HYGIENE OF THE EYES IN THE MEXICAN SCHOOLS.

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Since the year 1890 when Dr. Ramos made the first statistics of the errors of refraction in the school children of Mexico and to which I contributed with reports of about 1,000 cases, no systematic examination has been made with a practical object in view.

The statistical data which were then collected, clearly demonstrated the necessity of adopting hygienic measures to arrest the progress of the ametropia, that although not of such an alarming character as in Europe as regards the myopia, is sufficiently frequent to justify the intervention of the school authorities for the prevention of diseases of the eyes, which are caused by the continuous work in the schools.

In different articles I have insisted, since that period, not only on the necessity of modifying the hygienic conditions of the school buildings, but also on the greater advantage of making a systematic examination of the eyes and ears of the children in order to give them the necessary optical correction and thus prevent the progress of ametropia, and at the same time increase the proportion of children who can apply themselves to their studies, by placing them in a more favorable condition to take advantage of the instruction which they receive.

In order to practically demonstrate to the teachers, the facility with which they can examine the eyes, and the great advantages which not only the children, but the teachers themselves would derive from that practice, I recently undertook the task of inspecting the eyes of all the pupils in the Normal School for professors of the city of Mexico, in which about 500 pupils are receiving their education, ranging over all the ages. After giving a few lectures on the anatomy and physiology of the organs of vision to the Normal pupils who are about to graduate as professors and who will in future have ample opportunities to apply their knowledge, I gave them some practical demonstrations of the proper methods to be employed in such examinations. The proportion of pupils who were found suffering from ametropia in this school, is in itself sufficiently great to demonstrate the necessity of adopting measures for diminishing the evil influence of the school in the health of the eyes. I hope that on this occasion, my investiga-

1 The defects of refraction in Mexico, as compared with those of Europe. International Congress of Berlin, 1890.

2 Hygiene of the eyes in the schools and optical correction. Annals of Ophthalmology.
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tions will bring about a practical result, and by informing the parents of the conditions of their children's eyes, will induce them to adopt the necessary steps to enable them to continue their studies with advantage. The total number of pupils examined amounted to 449, of which 402 were between 7 and 18 years of age, and 47 of the Normal pupils were between 13 and 20 years of age. The methods adopted were as follows: the determination of the acuteness of vision at a distance of 5 metres, by means of the test-letters; the determination of the near point and the examination by skiascopy of those suffering from ametropia, when their sight did not reach the normal condition.

In doubtful cases or where profound lesions were suspected I recur to ophthalmoscopic examination, but never employed mydriatics. Although we carefully determined the near point, its indications were not taken into account for the hypermetropia, except in the older pupils, because it is known that this proof is subject to greater probabilities of error than that of the remote point, and dealing with children of minor age, its determination is not of any great practical result, as the correction of the hypermetropia in them is not generally accepted.

Of the 449 pupils who were examined, 260 or about 57.70% were normal, and 119, or 42.30% suffered from defective sight, the cases being divided as follows:

- Hypermetropia or hyperopic astigmatism ........... 24.93%
- Myopia or myopic astigmatism .................. 12.24%

In detail, these can be subdivided as follows:

- Pure hypermetropia .............................. 11.35%
- Pure myopia ..................................... 6.01%
- Hypermetropic astigmatism .................... 13.58%
- Myopic astigmatism ............................ 6.23%
- Mixed astigmatism ............................... 0.89%
- Irregular astigmatism ......................... 0.44%

It is necessary to bear in mind that the number of cases of hypermetropia only refers to the manifest and not the total hyperopia, which is certainly much greater; but from a practical point of view it is sufficient for an examination to reveal the presence of the former. In fact, Dr. Randall, after having, by the aid of the ophthalmoscope discovered 75% of cases of hypermetropia, only found 26% by subjective examination.

On making a comparative study of the data collected by ages, we find that pure hypermetropia diminishes in proportion to age, for which reason we only found one case among the Normal pupils; but on the other hand, the hyperopic astigmatism is much more frequent amongst them and the number of cases of myopia mounts up to 19%.
At all ages there is a very considerable proportion of hyperopic astigmatism and this fact tends to confirm the ideas of Javal and Risley, who consider astigmatism the principal factor in myopia, the intermediate stage between the emmetropic eye when the pupil enters the school and the myopic eye when he leaves it, after long hours of close work and of continued effort.

The attention of European hygienists had been specially directed at first to the study of myopia, which, especially in Germany, has acquired enormous proportions, amounting to 50% of the students; but after studying the evolution of the eye and its transformations, great importance is now given to astigmatism which requires to be corrected as soon as possible by means of appropriate glasses, as it is more active than pure myopia and the approximation which it requires is more constant.

In Mexico the proportion of myopic cases has not been very considerable; the influence of race is notorious; in place of the widely separated orbits of the broad-faced German who requires to make greater muscular efforts in order to obtain convergence, with the result that the globe is compressed by the belt of exterior muscles and that the optic nerve is strained, the conformation of the cranium of the Mexican native gives a very short distance between the two orbits. The greater luminous intensity of the high table-lands, also facilitates the work, and the fact that even in winter there is no necessity of using artificial light in the class rooms, greatly diminishes the danger of a prolonged and close work. But if the cases of myopia do not reach a very high figure, on the other hand the proportion of cases of ametropia is certainly very considerable. Forty-two per cent. of the boys in the Normal school, have not a sufficiently clear sight to enable them to follow the teacher's explanations on the black-board, and 25% require so close an approximation that it is incompatible with the functional integrity of the organ.

Accomodative asthenopia is also a constant source of trouble to the pupil who weary of the constant efforts that he has to make in order to read, abandons the work and really becomes dull and idle. It is therefore very necessary, both from a hygienic as well as an educational point of view, to place pupils who suffer from ametropia in a position to struggle against the dangers that necessarily threatens their sight through their school life, which in Mexico is becoming daily more active, thanks to the continual increase in the number of schools.

It was at first believed that the remedy would be found in a modification of the hygienic conditions of the school buildings, of the furniture, books, writing, etc., and from that date commenced the great
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hygienic revolution that has transformed those buildings into school palaces with all the proper conditions of light, ventilation, etc., in place of the former small and dark school rooms, situated in narrow and noisome streets. Hygienists pointed out the best conditions of light, of approximation during the work, the height of the benches according to the age of the pupil, that are required; the publishers reformed their books and printed them in larger type and on better paper, and certain schools were prohibited the use of sloping written characters, that require such a close application of the eyes in defective positions, and have substituted for it an upright style of writing. It was expected at first that all these improvements would for themselves give a complete result but after the lapse of several years, and with surprise it was found that they were not sufficient to detain the progress of myopia, which remained stationary. It has been so affirmed within a recent period by Cohn himself, after making very careful statistics.

The remedy consists in procuring for the pupils, besides all the hygienic conditions above mentioned, a complete optical correction of the defects of refraction, by making systematic examinations every year on opening the courses, separating those who suffer from ametropia and pointing out to the parents the necessity of putting them under the care of an oculist.

I would here mention the great impulse that many distinguished oculists of this country have given to the progress of ocular hygiene. The labors of Randall, Risley, Allport and others have greatly advanced this subject, not only by means of their carefully prepared statistics that have fully demonstrated the risks of scholastic life to the eyes, but have also practically facilitated the examinations, and shown that the masters themselves can assume this task, which presents no great difficulties.

By means of carefully prepared statistics of nearly 200,000 eyes which he has examined both in his own practice as well as through other opthalmologists, Dr. Risley⁸ has shown that the correction by means of adequate glasses has brought about a decrease of myopia in Philadelphia from 28.43% in 1874 to 1880, down to 16.98% in 1890 to 1893.

It therefore appears to be generally agreed, that it is necessary to examine all children and correct their defects of refraction in order to prevent the development of myopia, and the American Medical Association, the national association of the United States, in its last meeting in New Orleans, on motion of Dr. F. Allport, adopted a resolution recommending to the boards of education, boards of health and legislatures of the different States of the Union, that the eyes and

⁸ School Hygiene. Norris and Oliver. System of disease of the eye. Volume II.
ears of the school children of this country should be tested, both on their entering the schools, as well as on commencing their studies.

As the American Public Health Association is an international association which has representatives and influence in all of the four countries that occupy the North American territory, it would be desirable, that it should make its powerful voice heard and adopt similar resolutions, recommending their observance to the school and sanitary authorities as well as to the governments of those countries, so that they could be applied in practice.

This would certainly exercise a great influence in the preservation of the eyes of the children and would take from the schools the reproach that they are instruments of physical degeneration, instead of being an essentially civilizing means of culture.

I therefore have the honor to submit to the deliberation of this Association, the following resolution:

WHEREAS: the sight and hearing of school children is of inestimable value for their future, and it has been proved that scholastic life aggravates the defects of the sight and also that the want of proper care aggravates the affections of the ear, with the result that these conditions retard the progress of learning and conspire against the health of the child;

Be it resolved: that the American Public Health Association recommends that measures be taken by the various school authorities and boards of education, boards of health and if possible, by the several governments of the countries of North America, to secure examinations of the eyes and ears of all school children, with a view to their suitable treatment for the relief of the ophthalmologic and otologic imperfections.