

oysters, clams, mussels, or periwinkles, which also frequently distribute the eggs of tapeworms or other parasites.

NO LAW PROHIBITS THE SALE OF SEWAGE FED "FISH" OYSTERS, SHELL-FISH, ETC.

The present system of food inspection, especially as regards "fish," is an absolute farce, as the consumer is unprotected. Unfortunately there appears to be no law forbidding the sale of sewage fed aquatic and amphibian animals.

SCHOOL CLOSURE FOR INFECTIOUS DISEASES IN TOWNS.*

By M. A. ADAMS, F.R.C.S., M.O.H. for Maidstone.

I HAVE a word to say regarding school attendance in connection with the spread of scarlet fever and diphtheria. Of course, both are very contagious, and because children at school-going ages are most susceptible, it naturally follows that school attendance is a frequent means of propagation; consequently the closure of schools is often resorted to as a means of staying the spread of such diseases. To the best of my judgment, in towns at all events, when due care is taken, this course is seldom necessary, but often mischievous; practical experience convinces me that in the general way less risk is incurred by keeping children together under discipline and intelligent observation, than by sending them home to run loose upon the streets and out of sight and beyond the reach of discipline. I have repeatedly observed that the sudden accessions of these diseases often follow upon "treats," holidays, harvestings, and the like gatherings, but seldom arise during the regular course of school attendance. My rule is, in every instance upon infection being notified, immediately to stop all school attendance from the infected house, and by communication with the school authorities concerned, to prevent its resumption from implicated households until all risk is past.

With diphtheria, closure of a school on occasion may be necessary, not for the purpose of distributing the scholars, but because the school building, or the soil upon which it stands, has become the actual breeding ground of the infection, and before the disease can be got rid of, radical methods of disinfection must be resorted to. In my belief the repeated reappearance of diphtheria in certain cases on the reassembling of schools is to be explained, not by the scholars bringing the disease back to the school, but by their return to an infected building; and probably this is possible with diphtheria more than with most other diseases, because the bacillus of diphtheria is capable of living a saprophytic life at a comparatively low temperature when circumstances are favourable, in the structure of the building or the soil upon which it stands.

* From Mr. Adams' Annual Report for 1893.

OPEN MANHOLE VENTILATORS AND DIPHTHERIA.*

By SIDNEY DAVIES, M.D., Medical Officer of Health, for Plumstead.

THE desirability of having manholes in connection with the sewers at frequent intervals is undisputed. The only question is whether these manholes should be closed, or should be provided with open gratings.

(a) *Open Manholes Ineffectual and Unnecessary.*

—The chief object of all ventilation of sewers is by giving vent to the sewer gas outside houses to diminish the chance of its finding its way to the inside of houses, whether by faulty traps, or by forcing the traps, or by faulty drains under houses, or in any other way.

We see that the advocates of these ventilators recognise the injuriousness of sewer gas by the very fact of their attempting to keep it out of houses. They say, however, that the gas is much more injurious inside houses than outside, and this is true. But when there is direct communication between a sewer and the interior of a house the sewer gas would be drawn into the house in spite of open manholes.

The proper way to prevent sewer gas from entering houses is by having a disconnecting syphon on the house drain and a ventilating shaft at its termination. If anything more than this is needed on the sewer side of the disconnection another ventilating shaft should be run up the house from the drain between the disconnection and the sewer. This would produce far greater security than any number of grid ventilators on the sewers.

Another object of open manholes is to so dilute the sewer gas with fresh air as to oxidise it and render it innocuous. But unfortunately this object is not attained even by having the manholes at frequent intervals, as many members of the committee have observed for themselves in Plumstead Common Road, where four manholes within 150 yards are frequently found all emitting vile stenches at the same time.

The fact is that when sewers are badly constructed, so as not to allow the sewage to escape rapidly, there is such decomposition and formation of noxious effluvia as no amount of open manholes can render innocuous. A foul ditch is a nuisance, though it be completely open to the air. Much more so a foul sewer only partially open.

So far I have shown that (1) open manholes are not the best means of keeping sewer gas out of houses; (2) they cannot by themselves be relied on to attain this end; (3) they are ineffectual in rendering sewer gas innocuous by oxidation.

(b) *Open Manholes a Nuisance.*—But these manhole ventilators are not only unnecessary, but they are undesirable for two reasons: (1) because

* Abstract of Report to Sanitary Committee, Plumstead.

they are foul smelling and unpleasant ; (2) because they also produce disease.

If open manholes are unnecessary as a protection against sewer gas, the fact that they emit foul odours is sufficient reason for adopting different methods.

The question of the amount of disease caused by manhole ventilators is a very difficult one, and one about which doctors differ.

1. There is no difference of opinion as to the not infrequent occurrence of attacks of diarrhoea, sickness, indigestion, and headache. Attacks of all these maladies have been known to follow immediately after breathing foetid sewer air.

2. Enteric or typhoid fever has been proved pretty clearly to be spread by the air of sewers (Parkes' "Hygiene"). The origin of a recent epidemic of enteric fever at Stockport has been traced by the medical officer of health to the grid ventilators at the heads of some sewers. Two or three cases of enteric in Plumstead have recently been attributed to breathing foul emanations from sewer openings.

3. Diphtheria.—Dr. Thorne is the author of the principal recent work on diphtheria. In it he endeavours to show that the principal factor in the recent serious increase of diphtheria in towns is school aggregation, by means of which slight forms of sore throats may become developed into virulent diphtheria.

But Dr. Thorne himself allows that these slight forms of sore throat may be caused by inhaling sewer gas. And Dr. Thorne is obliged to admit that insanitary conditions seem to have caused some outbreaks of diphtheria. But the majority of sanitarians and medical authorities recognise insanitary conditions as one of the chief causes of diphtheria, though, of course, diphtheria being a directly infectious disease many of the cases which occur are quite independent of sanitary conditions, especially when the disease is epidemic, as in London at the present time.

The principal reason why this formerly generally accepted view has been questioned is that diphtheria has increased in towns concurrently with a general improvement in sanitary conditions, especially in the formation of sewers. Now undoubtedly the formation of sewers is a great sanitary advance on most older methods of sewage disposal. But they have not always been an unmitigated boon, for they have been shown to be the means of spreading enteric fever as referred to above. And who can say that they may not also by means of their ventilators spread diphtheria. Dr. Adams, medical officer of health at Maidstone, has traced an epidemic of diphtheria at that town to the manhole ventilators.* I will not go into details as to my reasons for suspecting that the recent prevalence of diphtheria in Plumstead is due to the

same cause. They are partly given in a paper read by me at the last meeting of the British Medical Association, and also mentioned in my last annual report. They are briefly as follows: (1) Diphtheria is far commoner in Plumstead than Woolwich; (2) Plumstead has manhole ventilators, Woolwich has not; (3) the recent increase of diphtheria in Plumstead has coincided in time with the increase in number of the manhole ventilators; (4) I can find no other conditions to account for this remarkable prevalence of diphtheria in Plumstead compared with Woolwich.

To summarise, I think I have shown that, although the whole question of diphtheria is still *sub judice*, there are very good reasons for considering its recent increase in great part due to open manholes, and that no other explanation has been found to account for its greater prevalence in Plumstead than Woolwich.

In conclusion, I submit that, if I have not shown sufficient reasons to make the Board give up altogether the system of road ventilators I have at least proved: (1) That sewer gas is a nuisance and injurious to health, whether inside or outside of houses; (2) that open manholes alone do not prevent the risk of sewer gas getting into houses, and cannot render it innocuous by oxidation where sewers are foul.

And I therefore recommend strongly: (1) That all houses should be disconnected from the sewers instead of the house drains being used as sewer ventilators, without any disconnection; (2) that large (6-8 in.) shaft ventilators be erected at the heads of all sewers of steep gradients; (3) that above all, the sewers be systematically flushed by automatic flushers or otherwise.

THE ANTHRAX ORDER OF 1892.—This order, which came into force on the first day of 1893, provides that the inspectors of the local authorities under the Contagious Diseases (Animals) Acts shall forthwith on receipt of notice of the existence of anthrax give information of the receipt of the notice to the medical officer of health of the sanitary district in which the disease has appeared. Acting in pursuance of this provision, the chief constable of Berkshire gave notice of an outbreak of anthrax at Spencer's Wood to me as medical officer of health of that district, and this information proved of much value, because it enabled us to cause the carcass of a cow to be buried which was believed to have been affected and had been brought into the borough. A butcher who had cut the carcass up suffered from a poisoned wound in his right hand; and his son, who had assisted him, was found by Dr. Wilcockson to be suffering from anthrax. The boy was removed into the Royal Berkshire Hospital, where he was operated upon, and recovered.—*From Dr. Ashby's Annual Report, Reading, 1893.*

* Russell's "Epidemics, Plagues and Fevers."