Original Articles.

SOME CAUSES OF PREVENTABLE BLINDNESS.¹

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ACCORDING to the figures given by Dr. Lucien Howe,² blindness in the United States increases at a rate out of proportion to that of the growth of the population. Between 1870 and 1880 the latter had increased 30.09%, and the number of blind 140.78%. The community is supposed to have been, in 1880, at a charge of between sixteen and seventeen millions of dollars for the support of these individuals.

A certain proportion of this loss of sight is, of course, preventable. Being desirous of estimating the relative number of such cases in our own community, I recently applied for permission to examine the inmates of the Perkins Institution for the Blind in South Boston. Mr. Anagnos very kindly placed at my disposition every possible facility, both at South Boston and at the Kindergarten in Jamaica Plain. I was thus enabled to take notes of 183 cases, all but one of which I personally examined. The single exception was absent at the time of my visit, but his recorded history left no doubt as to the cause of his loss of sight.

Following the classification of Magnus, I have divided these cases into four classes, and subdivided them as follows:

I. CONGENITAL BLINDNESS.

Mikrophthalmus	4	
Megalophthalmus	1	
Cataract	20	
Choroiditis	1	
Atrophy of optic nerves	9	
Anomalies of cornea	3	38

II. BLINDNESS IN CONSEQUENCE OF IDIOPATHIC DISEASES OF EYE.

Blennorrhœa neonatorum	34	
Trachoma	4	
Blennorrhœa	5	
Disease of cornea	1	
Irido-choroiditis and eyellitis	5	
Choroiditis	1	
Separation of retina	1	
Idiopathic optic nerve atrophy	4	55

III. BLINDNESS OF TRAUMATIC ORIGIN.

Direct injury of the eyes	9	
Unsuccessful operations	3	
Injuries of the head	16	
Traumatic sympathetic ophthalmia	12	40

IV. BLINDNESS ATTRIBUTABLE TO GENERAL DISEASE.

Syphilis	1	
Brain (atrophy of optic nerves)	27	
Typhoid	1	
Measles	5	
Scarlet fever	16	50

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It is with the figures in the second class that we are more immediately concerned, and especially with those of blindness dependent on the ophthalmia of new-born children. There were 34 such cases out of 183, being a percentage of about 18.6. This is, however, a smaller proportion than has been obtained by other observers, and can only be accounted for by the limited number of individuals I was able to examine. At the Sheffield School for the Blind, Mr. Snell found 38.3% blind

from this cause, and observers in general estimate that some 30% of all blindness is due to this disease.

Even the examination at South Boston reveals the fact that at least one in every five of the inmates of the institution need not necessarily have ever come there. For it is an established fact that the ophthalmia of new-born children can, with few exceptions, be successfully prevented when there is reason to apprehend its occurrence. It is also not an exaggeration to claim that hardly a disease of the eye yields with more certainty to appropriate treatment. As the experience gathered in various countries demonstrates that this affection ranks easily first among the causes of blindness; and as our own is, to my knowledge, the only community in which any difference of opinion as to its proper treatment has prevailed; I have thought it desirable to allude to the approved practice of the present day.

As regards prevention, those connected with lying-in hospitals speak with most authority. Modern observers are united in the belief that efforts at disinfection should mainly be directed to the eyes of the child, which are most apt to receive the poisonous matter after birth. Such being the case, is strict cleanliness alone sufficient, or should an active disinfectant in addition be employed?

This is no longer an open question. Experiments carried on by different observers, controlling ample material, have demonstrated, beyond a doubt, that the purulent infection of the eyes of new-born children can be reduced to a minimum by the use of a disinfectant, and that the most efficacious disinfectant is the nitrate of silver. Simple cleansing of the eyes with water was found by Bischoff to reduce the number of cases only one-half. Credé, the original proposer of the use of nitrate of silver, had, before the introduction of prophylaxis, 314 cases among 2,897 children, 10.8%. After beginning to use the 2% solution of nitrate of silver he had but from one to two cases in 1,160 children, being 0.1 to 0.2%.

Other agents have been tried, among which a 1% solution of carbolic acid gives the best results. Königstein's figures are very striking and particularly valuable, as they were all conducted at the same clinic and with the same attendants. In 1,092 cases, in which no treatment was used, his percentage of ophthalmia neonatorum was 4.76; in 1,541 treated with a 1% solution of carbolic acid, 1.42%; in 1,250 treated with a 2% solution of arg. nit., 0.72%.

In fine, the 2% solution of nitrate of silver gives the surest results, is devoid of danger, causes but trifling irritation, and deserves general use. It is to be applied to each eye as soon as the child has been washed, one or two drops being sufficient. It is not necessary to evert the lids, it having been found that the cornea is not injured if the application be made directly to the eyeball. Its application should be the rule in all lying-in hospitals, as well as in all cases occurring elsewhere in which, owing to the previous condition of the mother, infection is to be feared.

The *Wiener medizinische Zeitung*, of February 5, 1889, contains an interesting account of the trial of a midwife, which took place the week before. The individual in question was charged with the illegal practice of medicine, in that she had applied to the eyes of a new-born infant a two per cent. solution of nitrate of silver, as a preventative of ophthalmia neonatorum. Condemned to three days imprisonment she had ap-

¹ Read before the Boston Society for Medical Observation, April 1, 1889.

² Transactions Am. Ophth. Society, vol. iv, p. 532.

pealed, and it was pleaded in extenuation of her conduct that she had learned this method at the medical school, and that experience had proved it to exert a valuable prophylactic effect. This argument prevailed and the magistrate acquitted her. It appears that the Austrian Minister of the Interior had, several years previous, decreed that this method of Credé should be practised at all public lying-in institutions; and had, moreover, advised its use by physicians in general. The question that now arose was as to whether midwives should be allowed to adopt this method as a matter of routine, without special orders from a physician, and the feeling of the writer in the *Wiener Zeitung* was strongly in favor of their so doing.

Infection after birth may occur through contact with the lochial secretion, or any other want of cleanliness; particularly in hospitals through the employment of sponges, etc., that have been used with other children. There is no necessity for here dwelling on the symptoms of the disease, its rapid course when untreated, the danger to be apprehended from destruction of the cornea, either in part or wholly, and the almost certain results of appropriate and timely treatment. It is with the form of this last that we are chiefly concerned, and a proper knowledge of the subject is of the utmost importance, not so much to the specialist as to the general practitioner into whose hands the vast majority of these cases fall. Ophthalmia neonatorum, at the Boston Eye Infirmary, forms but .32% of all the diseases there treated, having occurred in 19 years but 386 times among 118,344 cases of ophthalmic disease. As we know the disease to be not uncommon among the poorer classes, the inference is that it is treated, if at all, by the regular medical attendant.

Scrupulous cleanliness, the frequent removal of the discharge and the use of mild astringents, may be by no means sufficient. In the present state of our knowledge it is not presumptuous to assert that a case of this disease, terminating in a manner fatal to sight, and treated without topical applications of nitrate of silver, would be regarded as having been culpably neglected. This is the remedy that acts with the most certainty as a specific against the gonococcus. It is not only antiseptic in its action, but works both superficially and deeply. As has been justly observed "it causes a sloughing of, the upper layer of epithelial cells; if then the micro-organisms have already penetrated there they are followed up and destroyed by the silver solution. Hence the action of the silver solution is so much more certain than that of the carbolic acid mixture."³ It is to the neglect of the timely use of nitrate of silver, and the failure to regularly inspect the cornea and provide in time against its destructive ulceration, that the blindness, occurring as a result of this disease, is generally due.

In this connection the experiments⁴ of Weeks may be quoted. He tested the antiseptic value of the topical remedies employed in ophthalmology, noting their effects on the staphylococcus pyogenes, the most prevalent of pyogenic germs. It was found that Panas' solution (biniodide of mercury, 1; absolute alcohol, 400; water, 20,000) destroyed the staphylococcus in exposures of from one to three days. I cite this first because this solution has been so largely used here. Carbolic acid it was found could not be used in solu-

tions of sufficient strength to be germicidal. Boric acid had no germicidal effect whatever. Iodoform not only did not destroy the germ, but, on being exposed to the air for several days, became itself the breeding ground of a bacillus. Corrosive sublimate, 1 to 10,000, destroyed vitality in five minutes, 1 to 5,000 in three minutes. A 1% solution of nitrate of silver, however, acted in twelve seconds, 2% in eight seconds, and 10% in four seconds.

So much of the principal factor that operates in causing preventable blindness. Of that from trachoma it is less necessary to speak, as that disease appears to be greatly decreasing in this community. The greater care used in the regulation of emigration, the gradual improvement in the housing and sanitary surroundings of the poor, and the discovery of jequirity as a remedy are all working such a change for the better that one is almost justified in looking forward to a time when "granular lids" will be a tradition of the past.

There is but one other cause of preventable blindness on which I wish briefly to dwell, traumatic sympathetic ophthalmia; of which I found 12 cases at the Blind Asylum, something over 6% of all affections investigated. With young children the occasion for the occurrence of this disease is most frequently the wounding the other eye by forks, scissors and knives, carelessly left in their way. As it can be guarded against by the timely removal of the injured eye, it is certainly desirable that the indications for the performance of this operation should be familiar to the profession. They may be condensed as follows:

The injured eye should be removed when:

- (a) It contains a foreign body that cannot be extracted without destroying the eye.
- (b) The nature of the injury is such that sight is unlikely to return, and there is danger of sympathetic disturbance.
- (c) There is tenderness on pressure, vision having been destroyed.

There are other rules laid down, but these are the most plain and practical. Had they been understood and followed in the twelve cases seen by me, it is safe to infer that no one of these individuals would have become an inmate of the asylum.

To sum up the results of my investigation, I found 34 cases of ophthalmia neonatorum, 4 of trachoma and 12 of the results of sympathetic ophthalmia; together, 50 instances of preventable blindness; in all, 27% of the inmates of the South Boston Asylum who need never have gone there had they received suitable care or enlightened treatment at the proper time. To diminish such a percentage in the future, the more careful medical education of the present day will not alone suffice. Those who propose to follow the profession of nursing must also be properly instructed, and some degree of knowledge on these subjects be diffused in the community.

—The *Western Medical Reporter* says: "Two German athletes have arrived in New York whose feats of strength, it is said, will be a revelation to the strong men of this country. One can lift 545 pounds with his middle finger, and can pass a weight of 200 pounds slowly over his head with one hand. The other is credited with being able to force a six-inch nail with his bare hand through a two-inch plank."

³ Fuchs, Die Ursachen und die Verhütung der Blindheit, s.s. 132-3.

⁴ Knapp's Archives of Ophthalmology, vol. 16, no. 4, p. 375, et seq.