

polluted by farm drainage. Theoretically, no doubt, a cow ought to have as pure a water as is possible, but even in farms where the general supply is above suspicion, any source seems to be considered good enough for the unfortunate animal.

The points I have raised have been in my mind for a considerable time, and I have not as yet managed to find a solution which gives me entire satisfaction. Consequently I shall be very grateful for any views which will throw light upon them.

POLLUTED OYSTERS.—At the Mansion House on February 15th, William Henry Gunn, of Hillside, Malpas, Truro, was summoned for being the owner of 1,000 oysters exposed for sale in Billingsgate Market, which were unwholesome and unfit for human food. The defendant pleaded "Guilty." Mr. Muskett, solicitor, who prosecuted on behalf of the Fishmongers' Company, said this was the second case of polluted oysters dealt with in that Court during the last two months. Last year the Company stopped the sale of oysters from the Falmouth and Truro districts, as the Truro river had become grossly polluted with the sewage of that city, and the oysters taken from the river proved, on bacteriological examination, to be dangerously unwholesome. Afterwards oysters from Lamouth and Coombe Creeks were allowed to be sold, as they were not infected. The defendant was found dealing with oysters not emanating from either of these creeks and sending them to London for sale. He had written to a salesman saying that, as he heard there was a little complaint, he must, if asked, say they came from Coombe Creek. Of these particular 1,000 oysters all were detected and destroyed, Dr. Klein's examination of twelve samples showing they were gravely polluted. At the same time 9,000 other oysters found elsewhere at Billingsgate and coming from the same locality were condemned and destroyed. The Company had no wish to press for a severe penalty, but the defendant admitted that he had been sending away 4,000 or 5,000 oysters per week. He was in a small way of business. Mr. Davey said his client regretted what he had done and would promise not to offend again. The Lord Mayor said the community ought to feel indebted to the Fishmongers' Company for their action in the interests of the public health. He fined the defendant £50 and £10 10s. costs, with the alternative of two months' imprisonment.

MILROY LECTURER FOR 1910.—Mr. G. R. Foulerton, F.R.C.S., D.P.H., Medical Officer of Health to the East Sussex County Council, and lecturer on bacteriology and public health at the Middlesex Hospital Medical School, has been appointed Milroy Lecturer to the Royal College of Physicians for the year 1910.

WATER SUPPLIES ON DAIRY FARMS.*

By H. DROOP RICHMOND, F.I.C.,
Chemist to the Aylesbury Dairy Company, Ltd.

IN the course of my ordinary duties I have to examine the water supplies on the farms from which the Aylesbury Dairy Company draw their supplies of milk.

The system adopted is briefly as follows:—When a farmer wishes to supply the Company, he fills up a form giving *inter alia* particulars of the water supply; if these particulars indicate that the supply is likely to be suitable, the farm is inspected on behalf of the Company by the medical officer of health for the district in which it is situated, whose report contains his observations as to the character and position of the supply or supplies, and the likelihood or otherwise of contamination. The medical officer of health takes samples of the water for chemical and bacteriological examination, which are forwarded to me. In the event of the water supply being passed, particulars of the water are entered in the contract, it being specified that no other water may be used under heavy penalties in the case of breach; samples of the water are regularly taken half-yearly so long as the contract continues. If the water is condemned, and no other good supply can be obtained within a reasonable space of time, no contract is of course made, and the farm is rejected. In many cases it happens that a new supply is easily available, and in others that there is more than one supply on the farm, one being passed and the other condemned; in these cases the condemned supplies must be cut off, if they are sufficiently near the dairy to afford any possibility of their being used.

In the table of statistics that follows, the column "Good" refers to farms which have only water supplies that have been passed; the column "Bad" refers to farms on which no good water was available, and which were consequently rejected; while the column "Good and Bad" indicates those farms on which a good water was found after the first supply had been condemned, which was subsequently cut off.

On looking through my books I find particulars of 278 dairy farms, on which there are altogether 447 water supplies; of these, 146 farms with a total of 210 water supplies

*Read before the Home Counties Branch of the Society of Medical Officers of Health, on November 19th 1903.

were passed, 86 farms with 113 water supplies were condemned and entirely rejected on this account, while 46 farms were found at first to have altogether 75 polluted supplies, which were cut off, and a total of 49 new good supplies were found on these farms.

The table below gives the farms arranged according to the counties in which they are situated:—

County.	Good.	Bad.	Good and Bad
Bedford ...	1	—	—
Berks ...	7	7	7 (1)
Bucks ...	4	4	1
Cambs ...	—	1	—
Cheshire ...	41 (29)	10	10 (7)
Derby ...	3	5	1
Essex ...	2 (2)	—	1 (1)
Gloucester ...	3	1	—
Herts ...	3	—	—
Leicester ...	2 (2)	2	—
Middlesex ...	1	—	—
Notts ...	—	2	—
Oxford ...	3	2	—
Shropshire ...	1	8	—
Somerset ...	18 (10)	2	2 (1)
Stafford ...	3	5	—
Surrey ...	1	—	—
Sussex ...	—	—	1
Warwick ...	—	1	—
Wilts ...	53 (16)	36	23 (3)
Total ...	146 (59)	86	46 (13)

The figures in brackets give the number of farms supplied with water from public mains; it is seen that there are 72 farms thus supplied, chiefly from the Liverpool mains in Cheshire, and the Trowbridge mains in Wiltshire.

Excluding the public supplies, and taking only wells, springs, etc., into account, I find that I have been able to pass 187 water supplies, while I have condemned 188. This indicates that 50 per cent. of the waters on farms are polluted.

From a public health point of view it is a matter of satisfaction that the examination of the water supplies on farms has resulted in the finding of new and good supplies on 46 farms, and the closing of the polluted wells, etc.; the total rejection of 86 other farms by the Aylesbury Dairy Company is, however, less satisfactory, as it simply means that the milk is supplied to the public through other channels where less attention is paid to the purity of the water supply.

In my experience the difficulty of finding a new supply on a farm on which the usual supply is found to be polluted is not very great, except when the underlying formation is clay; on many farms there is a stratum of

gravel overlying the clay, which yields abundance of water, but this is almost everywhere polluted (my experience is limited to the London, Kimmeridge and Oxford clays, but doubtless the remarks apply to other clay formations). By going to the strata below the clays, often at a considerable depth, it is usually possible to obtain unpolluted water, but these are often highly charged with salts—sulphates, chlorides, and carbonates—to such an extent that they are not desirable as potable waters. On other formations, such as the chalk, the upper and lower greensands, the oolites, and the new red sandstone, it is usually possible to find good water at a reasonable distance from the farm and at not too great a depth. My experience leads me to consider that the importance of making the upper portion of the well watertight is not generally appreciated, and that frequently the protection of the top of the well is neglected. In at least two instances I have seen the well covered with loose boards over which the men walked, and the pump so placed that the drippings from the spout washed the filth from their boots back into the well.

As instances of imperfect sides to the well, I may mention a case in which a well sunk through clay usually yielded good water, but in a season of drought was polluted from a cesspit thirty yards away owing to the cracks in the soil as it dried; another well which yielded water containing twenty-three parts of chlorine per 100,000, was in times of heavy rainfall contaminated by surface water of much lower chlorine content, the contamination being first indicated by a low chlorine; a third well which suddenly became polluted owing to the breakage of an unknown drain which ran within a very short distance; while a fourth instance is afforded by a well which became polluted whenever a cesspit, some distance away, and at a slightly higher level, became too full.

In every case a well should be cemented right down to an impervious stratum, and the sides brought up above the surface of the ground; it should be provided with a dome-shaped or conical cover.

With reference to the points raised by Dr. Porter in his paper on this subject, I am of opinion that as much attention should be paid to the water used for cooling as to that used for cleansing dairy utensils; it is by no

means uncommon when inspecting milk coolers to find a small leak either in the cooler or the water connections from which small quantities of water insufficient to be discovered by analysis of the milk may find their way into the milk.

When the bacteriological examination shows pollution while the chemical analysis is good, and *vice versa*, the supply should, at all events, be very carefully inspected, if not at once condemned; in one case the bacteriological results were so suspicious after twenty-four hours (turbidity in Parietti broth, which I then used, and sporogenes-like curdling of milk) that, notwithstanding a good chemical analysis, I telegraphed to have the well opened, and a small recent leak was discovered. In another case the chemical results were very bad, but the water was nearly sterile; on inspection the position of the well it was found to be hopelessly bad, and a later bacteriological examination was less favourable; in this instance it appeared that a quite unreliable filtration through the soil was going on.

I am of opinion that pollution from the drainage of cowsheds should be regarded as dangerous; I have seen so many instances during my visits to farms in which persons employed on the farm have relieved the calls of nature in the cowsheds, that for this reason alone I should condemn such a water.

With regard to the other two points, I would only mention that I know of two instances where water is brought in pipes for over one mile, and that I can confirm the extreme difficulty often mentioned by farmers of preventing cows from drinking from any dirty pool rather than from a good water supply.

TWENTY-NINE YEARS' SERVICE AS MEDICAL OFFICER OF HEALTH.—On January 1st, Dr. Joseph Henry, J.P., relinquished his office as medical officer of health of Rochdale, an office he had held continuously since October 30th, 1879. At the last meeting of the health committee he attended, Dr. Henry submitted a report in which he reviewed the improvements in the health and sanitary condition of Rochdale during his twenty-nine years of office. In this period the birth-rate had fallen from 35.6 to 23.8, the death-rate from 25.3 to 17, the phthisis death-rate from 2.4 to 1.28, and the infantile mortality from 176 to 121. On his retirement, Dr. Henry was presented with a silver tea and coffee service by the members of the health committee, and with a silver loving cup by the staff of the Marland Hospital.

THE EAR, NOSE, AND THROAT IN SCHOOL MEDICAL INSPECTION.*

By P. MACLEOD YEARSLEY, F.R.C.S.,
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IN your capacity as School Medical Inspectors you will have it in your power to do much toward the prevention of ear disease and, by the detection of incipient deafness, you will be able to arrest its further progress by ensuring appropriate treatment. The enormous importance of perfect hearing in the intellectual and moral development of children, and the serious handicap to them of moderate or even slight degrees of deafness, will become very patent to you after you have spent a short time at your duties, and you will quickly find that the prompt recognition of imperfect hearing is not the least of your responsibilities. Before we turn our attention to the inspection of ears, nose, and throat, it will be well, therefore, to consider what the possession of normal hearing means to the child's education.

The primary and most simple idea of an object is formed by the revival in the mind of the impression that the object has made upon the sensorium through the sense organs, and each percept or idea of an object is the complexus of images received through the different senses—sight, smell, hearing, taste, touch, and the muscular sense, some one of these being usually the "master sense." The blending of these sensory ideas is probably due to the presiding intelligence, which belongs to the cerebral cortex as a whole. As education proceeds, and language is developed, each object percept becomes related with its name, these names being the verbal symbols of the simplest ideas which we have of things.

In the language of a nation, certain articulate sounds become the symbolic representatives of certain definite ideas, learned by each child first as sounds, later as symbols. *The sounds are first registered in the cortical centre for hearing*, and it is under the guidance of this centre that the child trains the motor centre to articulate the sounds, thus getting second images imprinted upon the cortical motor centre for speech. The motor reproduction of sound becomes so interesting that the child reproduces many sounds by *echolalia*, without

* Lecture delivered at the Rooms of the Society of Medical Officers of Health, January 12th, 1909.