

herd; and the fact is important to be known, because it should lead to a frequent inspection of all herds. Any intelligent person with sharp ears can in a short time be taught how to detect the disease, if it has made any considerable progress, by auscultation and concussion,—that is, by listening and thumping at the chest. The sounds of the breathing are quite different between healthy and unhealthy lungs; and the sounds produced by thumping with the fingers over the seat of the disease is also markedly distinct between healthy and unhealthy portions. It is the same difference that there is between tapping with the finger upon a drum-head, and upon a board.

*Vt. Watchman.*

The discovery of tuberculosis in the Agricultural College herd has caused quite a commotion among dairymen; and it seems to us a good time to call attention to some very important points in the care and breeding of dairy cattle. "Tuberculosis" is simply the scientific name given to what is otherwise called consumption of the lungs. It is substantially the same disease in our cattle as in ourselves; and the cause is the same—breathing unwholesome air, and living "stived up," to use a very expressive common phrase. Add to these high living—that is, over feeding,—and you have the whole thing in a nutshell. It is in the pampered and crowded herd, crowded in the stable and crowded in feeding for high production under unnatural conditions, that develops this tendency; and when the tendency is developed, the germs of disease, which are everywhere, easily find the spot to grow and develop themselves. Not only must the college herd be sacrificed, but on all hands we are getting similar information,—almost uniformly from herds of rich men, or of men trying to get a great record, so as to get fancy prices for both butter and calves. The last exchange we picked up contained the following statement: "Nineteen head of valuable Guernsey cattle including the one which received the highest award at the World's Fair, the property of ex-Vice President Morton, have been killed on account of tuberculosis."

In order to keep cow stables warm in our climate, it is necessary to keep the winter's wind out; and all the teachings of the agricultural press, and of public speakers in agricultural meetings, have been in this direction, without a word of caution against the possible attendant danger from lack of pure air. As for ourselves, we have occupied the place of learner in dairying, and have in no way felt called upon to take up the rôle of instructor. But the facts of our profession, as a physician of men, have instinctively been kept in mind in our dealings with animals; and knowing how much better is prevention than cure, we have carefully avoided going to extremes, even in the matter of warm stables: and we say to-day that a stable of dairy cattle in which water never freezes, in Vermont, is a dangerous stable in which to keep cows.

*Dr. Hoskins.—Vt. Watchman.*

### AMERICAN COMPLIMENTS.

We have spoken of the losses to farmers entailed in the provisions of the Wilson tariff Bill vs. the lower duties on all farm products except foreign fruits. We are asked what gains

the farmer will make through tariff reduction. Here is what Mr. Wilson says in his report:

To the farmers of the country we have given untaxed agricultural implements and binding twine and untaxed cotton ties, for the additional reason, in the latter case, that cotton is the largest export crop of the country, sold abroad in competition with the cheap labor of India and of Egypt, believing that it was sufficient for the private tax gatherer to follow the farmer in the markets of his own country and not to pursue him into all the markets of the world.

Never mind where the tax-gatherer goes to, what will the farmer save by lower duties on these things? The most important is the farm implement duty. The Farm Implement News has collected a large amount of information on this subject—from the manufacturer's standpoint. There is, apparently little to fear from European competition, though some think that English and German imitations of some of our smaller implements might find a market in the West and South, but our manufacturers do evidently fear Canadian competition. On this head the News says:

Canadian manufacturers operate under the American system; their works are modern, and equipped with the best and latest appliances; their foremen are Americans or have served terms in the best factories in the United States, and their workmen are fully as intelligent and as expert as ours. They get much of their material cheaper, and labor at about 25 per cent less than our manufacturers have been paying. With these advantages they would be formidable competitors if free trade were reciprocal, and such reciprocity might be questionable as a business proposition; but to open our fields to them while theirs are closed to us would be a most stupid and ridiculous proceeding, as viewed from a business standpoint. And it may be remarked that these tariff questions, which so affect the commerce and industries of the country, should be regulated and settled by business men, and not be left to a lot of lawyers and politicians who know or care nothing practically about commercial and industrial affairs, and who will keep up this tariff agitation and tinkering, without regard to public welfare, so long as it can be used for party purposes.

That last sentence is as a nut. But if our manufacturing friends are to be considered so carefully how about farmers? There is a big Canadian tariff on corn meal and other agricultural products. Why give Canadians free access to our markets when they keep us out of theirs?

*Exchange.*

### The Farm.

#### Land Fertility.

At the Hurstmonceux Farmers' Club last week Mr. E. B. HADLEY read a paper on "How can the fertility of a farm be kept up without purchasing foodstuffs and manures?" After traversing the cause of the agricultural depression, and mentioning the remedies which had been suggested for the same, Mr. Hadley, in his highly interesting and deeply thought out

paper, said he was not sure that Protection would be an unmixed blessing to them, and thought that, at the present prices of agricultural produce, a good deal of land could not be farmed at a profit if held rent free. He was of opinion that it was to self-help they would have to look to enable them to steer through the present bad times; it was this, he said, which had suggested to him the title of his paper. One thing was certain, they must make more of their produce than the prices they at present obtained, or they must curtail their expenses in order to make both ends meet. Alluding to the present prices paid for stock, he believed that, given a fairly good prospect of grass during the coming spring, they would see a considerable advance in the price of store beasts and sheep before long, for they must look in the future to stock in one shape or another, to sheep or cattle, to breeding, feeding, or milking, as the sheet-anchor of their industry. Nitrogen was, without a doubt, one of the most expensive fertilisers the farmers had to buy. Recent research and experiment had proved to demonstration that there was a way by which this vast reservoir of fertility might be tapped, and that one great family of plants, viz., the leguminous, had the power of absorbing nitrogen from the air and stowing it up in the soil for the use of succeeding crops. These included peas, beans, tares, all the clovers, trifolium, lucerne, sainfoin, lupins, which had the power, if supplied with the two other great elements of plant food—potash and phosphoric acid—of assimilating the free nitrogen of the the atmosphere and leaving in its roots stubble and decayed leaves for the future use of the succeeding crop. No others of the ordinary cultivated plants seemed to possess that power, but, on the contrary wheat, oats, barley, potatoes, turnips, all left the soil poorer in nitrogen. He considered it the very worst of economy to let any crop stand still for the want of manure it may need. Having given the practical experiences of eminent agricultural scientists, he said the result taught them that nature furnished them gratis with ample supplies of a perfect substitute for their own purchased nitrates, guanos, and oil cakes, and the lesson to be learned was that they must endeavour to grow leguminous crops as extensively as possible. By a careful rotation they might manage to grow nitrogen-collecting crops alternately with a nitrogen-consuming crop, taking care to give the former a sufficient manuring of potash and phosphoric acid to ensure a luxuriant growth. It was a well-established fact that all leguminous crops are particularly grateful for a dressing of stable manure. He further said that the following rotation would give a leguminous crop every alternate year, and would not be unsuitable for a good deal of land in this district (Sussex, Eng.): 1, oats; 2, clover; 3, wheat; 4, green crops (rape and spring tares, trifolium, and cabbage, winter tares and thousand-heads, or rape); 5, mangels, swedes, potatoes; 6, beans. This could be varied to suit different circumstances or soils by growing barley instead of oats, or peas instead of beans. This rotation would provide a large amount of stock food, the land would be kept clean and in good heart, there would be no two white straw crops following each other, and no fear of clover sickness, as clover would only occur once in six years. (1)

(1) Once in eight years is safer, as the East-Anglian farmers found out 50 years ago.—Ed.

### GROWING ROOTS: BY THE EDITOR.

(Continued.)

**Sowing the seed.**—This, if you have a proper seed-drill is simple enough, particularly with unsteeped seed. The The Mathews and the Planet Jr. are fitted with regulators for the distribution of the proper quantities of seed to the acre, but, as a general rule, they both sow too thin, so, we recommend that the feed-hole for mangel-seed be not used, but a larger hole. Experience will soon show you what size or number is the right one. In all sowings with American seed-drills, we should open the distributor a hole or even two above the one on the indicator, for they are all made to sow too small quantities.

The drills, before sowing, should be rolled with a light roller. To act regularly, it should not cover more than two drills at once, as when three drills are taken in, and one happens to be a little higher than the other two, the latter will not be rolled at all, or hardly at all.

If you have no seed-drill, a rut must be made, with the corner of a hoe, along the very middle of the rolled drill, not more than  $\frac{1}{2}$  of an inch deep; the seed is to be sown carefully by hand in the rut, and covered with a wide-toothed rake. The roller must follow as before. All seed-drills have rollers attached, so, when they are used, the second use of the regular roller is not needed, though on very light land, we prefer them, and heavy ones too. One year we trod-in our mangel-seed, after the second rolling, walking on the flattened surface of the drills—in moccasins; heeled boots would bring some seeds deeper than the rest—and a perfect plant was the result; in fact, with only 3 lbs. of seed to the acre, there was not a vacant space two inches wide all over the piece. We do not recommend so small a quantity of seed to others, as it is rather risky.

**Depth of sowing.**—If we could be sure of hitting it exactly, we should prefer  $\frac{1}{2}$  of an inch as the depth for depositing mangel-seed. A great deal depends upon the state of the land: the finer the tilth, the shallower the seeding; but among clods, it must go in deeper.

**Time of sowing.**—In this part of the world, mangels can hardly be sown too early. There is no fear of their going to seed. The last week in April or the first week in May, according to the season, will do very well, but after the 15th of May, we should sow swedes. Some wiseacre, in one of the States' paper, enquired, last month, if it would not be as well to transplant mangels: don't; for the work would cost more than the seed; besides, the majority of plants would probably run up to seed. One of the mysteries of nature is that, in Australia and, we believe, in New-Zealand too, the whole tribe of beets increase continuously in size during two seasons! How about the quality of the giant-roots?

**Horse-hoeing.**—The plants from the steeped seed will probably begin to show above ground about ten days from the time of sowing—sooner or later, according to the season; and it is on this account that we laid so much stress on the necessity of keeping the rows in the middle of the drills; for, if the rows are equidistant, the horse hoe can pass along between the drills without damage to plants, even if, here and there, there may be a yard or two of plants not up