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State Board of Health of New York.

NOTES ON CONTAGIOUS DISEASES OF THE EYES

IN

SCHOOLS AND ASYLUMS.*

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Many evils exist in the method of treating children upon the congregate plan in schools and reformatories. I propose in the following brief chapter to call attention to one of them which does not seem to attract the attention its gravity demands. I refer to communicable eye disease. I constantly see in my practice at the Manhattan Eye and Ear Hospital, New York, and elsewhere, patients who have contracted these diseases and got as a consequence, some lesion of the palpebral conjunctiva or cornea, which has either resulted in blindness or such impairment of vision, or of the power of endurance of their eyes, as to reduce greatly the industrial capacity of the individual.

Diseases of the conjunctiva, and of the cornea are largely the cause of prevailing blindness, and yet they belong in a great degree to the class of preventable diseases. The fact that they do fall into this class gives to the sanitarian and to the legislators a special opportunity and advantage for inquiry, advice, and legal enactment to limit or prevent their prevalence.

Some time ago I was called to a school, in one of our counties, in which several hundred children had been gathered, chiefly from the streets of the city of New York. I found more than half the inmates suffering from a malignant type of purulent ophthalmia. The disease had rapidly become epidemic in the school and dormitories until the proper educational work of the establishment was suspended, and the insufficient energy of its entire force of teachers and nurses turned

* The occurrence of contagious ophthalmia in crowded primary schools and large asylums induced the State Board of Health to request Dr. Agnew to prepare this brief chapter of information and advice, derived from his recent and careful studies of the subject.

E. H., *Secretary of the Board.*

to fight the invader. Before I was called several cases of blindness had occurred, both among the scholars and their attendants, five children having lost both eyes and seventeen children having each lost an eye.

At my visit more than half of the inmates of the school, or nearly one hundred and fifty scholars, were found suffering from acute, communicable, purulent inflammation of the eyes in its various stages. I estimated that at least five per centum of these cases would become blind from the acute processes in one or both eyes, and that a considerable number, probably one-half, would have such morbid changes produced in the conjunctiva or lining of their eyelids as would render them liable to constantly recurring inflammation, thus impairing their comfort and usefulness, lowering their industrial capacity, and threatening them with constantly impending blindness.

These children, largely of Irish parentage, had been gathered in the streets of New York, and snatched, as it was supposed, from the dangers which surrounded them. A considerable number, as I was informed, had been committed to the school through the agency of one of our most active protective societies. As I stood amid the little victims a conviction of the crudeness and ignorance which mark so many of our attempts at benevolence penetrated me. Here was a mass of little sufferers gathered from the scenes of squallor and neglect in a great city, committed to a school in which their interests, physical and religious, were supposed to be protected, but in which there was an absence of those things which were essential to their bodily health and safety. Several conditions existed in this school, favorable to the development of the horrid epidemic.

1. Imperfect quarantine.
2. Bad, or insufficient lavatories.
3. Overcrowding.
4. Bad food.
5. Bad drainage.

The mere presence of such disease in a school, or reformatory, is censurable. If it gets into, or originates there it is a serious reflection upon its management. If it spreads, it shows that the internal police of the establishment is bad. Every candidate for admission to a residential public school, or school dormitory, should be examined by an expert to ascertain whether he has a communicable eye disease. Especially should this be done in schools and reformatories maintained for the good of the poor and degraded, since it is largely among these classes that communicable eye diseases prevail. There should be a competent medical officer at the reception quarters of every such school, capable of turning the eyelids of candidates and ascertaining whether they have catarrhal affections.

It may not be possible, or wise, to turn back into society, cases of communicable eye disease, as they may have been committed for vagrancy or other good cause. Moreover, it is better that such cases should be kept where they may be skillfully treated, and thus so isolated as to cease to be the sources of dangerous contagion. Every school and reformatory should have ample provision in the form of wooden shanties or tents and play-grounds to safely treat such cases till they shall have been carried beyond the point at which they cease to be foci of disease for others.

But as these diseases, so fatal to vision, may in spite of all available caution get into the schools and become endemic, we must insist that their known causes be, so far as possible, guarded against. It is certainly competent for the State to enforce the rules which would reduce the risk of such communicable diseases occurring in all schools and reformatories that draw any portion of their maintenance from the State treasury, or exist under a State charter.

Let us, then, consider the conditions which favor the introduction into, and prevalence in, a school of such communicable eye diseases.

1. The conditions which lead to the introduction of the communicable catarrhal eye disease into a school or reformatory.

A child is taken by an agent of * * * or some other representative of law or philanthropy, and with more or less haste is run through the judicial mill and committed to a school or reformatory. If such a child has catarrhal disease of the eyes, or granular lids, the chances are that it will become a vehicle of contagion to the school. If such a child had small-pox, it would not be let loose to spread the malady in a school; and yet that disease would be comparatively harmless in a school in which vaccination had been properly done. But there is no such protection against catarrhal or purulent eye disease. The lesson, then, is that the safety of children in such institutions demands that a proper examination be made of every child before he is admitted to see whether he has catarrhal eye disease, that he may, if the disease exists, be so domiciled as not to communicate it to others.

Furthermore, as the disease may originate in a school from overcrowding and bad food, the committing parties should see to it that children are not sent to institutions in excess of their sanitary accommodations, nurses and other resources.

If a child cannot be provided in an institution with a thousand cubic feet of air in the dormitories and class rooms, and be guaranteed, also, abundance of milk and facilities for being nursed and kept clean, then it is better that it be allowed to run in the streets, getting, at least, the physical benefit of the "wild ass," till caught by the beau-

tiful hand of the Children's Aid Society or the Industrial Schools, and sent off to the West and into rural life.

2. We would now consider briefly causes which lead to the spreading of catarrhal eye diseases in such schools or reformatories.

- a. *Imperfect quarantine.*
- b. *Bad lavatories.*
- c. *Overcrowding.*
- d. *Bad food.*
- e. *Bad drainage.*

a. *Imperfect Quarantine.*—We have already alluded to the necessity for examining carefully the eyes of children sent to residential schools and reformatories. This would of course involve more knowledge and care on the part of those who gather the children and commit them to the institutions. It would also involve proper provisions within such institutions, for the isolation and treatment of those who enter them with communicable ophthalmia. It is eminently *improper* to have what are commonly called ophthalmic wards of the conventional type. Such places are very defective, and tend to develop an atmosphere which soon saturates walls and furniture and to beget disgusting hospitalism. I saw, some time ago, such a night ward in a garret where the inmates had less than one hundred and seventy cubic feet of air each. Wilde, in his tract, alludes to the fact that in the epidemics referred to, the disease seemed to be reproduced most freely *at night*, and no doubt from the effects of overcrowding bad air and actual contact of individuals.

These cases should be treated, except during the coldest weather, in tents, or throughout the year in wooden shanties raised above the ground by under pinning, and with ample rooms to enable the children, so isolated from the entirely healthy inmates, to have such instruction and amusements as may be necessary for their best moral and physical interests. They should have the largest amount of out-of-door life to improve their tissue building, as defective tissue building is at the bottom of chronic ophthalmia. A healthy child getting catarrhal conjunctivitis will, as a rule, make it self limiting, and throw off the malady without any incorrigible tissue lesion if its nutritive processes are not degraded by bad hygiene.

b. *Bad Lavatories.*—It has been and still is the practice in some schools and reformatories, to have insufficient or badly arranged lavatories. The children are allowed to rush in masses into damp and reeking basements, where they wash in common. The process of washing is too often a mere smearing of the face or a rubbing of dirt

into the eyes, and then a chance grab at an omnibus-towel. In many schools and reformatories this evil has been lessened, but in very few of them has the matter of careful, separate ablutions been duly provided for. Every child should have its own place for washing, with due privacy and adequate attendance and an individual towel. Cases of "chronic sore eyes" should have distinct arrangements and ample provision made that the eyes may be gently, but thoroughly cleansed, at least twice a day, and the edges of the lids properly annointed to prevent the accumulations of secretions among the eyelashes, from which they so readily get to the eyes of others. The local treatment of the acute cases does not properly fall to be considered in this paper.

c. *Overcrowding*.—Of all the causes mentioned, it is not easy to estimate which is the worst. All sanitarians will, however, agree that overcrowding is a most fertile cause and aggravation of sickness in every variety. It is probably the most common and, therefore, the most universally damaging. *Crowd poison is a most subtle and most fatal poison.* Alcohol and syphilis produce results which attract more attention because some of them are very phenomenal, but they do not work the mischief which the presence in the atmosphere of invisible human filth does. It constantly poisons the blood of the sufferer, and *insidiously undermines his tissue-building* by day and by night.

Moreover, crowding makes it impossible to guard the sufferers against contagion and the rapid transportation of polluting secretions from a diseased eye to a well one. Flies and other insects become the conveyors of the contagium, and should be destroyed by the use of all the available traps and other means. *Light should not be excluded for this purpose, as that would enfeeble the children, and degrade their tissue-building and make the destructive effects of the disease greater.*

d. *Bad Food*.—What we have said of the effects of bad air applies in a measure also to bad food. The quality and quantity of the air supplied are closely related to the food supply. Indeed, the air we breathe is, in a very important sense, a food, or blood-making element. If the health of children in a public institution is largely due to the quantity and quality of the air which they have supplied to them, it is also very largely determined by the extent to which *milk* forms the basis of their dietary. Let children in schools and reformatories have a thousand cubic feet of air space, each, by day and by night, and all the good bread and milk that they can be made to eat and there will be insured comparatively good health. It is now as it always has been, that the badly fed are the first to fall victims to ophthalmia. I have

read the tract of the late Sir W. R. Wilde, entitled "Observations on the Epidemic Ophthalmia, which has prevailed in the work-houses and schools of the Tipperary and Athlone unions, Dublin, 1851." In this tract great stress is laid on the relations existing between the disease and filth and starvation. He says, "the class of patients attacked were debilitated, starved female children, generally those recently admitted, worn out by previous want and privation of every kind."

e. *Bad Drainage*.—This is also a fertile cause of ill-health in public institutions. Not that we can yet safely attribute special diseases to particular germs, and say that they came up out of a sewer and seized a child by the eye or throat, and produced such and such a disease. But sewer air and polluted ground-air vitiate the atmosphere and render it unsuitable for purposes of respiration and tissue-building. The annual reports of all public institutions should contain a certificate from an expert setting forth the known condition of their water supply and sewerage, and an effort should be made to so construct all lines of drains, that they may be in sight within the buildings, and easily overhauled outside of them at the time of annual scrutiny, and report.

The children gathered in our State schools and reformatories are largely drawn from the homes of our Irish fellow-citizens, and seem to be peculiarly liable to destructive or chronic affections of the conjunctiva. It must be remembered, however, that the catarrhal affection on which we are writing is very communicable, and may be easily imported into any school. A single case in a school, if not isolated, is like leaven. If the sanitary conditions of the schools are good, it may not find congenial soil, or become rooted, or spread. If, however, the school is badly lighted, damp and overcrowded, and the dietary deficient in animal food; if the dormitories are crowded and the arrangements for the daily ablutions insufficient, or the basins and towels for congregate or promiscuous use, and the drainage bad, then we may expect evil to follow. I found, even in the hospital dormitory of the school to which I first referred, less than two hundred cubic feet of air per inmate, and the atmosphere loaded with impurities.

It is with great pleasure that I say to the credit of the medical man in attendance that he had only recently been called to the charge of the school, and that he was instituting reforms with intelligence, and as rapidly as the nature of the establishment would allow.

I advised that tents should immediately be set up in the fields near by, and the sufferers scattered beneath their shelter, assuring the non-medical officers of the school that the much dreaded light and air would only have a salutary effect. I also insisted with the doctor upon the

freest use of milk in the dietary, and it was increased in quantity from fifteen to four hundred quarts. The subject seems to be of such importance that I here give a note just received from the medical man in charge, refraining, of course, from publishing either his name or that of the institution referred to, as my object in writing this paper is to do good, and not to make a sensational point against any one, or to stigmatize those whom I intend quietly to help to do better things than they are now enabled by their present knowledge and economic resources to accomplish :

December 28th, 1881.

“ DR. C. R. AGNEW:

“ DEAR SIR—In compliance with your request I herewith send you a statement of the condition in which I found the institution in question. I was first called April 1, 1881. A strong odor of sewer gas pervaded the building, which proceeded from several foul and entirely unventilated pan water closets, the soil pipe from which emptied by means of a leaking sewer, which was also without trap or ventilator, into an adjoining privy vault, the discharge being entirely below the water line. No fresh air was admitted to the soil pipe or sewer. The kitchen and laundry waste was discharged upon the surface of the ground, *the latter under its floor*. The institution contained 308 children crowded together in close, unventilated rooms, sunlight and air being rigidly excluded. In one sleeping apartment *above* the laundry these children were placed two and three in a bed with *less than one hundred and twenty-five* cubic feet of air apiece, the windows and blind being closed. Fortunately no water closets had been placed here, but two tin slop pails, placed in the center of the room, were used instead. The food was of poor quality. I believe but ten (10) quarts of milk were furnished daily. Two troughs sixteen (16) feet in length answered for a lavatory, all washing in the same water, while the few towels in use were employed indiscriminately. Sore heads were almost universal, dependent principally on the vermin inhabiting them. The itch was also very prevalent. I subsequently learned that several children had died from *cerebro-spinal meningitis*. Forty-eight (48) Children and attendants were suffering from fully developed purulent conjunctivitis. Perforation of one cornea had already taken place in three (3) cases, of both cornea in one (1) case. *Six cases had been removed to hospital. Of these, three (3) lost both eyes. Three (3) lost one eye, each.* The disease had prevailed the preceding year, just how extensively, I was unable to ascertain ; but the institution still contained five (5) children who had lost both eyes, and seventeen (17) who had lost one (1), each at that time.

“Of the remaining children scarcely one could be said to possess a healthy conjunctiva. Between the months of April and September, since when no new cases have appeared, I treated among the inmates 129 cases of severe purulent conjunctivitis which ran their full courses, and 114 of a milder type. I this day examined 111 of those who passed through the same form with reference to the condition in which the conjunctiva has been left.

22 had healthy lids.

56 granular lids.

33 chronic conjunctivitis.

“Many of the latter have hypertrophoid papillae, and I think that when they subside the granulations will appear. Except the cases before mentioned, but one (1) child had perforation of the cornea. Under the directions of an experienced sanitary engineer, all of the old closets, plumbing and sewers were removed, new means of drainage introduced, and the premises placed in as good a sanitary condition as our present knowledge will allow. Finding it impossible to quarantine the great number of cases, the children were all placed in tents, where they remained throughout the summer and autumn. They were given as much good cows milk as they could use. Great care was exercised that no child used another’s basin, towel, comb, etc. Under the influence of fresh air and good food the disease soon disappeared.

“Yours, &c., &c.”

The occurrence of an epidemic of purulent ophthalmia not only produces cases of partial or entire blindness, but spoils the integrity of the lining of the eyelids. This latter condition of proliferation or thickening of the conjunctiva of the eyelids, and production of so called granulations is a most obstinate and incorrigible affection. It leads in very many cases to a life of troublesome eyes, to cloudy cornea and imperfect sight, or ultimately ulcerations, staphyloma, and possibly destruction of one or both eyes.

The bad effects of this preventable malady are not confined to the limited school life, but run through the entire career of the sufferer or make him a vehicle of contagion to others. I have often seen an entire family inoculated by the arrival in their midst of a case from a public institution. I have seen it carried into a community and there spread by a child discharged from such a school. It will be seen that we have not only the acute malady to deal with, but the baleful after effects, in blindness, chronic eye trouble and the spread of catarrhal eye disease in tenements and other communities. The authorities then, and those who make the reduction of the expenses of public char

ities the special object of their zeal should become broader students of the matters they undertake to regulate. "There is that scattereth and yet increaseth, there is that withholdeth and yet tendeth to poverty." It would be easy to stamp out ophthalmia in public schools, if all who are interested would work in unison. We have so many societies to do charitable work, and so much pulling at cross purposes to catch each other, and to get sensational points for mutual recrimination, and so much tendency to use raw facts for temporary or selfish our political purposes that one sometimes almost despairs of eve seeing a wise and generous economy introduced. I think that schoos- and reformatories should be licensed by the State under a general law like that, for instance, determining the capacity of emigrant ships so that overcrowding and bad food would be impossible without a misdemeanor on the part of their managers. The license should state in terms what cubic air space must be secured for each inmate and what the dietary must be. Then no school or reformatory would have more inmates than the building should contain or its resources properly maintain, and societies for inquiry and advice would have some definite duties to perform with reference to them. The law should fix a minimum of eight hundred or one thousand cubic feet of air space for every such inmate, and at least one quart and a half of good milk, of definite purity, besides other specified food for each inmate and also determine methods of applying the principles for drainage and ventilation and out of door work and amusements.

All over our State there are schools in which the effects of over crowding and insufficient food and other preventable causes of disease are telling disastrously upon the health of their inmates, and so are seminaries, or seed places, from which legions of children go out to recruit the ranks of long-lived paupers. There are also, as I well know near this city, New York, institutions against which I make no complaint and I purposely avoid any injudicious criticisms or comparisons.

