“A negative result obtained with the serum of a case of suspected typhoid affords a presumption against the diagnosis of typhoid fever, but this is only a probability, especially if the examination has been made in the first few days of the disease. The examination should then be repeated during the next few days. The presumption that a case in which a negative result has been obtained is not typhoid, becomes correspondingly stronger as the stage of the disease becomes more advanced.”

HEALTHY MILK.

DR. NIVEN, Medical Officer of Health of the City of Manchester, delivered a Lecture on the 9th ult. on “How a City may be Supplied with Good Milk,” under the auspices of the Ancoats Healthy Homes Society. Dr. Niven said a vast number of children were swept away every year by diarrhoea, and the most searching enquiry showed that these deaths were directly caused by the milk on which the children were fed. This was often the fault of the mother by not taking the precaution to boil the milk, but it would not avail to boil the milk unless it arrived of sufficiently good quality. They could kill the living matter in the milk, but could not by boiling deprive it of its poisonous properties if it had become poisoned. Those injurious properties the milk too often acquired as soon as it came from the cow. Cows in a very large number of instances were infected with tubercular disease. In a certain proportion of cows, and practically in all when the udder had become tuberculous, the milk became infected, and was capable of giving children consumption of the bowels. Generally speaking, about twenty per cent. of the cows in this country were affected with this disease. Every now and then they also found widespread and disastrous epidemics of typhoid fever, scarlet fever, and diphtheria attributed to and clearly proved to have come from milk which had become infected, and they ought seriously to consider where it was a necessary thing for these evil consequences to accrue from the use of milk. About two years ago, Dr. Niven said, his attention was called to a pamphlet published by Mr. Stuart Macgregor, the British Vice-Consul in the Danish Capital, describing the system whereby they could have milk fragrant, pure, and clean. He was sure every one would wish that such milk should be brought into this community. If milk were drawn from the cow on a summer day, and exposed a short time, a vast number of micro-organisms developed, and caused changes in it which led to the production of elements that were poisonous to the human system. He did not mean to say that all the milk used contained poisonous material, but that the milk used in summer was liable to contain such material. In August last, when he journeyed through Denmark to Copenhagen, he found that the fields consisted

chiefly of red clover, and in these the cows grazed, and they were milked in the fields. He went through one of the factories to which the milk was taken in cans—the *employés* were compelled to put on clean cotton outer clothing as they came in to work—the milk was brought to the factory from the farms in railway trucks, and the cans were surrounded by ice, and the cows were periodically examined by the veterinary surgeons appointed by the company. They had one special quality of milk for the feeding of children, which was called “children’s milk.” For the supply of this they selected the best cows. The milk was tested by an expert, and if any of it was found to be in the slightest degree disagreeable, it was rejected. The cows were allowed no brewers’ grains or turnips, but they were allowed carrots and beetroot. This special feeding was the result of careful experiment and scientific knowledge, and it was worthy of note that the chief food here was distinctly and absolutely excluded there. From the moment of the milk leaving the cow, it was kept in a very low temperature, and as the cans or bottles left the factory for the consumer they were surrounded with ice. The company received the milk from fifty-seven large farms, each farm having from 50 to 200 cows. The total number of cows supplying the company last year was 5,024, and the amount of milk supplied to the public in 1894 was two million gallons. The farms he visited were beautifully clean, the floor was of concrete, and the cows were invariably littered with clean straw. The price in Denmark was 1s. per gallon for the best milk, and he thought every one would agree, if they could get milk from English dairies protected in this manner, at a reasonable price, they would be conferring a great boon on the community, and he did not see any reason why it should not be done.

STEAMING IN COTTON WEAVING SHEDS*

BY

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THE agitation which has recently arisen against steam in certain districts of this county, induced me to visit several weaving sheds in the Urban districts of Hurst and Padiham, and facilities have also been kindly extended to me for an examination of the conditions affecting weavers in the county boroughs of Blackburn and Preston.

From personal knowledge of weaving sheds, extending over many years, I feel justified in saying that the working of the Cotton Cloth Factories Act, 1889, has been productive of much good, and with few exceptions the limits of humidity allowed by the Act are faithfully adhered to. In the manufacture of heavily-sized cloth a high state of humidity seems to be necessary, and at the

* From Annual Report, for 1895, to the Lancashire County Council.

temperature favourable to this class of weaving, say from 70 deg. to 80 deg. Fahr., the humidity allowed varies from 88 to 77·5 per cent. These maximum limits often give rise to a feeling of lassitude, and tend to reduce the vitality of the operatives, rendering them less able to withstand the attacks of disease. In many sheds where the maximum humidity is not as a rule attained, I have frequently observed a distinct improvement in the physical appearance of the workpeople. The death statistics of the operative classes do not enable one to form an opinion as to the comparative incidence of fatal diseases among them, for, unfortunately, the industrial occupation has not always been given in the death certificate with sufficient accuracy. The Blackburn statistics, however, show that the mortality of weavers—even as regards phthisis—is more favourable than among other cotton workers. But further investigation will be required before a correct conclusion can be arrived at.

The introduction of what is known as "live steam" into weaving sheds is open to the objection that it unduly raises the temperature, and usually has an unpleasant smell dependent on the impure water from which it is derived. Better results are obtained from the evaporation of warm water, or by the air being allowed to pass through specially arranged wet sheeting; and this system seems to me preferable to the introduction of finely divided particles of water by means of the "drosophore." Section 9 of the Cotton Cloth Factories Act requiring the hourly admission of not less than 600 cubic feet of fresh air for each person employed in a factory in which humidity of the atmosphere is artificially produced, and the power given to inspectors under Section 12 to insist on means being provided to remove the dust, when generated to an injurious extent, are extremely valuable, and their operation will tend to greatly minimise the effects attributable to humidity. This view is borne out by the air analyses made by me in the course of my investigation. From these it appears that the atmospheric impurities as represented by the presence of CO_2 was in one shed as low as 0·65 to 1,000 parts; 0·73 and 0·75 per 1,000 being found in two other instances, while in the "non-steaming" sheds the carbonic acid varied from 0·99 to 1·9 per 1,000, therefore showing the desirability of securing efficient ventilation in all weaving sheds without distinction. The volume of air required to be introduced hourly for each person is admitted to be insufficient to secure a good atmosphere, and it is not unusual for the hourly supply provided by the employer to be much in excess of the amount legally required; for instance, in one mill it averaged 2,000 cubic feet. I quite agree with the suggestion made by Mr. Osborn to fix a standard of permissible maximum impurity, and eight parts of CO_2 in 10,000 cannot be considered as an un-

reasonable basis. Some improvement might be effected in the appliances for ventilation. Extraction fans are generally used, but no special air inlets are provided. In a few sheds I noticed ventilators in the roof which were closed, and if they had been open most probably short circuiting would have taken place. Ventilation by extraction allows air to be drawn from the closets closely connected with the shed—too often very foul—and from other impure sources. In one mill these dangers are avoided by a system of air propulsion, which seems to act admirably. The provision of properly-heated cloak-rooms is distinctly a step in the right direction. The air of the shed is kept purer in consequence, and the operative has the comfort of a dry coat or shawl when leaving the mill.

No difficulty need be experienced in removing all causes of complaint—which, in my opinion, are not of a serious character—from weaving sheds, providing satisfactory ventilating appliances are arranged so as to secure to each operative a sufficient volume of pure air at a given temperature and humidity, and by attention to the other requirements mentioned, which, to my mind, seem to be of great importance. More consideration might with advantage be directed to the surroundings of the spinners, winders, warpers, and card-room hands, whose occupations, judging from the only available mortality statistics, must be regarded as far from healthy.

A NINETEEN-YEARS' CYCLE IN THE SEASONS.

MR. H. C. RUSSELL, F.R.S., of Sydney Observatory, has done much good Meteorological Work, but we are afraid we should be out of our depth if we tried to follow him in his latest study. Forsaking the "millions of useless figures" so well-known to the meteorologist, he has discovered that the most pronounced droughts recur with great regularity at every nineteen years. Mr. Russell uses the word drought "to signify a period of months or years during which little rain falls, and the country gets burnt up, grass and water disappear, crops become worthless, and sheep and cattle die. An examination of the weather for one hundred years of New South Wales has shown that certain features recur every nineteen years, and all the great and conspicuous droughts of history all drop into the same cycle—both those that happened before the Christian era and since. Thus, Elijah's drought happened in B.C. 908—that is 2,736 years before our great drought of 1828, and the interval is 19×144 . As Mr. Russell's investigations into this phenomenon of periodicity proceeded, he was gradually led by the weight of evidence to fix upon the moon as the exciting cause." In the *Australian* of June 20th, 1896, is a diagram, purporting to be Mr. Russell's, showing