised, but the condition was not much improved and she was obliged to abandon her needle. As there was no want of association between the ciliary and recti muscles, the case resolved itself into one of exhaustion—*asthenopia-atonica.* It has been my experience that time is inefficient in such cases. Having once been exhausted, after partial recovery following continued rest, a similar condition is re-developed on the slightest provocation. In the case before us, circumstances had placed suspension of the use of her eyes beyond her control. Rest was out of the question. From what has already been said the reader will anticipate the prescription in her case. With + $\frac{1}{30}$ = 1.25 D. on a prism of four degrees, base inwards, she was in three weeks time able to do an average day's work and she continues to wear them and realizes no inconvenience from her asthenopia. In view of the hopeless situation in which the occulist is placed without this form of glass, it is felt that its merits demand a candid consideration.

Case after case illustrative of the condition might be detailed, but from a due appreciation of the reader's time, only such cases have been selected as may be taken as types of classes to which the above is applicable.

The following may prove of advantage to those who have under their care cases of granulated lids:

4. Rev. Chas. M. is a young preacher 28 years of age. A year after entering on his ministerial duties he had the misfortune to contract an ophthalmia, which became chronic and for which he had been under the care of a physician for four months. Upon his coming under my observation I found that his case was one of hypertrophy of the papillæ and not one of engorgement of the lymph-follicles (Granular-trachoma of Stelwag.) There was not a great deal of roughness, but there were numerous papillary, small elevations and a slight pannus. When under treatment and not engaged in his work, there seemed to be a strong tendency to get well. He had no error of refraction made manifest either with or without atropia, and hence no glass had been recommended; which is of such well known value in these cases, especially when H. is present. I felt convinced that the use required of the eyes in the exercise of his vocation was the principle reason why his trouble did not yield, and hence resorted to the continuous use of atropia, which seemed to do well for a time, but on its withdrawal the eyes lapsed into their former condition of congestion and asthenopia. It occurred to me to give him fifty per cent. of rest at 12 inches. This I accomplished with $+ \frac{1}{24}$ ($= + 1.5$ D.) on a prism of 5° base inwards. Nothing could have acted more admirably, and under the relief of accommodation he soon needed no further treatment for his granulations. I would now employ + 1.25 D., prism 4° as less unwieldy—

since above 4°, each additional degree causes the glass to become disproportionately heavy and inelegant.

There remains a class of cases in which the asthenopia is due not to any error of refraction but to an opacity of the cornea or other of the diophric media which neccessitates objects being held closer than natural to the eyes, that a magnified image may be obtained to compensate for its indistinctness. In order to accomplish this more tension of the cilary muscle is demanded than in the normal condition, and hence a premature fatigue. A person whose vision is $\frac{20}{40}$ is obliged to hold at a distance of $7\frac{1}{2}$ inches print which can be read with the normal eye at 18 inches; and this requires twice the power of accommodation. This is a fruitful source of asthenopia greatly relieved by this form of glass. The following case will suffice for illustration.

5. Mr. G. is a book keeper, 25 years of age. When a child he had ulcerative keratitis, and it left him with irregular astigmatism due to facets of the cornea. In an ordinary ocular inspection his eyes look very natural, but by oblique illumination or in the reflection of the window minute irregularities and opacities are to be discovered, which account for the greatly impaired condition of his vision. During childhood his eyes were considered strong, though he was thought to be somewhat near-sighted, but no concave glass was found with which he could see any better in the distance. During these years of youth he was obliged to do twice as much work with his ciliary muscle as the other boys of his age. This disadvantage became more insurmountable with the advance of years, on account of the concomitant hardening of the crystaline lens. At the age of twenty the ciliary muscle proved unequal to the task of operating under so great a disadvantage in the discharge of the duties of the individual. He had

never been able to find a convex glass which would not cause fatique after using it a short time, on account of the limited range of his relative accommodation. Following out the same principle, he was provided with a glass of + 1.25 D., with prism of 4°, base inward. In this manner both ciliary and recti muscles were relieved from strain and the eye was enabled to work with book held at the distance of ten inches, with the same relative tension on the ciliary and recti muscles, and with correspondingly enlarged retinal images, which normally occurred under a reading range of twenty inches.

Finally, a class which is by no means limited to a few individuals, is that of amblyopia alone or associated with some error of refraction, the correction of which does not bring vision up to $\frac{20}{20}$. When it occurs alone, any one of the regular combinations will suffice and no further special remark will be necessary. In illustration of the complication of amblyopia with astigmatism, I will briefly detail the case of Miss K., 20 years of age, who called to see me two years ago, complaining of symptoms of asthenopia and also of general asthenia. She had been confining herself a good deal at indoor work, pursuing the business of taxidermy. Upon examining her eyes it was found that she had a manifest degree of hypermetropic astigmatism:

O. D. + 1.5 D., Cl. + .75 D., Cl. Ax. 75°.
O. S. + .3 D., Cl. Ax. 105°.

With this combination vision under the most favorable circumstances became only $\frac{20}{30}$. Under their use, assisted by tonics, she improved greatly; still she was unable to use the eyes to an unlimited degree and constantly felt the necessity of using the eyes to a limited degree. She was not able to use the eyes to the extent of a healthy person with a normally con-

structed eye, because with proper correction she was obliged to overcome a defect of $\frac{1}{3}$, in addition to her state of general asthenia. The use of prismatic glasses was a hobby of mine at that time and I determined to add to the strength of her glass so as to relieve the cilary muscle still more, and to combine it with such a prism as would make vision comfortable while engaged at close work. I accordingly added + 1.25 D. and a prism of 4° with base inward to the astigmatic combination of each of her eyes, and had the glass ground in the clerical form so as not to interfere with vision in the distance. With this glass she was enabled to work in a manner quite satisfactory.

Having been myself a sufferer from asthenopia-atonica, I might add another case which has been under the care of a number of the best oculists of this and other countries, and from my own experience both as patient and physician I feel warranted in offering no apology for emphasizing the value of prismatic glasses in the treatment of those cases, the causes of which do not lie in errors of refraction.