

by the green matter in the leaves under the influence of sun light. The carbonic acid (carbon dioxide) enters the leaves through millions of tiny pores, mainly on the under side, and the green matter of the plant has the power to decompose it, taking the carbon and rejecting part of the oxygen which returns to the air to purify it for animal life. With this carbon, and the water taken up by the roots in which mineral matters are dissolved, the plant makes all the various substances which are used in its growth. The sap-water reaches the leaves through the tubular vessels of the leaf stalk, which are in direct connection with the vessels in the young sap-wood, and thence through the network of veins which traverse the whole leaf.

Leaves are arranged on the stem in several ways. When only one leaf grows on a node, the successive leaves beyond form a spiral, making one or more turns around the stem before another leaf comes exactly above the one at the beginning. This is called the alternate arrangement. When two leaves grow at a node they are on opposite sides, and the arrangement is called opposite. When more than two grow at a node they form a circle or whorl. The branching of a tree is governed by the leaf arrangement, for the buds that make new branches start in the axil or angle that a leaf makes with the stem. Therefore, if the leaf arrangement is alternate, the branches will be alternate, and if opposite, the branches too are opposite.

Leaves not only take in food from the air, but they also pass off or transpire into the air surplus moisture in the shape of invisible vapor, thus condensing the watery sap brought up from the roots. This evaporation of water is shown by the rapid wilting of leaves when the shoot is severed from its connection with the stem and roots.

Correspondence.

122 St. Lawrence,
June 9, 1894.

DEAR MR. JENNER FUST,

Yours to hand and am much obliged to you for the information about the not poisonous sheep-dip.

I have written this day to the Lawes Chemical Co. 59 Mark Lane for circulars and prices. I imagine it will never sell in any large quantity here, for as you know very few farmers wash their sheep at all. My experience with the average F. C. farmer is that he washes the wool after it is sheared, and that is about all he can be induced to do. The paragraph says it will protect horses from the annoyance of flies, if this is the case why would it not do to sponge cattle in the summer to keep off the "horn-fly"?

I presume it is some by-product of the distillation of Coal-tar, which is non poisonous and therefore not so dangerous as Carbolic Acid, derived from the same sources.

Believe me, Dear Mr. Jenner Fust,
Yours very truly,
HENRY R. GRAY.

Abercorn, June 4th 1894.

TO THE EDITOR OF THE
Journal of Agriculture.

Sir,—In your June number, under heading of "New York Farmer's Institutes Dairy Notes," which the questions of watering, feeding and stanchioning and dehorning cows were discussed, I should be glad to submit some ideas which I have found to be profitable, at least for one situated as I am; and I have no doubt that I have been in more farmers' barns in the last two years than any other man in Canada, consequently have had a wide field for observation, and in speaking for myself I speak from the standpoint of a farmer leasing his land, rather than the one that works his land himself. First, the question of watering the stock: my first idea was to put in running water, then I did not like having my cows kept in for months, and if cattle could be watered without turning out from the stall, the average tenant could and would pile up feed enough before them to last all day, and let them take care of themselves. Then, there would be

leans and Franklin, in the State of Vermont, having taken off nearly ten thousand pairs of horns in the last two years. Yours &c.,

J. S. SHEPARD.
Abercorn, Que.

We prefer having the cows in doors all the hard weather. No objection to their taking a walk on mild days, but the water should be always before them and of the same temperature as the stable. We never yet met with a good feeder who only fed twice a day. As for de-horning cattle, more experience is needed before we can decide *pro or con*.—EDITOR.

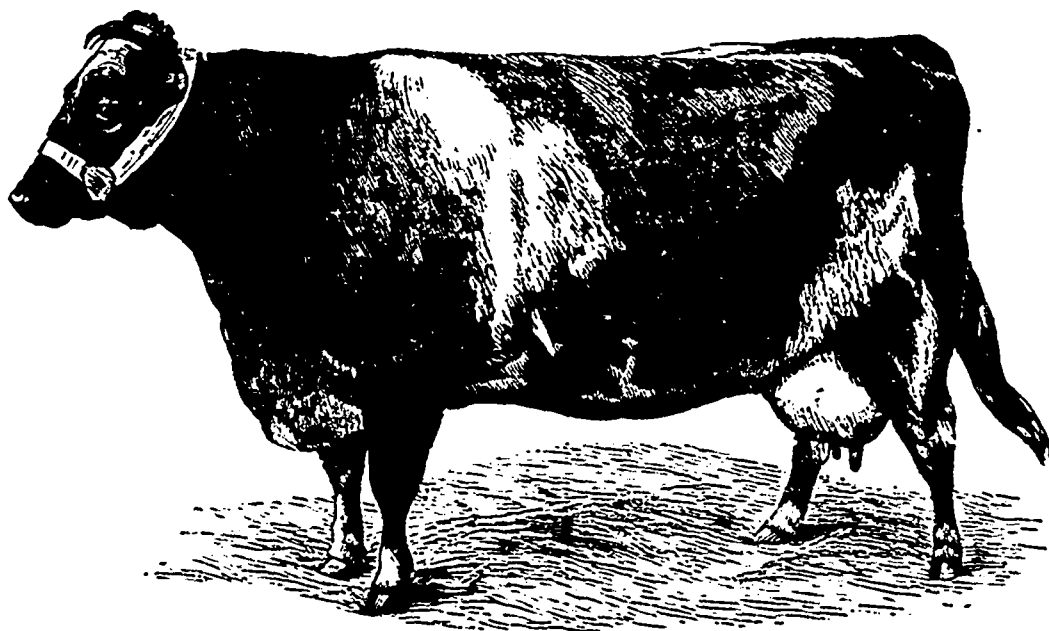
Danville, April 18th 1894.

A. JENNER FUST, Esq.,

Montreal.

Dear Sir,

I hope you will excuse the liberty I take in asking you for information. But I know of no one whose opinion I would follow sooner than yours. We have 25 acres of hill pasture-land



MILKING SHORTHORN COW VICTORIA. (First prize, London Dairy Show, 1890.)

more or less drip from the troughs, so I decided to bring water to the barn, on the sheltered side, have tight shuttling covers to the tank, and turn the cows out twice a day, giving a better chance to clear and litter the stable, &c., than when cows were in their places. Feeding twice a day I consider better in many respects and one in particular avoiding taking the light into the mow by careless farms hands or tenant early and late. Then came the question of stanchions: the rigid stanchion is an uncomfortable contrivance for a cow to pass much of her time in, but a good arrangement for milking purposes, so I attach a chain to the stiff stanchion, fasten the loose one back for the winter, so that in summer, when the cows come in, only at milking time, use the more handy stanchion again. A few years since I dehorned my dairy and young stock of between 35 and 40 heads having been convinced of its beneficial results in the West. I was prosecuted for so doing by the S. P. C. A. of Montreal, but I was able to convince them of the propriety of my so doing, and now my cows enjoy their semi daily trips out to the tank, which never skins over in the coldest weather under the close fitting cover. Since then, I have been over most of the District of Bedford, and adjoining counties of Or-

3 miles from home and not requiring it for pasture 5 years ago, we broke it up, put on 300 lbs. of "Victor" superphosphates and 50 bush-hardwood ashes per acre, sowed it to barley on the sod, and seeded it with clover and timothy, got a fair crop of barley and have had 4 crops of hay.

We have on hand, but cannot haul this season 200 loads of manure. We have it plowed and ready for a crop and intended manuring it and seeding as before, but cannot get the manure there. Now, what special fertilizer would give me the best crop of oats and leave the manuring and seeding down till another year. The land is good strong loam, the rock coming near the surface in spots, somewhat stoney, which we intend to pick off. As your reply through the Journal, will be to late to be useful, I would take it as a great favour, if you will write me

Yours Truly,
A. McCALLUM.

I advised a mixture of 200 lbs. high grade superphosphate and 120 lbs. of nitrate of soda to the acre, but fear the latter is too dear now to be profitable.

Ed.

Breeder and Grazier.

WARM STABLES AND HEALTH OF CATTLE.

EDS. COUNTRY GENTLEMAN — Mr. John Gould on p. 352 has an article under the above title that is of more than usual interest. Certain statements made therein are pregnant with suggestions and others call for discussion. Almost at the outset he states that "it may be well to inquire if, in some of this advance teaching of the care of the dairy cow, there has not been here and there a little too much of the 'hot-house' culture introduced. He then contrasts the method of keeping cows in warm well-ventilated stables with the old times "when cows were toughened by nature, fed hay at the stack," &c. I make no issue with Mr. Gould on the absolute necessity to profitable dairying of having cows well fed and cared for in well ventilated stables. It is only on the question of degree of warmth of the stables that in this day of 1894 a discussion may take place.

On this point the pendulum is certainly swinging toward the adoption of a lower temperature. It was but a few years ago when at the farmers' institutes and in the dairy columns of the agricultural press it was thought that, since warmth was good, more of it was better, and the stables should be kept at summer temperature during the cold weather of winter; June conditions must be maintained; the water must be warm to save the expenditure of heat to warm it, with the consequent waste of food; no exercise must be allowed, as every movement caused a loss of energy that should be devoted to milk production. In short, the necessary logical conclusion from the arguments and theories put forth

was that the true dairy treatment was to keep the cow at blood heat and well supplied with already partly digested food, leaving for her nothing to do but to lie still, digest, assimilate and secrete.

It seems to me that nature has taken this question of the regulation of temperature of the animal body largely into her own hands, and has supplied every cow with an unpatentable temperature-regulator. As soon as the thermometer in the stable comes up, the pores in the skin open, perspiration takes place, and the evaporation of water so transpired cools the system. When the temperature of the stable is kept habitually lower, the pores are closed, very much less perspiration takes place, and this source of loss is prevented.

Nature applies still another check on this elevation of temperature. When the stables are kept regularly warm, there is less appetite. With a diminished indigestion of food, there is more than a corresponding diminution of the yield. The tonic effect of cold air is felt not only on the skin, but sympathetically on the membranes of the stomach and intestines as well. All of the internal organs are excited to great activity by it, a larger milk yield results. The appetite is increased far beyond the increased requirement for the heat supply, and the surplus goes