

# The Journal of the American Medical Association

VOL. XXIII.

CHICAGO, SEPTEMBER 15, 1894.

No. 11.

## ORIGINAL ARTICLES.

### REPORT ON EXAMINATIONS OF THE EYES OF 1,900 SCHOOL CHILDREN OF THE PUBLIC SCHOOLS OF SAN FRANCISCO.

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

BY KASPAR PISCHL, M.D.  
SAN FRANCISCO.

Since Professor Jaeger, of Vienna, in 1861 had begun the first scientific examination of the eyes of school children, over 200,000 pupils in all parts of the civilized world have been examined. All those investigations have proven that myopia stands in direct proportion to the education of the people. If I venture to ask your attention for a few minutes only to hear the report of the examinations made in the schools of San Francisco I do not pretend to show you anything new, but I hope it will be interesting enough to compare the conditions of the eyes of the children in this new country with those of other countries.

To enable you to judge about the value of the data of my examination, I will explain in a few words the method I employed. I examined the sight of every child, each eye separately, with Snellen's letters. When I found normal sight not impaired by putting before the eyes  $+1^{\circ}$  I marked hypermetropia. If  $+1^{\circ}$  blurred the sight, emetropia. This last column is not reliable. I am sure that many hypermetropic and astigmatic eyes were classed among emetropia. Those who with one or both eyes did not show normal sight were examined with the ophthalmoscope. Every pupil was examined regarding the conjunctiva and lids. A glance at Table 1 shows us at once an increase of myopia with the grade of the class; from 3.98 per cent. in the grammar school to 11.59 per cent. in the normal school. At the same time, the number of pupils with normal sight decreases from 90.20 to 75.71 per cent. This deficiency of sight and increase of myopia is most prominent among the girls of the high and normal schools.

SAN FRANCISCO SCHOOLS, 1891-92. PERCENTAGE OF.  
Table 1.

Schools.	No. of Schol- ars.	E.	An.	H.	M.	Conj.	B. E.	One E.	Both E.
Grammar . . . .	1,280	68.60	6.32	20.9	3.98	26.25	90.20	7.03	2.77
Boys' High . . .	305	76.06	13.12	4.56	6.23	31.11	85.91	7.86	6.23
Girls' High . . .	299	69.68	9.28	14.02	7.02	41.00	80.66	5.00	14.34
Normal Class . .	69	63.76	18.86	5.79	11.59	41.42	75.71	1.00	28.29
Total . . . . .	1,953	69.52	11.89	11.12	7.20	34.94	83.7	5.22	11.65

This fact is quite in accordance with the observations of Dr. Gould and Dr. Southard, our esteemed colleague present, who in his examinations of the eyes of the students of the University as well as his analysis of 1,300 cases of refraction found myopia or refraction

errors in general more frequent in the female sex than in the male. He gives a clear explanation for it: They use their eyes more. In Europe we find the contrary to be the case. There the boy gets a much better education, boys only are admitted to the gymnasium and then to the university, and among those students we find over 50 per cent. myopia.

Table 2.

1890 24 German . .	Gymnasium . .		9,344	22-58%	Myopia.
1891 Gelphe . . . .	Karlsruhe . . .	Erneiterte Ele- mentar Schule	2,406	8.9%	"
1885 Axel Key . . .	Stockholm . . .	7 Class School .	11,210	15%	"
1879 Nicati . . . .	Marseilles . . .	Lyceum . . . . .	About	30%	"
1881 Risley . . . .	Philadelphia . .	Gramm'r School	430	11%	"
" . . . . .	" . . . . .	14 years . . . .			
1882 Dr. Derby . .	New York . . .	Normal School .	553	19%	"
Mittendorf . . .	" . . . . .	Gramm'r School .	1,594	10.5%	"
1892 Southard, . .	University of	E.	H.	M.	
San Francisco	California	34.35%	35.63%	6.9%	
311 Students . . .					

Of all the myopic pupils, 25.25 per cent. are of American parentage, 25.25 per cent. of mixed American and European parentage, and 49.50 per cent. are of European parentage.

With conjunctivitis I marked irritation, simple and follicular conjunctivitis. This affection increases in number with the classes.

The fact that myopia is much less prevalent here among children than in Europe or even in the East, may be explained by their better physical development, caused by abundance of good food, due to our fertile soil, and the almost constant outdoor life permitted by our wonderful climate.

In conclusion, I have remarked that these school examinations do not pretend to be of the exactness of the office examinations, but I consider them exact enough for statistical purposes. The column for myopia I believe to be reliable, the column for hypermetropia probably shows too small a percentage as some hypermetropic and astigmatic eyes are classed among emetropia having normal sight. An exact examination of refraction with mydriatic was impossible, as it would not have been permitted by the school authorities.

The great increase of the conjunctival affection with the grade of the classes points to the existence of eye strain which in a great many cases may be caused by hypermetropic astigmatism, therefore an exact examination of every pupil would be desirable.

## DISCUSSION.

DR. S. B. DAVIS—In the Young Ladies' High School, I found many cases where astigmatism was reducing the vision to twenty-two-hundredths. In some cases, their vision was practically good and a slight correction made wonderful results. The difficulty was chiefly with those whose studies were pressing them, and we came to the conclusion before we examined 500 students in that way that they were getting their education at the expense of their sight.

DR. H. H. WEER—It strikes me that physicians assume too much in regard to the eye. If there is anything that makes an eye man tired, it is to see some one attempt to do some-

thing according to some hypothetic theory and make a dismal failure of it. I can not understand how the use of test cards is any test for hypermetropia or myopia. It strikes me that a person having astigmatism of very low degree and in ill health, would have disturbance of vision. I have been acquainted with one of the assistants of the Manhattan Eye and Ear Hospital in New York City who had 12 D. astigmatism and never wore a glass.

I would like to ask how in determining the hypermetropia and myopia, do you dispose of the accommodation? If I remember correctly, there is a vasomotor nervous system, and I have had pupils stand up in front of me whose vasomotor and spinal nervous system were so thrilled that they had lost entire control over every sphincter muscle in the body.

Now, you will all agree that one of our great troubles is our accommodation. This seems to me to be a point that should be taken into consideration in determining the hypermetropia of school children. In the dark room of the Manhattan Eye and Ear Hospital, we were requested to examine a very marked case of myopia. I examined the case with my ophthalmoscope, and I pride myself on the use of it. If I see the blood vessels and the velvety appearance I turn the glass, and if the velvety appearance comes out stronger than the white lines, then I say I have not here a case of myopia. I ran up to 8 D. and got a clear perfect vision of the disc, and the velvety condition of the retina. I remarked that it was a case of high degree of hypermetropia, and it was decided by the great Dr. Morrison that it was hypermetropia. There we had a patient who had been diagnosed by several physicians as myopia. That is merely a mistake. It illustrates the fact that if you rely on the test card to decide what the error is, and pronounce that child myopic and attempt to give it correction with the minus glass it would be entirely an error. There is another interrogation I would like to make for my own information. I notice, according to the chart, that as the school life advances, the conjunctivitis advances. Might not that be from eye-strain? Another thing—I have been so unfortunate as to just conclude fitting patients, when they took a spell of sickness. Upon recovery I found that my glass was entirely useless. This brings up another matter I wish to advance: Is not the hypertropic eye the normal eye? Is not the metropic eye, the uncommon eye, called the normal eye?

DR. H. B. YOUNG—I look upon all these statistics with regard to school children with a little allowance. If we could be sure that those marked for myopia were myopia—but with the methods hitherto employed, I think there is room for doubt about it. There is but one way I can imagine, without an enormous amount of work that we can get at it with anything like accuracy, and that is that we must make ourselves expert skiascopists. I should not be in dependence myself upon the lenses for half the cases. I believe when we get statistics by this method of examination, we will get something very much more reliable.

DR. W. F. SOUTHARD—The fact about statistics is this, that we have had gathered up by a very large number of gentlemen in the last twenty years an enormous amount of statistical matter, which has proved that there is a vast percentage of errors from refraction existing among school children, covering the ages between 5 and 25, besides others that have been carried on in the higher schools to which I referred this morning. The point that has been established is that nearly every child of 5 years of age is hypertropic. The second point that has been established is that myopia is but rarely seen in childhood. It has also been very accurately determined that myopia is a condition which does advance step by step in school life, as we go from grade to grade.

Now, throwing aside all the statistics relating to hyper-

metropia and astigmatism, one phase of myopia is not so difficult to arrive at. Myopia is very much more easily determined. In fact, it is found that using the same methods which do not show myopia at 5 years of age, it does show a percentage of myopia increasing with each grade of school life as we ascend from the primary schools into the grammar schools. If we take the European statistics, especially on myopia, because in Europe this examination has been more especially applied to myopia than to anything else—the most exhaustive paper written in the past ten years has been written and re-published in this country, and it covers the error of myopia more especially. I wish to call attention to the test which shows that more myopia exists in the peasant schools, and shows it to increase from grade to grade in rapid ratio in Germany. That is an important factor, whatever the methods established may have been. If we analyze the greater portion of these statistics that have been made, it is very curious that they have not given their methods of procedure more accurately, so that we could know what their methods were. I should say the work had been by the use of a test card and probably glasses. We have found by a less number of examinations, covering over a considerable portion of our own country, that we do have in America a vastly less percentage of myopia for the same grades as they have abroad. Dr. Shrady, of New York, in reviewing some statistics I have made, said he believed that was the result of older civilizations—that there would be found in them a much greater percentage than in the newer countries. We have a much larger per cent. in New York and Boston than here on the Pacific coast.

Now, it being certain that myopia is the accompaniment of civilization, we as oculists should advocate laws compelling the examination of school children. I have not much faith in examinations that are not made by ophthalmoscopic examination in the dark room. I have not examined a single patient without the use of the ophthalmoscope. I do not rely upon a test card. I think that in the entire series of examinations the test has but one value, which was to determine the equivalents. That does not determine the ametropia at all. Out of a large number of students the equivalents run to 60 and 70 per cent. and 20-20. I agree with the writer who states that ametropia is simply a stage in the progress towards myopia. I want to say that I am not particular about the statistics. I think the statistical matter has been carried to the extent that we now know we have this enormous percentage of errors. The question is to know how to prevent it. I have about seven or eight hundred papers of figures in my desk that have not been tabulated, because I concluded that there is enough of that work done to show the facts, and I want to bring before the teachers and others, methods by which the troubles can be prevented in an expeditious manner. I do not think that there is any need of our having any more than a very small percentage of error, if we do examine under the proper tests. It is proven that we have an enormous percentage of children in the primary and grammar schools who are suffering from hypermetropia uncorrected. My position in regard to children's eyes is that if we are to bring about any change in those who are older, we must begin with the school children. If we can have an examination made of the eyes of the school children, it is of just as much value as is the physical examination made in larger schools for the determining of their body power to study, as far as the functions go. Upon that point I have dwelt for some years and feel it is important for us as oculists to attempt to sustain any effort to secure legislation that will obtain compulsory examination of children at school.

H. L. BURRELL—Mr. Chairman, I believe that statistics of

myopia in children are absolutely unreliable, unless a course of mydriatics is given.

A MEMBER—Mr. Chairman, we did not say in our reports myopia, hypermetropia, or astigmatism. Our reports simply say "errors of vision brought out by the tests." My reports read "such a per cent., as nine, seven, six, five or one-tenth" as the case might be.

DR. FISCHL—Mr. Chairman, I started the examination in order to compare especially the myopia which I might find here with the schools in Europe. I knew from the beginning, and I said this in my paper, that in the schools I could not possibly find out exactly the hypermetropia or the astigmatism. That can only be done in the office. It can not be done in the school room, and would not have been permitted. It would have kept the child away from the school rooms and would have been impossible. Many of my scholars were hypermetropic or astigmatic as I said in the paper. As to those which were not, that could not be decided. But I think that the numbers for myopia are reliable. I do not think it is necessary to apply the ophthalmoscope for the myopia. The trouble in the conjunctiva, or the irritation, increased with the glasses to 41 per cent., showing clearly or at least hinting that there is eye-strain in many cases, and giving us the hint that not such a great portion have normal sight. They have errors which could only be corrected in the office.

### SUB-CONJUNCTIVAL INJECTIONS IN THE TREATMENT OF EYE DISEASES.

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

BY WM. ELLERY BRIGGS, M.D.

SACRAMENTO, CAL.

*Subconjunctival Injections in Ocular Therapeutics.*—During the past four years Drs. Darier and Abadie, two very progressive Paris oculists, have been extensively using subconjunctival injections of mercuric chlorid solution in the treatment of many eye diseases. As I watched their work in their large clinic, during the experimental stage of the method I saw it tried in many diseases in which there was obviously little or no hope of benefit to be derived from any treatment. But from my observations I became convinced that good results were obtained in a certain class of cases. Since that time I have treated quite a number of cases by the method and have been led to the conclusion that many of them had done better than they would under the other treatments alone.

Most of the cases under my care have been of septic or syphilitic origin, so other treatments had been used in conjunction with the subconjunctival injections.

I deem it an injustice to a private patient to neglect the use of a remedy which is known to be beneficial in order to try some uncertain treatment. It is the class of cases to which this treatment is applicable that require prompt and efficient care. It is impossible to determine with any degree of certainty the amount of influence the injections may exert on the course of a disease process. We can arrive at our conclusions only in a general way by comparing the progress of a number of cases treated by usual methods with others similarly treated with the injections added. My conclusions may not be shared by many, but I believe that this method of treatment is a real advance and will establish a permanent place in ocular therapeutics. In Germany as well as in France

a number of prominent oculists have reported very favorable results from the method, but I have been surprised that so little attention has been paid to it in this country.

Previous to the adoption of subconjunctival injections Drs. Abadie and Darier had injected sublimate solutions directly into the vitreous. They claimed that this rather bold procedure had yielded good results but it was abandoned for subconjunctival injections as being less dangerous.

Dr. Darier injects two to five drops of a 1 to 1000 sublimate solution beneath the conjunctiva and not nearer than seven millimeters to the corneal border. If the injection is made too near the cornea the pain is likely to be severe. Care should be taken not to puncture a conjunctival vessel or unpleasant ecchymosis will follow. In case this does unavoidably occur it will soon disappear under applications of hot water. The conjunctiva should be thoroughly anesthetized by cocain previous to treatment. It is hardly necessary to mention that the solutions and instruments used should be perfectly sterilized.

In my practice I have generally employed three to five drops of a 1 to 2000 bichlorid solution. The frequency of the injections should be regulated by the urgency of the case and the severity of the reaction. In a few cases they can be made daily for a few times but in most cases not oftener than two or three times a week. Immediately after the injection a little bleb appears at the point the fluid enters. Frequently sharp pains are experienced for a couple of hours after the injections. This can be mostly relieved by cocain drops and hot or cold water. The position of the injection should vary to prevent excessive irritation—a point covered by one of the lids is most favorable.

Local treatment has been made in different parts of the body by injections in the location of the disease process with more or less success for a long time. We owe our knowledge of the method of action of subconjunctival injections to the experiments of Phlüger and some others. These experiments have demonstrated that after subconjunctival injections of bichlorid solution the salt is found in the cornea, aqueous humor, suprachoroidal space, vitreous humor, and the superficial layers of the lens. The mercuric chlorid reaches the tissues of the eye before being taken up by the general circulation. We can thus readily understand how diseases of septic or syphilitic origin are promptly benefited. These are the cases which experience shows are most improved by this method of treatment.

In years past patients suffering from local inflammations of septic origin were given mercury internally to counteract the septic process. I have no doubt that by administering bichlorid solution subconjunctivally in septic ocular disease the same end can be attained with greater certainty and rapidity than by means of general medication. In nearly all cases the subconjunctival injections should be supplemented by other treatment appropriate to the case. The constitutional treatment is of the utmost importance in most affections of the uveal tract. The injections are frequently of the greatest benefit on account of the promptness by which the mercury can be made to reach the disease process. But the constitutional treatment is of quite as much importance in order to eradicate the constitutional disease upon which the local affection depends.