

putting the flexible tube into the throat and forcing the food into the crop with a few strokes of the treadle. The birds are said to suffer no ill treatment by this method, and they fatten and are ready for the market in three weeks.

It is stated that no less than 1,765 tons of dead fowls were sent to London last year from one little village near Tunbridge Wells, and that they were fattened by this process. The average weekly output of English poultry farmers as sent to London is fifty-two tons of birds. This new process of fattening poultry, which appears to be successful in England, might, with advantage, be tried here. The Agricultural and Dairy Commissioner might have the method tried at the Government Poultry-Fattening Station.

Bovine Tuberculosis in New Hampshire

By Col. D. McCrae, Guelph, Ont.

Sanitation as a means, not only of preventing the spread of this disease amongst our herds of cattle, but also as a valuable means of curing animals already affected, is now strongly recommended by scientists. At the annual meeting of the American Public Health Association recently held in Ottawa, Dr. Irving A. Watson, of Concord, New Hampshire, read a valuable paper detailing his observations on bovine tuberculosis in New Hampshire and strongly advocating sanitary measures as the best means of fighting the disease. Dr. Watson is Secretary of the State Board of Health for New Hampshire and also President of the State Board of Cattle Commissioners, and frankly admits a great change in his views on the subject. He says: "We believe that the danger of infection from bovine tuberculosis has been greatly over-rated. On this point our views have undergone a somewhat radical change from those already on record, brought about by evidence which can not be fully discussed at this time. We are convinced that whatever danger exists arises almost entirely, if not wholly, from those animals in which the disease is so far advanced that it may be detected by a competent veterinary surgeon upon physical examination, barring, possibly, the localized appearance of the disease in the udder, in which event the tuberculin test would determine the diagnosis. We believe that a majority of the cattle reacting to the tuberculin test are not diseased to an extent that requires their slaughter for the protection of the public health. This conclusion has been arrived at, not only by the cattle commissioners of New Hampshire, but also by Massachusetts and Connecticut." Dr. Watson is not alone in his change of views on the danger to public health from tuberculosis in cattle. Professor James Law, of Cornell University, has recently written a paper on "Tuberculosis in Cattle and its Control," which is a remarkable modification of his views regarding this disease. Massachusetts, led by medical men who had but a cursory knowledge of the disease, undertook to stamp out the disease thoroughly. The State spent \$700,000 in the destruction of tuberculous animals and then abandoned the attempt. Michigan also began similar work, but had soon to quit, and the expense to that State was enormous.

Dr. Watson says his idea is that stamping out the disease is quite impracticable. To do so, he says, it would be "necessary to destroy all tuberculous animals and persons, and to hold all others in strict quarantine until all the existing germs of the disease were destroyed." How long the latter would take no one knows. Much of the danger to the public health comes from infected buildings holding and disseminating the germs. We know but little about the way the disease spreads, but it seems probable that infected buildings are very dangerous. Were it possible to thoroughly disinfect every stable in the land it would require to keep them pure by a rigid quarantine against all careless and dangerously tuberculous persons entering them.

Good work has been done in New Hampshire to prevent the spread of this disease. In 1891 the State Board of Cattle Commissioners was formed. They went to work at once and the people of the state, through the publication

of the Board of Health, the Board of Agriculture, the State Grange and addresses at agricultural meetings became comparatively well informed regarding this disease. The legislature gave \$10,000 a year, with ample authority and power, to the Cattle Commissioner. In 1895 they passed almost unanimously a grant of \$100,000 to them to begin a systematic examination of all the cattle in the state. This was vetoed by the Governor. Probably a good thing, as at that time the slaughter fever was still prevalent and might have been tried in this state.

The commissioners have examined 1846 herds of cattle—many thousands in number—1,483 animals were condemned and killed. In this number only five showed no traces of the disease. Wherever the disease was found to exist extensively in a herd they always found one of two conditions—either the animals were stabled in close quarters, with an entire absence of proper ventilation and cleanliness—or, second, a degree of inbreeding that, in all probability, improved the power of resistance and made the animals more susceptible to infection.

Where stables are constructed to retain the animal heat without attention to ventilation or other sanitary conditions the surroundings are very favorable for the spread of tuberculosis. If infection be brought to such a herd, either by animals or persons, disinfection of the stable afterwards is very difficult. The germ is said to live indefinitely under conditions of warmth and darkness, more especially if there also be moisture associated with nitrogenous matter. Animals kept in such a stable that had once been thoroughly infected might take the disease two or three years afterwards.

Dr. Watson says: "If particular attention were given to the sanitary construction and care of stables, these kept in thoroughly clean condition, with the addition of some disinfectant and segregation of animals discovered to be diseased, we believe the spread of tuberculosis would be practically nil." He gives particulars of an experiment with twelve Holstein cattle reacting under the tuberculosis test. Of these two were evidently in an advanced stage of tuberculosis, and were destroyed on June 12th, 1897. Of the remaining ten one was a heavy bull and he was killed, but the *post-mortem* revealed only the slightest evidences of tuberculosis. The nine remaining were placed upon an isolated farm, where they were given proper sanitary care, including good ventilation, light and moderate feed. They were kept in the open air day and night except in stormy weather. They were tested again December 9th; only three of the animals reacted. One was evidently diseased. They were all again tested February 23 with no change, and on March 29 the three were killed. One was well developed, the other two only showed the slightest traces, and their condition led to the belief that the disease was not only being reduced, but was on the way to ultimate recovery. The six remaining animals were tested with tuberculin February 23 and again May 9 and passed all right. They appeared to be in perfect health and were returned to the original owner, who was well pleased with the result. This act of the board was severely criticised in certain quarters, and the owner, to settle the matter, decided to kill the whole lot. In August, 1898, they were killed. A careful autopsy was made in each case. In not a single case was there evidence of active tubercular progress. If the tubercular process was arrested, as appears to have been the case, there was no reason why the cows might not have died of old age, had they not been slaughtered. A similar experiment was made in Maine in 1895-96, and the animals killed in October 1897. In 50 per cent. of the animals the disease was held in check so that it made practically no progress.

Dr. Watson presented the following propositions:

1. That it is impossible to eradicate bovine tuberculosis, but that it may, without inflicting a great burden upon the state, be reduced to a degree that will subserve the interests of the stock-raisers and likewise protect the public health.
2. That but a very small percentage of the animals infected with tuberculosis in any way endanger the public