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THE EYE OF THE ADULT  
IMBECILE.

## THE EYE OF THE ADULT IMBECILE.

THE following observations and conclusions in reference to some of the ocular symptoms that were obtained from the study of the eyes of twenty young adult male imbeciles at the State Hospital for the Insane at Norristown, Pennsylvania, and which are a continuation of a series of studies of the ophthalmic condition of definite groupings *en masse* of special forms of symptomatic nerve malformation and disease, are here presented, not as a *resumé* of the state of the eyes seen among such subjects (which will be given as a part of the Second Annual Report of the Ophthalmological Department of the Hospital), but as a contribution to the subject of the significance of the local condition so generally found in adolescent and young adult eyes, which are the victims of asthenopia and are undergoing changes in refraction. In this particular, the subject is approached from a new and almost unique standpoint,—that of negative evidence. It argues, that as we find in the eyes of this class of cases (where little or no employment for maintenance of vision for near objects is seldom, if ever, brought into play) a direct negation, in proportion to the amount of use, of those local changes which are so frequently seen in eyes which have been much used for prolonged fine and close work, that these changes must be but the visible evidences of the wear and tear upon disturbed delicate tissue and structures.

During the examination, the following precautions were observed:—

*First.*—Care was taken to exclude all but the proper class of subjects, no one being admitted who could not be properly

designated as one with decided loss of mental power, of a minor degree than idiocy, from malformation or disease of the nervous system, either supervening in infancy or occurring before birth. This was done so as to avoid any error that might arise from the presence of ocular symptoms which might be dependent upon other malformation or disease, and to exclude any question as to the intelligent use of eyes for prolonged near work during the early years of life.

*Second.*—Subjects chosen whose eyes were free from extraneous disease or inflammation. Sore eyes of inflammatory and traumatic type were avoided, so as to obtain as nearly as possible, representative peripheral (end) organs of comparatively healthy functional activity.

*Third.*—Young adults were used. This was done for two reasons: first, to have the eye at its full maturity, and thus not to allow any question of further development to enter into the argument; and second, to have the tissues of the eye at their best, before any of the processes of natural decay should have manifestly asserted themselves.

*Fourth.*—Males have been taken. These were chosen so as to avoid any errors that might arise from additional ocular changes which might be associated with diseases peculiar to the female sex.

*Fifth.*—Every subject was submitted to the same routine examination, thus preventing any seemingly gross changes to appear that might arise from differences in methods of study.

The reasons for such rules must be obvious, as by their observance, all faults in working and want of precision in method are reduced to a minimum, and the conclusions, which are the very import of the entire work, are thus rendered more valuable and less liable to grave and deceptive error.

In framing the observations, it has been found necessary, by reason of the mental incapacity of the subjects, to divide the results into two groupings, the subjective and the objective; the former resulting, for the most part, in a series of negative and questionable inferences, while the latter terminating in a set of fixed and definite conclusions.

## OBSERVATIONS.

*Subjective.*

*First.*—Direct vision for form, as a rule, normal.<sup>1</sup>

*Second.*—Accommodative action : impossible to obtain any reliable result.<sup>2</sup>

*Third.*—Visual field : nothing could be gotten.

*Fourth.*—Color perception probably normal.<sup>3</sup>

*Objective.*

*Fifth.*—Pupils generally, relatively equal in size, but frequently opposed to each other in their long diameters; the average size being two and a half millimetres in horizontal meridian.

*Sixth.*—Irides equally, though sometimes sluggishly, mobile to light-stimulus, convergence and accommodation.

*Seventh.*—Extra-ocular motion intact in all directions. By the ordinary tests, very slight insufficiency of the interni found to exist in but one-half of the cases, the remaining half preserving proper muscle-balance.<sup>4</sup>

*Eighth.*—Optic disc seemingly healthy, more so than would be expected for age.

*Ninth.*—Physiological excavation frequent, usually small, shallow, oval in outline (the long axis bearing no definite relation to the long axis of the disc) and generally occupying a position slightly to the temporal side of the centre of the disc.

*Tenth.*—Scleral ring, as a rule, visible all around disc, and slightly broader to the outer side, being but seldom hidden above and below.

*Eleventh.*—Pigment massings beyond scleral ring, generally limited to narrow, concentric splotchings and double loops

<sup>1</sup> This was obtained by having the subject compare letters cut and held in his hand, with the variously sized types placed at proper distances. Frequently when this was unsuccessful, resource was made to small articles such as keys, coins, etc., of about the same size as number XX. type; these were held at twenty-feet distance (or less, as necessary), and the patient made to select the duplicate amongst those in his lap.

<sup>2</sup> Various plans, both subjective and objective, were tried, but no trustworthy answer could be obtained.

<sup>3</sup> Easily done by Holmgren's method.

<sup>4</sup> This is in contradistinction to the presence of insufficiency of the interni which was most readily obtained by the same plans amongst the epileptic demented, a class of cases in which intelligence as a rule is constantly decreasing.

with undisturbed areas beyond and between; these, as a rule, more pronounced to the nasal and temporal borders of the disc; the outer massings being most usually crescentic. In a few instances, nothing but annular pigmentation with clear cut edges could be seen.

*Twelfth.*—Entire absence of the so-called absorbed conus. In no case could a broad crescentic area of bared sclera be distinctly seen; the temporal massings in those eyes which were presumably used the most, being roughened and broken on their outer edge, and connected with small and narrow areas of disturbed retina and choroid.

*Thirteenth.*—Fibre layer of the retina but very slightly increased in thickness; the fine and oftentimes almost imperceptible striation being almost entirely limited to the superior and inferior portions of the nerve border, and extending but a short distance out into the retinal plane.

*Fourteenth.*—Very few lymph reflexes and opacities of vascular sheaths, these being mostly confined to the main venous stems at their exit on the disk.

*Fifteenth.*—Retinal vessels about normal in comparative size, and in a few instances carrying impoverished blood; the arterial blood in two cases being so pale as to permit the venous column of underlying vessels to be plainly recognized.

*Sixteenth.*—No changes in the choroid except a somewhat granular condition, more pronounced in the macular region; this sometimes being accompanied by a slight absorption of epithelium (especially amongst the most intelligent).

*Seventeenth.*—Almost equal degrees of hypermetropia, with slight amount of astigmatism present in every case; the average amount of H. (without paralysis of accommodation) being one and a half dioptics to two dioptics.

*Eighteenth.*—Entire absence of any congenital external or internal gross local malformation.

*Nineteenth.*—The less imbecile the subject, the more common were the ordinary conditions seen in the used eyes of the mentally healthy.

It must be remembered that these observations do not hold absolutely good as written in every individual case, each

subject presenting different degrees of the main features expressed, in seemingly due proportions to amount of intelligence and consequent use of eyes for continued near work. They merely show what should be expected in an average case, and thus serve to express the type.

It may be interesting to note that the following averages have been made: Age—twenty-three years; height—five feet and seven inches; complexion—eight brunettes, four blondes, and seven medium; nativity—eighteen born in United States, one in Ireland, and one in Scotland; intra-pupillary space—fifty-five millimetres; corneæ—eleven millimetres in horizontal diameter; pupillary diameter—two and a half millimetres in horizontal meridian.

#### CONCLUSIONS.

*First.*—Although it must be conceded from the results of the many researches made in reference to the so-called sensory deficiencies amongst imbeciles (more properly amongst idiots) that the end-organs do suffer in obtaining a physiological perfection, yet the present study tends to show that the adult eye of such subjects is an organ which is capable of proper functional activity, and that the want of action is in the main due to what may be termed intellectual hebetude.

*Second.*—By reason of mental incapacity which has supervened in such subjects, before the eye has been brought into continued and constant action as an instrument of accurate and delicate use, the ordinary appearances seen in the used eyes of the mentally healthy are lessened in due proportion to the amount of work given to the organ.

*Third.*—The eye of the imbecile, being practically an unused organ for close and careful near-work where prolonged action of both the extra-ocular muscles and intra-ocular muscles with consecutive increase of nutritive fluids is necessary, the distention of the globe and elongation in its visual axis, with consequent increase in index of refraction so frequently seen in the over-used eyes of the healthy adolescents,<sup>1</sup> is almost entirely avoided; this being in direct ratio to use.

<sup>1</sup> Vide Norris's article on "Some Remarks on Asthenopia and the Changes in Refraction in Adolescent and Adult Eyes."—*Trans. Amer. Ophthal. Soc.*, 1886, p. 369.

*Fourth.*—The want of these physical changes, which is shown by a proper balance of muscular action, a persistence of congenital hypermetropia, and an abnormally healthy appearance of the eye-ground (presenting a picture that is almost identical to the one seen during infantile existence), may be considered as significant of a type of unused, healthy, adult human eye.

*Fifth.*—The healthy eye of the adult imbecile, therefore, serves to teach us that the conditions known as: insufficiency of the interni; dirty-red, gray appearance of the optic disc; irregularity of physiological excavation; non-visibility of the superior and inferior portions of the scleral ring; absorbing conuses in all of their varieties; increase in density and thickness of the retinal fibres; opacities of vascular lymph-sheaths; disturbed states of the choroid; and gross errors in astigmatism, with changes in indices of refraction—which are so frequent in the used eye of the mentally healthy—must be considered as pathological changes expressive of low inflammatory action, with stretching and distortion from increased intra-ocular and extra-ocular pressure; these being representatives not only of general want of tone so often seen amongst those of sedentary life, but of constant and frequent abuse of a delicate organ.