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### AMBLYOPIATRICS.<sup>1</sup>

BY GEORGE M. GOULD, A.M., M.D.,  
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THE fact that no name exists for the therapeutics of amblyopia in the cases in which the defect is ascribed to "disuse," and coëxisting either with squint, muscular insufficiency, or a high degree of ametropia and probably of anisometropia, leads to the astonishing fact that the desire or the attempt to cure amblyopia does not exist on the part of ophthalmologists. If a child with one weak and deformed leg is brought to the orthopedic surgeon, he does not say, "Oh, well, the child has one good leg, let it get on with that alone." If a finger or a hand is injured, does a surgeon ignore its needs and congratulate himself and the patient that the rest of the fingers or the other hand is all right? But it is a literal truth that an argamblyopic eye (*i. e.*, one amblyopic from disuse) brought to the oculist is dismissed without care and without attempt at cure. In no text-book with which I am acquainted are either principles or rules laid down to govern the treatment, and no hint is given that any treatment is desirable. Not only so, but

<sup>1</sup> Read before the Philadelphia County Medical Society, December 28, 1892.





positive instructions are laid down that, carried out, prevent the weakened eye from ever regaining its lost power. It is as if the surgeon should say of a lame leg: *Strap it up out of the way; it can't work with the other, or as well as the other; let it go.* Listen to this extract from the latest text-book on ophthalmology, fresh from the press:

IN ANISOMETROPIA WE GIVE THE SAME GLASSES FOR BOTH EYES, OR CORRECT ONLY ONE EYE AND PLACE A PLANE GLASS BEFORE THE OTHER.—*Fuchs, Text-book of Ophthalmology.*

I set this sentence out in capital letters, as displaying as much ophthalmologic error and therapeutic sin as could easily be gathered into so many words. Another popular treatise puts it this way: "For the class of patients whose ocular discrepancies [*anisometropia*] are so great that they always use only one eye, nothing is to be done save to aid as perfectly as possible the working member in case it needs assistance. The other is to be left to purely ornamental functions."

Any number of such quotations could be added were it necessary to show that the established conviction and practice of the ophthalmologic profession is not only to completely ignore the need and the duty of treatment of argamblyopia, but even to so further handicap eyes thus afflicted by measures of anti-therapeutics as to render recovery impossible, and even to increase the defect.

In square and absolute opposition to this I contend that every amblyopic eye is a sick eye, and that it is the physician's first duty to cure, whether it be eyes, or legs, or bodies.

Our impotent willingness to permit such a lazy method of non-treatment is a distinct reproach and discredit to us. It is simply untrue that patients with anisometropia will not permit a proper and helpful correction of each eye. In some 2500 cases occurring in private practice, I have found none such except two or three who had simple myopia in one eye and approximate emmetropia in the other. But, for obvious reasons, in such cases there is no amblyopia, and they are, therefore, out of the count. Of course, correction of anisometropia may be inconvenient and even uncomfortable to the patient for a short time, but could one expect the abnormal habits and weakened organs of a lifetime to resume normality in a few days? Do orthopedic surgeons thus treat the consequences of spinal curvature or talipes? Instead of the supine let-alone policy we should seek to save and to heal and to strengthen. Instead of non-response to treatment and inability of the patient to wear binocular correcting glasses, I have, in fact, been delighted and astonished to witness how soon response comes, and how short or non-existent is the period of discomfort. The weakened, almost blinded eye, soon reacts to the spur of kind, intelligent helpfulness, and, as month by month one watches these eyes improve and gather strength, one feels the pride and pleasure of the true physician in his true work. I have never failed to find such reaction even in the most hopeless cases of argamblyopia.

And first, a prefatory word as to the new coinages that, with some trembling, I have ventured to

strike: The needed word *amblyopiatrics*, or the therapeutics of amblyopia, explains itself, but it seems surprising that scholarly ophthalmologists should have continued to use the tautologic barbarism, *amblyopia exanopsia*. According to its Greek roots amblyopia can mean nothing but *dimness or dulness of the eyes or of vision*; and *exanopsia* can mean only, *from absence of sight*. The combined term, therefore, is literally and absurdly enough this: *dimness of sight due to want of sight, or, lessened visual power from failure or absence of visual power*. There is no hint in the etymology of the supposed meaning, *amblyopia from disuse (of the eye)*. It seems clear that we should drop such a term and make use of some one that will express what we mean and desire. In Greek we have *ἔργον*, meaning *function*, *ἐνέργεια*, *activity of function*, of which the opposites are, *ἀργός* and *ἀργία*. A well-formed and significant compound for *disuse-amblyopia*, would, therefore, be *argiamblyopia*, contracted naturally to *argamblyopia*.

I have no desire to enter into the vexed question as to whether the muscular anomaly or ametropia precedes and causes the amblyopia, or whether the reverse is the case. When the patient appears in the oculist's office, the two facts are (at least often) presented at the same time, and our task is at once the very practical one of therapeutics, the question of etiology being of minor or theoretic importance.

There is, however, a very suggestive illumination thrown back upon the question of etiology by the practical results of intelligent and persistent therapeutics. When large numbers of amblyopic eyes

recover their lost acuteness of vision by means that permit and necessitate their functionalization, the dogmatism of authorities and the negligence of oculists receive a suggestive comment amounting to refutation, both of the theory and of the sadly common resultant practice, that the amblyopia is cerebral or that it is the causal agent of the muscular or ametropic anomaly. Almost without exception, my cases teach me that amblyopia is argamblyopia. (It goes without saying, of course, that amblyopia due to fundus-lesions and media-lesions are out of the count.) And when such improvement of vision follows the removal of the ametropic or heterophoric hindrance it, *ipse facto*, justifies the acceptance of the theory of effect-amblyopia implicit in the word coined.

But whether the one theory or the other be the true one, the therapeutic sin of not attempting to bring back the lost power of these handicapped and half-ruined eyes, is a sin that cries out against us. The number of persons going about, and going on to the age of cataract-possibility, with such eyes, is surprisingly large. Whether with growing practice one sees more patients, or whether such argamblyopic patients, neglected by others, drift into one's hands, one is amazed at the frequency of the fact, and that instead of heroic effort to save, there has usually been pursued a no-policy of the most atrocious and let-alone indifference. Now this policy of *laisser-aller* is to me incomprehensible, unethical, antimedical, and impolitic, and the object of this writing is to protest against it and to offer proofs that it is in all these ways wrong. "Far from



telling me how to save the bad eye, my doctor never suggested that it could or need be saved"—that gives the hint of the impolitic policy. "I now have cataract in my best eye, and the other has been no good for many years"—that should deeply sting the heart of the negligent physician—if he could hear it.

The practice may partially be a conscious or unconscious result of what I believe the false teaching that the amblyopia is cerebral or idiopathic, or is the cause of the coëxistent strabismus or insufficiency, or again of the still more execrable teaching to correct the ametropic defect of one anisometropic eye, leaving the other to go to the dogs.

The functionalization of argamblyopic eyes consists, of course, in three things: 1. The correction of the ametropia; 2. The reinstatement of the muscular balance, if imbalance exists; 3. Exercise.

As to the correction of the ametropia, there are a number of peculiar difficulties and problems. These each refractionist will overcome and answer according to his teaching, his habit, or his intelligence. Assuredly no hard-and-fast rule will suffice, nor can such a rule be even approximately formulated. Each case will be a study in itself, requiring the most accurate discrimination of judgment, and the finest delicacy of testing. In an eye of which the neurologic elements and the cerebral centers are certainly weakened and partially atrophied, the failure to hit exactly the right kind, degree, or precise proportion of help required, foredooms at once to failure. The very breath of life in such an eye is trembling between endeavor and renuncia-



tion. A shade of over-correction or of under-correction, a slightly misplaced axis of astigmatism, a misplaced or maladjusted spectacle, a touch at the wrong place, the lack of a wee-bit of help at the right place—*anything except the right thing*—smothers the little remaining power of recuperation, and proves a tiny load too great for the tiny forces to lift. We are here dealing with infinitesimals, and the keenest and swiftest perception will win where a less subtle discrimination will fail.

It is evident that such eyes must be nursed and encouraged, as it were, into convalescence. Frequent re-testings will be required; frequent adaptations to the changed conditions sure to follow; watchful care if one weak part of the complex system fails to respond or temporarily gives way; constant readjustment of the spectacles following and stimulating the renascent powers, and meeting them with the precise modicum of lessened or increased aid—these and many such methods of guiding and guarding, must be kept in mind until full health is restored, and the convalescent eye enjoys and shares the labors of its fellow.

In the same way the reestablishment of muscular coördination, still further complicating the problem, will be brought about according to the peculiarities both of the case and of the physician.

But these questions having been settled, gymnastics will remain as the very heart of the matter and crux of the difficulty. An eye the visual power of which has from disuse fallen to 20/c, let us say, and reduced to only the temporary holding of the image of Jaeger 14 or 18, will not participate in

binocular vision, however perfect the image formed on the retina, or however balanced the muscles. It must be exercised, and gently forced to function. It is clear that the good eye must be temporarily thrown out of use, and the weakened brother put to work alone. The kind and the amount of exercise will again depend on the retained visual acuteness of the eye to read print, large or small, and the retained power to continue this for a longer or a shorter period of time. Here again appears the necessity on the part of the physician of careful estimation by a trained judgment to give the proper instructions.

But the final success will depend upon the patient's persistence, patience, and coöperation. This coöperation will only be certainly gained by making him (or, if a child, his parents) thoroughly understand just what is desired, and the full significance of it all. To him it should be explained in detail and fulness, that exercise only develops function; that as years go by, non-exercise will still further and hopelessly ruin the eye; and that as age approaches, the possibilities of danger to the good eye (always doubled if there be but one!) are greatly increased by the liability of cataract, of inflammation, of injury, etc.

The method of monocular gymnastics in these cases will depend upon the interest of the patient, the age, occupation, etc. In children too small to wear glasses, or to wear the blinder willingly, I keep the good eye under continuous mydriasis for weeks, or even for a month or two. Some ladies prefer holding the fan, a bit of paper, etc., before the

sound eye while exercising the weaker one. I have, during the past year or two, ordered the patient to get a disc of black rubber fitted with two hooks, so that it may be hung on the spectacle-lens in front of the good (unclosed) eye. Such discs are supplied by my opticians, who have prepared them in accordance with my request. The patient is to read print of a size that can be easily distinguished, and only so long as signs of positive discomfort or weakness do not appear. Some patients can at first hold the image for but a few seconds. The shorter the necessary duration of such periods the more frequently they should be undertaken. Some patients can read or work with the single eye for an hour or two without trouble. The plan that has proved of most service, and has been productive of the best results, is to use "the blinder" when eating the meals. If living at home, the extra blinder is left at the plate as a reminder, and the practice is excused by friends. It gives an hour or more of varied and easy exercise without loss of time or the annoyance of special attention to the matter. I have a patient, a jeweler, who works at his bench with his blinder, in all one or two hours a day, and whose power and vision have been greatly improved thereby.

A certain proportion of cases do not report; a few get tired, or are indifferent to the matter. The following cases illustrative of the method and of its results may be cited:

CASE I.—Mrs. H., nineteen years of age, has had severe and continuous headache from early childhood, with gastric trouble, malnutrition, etc. Natu-



ral vision is R. 20/XX; L. 10/CC. Mydriatic refraction =

R.—sph. 0.25 D,  $\bigcirc$  + cyl. 0.50 D, ax.  $90^\circ = 20/XX+$ .  
L. +sph. 2.50 D,  $\bigcirc$  — cyl. 5.50 D, ax.  $180^\circ = 20/XL$ .  
With muscular balance.

After the return of the accommodation, and with the proper correcting glass, the left eye could read only Jaeger 14 at twelve inches.

Monocular exercise was ordered. In three months all headache had disappeared, the distant vision of the left eye, both at near and distant range, equaling that of the right eye.

CASE II.—Miss M., aged twenty, had the following defect:

R. +sph. 0.75 D,  $\bigcirc$  + cyl. 0.75 D, ax.  $1.25^\circ = 20/L$ .  
L. +sph. 0.50 D,  $\bigcirc$  + cyl. 3.50 D, ax.  $1.15^\circ = 20/C$ .

Careful instructions as to ocular gymnastics has improved the vision in four months to R. 20/XX; L. 20/L +.

CASE III.—Mrs. R., aged fifty-one, had the following refractive error:

R. 20/XXX + sph. 0.37 D, = 20/XX.  
L. 10/CC + sph. 3.00 D,  $\bigcirc$  + cyl. 1.00 D, ax.  $90^\circ = 20/CC$ .

With the left eye the patient could read only the large-print "Scripture leaflets" hung in rooms—the only thing I could get for her of sufficiently large-sized letters with which to exercise the eye. One year later, after more or less exercise of this eye alone, she was able to read Jaeger 12, slowly.

CASE IV.—Miss R., aged twenty-five, under homatropine was found to have the following error of refraction:

R.—sph. 3.00 D,  $\bigcirc$  — cyl. 0.50 ax.  $150^\circ = 20/LXX+$ .  
L.—sph. 7.00 D,  $\bigcirc$  — cyl. 0.50 ax.  $180^\circ = 20/LXX$ .

Eight months later the vision was: R. 20/XX?  
L. 20/XL.

CASE V.—Mrs. K., aged forty-five, had 20/XL vision in the right eye, with a compound myopic astigmatism twice as great in this eye as in the left. There were six degrees of exophoria. Proper correction of all ametropia and insufficiency with monocular exercise relieved the life-long sick-headache, etc., and in five months the vision of the left was brought to the normal.

CASE VI.—Miss S., thirty-five years of age, had had frontal headaches all her life, and, with much near-work, ptosis of the left lid. Refraction was:

R.— sph. 1.50 D,  $\odot$  + cyl. 5.00 D, ax.  $105^\circ = 20/LXX.$

L. + cyl. 1.25 D, ax.  $80^\circ = 20/XX.$

Five months later, after the monocular course of gymnastics, all headache and ptosis had disappeared, and the vision of the right eye was 20/XX?

CASE VII.—Mr. P., twenty-five years of age, was found to have the following refraction:

R.— sph. 0.25 D,  $\odot$  + cyl. 1.00 D, ax.  $125^\circ = 20/XX.$

L. + sph. 0.75 D,  $\odot$  + cyl. 3.00 D, ax.  $180^\circ = 20/LXX.$

He had been wearing a plane glass. After mydriasis had passed off he could, with proper correction, barely read with the defective eye Jaeger 10. Three months later he read Jaeger 4, with ease.

CASE VIII.—Miss M., forty-six years of age, gave a history of a lifetime of sick-headaches, once or twice a week, with anorexia, anemia, etc. She was wearing:

R.— sph. 3.00 D,  $\odot$  — cyl. 2.25 ax.  $180^\circ.$

L. + sph. 0.75.

This had been given her for constant use, although her age was forty-six, and she was employed at writing all day. I found that her refraction was :

R.—sph. 2.50 D,  $\ominus$  — cyl. 5.00 D, ax.  $165^{\circ} = 20/LXX.$

L.+ sph. 0.37 D, = 20/XX.

Hyperphoria of  $3^{\circ}$ .

A few months after correcting the ametropia, presbyopia, and hyperphoria, with monocular exercise of the right, the vision in that eye had improved to 20/XL, and all the reflex symptoms mentioned had disappeared.

CASE IX.—A little girl of nine was greatly afflicted with night-terrors, somnambulism, headache, anorexia, nervousness, etc. Her refraction was as follows :

R.+sph. 0.75  $\ominus$  + cyl. 5.00 D, ax.  $100^{\circ} = 20/LXX.$

L.+sph. 1.00  $\ominus$  + cyl. 5.00 D, ax.  $85^{\circ} = 20/C.$

The blinder was ordered for the right eye, with daily exercise of the left alone in reading large-print toy-books, in playing, etc. The right eye soon recovered a normal acuity, but it took nearly a year of watchful care and exercise to bring the left to 20/XX?

CASE X.—Mrs. A., has had constant frontal headache for the past five years, culminating in paroxysms of sick headache every few days. When a girl at school she had “numb spells,” “blind spells,” etc. I found :

R.+ sph. 3.50  $\ominus$  + cyl. 1.00 ax.  $150^{\circ} = 20/CC.$

L.+ sph. 1.00  $\ominus$  + cyl. 0.75 ax.  $150^{\circ} = 20/XX.$

Persistent exercise with the blinder brought progressive increase of visual acuteness and power. The reading ability descended through all the sizes of letters from Jaeger 18 to Jaeger 8, and from



ability to hold the image for only a few seconds, until now, seven months since beginning, she can read ordinary print with the right eye for a half-hour, and distant vision at the last visit was 20/LXX, with improvement still in progress. The headache, anorexia, ill-health, etc., have entirely disappeared.

CASE XI.—A girl of ten years of age, anemic, with ocular and forehead-pain, was refracted on April 16, 1892:

R. 20/LXX + sph. 1.00  $\odot$  + cyl. 0.25 ax. 90° =  
20/XXX.

L. 20/CC + sph. 1.25  $\odot$  + cyl. 0.37 ax. 90° =  
20/LXX.

With esophoria.

With the prescribed exercise of the left eye, the vision in six months had reached 20/XXX, and will doubtless soon be equal to that of the other.

CASE XII.—A lad of seventeen, with a high degree of compound hyperopic astigmatism in the right, and 20/LXX vision, while the left had perfect vision, and a low degree of the same refractive error. The blinder treatment has brought vision in the right eye to 20/XX? in six months.

CASE XIII.—The last case I shall refer to is an instructive one. A gentleman of forty-six years has had severe ocular trouble and headache all his life, but for the past twelve years, these and other symptoms have been excessive, and he has reason, if he but knew it, to preach some useful lessons to ophthalmic specialists. One of these gentlemen, who prides himself on prescribing by ophthalmoscopic examination alone, fitted him with glasses twelve years ago, but with the most heroic endeavor he could not wear them. Vertigo was at this time, and for six years, so pronounced that it was a source of daily wretchedness. Then came the

turn of the graduated tenotomist, but the vertigo was worse and mental confusion became so great that pronounced cerebral disease was diagnosed by physicians. He feared insanity, and was so haunted by suicidal mania that he had to take daily precautions to obviate the thought and the circumstances that might lead to its execution. This went on for years. A firm will has kept the upper hand through all these years. The patient describes his symptoms as "panic-feelings and palpitation of the brain," with extreme nervousness and nausea. The headache has been less of late. Lastly, a famous oculist told him to go to an optician and get whatever glasses should be given to him there. These he has been wearing for reading—what little he can do! They are simple plus spherical 3.00 D lenses, the same for each eye!

After hours of careful work I find his true refraction to be:

R. +sph. 2.00 D,  $\odot$  + cyl. 2.00 ax.  $40^{\circ} = 20/XL$ .

L. +sph. 1.50 D,  $\odot$  + cyl. 1.00 ax.  $90^{\circ} = 20/XXX+$ .

With some exophoria and hyperphoria.

With the right eye alone he can hold an image of Jaeger 10 but a second or two, the letters then "jump" and fade.

When one thinks of the lifetime during which the poor eyes and the cerebral centers of the last case, for example, have struggled and begged for a bit of intelligent help; when one analyzes the peculiar defect that would not let either eye renounce vision; when one considers the fact that a strong healthy masculine will has fought against this frightful evil, and preserved its defective mechanism so well; or what would have been the result in a woman—when one ponders over these and many such related things,

one is pained with sympathy, and indignant at the failure to help.

The age of the patient, of course, has a great deal to do with success of treatment in all these cases, and one fact stands out with clearness: the younger the age at which the treatment is begun the better. Reaction is prompt in the young, and every added year of failure, and wrench, and wreck, makes the task ever more difficult.

I have had something like fifty of these cases, and many had previously passed through the hands of others unbenefited. It would therefore appear that the duty to "fight for a bad eye" is at present not at all recognized. Every such case is pathetic with dumb pleading for a simple bit of help that it should be at once our highest duty and privilege to give. Moreover, to prevent disease is even greater than to cure it, and if taken early in life in no branch of medicine is intelligent prevention of intolerable evil so possible and so beautifully resultful as in painstaking and skilled refraction-work.







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