

for a cow as it is for the rest of the animal kingdom yet it is something the dairy cow does not get.

Every one knows that exercise increases the flow of blood to the muscles; and in consequence of the greater amount of waste products carried off, and the greater amount of oxygen required by the system, a quickening of the heart's action and a quickening of breathing result. On the other hand, when little or no exercise is taken, the circulation becomes sluggish, and the heart, like any other muscle, degenerates for want of use; the breathing becomes shallow, and the lungs are not expanded. When any extra strain is put upon them, they are not able to do their work; and we have rupture and permanent dilatation of air-cells, along with weak lungs and a predisposition to pulmonary disease.

Exercise, on the other hand, causes an increased flow of blood to the lungs, with an increased vitality and strength. The increased flow of tidal air in and out of the lungs will tend to prevent the slow-growing tubercle bacilli finding lodgement, and in this way prevent their growth and development in the lungs.

In referring to exercise, I don't wish to be understood as advocating a large field or range for the cattle to run over. I don't wish to advocate anything impractical; but I do think that the present method of confining the dairy cattle with stanchions is capable of improvement. I do think they ought to be allowed their liberty; and further I do not see anything impractical in any such suggestions. Any condition that affects the comfort of the animals must affect their general well-being. Every one here must have seen how cows will rub and scratch themselves when first let out for water; often, even when thirsty, they will not touch the water till they have first licked themselves all over. It is impossible to stand behind a row of cattle for five minutes without seeing one or the other make a more or less ineffectual effort to scratch the body. No animal can be comfortable confined as they are in New England at the present time.

Every one knows that these conditions exist and are detrimental to the health of the animal. Then why are they not attended to? It is because through force of habit we have got accustomed to them, we simply take it for granted that these conditions cannot be improved.

## THE AGRICULTURAL ASPECT OF TUBERCULOSIS.<sup>1</sup>

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It is but a few years since tuberculosis in cattle was known to the public to be prevalent. The attention of scientists, particularly of veterinarians, has lately been directed to the disease as a source of danger to the life and health of the human family. Investigations have proved the disease to be generally prevalent among the cattle in all thickly inhabited countries, although most of the cattle affected show few outward indications of the disease. In fact, a large majority of such infected animals are apparently healthy, and the presence of the disease cannot be detected with certainty without the use of tuberculin.

The danger to human life and health has been discussed and magnified until the public are demanding

action by the State authorities for their protection. Authority has been given the Cattle Commissioners to kill without appraisal all cattle found to be infected with the disease.

The discovery that the injection of tuberculin is a very reliable method of detecting the disease has led many to believe that this should be applied by the authorities to all suspected herds, and some people are of the opinion that all the cattle of the State should be subjected to this test. From the experience thus far had in the use of tuberculin, we are led to believe that a large proportion of the cattle that are apparently healthy would be condemned by this test. The present law provides no recompense to the owner of such cattle. These conditions make the agricultural aspect of tuberculosis very serious indeed. The neat stock of the State is rapidly decreasing, the decrease having begun with the agitation of the danger from tuberculosis. In 1890, 200,658 cows and 62,549 neat cattle other than cows were assessed. In 1893, 186,806 cows and 47,528 neat cattle other than cows were assessed, a decrease of 13,852 in cows and of 15,021 in other neat cattle, making a total decrease of 28,873 in three years. The number of cows had been previously quite steadily increasing for thirty years from 149,090 in 1861 to 200,658 in 1890.

The dairy is easily the most important branch of farming in Massachusetts. The State Census of 1885 gives us the latest reliable figures. By that the value of dairy products was \$13,080,526; hay, \$9,676,893; other staple products, \$4,578,763; fruit, \$2,386,290; vegetables (potatoes are included in staple products), \$2,762,941; animal products, \$5,398,439. The hay crop is quite largely dependent upon the dairy interest, and the animal products are so largely dependent upon the dairy as to be almost a part of it. The veal product is certainly a dairy product, and most of the veal of the State is grown on the skim-milk of our dairies.

If the killing of tuberculous animals is to go on without compensation to the owners, this most important industry must rapidly decrease, carrying along with this decrease a still greater decrease in the value of much of the farming property of the State. The fine dairy barns that dot the farms of the State will become valueless, and the pastures will be allowed to grow up to brush. The State can ill afford a decrease in its agriculture and in its agricultural population. If the fight against tuberculosis is for the public good, the public should make part, at least, of the sacrifice deemed necessary. Especially is this proper in view of the fact that many cases of tuberculosis in human subjects do not terminate fatally and many apparently recover. I quote from "Tuberculosis in Relation to Animal Industry and Public Health," by Dr. James Law. "Dr. Biggs tells us . . . that in the Charity Hospital of the city [New York], 30 per cent. of all deaths show old lesions of tuberculosis now becoming stationary. He quotes a Vienna hospital pathologist to the effect that he finds similar old stationary lesions in 85 per cent. of all post-mortem examinations. This leaves but 15 per cent. who have not suffered from tuberculosis." It is not too much to claim that a like proportion of bovines slightly affected with tuberculosis would never be apparently injured by it. Such cases should be paid for in full, if sacrificed for the public good. But it would be difficult for the officials to discriminate in the matter of allowance for cattle killed;

<sup>1</sup> Read before the Massachusetts Veterinary Association, May 23, 1894.

and so it would probably be better to fix upon a portion of the value of the animal in health as the amount that should be paid to the owner of an animal condemned to destruction because infected with tuberculosis. I believe the owners of neat cattle as a class are unwilling to bear all the burden. They believe that if the public takes arbitrary possession of their property and destroys it, that an equitable portion of its value should be returned to them. In view of all that we know about tuberculosis, it cannot be absolutely determined what an equitable proportion is, and the matter must be decided by granting an arbitrary part of the original value.

The value of the animal condemned is but a part of the loss to the owner. His business is broken into; his herd is discredited; his customers are afraid of his product; and if permanent future immunity is to be gained by him, he must be to a large expense in disinfecting his barns and stables. This disinfecting is out of his line, but is as necessary to the public health as the slaughter of infected animals. The State should see that it is properly done; and it could be done cheaper and more certainly by agents of the State than by the numerous private owners. Why should not the State provide for this very necessary part of the protection of public health? Dr. Law says in the paper quoted above, "Sanitary laws, which in any way ignore or disregard the rights of property have within themselves the seeds of defeat. . . . If the stock-owner is not fairly reimbursed for his animals slaughtered, and for other losses sustained for the protection of the public health and of the country's herds, unscrupulous men will find ample means of trading off the as yet incipient and occult cases of tuberculosis, thereby planting the infection in new herds. Compensation must stop short of making the sanitary bureau a profitable customer for tuberculous animals at sound prices, but it must be so liberal as to enlist the ready co-operation of the stock-owner in having every infected beast safely disposed of."

The State is bound to protect the life and health of the people, and is also bound to do justice to all parties. The State is also, for its own good, bound to foster agriculture, for no nation can long continue prosperous without a prosperous agricultural population. A large per cent. of the successful men of our nation have always been from those born and reared on farms. It must continue to be so. And the more prosperous the rural population is, the larger proportion of able and faithful young men will it furnish for the service of the City, State and Nation.

#### A DISORDERED PERIPHERAL SPACE-ORGAN.

BY EDMUND D. SPEAR, M.D., BOSTON.

ON Wednesday, November 23, 1892, Mrs. J. F. T. came for treatment of her head, because she had not improved under the care of a general practitioner, who was treating her for disease of the stomach and liver. Two months before, she had applied at the ear department of the City Hospital because she had previously obtained relief there for certain head symptoms. At that time she was told that the ear was not at fault, and was referred to her family physician. She had symptoms as follows: a "dazed" feeling, a nervous sinking and desire to get a long breath. She was

dizzy at times, but without tendency to fall in any particular direction; had a 'swishing' sound in the right ear; was not nauseated.

At the date, November 23d, she had all these sensations increased in intensity and accompanied with weakness of the back, palpitation of the heart and nausea. The previous evening's meal and the day's breakfast, though very moderate in quantity, were both lost by vomiting.

It is a very difficult matter, even for intelligent patients, to describe the symptoms which indicate the presence of a disordered space-centre. Witness the difficulty which obtains among writers, who try to give an idea of their feelings when returning from their first ocean voyage. I attempt an explanation of the term "dazed feeling."

It is an accepted fact that the knowledge of self-existence is derived from three sources. The consciousness of being comes to us slowly and gradually through long years of experiment with certain senses which can be named: the visual-sense, tactile-sense, and the space-sense. The organs giving us the sensations from which we learn the place we occupy in the physical world are nerves of touch, whose extremities are provided with special organs, the eyes, and the semicircular canals of the ear.

Ferrier has carefully collected the opinions of many experimenters as Cyon, Spamer, Högyes, Crum-Brown, to which he has added his own suggestions, and it is evident from these, as well as from other data, that we are constantly making use of these different senses, though more or less unconsciously, to maintain our equilibrium and adjust the movements of our muscles in performing the manifold acts necessary to the functions of the organism.

I have before referred in other writings, to certain phenomena illustrating the uses of the semicircular canals of the ear (or the peripheral space-organ) and the results of the observations in this case confirm my opinions then expressed.

If the space-organ is disturbed and performs its functions improperly, conveying impressions to the brain centres when it ought not to do so, we say we are dizzy. When the brain has been thus wrongly impressed for a considerable period of time the eye-muscles become affected, the visual impressions are not correctly transmitted to the brain, and there remains only the tactile sense from which the conscious ego retains its proper connection with the material world. This sense is not usually an acute or a cultivated one, and is insufficient to continue to serve in the place of the natural peripheral space-organ, so that the individual thus deprived of all means of properly locating himself in space loses confidence in himself, as having existence, and describes his condition as that of being dazed or dazzled.

When I first saw this patient's ear several years ago, she was frequently very dizzy. I then found an open tympanum with the membrane entirely destroyed, a mild form of inflammation of the mucous membrane in the "attic" or upper portion of the tympanum among those reduplications of membranes so carefully described by Bryant, and fluid lying between the two walls of the cavity and pressing through the incus and stapes against the oval window. At this time she obtained entire relief from the dizziness and improved somewhat in hearing.

Three months later she returned to my clinic after