**Torticollis and spinal curvature due to eyestrain / by George M. Gould.**

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# TORTICOLLIS AND SPINAL CURVATURE DUE TO EYESTRAIN.

BY

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of Philadelphia.

The report of the following case should prove of interest alike to the general physician, the orthopedic surgeon and the oculist. To the first because the patient was of tuberculous parentage and it had been feared that she would develop tuberculosis, if she already did not have the disease. The symptoms simulating tuberculosis were soon found to be caused by a false position of the head. In the course of the treatment of eyestrain, it was discovered that the wry-neck had caused spinal curvature. By accident it was learned that the torticollis and spinal curvature were both due to an odd axis of astigmatism. The details are as follows:

In 1901 a young woman of 18 years of age, was sent to me from a distance because of severe and protracted headaches, bloodshot eyes, blepharitis, and pains in the eyeballs. The state of her health had compelled her to quit school. She had breakfast-anorexia, and a poor appetite generally. I found her static refraction was:

R. + Sph. 2.50 + cyl. 0.37 ax. 90° = 20/20 +
L. + Sph. 2.25 + cyl. 0.50 ax. 90° = 20/20 +

without muscle imbalance.

There was no improvement in her general or special ocular symptoms by the use of the glasses that I had ordered. On account of the tuberculous history of her parents and of a continuous cough, I advised that she should be placed under the care of a general physician, to live out of doors, etc. I did not suspect that I had made a blunder in my prescription for glasses. Two years later, *i. e.*, in 1903, I could not find that any change was required in her glasses, although I made a careful retesting, again under mydriasis. I had evidently repeated my error, however, of two years previous. I then noticed a drooping of the right shoulder, an inclination of the head to the right and downward, a flat chest, round shoulders, etc. (Fig. 1), and urged that the girl should be placed in the care of a teacher of physical training, to correct these vicious conditions. This was finally agreed to, and Miss Devennie, of Philadelphia, took

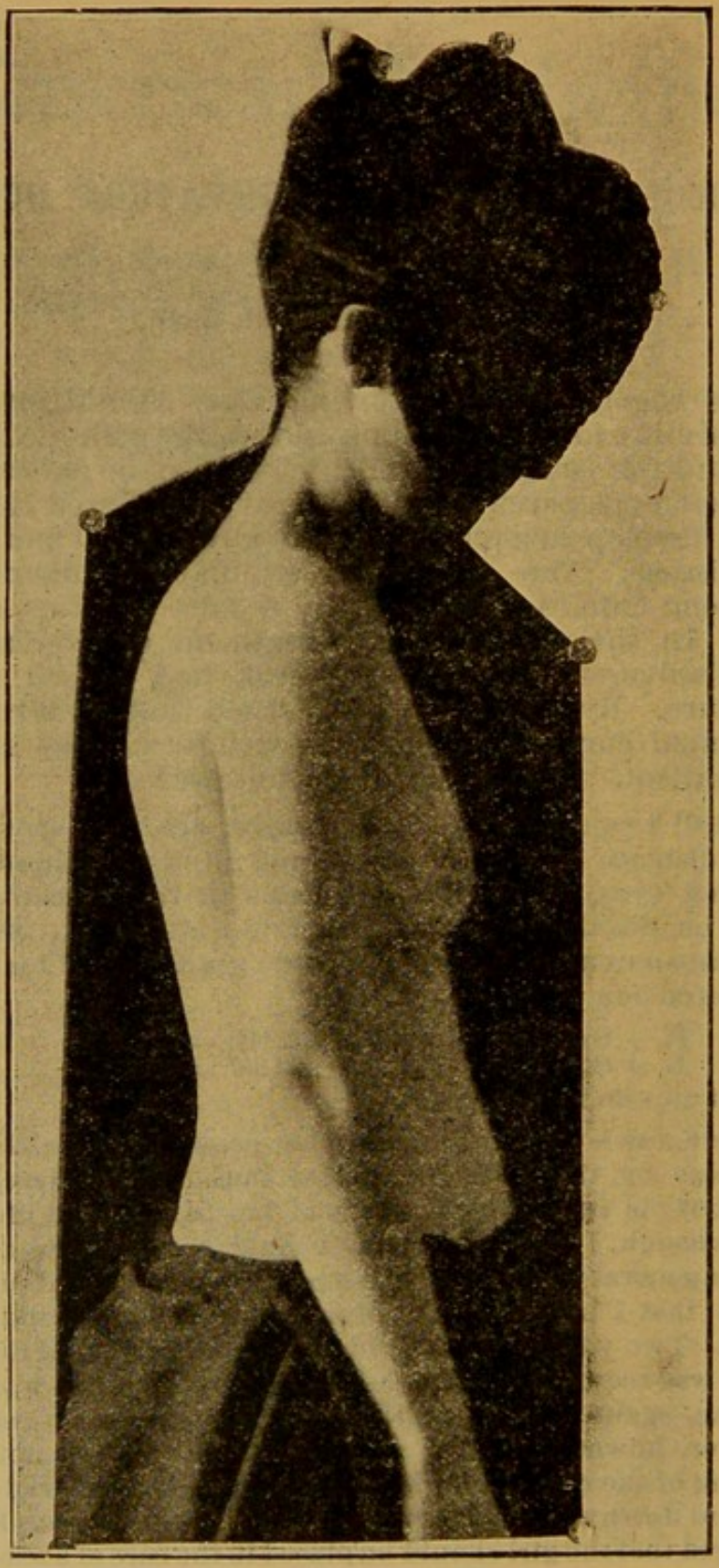

Fig. 1.

charge of her. As a result of her examination she found the spinal curvature, which is shown in Fig. 2. There was no disease of the bone, and an orthopedic surgeon was not called in. Within a few days after systematic gymnastic training was begun the patient returned to my office with a spontaneously-made and original discovery. It was announced in these words: "Doctor, when I straighten up and hold my head straight as you and Miss Devennie want me to do, I cannot see well." The explanation of the failure of the glasses to cure the headaches, etc., was at once plain, and still clearer the reason for the spinal curvature and torticollis. I had undoubtedly failed in accuracy to correct some odd axis of astigmatism. Painstaking testing now showed that the astigmatic axis of the right eye was 90°, with the head slightly canted down and to the right, and that it was 75° with the head erect. In previous refractions I had stupidly allowed the girl to hold her head in this way while refracting the right eye. Immediate change of the right lens in her spectacles from 90° to 75° (there was no change in the amount of ametropia, and none in the axis of the left eye), produced the noteworthy result that she can now see well only with the head erect. When holding the head canted down and to the right, as formerly, she "cannot see well." The habitual position in reading is shown in Fig. 3. While taking gymnastic exercises her teacher has noticed, without the girl's knowledge of the fact, that, being without the glasses, the head takes its former abnormal position and the right shoulder droops, the back becomes more humped, etc. With the glasses on, the erect position is at once assumed. The proof seems beyond question that the torticollis, drooping shoulder, bent back, flattened chest, and spinal curvature, are all the product of 18 years of the enforced habit of inclining the head in order to obtain clearer vision with the right eye through an axis of astigmatism differing 15° from that of the other eye in symmetry.

Moreover, since the change in the right lens was made, and the erect position assumed, the patient has been suddenly and entirely relieved of a pain in and about the sternum, which for many years had given her much uneasiness. This pain was not constant, but came on with exercise, deep breathing, coughing, etc. She had not spoken of it much, because of the disinclination to allude to the "consumption" which it was supposed to indicate.

It is needless to add that the headaches, anorexia, etc., which the former glasses failed to cure have also disappeared with the placing of the right axis at 75° instead of 90°. I think this is primarily due directly to the correct lens, which has abolished the reflex, but of course there is a secondary result from the

proper position of the body, increased lung-capacity (which is demonstrated), better oxygenation of the blood, etc. The spinal curvature is rapidly disappearing, the head is habitually

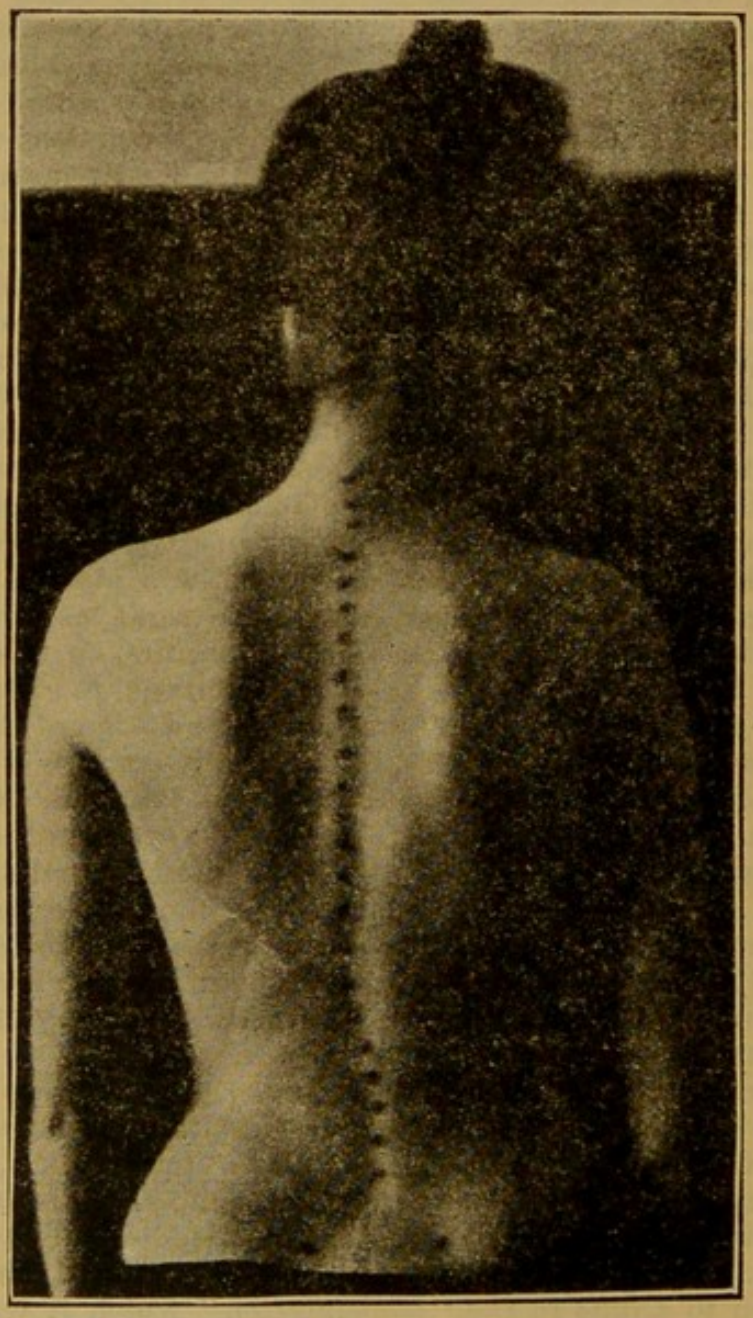

Fig. 2.

held erect, the shoulders and back are almost normal and the general health perfect.

The following additional case is confirmatory evidence of the theory:

A patient, herself a professional physical training expert, a woman of 25, of perfect physical form and health (except occasional ocular reflexes) tells me that, for several years,

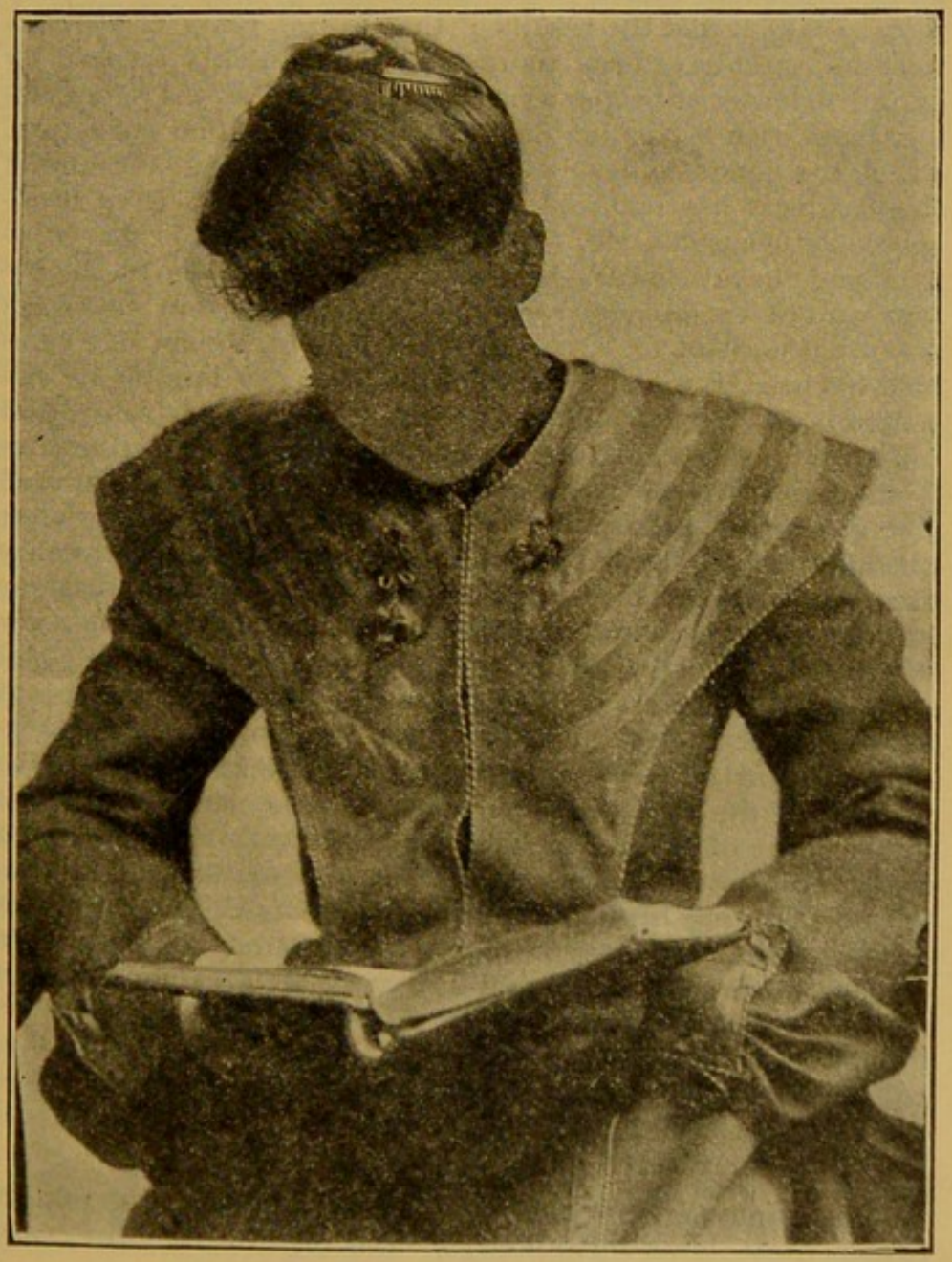

Fig. 3.

at about the age of 16 to 19, she had a decided curvature of the spine, diagnosed by excellent physicians. She also had torticollis. By the most careful and long-continued

physical training under experts in physical culture the head was brought to a normal position and the spine made perfectly normal. She now has a very high degree of astigmatism both axes at 170°—a defect which would not allow binocular fusion with the head in the normal position. I take it that the results of the several years of arduous training could have been more easily and quickly secured by cylindric lenses at proper axes. Several girls in the same college class with my patient had torticollis and spinal curvature, which has persisted despite all efforts and training, and one of these at least has endured years of wretchedness from headache, sickheadache, etc. (eyestrain reflexes), while her wryneck and curvature have become worse. I have also had a case that cannot be described as one of torticollis, but rather of abnormal position of the head. This patient, a man of 25, has held his head in the position to be described so long as he can remember. The head is thrown backward in a constrained and unnatural position, and also to the left side. In refracting him it was impossible for me to get him to hold the head downward and forward in a normal position. In a second or two after placing it so, it would return to the retracted and noticeably unnatural poise. This led me to examine the ocular muscular imbalance more accurately, and I found that most rare anomaly which has been called "cyclophoria." He had never had diplopia, but the axis of vision of one eye was so far below and to one side of that of the other that it was only by this abnormal and constrained position of the head that they could be fused and diplopia thus prevented. The patient said that this position of the head prevents him in walking from seeing the ground for some distance in front of him; it also necessitates his holding his book or paper very high. He has never had the usual reflex symptoms of eyestrain, and has only a moderate degree of compound hyperopic astigmatism without anisometropia. Prisms equal to 6° base down right, axis 100°, fused the two images, added greatly to the clearness of vision, and enabled him to hold his head in a normal position. He was right-eyed, with equal acuity of vision. He had never had any spinal curvature.

In order to illustrate the ease with which the ocular cause may be overlooked, I will epitomize the case history of another patient:

A young man was brought to me in 1901 by his father. He had evident symptoms of eyestrain. I found the following error of refraction:

R. — S. 0.25 + C. 5.25 ax. 75°
L. + S. 0.50 + C. 6.00 ax. 75°

This ametropia was properly corrected. The father incidentally remarked that the boy had spinal curvature. I had noticed that he had a malpoise of the head, but I was too stupid to recognize its significance. I recommended that the boy should be placed in charge of a good orthopedic surgeon. Dr. H. Augustus Wilson was consulted, verified the diagnosis of spinal curvature, and, by proper treatment, the spinal abnormality and malposition of the head have entirely disappeared. Dr. Wilson had also in mind the possibility of the spinal trouble being due to the eyes, but as the patient was referred by an oculist, he undertook the correction of the defect by orthopopedic methods only, and said nothing to me of the possible cause, the ametropia. There is no doubt as to the truth of the theory in this case, and almost none, also, as to the fact that without the correction of the ametropia there would not have been so speedy a cure of the spinal malcurvature.

The possible influence of eyestrain in producing torticollis, so far as I have been able to find, was first suggested by Dr. George T. Stevens. In the June, 1877 number of the *Archives of Ophthalmology* he speaks of the tendency of patients with insufficiency of the superior or inferior recti muscles of the eyes, to carry the head turned to one side. He says that once become permanent, tenotomy of the sternocleidomastoid muscles is necessary, but that "in a much greater number the muscles of the neck will regain equilibrium either speedily or after some time when once the vicious ocular tendency is removed." But no cases are reported by Dr. Stevens, and none definitely referred to. I shall later point out what seems to me the fundamental error in Dr. Stevens' interesting and valuable thought.

In the *Transactions of the American Orthopedic Association* for 1889, Dr. E. H. Bradford reports a case of "Functional Torticollis from Defective Eyesight." The same case is reported by Dr. Wadsworth from the ophthalmologist's standpoint in the *Transactions of the American Ophthalmological Society* for 1889.

*Case of Drs. Bradford and Wadsworth, of Boston.*—A bright boy of 14, had had wry-neck from infancy, together with lateral spinal curvature to the left. There was no permanent contraction of the muscles of the neck. Although there was a well-marked convexity of the spine to the left, the vertebras were apparently normal. Long-continued attempts, chiefly of a gymnastic kind, had been carried out in Sweden in the attempt to normalize the position, but without any effect upon it. Dr. E. H. Bradford referred the patient to Dr. Wadsworth. The

left eye, from childhood, "rolled up" and the head was tipped to the right. The right shoulder drooped. There had never been diplopia. "Only when the eyes were turned strongly down and to the left, while at the same time the head was inclined forward and to the right, and rotated a little to the right, did he apparently get binocular fixation." Prisms, amounting together to 20° to 25° base down L., base up right, apparently gave binocular fixation with the head nearly in the normal position. Fundus was normal. Vision each eye was $\frac{14}{12}$. Vision under homatropin R. or L. with $+0.75=\frac{14}{12}+$. Two unsuccessful attempts to tenotomize the left superior rectus were made, but success was attained at a third trial. The result in one month, was that the boy was much straighter both in head and trunk, and improving. The left eye now turns down as far as the right. Stereoscopic vision was, however, still impossible, and the cover-test showed deviations. A month later there was still drooping of the right shoulder, and the head was slightly tipped. Vision R. with 1 Cyl. $0.50=\frac{14}{12}$., L. with $+0.50=\frac{14}{12}$. Dr. Wadsworth adds:

"The fact that the distortion did, to all appearance, render binocular fixation possible in one position of the object, led me, in the absence of other discoverable cause to think this supposition (of the ocular etiology) probable. It is within the bounds of possibility also that in earlier life the twisted posture gave binocular fixation over a wider area, and, therefore, for a larger part of the time, and that the posture once become habitual, occasional binocular fixation only was needed to maintain it in permanency. The rapid improvement that took place after tenotomy appears to sufficiently confirm the correctness of the theory." Dr. Bradford says: "To attain binocular vision the boy is obliged to hold the head on one side."

*Case of Dr. Lovett and Dr. Cheney.*[1]—A boy of 3 years of age had turned his face to the right side for about 6 months. The head resisted manipulation, to place it erect, although the turning was not constant. When looking attentively at any object the child always turns the head. Dr. Cheney found slight convergence of the right eye. Diplopia could not be diagnosed in a child of the age of this one. There was chronic choroiditis of both eyes, with central choroiditis of the right sufficient to impair vision. Idiopathic torticollis seemed the necessary diagnosis of the orthopedic surgeon. Dr. Cheney performed tenotomy of the right internal rectus. There was improvement noted in a month in the position of the head, although there still remained some convergence of the eye, and another operation would probably be necessary.

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[1] Transactions American Orthopedic Society, Vol. ii.

*Three Cases of Dr. S. D. Risley, of Philadelphia*,[1] as reported in the discussion of Dr. Wadsworth's paper. Dr. Risley said:

"I have had the opportunity of studying three similar cases, and do not know of any recorded case. The first was seen in 1880, age 15, a stalwart lad, the son of a physician. The head was carried strongly to the left side, both in reading and walking, but could be readily and voluntarily brought to the upright position. Notwithstanding this fact, a general surgeon had advised a tenotomy of the muscles of the neck. The boy volunteered the statement that when he held his head erect his vision was impaired. His father, therefore, brought him for advice about the eye trouble. In the habitual position the boy enjoyed binocular vision sharpness 20/xx, while in the erect posture the letters were confused by vertical diplopia, which was, however, corrected at 20 feet by a 3° prism placed with its base down over the right eye, and V. = 20/xx. The refraction was for O.D.H. = 1 D., O.S. H.As. = + .50 ⊂ + .50 cy. ax .90°. A tenotomy complete of the right superior rectus was done under ether, assisted by Dr. Randall and the boy's father. The result was to relieve the faulty position in which the head was habitually carried for several years. He was placed as accountant in a badly-lighted counting-room in 1887, and soon developed asthenopia and a return of the faulty posture, but allowed a year or more to pass without seeking advice. I then found not only a return of the former conditions, but a marked lateral curvature of the spine. A complete tenotomy of the left inferior rectus was done, and subsequently a second division of the right superior rectus, which, together with a correcting glass, relieved the asthenopia, but did not affect the ungraceful carriage which was now produced by the permanent deviation of the spine.

"In the other cases, one was relieved by prismatic glasses without operation both from the faulty posture and the asthenopia; the other by a double tenotomy and the subsequent use of weak prisms. It had not occurred to me, however, to place these cases in the category of torticollis."

*Case of Dr. J. K. Young, of Philadelphia.*—A woman of 30, in 1891 had torticollis, which was cured by a prism of 3° Base down in the right lens. The asthenopic symptoms were also improved. The glasses ordered were:

R. Prism 3° Base Down.
L + Sph. 0.25.

The head was turned down and to the right. It is not known whether there was any spinal curvature. There was

[1] Transactions American Ophthalmological Society, 1889, p. 384.

R.+Sph. 0.50+Cyl. 0.37 ax. 180°
L.+Sph. 0.75+Cyl. 0.25 ax. 180°

Ten series of refractions had given no relief of supraorbital headaches and many other symptoms. One was sufficient when it was correct.

18. A patient came to me wearing:—

R.−Sph. 0.37−Cyl. 0.12 ax. 180°
L.−Sph. 0.37−Cyl. 0.50 ax. 10°

He has had much indigestion, was unable to read, especially at night, was wakeful at night, excitable, etc. His need was for:—

R.+Cyl. 0.75 ax. 100°
L.−Sph. 0.37+Cyl. 1.50 ax. 100°

Of course he tilted his head persistently to the left, because he wished to see the things he looked at. And of course he had lateral curvature of the spine. But he was 43 years old.

19. A woman of 52 came to me last year complaining of violent "migraine" or sick-headaches existing since childhood. She has also had pain in the forehead, occiput, back of neck, and in the spine. During the life of intense suffering she has had other related symptoms, depression, palpitation of the heart, etc. For this condition her Brooklyn oculist gave her, for near-work, in pulpit spectacles, both eyes, + Sph. 2.00. Mrs. Eddy could have done better! The woman's nervous system and health, and great usefulness as a teacher demanded:—

| | | |
|---|---|---|
| R.+Sph. 0.12+Cyl. 0.62 ax. 10° | Distance | Bifocals |
| L.+Sph. 0.25+Cyl. 0.37 ax. 170° | | |
| R.+Sph. 2.50 and Cyl. ..... | Near .. | |
| L.+Sph. 2.62 and Cyl. ..... | | |

For a peculiar intermediate work + Sph. 1.50 and Cyl., and + Sph. 1.62 and Cyl. were ordered. The former oculist lost his patient, the patient found perfect health, and the second oculist got the unlimited gratitude of the patient whose life of torment had been entirely unnecessary.

20. At the age of 8 a boy had to be taken from school for two years because of chorea, "of the whole body," irritability, etc. Later headaches became troublesome, and dyspepsia. At the age of 15 an ophthalmic surgeon to a dozen hospitals ordered:—

R.−Cyl. 0.50 ax. 180°
L.+Cyl. 0.37 ax. 180°

The right lens was correct but the left should have been—Sph. 0.50—Cyl. 0.25 ax. 180°. The blunder could have been worse only if it had been made in the right eye.

21. A wellknown oculist in Philadelphia ordered for a man of 37, for headaches, both eyes, +Sph. 0.75. His refractive error was:—

R.+Sph. 0.75+Cyl. 0.50 ax. 75°=20/30 ?
L.+Sph. 0.62+Cyl. 0.37 ax. 105°=20/40+
with exophoria.

Deducting +Sph. 0.37, from this, one sees that the overcorrection of hyperopia and the noncorrection of astigmatism, added insult to injury as regards this man's eyes and nervous system.

22. The "best oculist" in a neighboring city, without having used "drops" ordered a man of 25 for both eyes alike,—Cyl. 0.25 ax. 180°. Headaches, severe and constant, pains in the eyes, drowsiness on reading, etc., were the complaints. The man's error of refraction was:—

R.+Sph. 1.50+Cyl. 0.62 ax. 90°
L.+Sph. 1.50+Cyl. 0.50 ax. 90°

Comment is unnecessary!

23. A visiting surgeon to a famed Eye Hospital told a woman of 34 that she had no astigmatism and ordered:—

R.−Sph. 0.50
L.−Sph. 0.75

She had been confined to sanatoriums and asylums because of ill-health, physical and psychic, characterized chiefly by nervousness and certain delusions. The above glasses ordered

had added to the symptoms "twitching of the eyes." I found the woman had:—

R. −Sph. 0.37 − Cyl. 0.37 ax. 105°
L. − Sph. 0.25 − Cyl. 0.50 ax. 60°

This is an error which, in my experience, is as certain as any to upset the nervous system, and even the mental balance. Professors who ignore such errors should be sent to some refraction school—when it is established.

24. For years a little girl's mother had been incessantly trying to get the child to "stop poking her head sideways." She had been "bilious," constipated, and suffered in many ways; she was morbid-minded, irritable, and excessively, even alarmingly, "nervous." There was persistent "batting of her eyes." The New York "Ophthalmic Surgeon" had recently given her, both eyes the same: + Sph. 0.50 + Cyl. 0.75 ax. 90°, and for this piece of scientific work he should have been sued for malpractice. The child's mydriatic error was:

R. +Sph. 0.87 +Cyl. 0.25 ax. 75°
L. +Sph. 0.75 +Cyl. 0.37 ax. 75°

The symptoms disappeared, and the child's back is today normally straight and her head held erect.

25. For a dozen years a woman of 28 had been wearing glasses from a physician, a specialist in diseases of the eye. She first consulted him on account of using but one eye, and also for headaches. For seven years she has had severe backache, weakness of the legs, etc. She had sudden "dizzy spells" during which she must lie down. She had great and constant drowsiness. She complained of nervous headaches, "but without pain." (Patients frequently say they have "headaches without any pain in the head," or *vice versa*, that they have "pain in the head without any headaches.") The shame and horror in this case is that the woman's oculist

had compelled her to wear the following murderous lenses:—

R. Plano
L. −Sph. 0.62

I ordered instead these:—

R. +Sph. 0.25 +Cyl. 0.25 ax. 60° = 20/20 +
L. −Sph. 0.12 +Cyl. 0.25 ax. 105° = 20/25

The woman had been a life-long headtilter. The left eye was fast going out of function.

26. In 1902 the parents of a young woman, 19, for many years a headtilter, afflicted with headaches, sick-headaches, vomiting, etc., were told by her famous Philadelphia "Ophthalmic Surgeon" that she would before long be insane. But just to lessen the danger he prescribed:—

R. +Cyl. 2.50 ax. 90°
L. +Sph. 0.50 +Cyl. 2.25 ax. 90°

The ophthalmologist's prognosis for the poor girl was perfectly correct—if she had continued under his care! She consulted another, a non-famous advisor, and he ordered:—

R. +Cyl. 5.00 ax. 100°
L. +Cyl. 4.75 ax. 105°

She has been happy ever since.

27. There is in Philadelphia a great "conservative" much addicted to patient-stealing, surgery, and ordering many "office-visits," who prescribed for a patient, a child of ten years of age, the following:—

R. −Sph. 0.62 +Cyl. 3.75 ax. 90°
L. −Sph. 0.50 +Cyl. 3.75 ax. 75°

But the lad's total error of refraction was:—

R. +Sph. 0.75 +Cyl. 3.25 ax. 90°
L. +Sph. 0.75 +Cyl. 3.50 ax. 80°

This child was a constant headtilter, had chorea, headache, disordered stomach, etc. It was fortunate for that child that he escaped "scientific treatment."

28. In 1899, a man of 30, suffering from nau-

sea and headache came to me wearing the following, from an eminent author of ophthalmic textbooks, "Ex-President, etc., etc.," "Visiting Ophthalmologist to the etc., etc.":—

Both eyes + Sph. 0.75 + Cyl. 1.00 ax. 90°

But his proper correction was:—

R. + Sph. 0.37 + Cyl. 1.00 ax. 90°
L. + Cyl. 1.75 ax. 90°

The eminent expert should be compelled to take a course in the New Refraction College to be established—when?

29. From the "best oculist in California" a physician, suffering with frontal headaches, sleepiness, etc., was wearing, both eyes,—Cyl. 0.75 ax. 180°. The optical error of this "Member of the Guild" was, both eyes, + Cyl. 0.75 ax. 90°. Even science and skill will make such blunders when a cycloplegic is not used.

30. From one of Pittsburg's most reputable oculists a surgeon, aged 58, was wearing, both eyes, + Sph. 3.00, but was much troubled with subconjunctival hemorrhages. I ordered:

R.+Sph. 2.75+Cyl. 0.75 ax. 180°
L.+Sph. 3.50+Cyl. 0.37 ax. 180°
Sph. +2.50 added for near in bifocals

R. Sph.+3.75 and Cyl.
L. Sph.+4.50 and Cyl. } Operating glasses

The hemorrhages disappeared until two years later differences of refraction and accommodation required changes in the lenses.

31. In 1900, a woman of 45 came to me wearing an atrociously wrong pair of glasses. She had had "St. Vitus Dance," all sorts of headaches, much indigestion, etc. Seven years ago she began having seizures of swooning or unconsciousness with "spasms." Two fingers of the left hand have been paresthetic. The "falling fits" latterly have been recurring every two or three days, unless she takes bromids,

when they are delayed, and occur about once a week. I ordered:—

R.+Sph. 1.12+Cyl. 0.75 ax. 90°, Prism 2° Base up
L.+Sph. 1.25+Cyl. 0.50 ax. 90°, Prism 2° Base down
With Presbyopic correction, in bifocals.

Since the day the glasses were worn there has been but one slight attack of unconsciousness, and the health is good.

32. A man of 38 came to me in 1898 wearing from a great textbookmaker, an ophthalmologist of fame, B. E. + Sph. 1.00. He had had severe frontal headaches, some sick-headaches, and pain between the shoulders. These symptoms disappeared when he began wearing:—

R.+Sph. 1.00+Cyl. 0.37 ax. 165°
L.+Sph. 0.75+Cyl. 0.62 ax. 180°

33. In 1896 a child of 8 was told by a Philadelphia oculist that no error of refraction existed sufficient to cause the frontal headaches, pain in the back of the neck, and anorexia. The symptoms kept on and grew worse. I found:—

R.+Sph. 0.25+Cyl. 0.37 ax. 35°
L.+Sph. 0.37+Cyl. 0.37 ax. 145°

and ordered spectacles to be worn all the time. Since then there have been no headaches, no lack of appetite, no neckache. She demands her glasses, wears them all the time, as their disuse at once brings on headache.

34. In the summer of 1904 a young woman of 23 was sent to a sanatorium with "breakdown" or "collapse." All her life she had gone to bed with headache almost every day. She had chorea as a child, and still had it so far as concerned the facial muscles. When the crises of "congestive headache" come on she is so dizzy she cannot see or walk. Her oculists have never demanded that she should wear their glasses *all* the time so she has not done so much of the time, especially when not using her eyes for near-work. She has been under the care of many physicians, especially that of a great

New York neurologist. She has taken all sorts of drugs, baths, electricity and—the rest! A prominent Philadelphia oculist recently ordered:—

R.+Sph. 1.62+Cyl. 0.75 ax. 110°
L.+Sph. 1.62+Cyl. 1.00 ax. 80°

Her proper correction is:—

R.+Sph. 1.75+Cyl. 0.62 ax. 100°
L.+Sph. 2.00+Cyl. 0.62 ax. 80°

35. A man, 57 years of age, came to me saying "I have been to many oculists but all have refused to give me glasses, or have given me things I could not wear a minute See if you can help me." The history was of headaches, dyspepsia, and a life of inability to read or write, a life of out-of-doors, every day and all day. Several of the oldest oculists of the city of ——, and of the city of ——, and of ——, did order spectacles but he could not wear them despite all efforts to do so. One had ordered a plano lens in one eye. Several refused to order glasses at all. Dr. ——, of B., five years ago ordered: R.—Sph. 0.50—Cyl. 3.50 ax. 30°, L. —Cyl. 4.00 ax. 30°. The man was a head-tilter, had a long spinal S. curve, etc. I found his refraction errors to be:—

R.−Cyl. 5.00 ax. 20°=20/30?
L.−Cyl. 1.00 ax. 45°=20/30?
+Sph. 2.50 added for near in bifocals

He has not had a minute of discomfort with these lenses; he immediately regained health. But the most gratifying change is that of his mind, disposition, and actions, which before were morbid, in many distressing ways, but which are now natural and pleasing.

36. These are the last three prescriptions given a man of 53 by the best oculist of his native city in New England:—

R.+Cyl. 2.50 ax 180°
L.+Sph. 2.50+Cyl. 0.50 ax. 135° } Distance
+Sph. 2.00 added for near-work

R.+Sph. 2.00+Cyl. 2.50 ax. 80° } Near
L.+Sph. 4.50+Cyl. 0.50 ax. 135° }

R.+Sph. 1.25+Cyl. 2.25 ax. 80°
L.+Sph. 3.00+Cyl. 0.50 ax. 30°

The correct diagnosis is:—

R.+Sph. 0.75+Cyl. 1.75 ax. 75°=20/30 } Dist.
L.+Sph. 1.62+Cyl. 2.25 ax. 145°=20/50+ }

R.+Sph. 3.00 and Cyl. } Near
L.+Sph. 3.50 and Cyl. }
In bifocals

Is it any wonder the man's troubles were not relieved, and that the left eye was half-ruined?

37. In February, 1904, came to me as perfect an example of physical womanhood as I ever saw, 24 years of age, with a history of severe "migraine" or sick-headaches, keeping up at intervals all her life. Excitement, or menstruation, etc., has been likely to bring on the crises. She had also many other of the common symptoms of "migraine." I ordered B. E. + Cyl. 0.62 ax. 90° and the sick-headaches grew worse. I rerefracted but failed again to give her relief. Laboratory diagnoses revealed low hemoglobin, but nothing else wrong. Three years passed without further visits and there was still no relief from the migraine. It looked bad for my theory! But during these three years I had learned something about tilted heads and kinked backs. I now found that three years ago I had failed to notice the tilted head of this woman, and so I had not discovered that her right axis was not 90° but was 105°.

38. A man of 56 had suffered from indigestion, flatulence, and constipation since early childhood. Fifteen years ago he had a "general breakdown," "nervous prostration," etc., attributed to "overwork." A few years ago headaches came on, heaviness of eyes, distress in head, etc. Later vomiting, great numbness of the arms, dizziness, and nausea, and great

insomnia. He came to me wearing, from one of Philadelphia's prominent oculists:—

R.+Sph. 0.62+Cyl. 0.50 ax. 90°
L.+Sph. 0.37+Cyl. 0.75 ax. 60°
With 2.75 added for near-work.

Now a man of 54 (he was 54 when they were ordered) does not normally have a presbyopic failure of 2.75, and this man did not. He was thus compelled to hold his book within eight inches of his eyes—a source of eyestrain, *per se*. But even at 56 his proper correction was:—

R.+Sph. 0.50+Cyl. 0.37 ax. 120°
L.+Sph. 0.37+Cyl. 0.37 ax. 90°
With +Sph. 2.25 added for near-work, in bifocals.

There is no cure of eyestrain without the absolutely correct location of the axes of astigmatism.

39. From one of Newark, New Jersey's foremost oculists a patient of 67 years of age came to me wearing, B. E., + Sph. 1.25 for distance, and for near +Sph. 3.25. She has worn such glasses as these for 23 years, but for 50 or more years she has been almost a constant sufferer from chronic constipation, severe and almost uninterrupted headache, pain in the eyes, sleeplessness, etc. Can any but "conservative" ophthalmologists, and typical neurologists dream that this woman's half-century of suffering has been useless, has been due, at least in the last 25 years, to ophthalmologic crime, to the lack of correction of this error of refraction:—

R.+Sph. 0.75+Cyl. 1.12 ax. 180°
L.+Sph. 0.62+Cyl. 1.00 ax. 180°

with proper presbyopic correction in bifocal spectacles?

40. In October, 1905, a woman of 45 came to me complaining of nausea without apparent cause, frontal headache, car-sickness, "stomach trouble," insomnia, "nervousness," cardiac palpitation, etc. She had taken nitroglycerin for two years. For some of these things, grow-

ing worse, she had worn glasses for 21 years, from a number of oculists, the last prescription being:—

R.—Sph. 4.00—Cyl. 2.00 ax. 120°
L.—Sph. 2.50—Cyl. 0.25 ax. 180°
Exophoria 4°

This correction was not far wrong, but no reading glasses were ordered, and especially no bifocals. I ordered:—

R.—Sph. 4.12—Cyl. 2.25 ax. 110° } Dist. } Bifocals
L.—Sph. 1.87—Cyl. 0.25 ax. 180° }
R.—Sph. 3.00 and Cyl. ..... } Near }
L.—Sph. 0.75 and Cyl. ..... }

In a month the woman was "getting fat," and later she was (and continues to be) "practically well."

41. A woman of 38 came to me three years ago wearing:—

B. E.—Sph. 0.12+Cyl. 0.62 ax. 90°

from one of Philadelphia's prominent oculists. She had recently begun having severe attacks of "migraine," being kept in bed by them two days, with vomiting. She has had intestinal indigestion "all her life." I found:—

R.+Sph. 0.12+Cyl. 0.75 ax. 90°=20/20+
L.+Sph. 0.12+Cyl. 0.75 ax. 75°=20/20+
Exophoria 4°, Abduction 8°, Adduction 9°

Simple cylinders were ordered, and the adduction increased by gymnastic exercises to 80°, with slight esophoria. All symptoms disappeared in a couple of months, there was a gain in weight, and there has since been perfect health.

42. "I can't eat anything, I have such a sick stomach, and I have doctored until I am tired; no glasses have done any good." Thus said a patient, 25 years old, in 1896. I could not get a copy of other prescriptions. I ordered:—

R.—Sph. 0.50+Cyl. 1.50 ax. 90°
L.+Cyl. 1.00 ax. 90°

There was immediate cure—all symptoms vanishing at once. Slight symptoms recurred when glasses needed changing, to disappear when the change was made. At the last visit, in 1907, the error was, both eyes + Cyl. 2.00 ax. 90°.

43. A woman, 39 years of age, had vertical and occipital headache for years, worsened by use of eyes at near-range, occasional sick-headaches with both nausea and vomiting, indigestion, neuralgia, melancholy, etc. She had recently been ordered by her oculist:—

R.+Sph. 0.25 − Cyl. 0.62 ax. 180°
L.—Cyl. 0.50 ax. 180°

I ordered this:—

R.−Sph. 0.12+Cyl. 0.62 ax. 105°
L.−Sph. 0.25+Cyl. 0.50 ax. 90°

There was so much improvement in all the symptoms that it might almost be pronounced a cure. As this was not completely satisfactory to me, I asked her to return, and I found at this time what I should have found at the first visit, a slight lumbar left curve of the spine, with resultant facts and symptoms.

44. For many years a woman of one of the New England States had been an invalid, surrounded by nurses, and by physicians. To describe the symptoms and long history of illness would take too much space. She had recently been ordered by one oculist:—

R.+Cyl. 0.25 ax. 180°
L.+Cyl. 0.50 ax. 90°

and by another:—

R.+Sph. 0.25+Cyl. 0.25 ax. 45°
L.+Sph. 0.25—Cyl. 0.25 ax. 135°

She had, however, the worst sort of ametropia, a low degree of simple myopic astigmatism. I ordered:—

R.−Cyl. 0.25 ax. 150°
L.−Cyl. 0.25 ax. 30° } Distance

B. E.+Sph. 0.50 added } Near

In a month her husband wrote me she "began to improve at once" after getting glasses; "progress is steady and rapid." "When she takes her glasses off she has flashes of light." In six months the progress toward health was still gratifying.

45. A famed "ophthalmic surgeon" of New York City last year ordered a woman of 31 to wear:—

B. E.—Cyl. 2.50 ax. 180°

The woman had great suffering of many kinds, and because of troubles in her own family, with supposed inheritance of insanity, etc., was so profoundly depressed that she was frequently on the verge of committing suicide. The gynecologists had done what they could (most of the women who reach the gynecologic operating table have been lifelong sufferers from eyestrain), the nerve men have done what they couldn't, and two tenotomomaniacs demanded permission to cut her ocular muscles. There was, however, need for:—

R.+Sph. 0.25—Cyl. 3.00 ax. 180°
L.+Sph. 0.25—Cyl. 3.00 ax. 180° } Distance

R.+Sph. 0.87 and Cyl.
L.+Sph. 0.75 and Cyl. } Near

Her muscles were to be advanced or tenotomized for one degree of exophoria! How many crimes are committed in the name of medical science!

46. A boy of 11 had chorea, headache, blepharitis, and great "nervousness." His local oculist in a neighboring State ordered:—

R.+Sph. 2.00
L.+Sph. 2.50+Cyl. 0.25 ax. 90°

I ordered the following:—

R.+Sph. 1.50+Cyl. 1.62 ax. 90°
L.+Sph. 2.00+Cyl. 1.00 ax. 90°

The chorea had extended to constant spasmodic motions of the right arm and leg. In addition

there was stammering, a halting and then explosive method of speaking. All these things disappeared gradually after wearing the last glasses and for the last three or four years have not existed.

47. For a girl 10 years of age, an oculist of Leipzig, Germany, prescribed, according to Continental wisdom, both eyes, +Sph. 1.00, and an American, B. E. +Cyl. 0.25 ax. 90°. The child was constipated, had "bilious attacks" with vomiting, coated tongue, fickle appetite, headaches, etc. As no relief came from the glasses the American ordered their use discontinued. Then to former troubles, temporary strabismus was added, with diplopia. The following in spectacles cured the child of every complaint:—

B. E.+Sph. 0.37+Cyl. 0.37 ax. 90°

48. An ophthalmic surgeon of international reputation in New York City ordered a woman of 24:—

R.+Cyl. 0.25 ax. 90°, Prism 1.5° Base in
L.+Cyl. 0.25 ax. 90°, Prism 1.5° Base in

The woman's symptoms were frequent headaches, with nausea, since childhood, and great insomnia, extreme nervousness and restlessness. It has been well said that "Happiness is made up of little things, but itself is not a little thing." It could aptly be said of eyestrain. I ordered for the much and longsuffering woman:—

R.+Cyl. 0.37 ax. 90°
L.+Cyl. 0.25 ax. 105°

Her letters since express "gratitude for the perfect comfort she has had, although using her eyes more than for several years." A famous orthopedic surgeon discovered spinal curvature soon after she first came to me, and ordered a thick-soled shoe. It hurt her so (pain in the the back) that she took it off and successfully

took up gymnastic exercises instead. She suffers, however, if her glasses get crooked, or if she leaves them off.

49. A Philadelphia oculist ordered, in 1899, for a man of 28 the following:—

R.+Sph. 2.25+Cyl. 1.00 ax. 180°
L.+Sph. 2.25+Cyl. 1.00 ax. 90° } Distance

R. Prism 1.5° Base in
L. Prism 2.0° Base in } Fronts

The man had pain in eyes, frontal headaches, daytime sleepiness, indigestion, and "nervousness." He had been wearing glasses for 14 years. I at once ordered:—

R.+Sph. 2.00+Cyl. 1.25 ax. 15°
L.+Sph. 2.00+Cyl. 1.12 ax. 80°

For his esophoria of 18°, and hyperphoria of 3° I did nothing beyond advising the man for awhile not to visit New York. He has had none of the old symptoms since wearing the glasses I ordered. He still has an esophoria of ten or twelve degrees. There is no hyperphoria. I long ago gave him permission to go to New York if he wished to do so. I have another patient with 22° of esophoria, a student and great reader, who is likewise without a symptom.

50. "Deficiency of hydrochloric acid" is often due to eyestrain. This was proved to be true in Mrs. H.'s case, a woman of 33, who consulted me first in 1895. There was also severe indigestion, pain in stomach, inability to read five minutes without bringing on this pain, etc. Sometimes it has been called nervous dyspepsia. The most troublesome of all her symptoms however was a dermatitis, "an eruption," especially of the face, so great as to require "lancing" by a dermatologist of her city. She had been treated in vain for this affection for six months. A general physician who had exceptional observing powers finally told her, despite her glasses from a reputable oph-

thalmologist, that her skin-trouble was due to her eyestrain. Within two weeks after I had ordered a change of glasses the diseases both of the stomach and skin disappeared. Both returned eight years later when she had neglected to have her glasses changed as I had advised. With new glasses they promptly disappeared once more. The last prescription was:—

| | | |
|---|---|---|
| R.+Sph. 1.87+Cyl. 0.25 ax. 45° | Distance | Bifocals |
| L.+Sph. 2.12+Cyl. 0.25 ax. 135° | | |
| R.+Sph. 3.00 and Cyl..... | Near ... | |
| L.+Sph. 3.25 and Cyl..... | | |

Dermatologists are vainly treating many patients which the refractionist could speedily cure.