into the milkpail. Moreover, we are still ignorant as to the details of the food metabolism in the body, and it may be that the heat developed by the oxidation of the waste products of the system, after all, is an incident rather than an end.

Several years ago, in fatoning a carload of steers in a warm but well-ventilated stable, we found it necessary to take out the windows on the south and east sides of the building, and allow the free passage of a current of fresh cold air through the stable, in which the dishorned steers were running loose, to prevent perspiration. Moreover, we could not get them to eat heartily untill we reduced the temperature of the stable, when their appetites became keen and their gains satisfactory.

During the past winter, it has been my pleasure to have under my control the feeding and care of several choice cow making large milk and butter records—one record of considerably over 100 pounds of milk and 3½ pounds of butter per day. Although the thermometer was below zero many nights in February, when the largest record was made, and on several days hardly touched 10° above during the day, still the cow was kept in a loose box stall, away from the heat of the regular stable, and with no protection from the severity of the outside cold but a board wall an inch in thickness with battened cracks, and with a loose door. The temperature in the stall, therefore, was below 20° for days at a time. Her feed consisted largely of roots and ensilage, with a grain ration of corn, oat, brand and oil meal. Note the results.

In this cold weather the economy of food was excellent, as a pound of butter fat was yielded for every 15.9 lb. of dry matter consumed; while in the warm spell following, the consumption of 17.9 lbs. of dry matter of identical composition was required to produce a pound of butter fat. In the week ending Feb. 27, for instance, the cow consumed 331.09 lbs. of dry matter, and yielded 19.74 lbs. of butter fat, or 16.7 lbs. of dry matter to a pound of fat. For the week ending March 6, the dry matter consumed was 320 55 lbs., and the fat yield was 20.05 lbs., or 15.9 lbs. of dry matter to one pound of butter fat. For the week ending March 13, a warm week, the dry matter consumed was 342.67 lbs.; the fat yield was only 19.04 lbs., requiring 17.9 lbs. of dry matter per pound of fat yielded. During the following warm weeks, ending March 20 and March 27, the pounds of dry matter required per pound of butter fat yielded were respectively 19.1 and 18.4; while in the cold week ending April 10, she required but 16 lbs. of dry matter to make a pound of butter fat. The per cent. of fat was determined by duplicate test with the Babcock test. The weight of the cow gradually increased during this time.

For sake of comparison it might be added that, in the dairy test at the world's fair, with all the advantages of a barn surely warm enough, the best combinations of feed that the best skill in the country could suggest, and with the best herd of Jersey cows that the world has ever seen, it required 19 1 lbs of dry matter for every pound of butter fat yielded, while our record was made by a despised Holstein, in the dead of winter, in a cold shed.

The limitation of space does not permit further discussion of theory or the quotation of additional facts; my sole purpose in discussing this matter at all is to suggest that undue importance may have been attached to the necessity of warmth in stables. What a cow needs first is plenty of feed, and next, and of equal value and importance, is plenty of fresh air. The chemical action involved in the transmutation of over 50 lbs. of dry matter in 24 hours into 11 or 12 lbs. of the total solids in the milk in the instance above quoted, is something enormous, and necessitates the supply of abundance of oxygen. The burning up and disintegration of so large an amount of material in the formation of this 11 or 12 lbs. of milk solids per day necessarily evolves a large amount of heat.

May we not consider this evolution of heat as a necessary attendant upon the formation of this large amount of dry matter in the milk, and not at all an end in the consumption of feed? The consumption of this amount of food was necessary to furnish the material for the total solids in the milk and the heat evolved by the chemical actions taking place in the formation of the milk solids, and must be amply sufficient to keep up the heat of the body, even in the coldest stable.

It seems to me that our feeding theories have been partly wrong in this matter in the past, and the question is of great importance.

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OUR ENGRAVINGS.

The two "Dairy-Shorthorns" cows are really portraits, and are good specimens of their sort. This is what we mean when we speak of the regular "Farmer's Cow." Anything meaner than the miserable things shown at Chicago it would be hard to find.

PREPARATION and EMPLOYMENT OF INSECTICIDES AND FUNGICIDES.

Bouillie Bordelaise is composed of

Sulphate of copper (blue vitriol)	4 to 6 pounds.
Quick lime	4 "
Water	40 gallons.

To prepare it, take 4 lbs. of sulphate of copper, in powder, and dissolve it in a gallon of hot water in a wooden tub (no iron vessel must be used, as the sulphate would attack it). Four pounds of lime are to be slaked in water sufficient to make a clear solution. This solution, or milk of lime, is to be passed through a sieve or a piece of sackcloth that will keep back all the lumps. When the two liquids are cool (the cooling may be hastened by adding to the sulphate of copper solution a few gallons of cold water), the milk of lime is to be poured into the solution of the sulphate of copper, stirring continually with a stick. Then, water is to be added until there are 40 gallons in all. Every time this is to be used, the mixture is to be stirred up, and the tub must be covered to prevent any dust or dirt getting in to it.

To use this, on the leaves, a pulverizer (sprayer) should be used; but, if there is none, a watering-pot, with the rose pierced with very fine holes, will do. There are several kinds of sprayer for sale, but the handiest is a force-pump fixed in a cask on wheels, drawn by a horse across the field.

The Bouillie Bordelaise is an excellent *fungicide*, i. e., it will hinder and destroy the growth of parasitic fungi, such as the rust and rot of the potato, the scab and black-knot of fruit-trees, &c.

Bouillie Bordelaise and Paris-green. As Paris-green is the best of all insecticides, especially for the potato-beetle, the apple worm, &c., it is often used in conjunction with the bouillie Bordelaise:

To make the mixture, dilute ¼ lb. of Paris-green with a little water so as to make a thick paste, to be subsequently added to the 40 gallons of Bordeaux mixture. No better fungicide and insecticide than this can be made.

During its application to the leaves of plants, the mixture must be kept in agitation — good sprayers are furnished with an automatic agitator,—for the lime and Paris-green quickly sink to the bottom unless the mixture is constantly stirred.

Petroleum-emulsion. — This insecticide, very much in use against lice, caterpillars, *tigres sur bois*, the parasites on animals, the horn-fly, &c., is thus compounded:

Petroleum—coal-oil	2 quarts.
Common hard-soap	2 oz.
Water	7 gallons.

The soap is to be boiled in a quart of water till dissolved, and the boiling solution poured into the petroleum, and, with a syringe or a force pump, the mixture is to be agitated for 5 minutes: when it looks like cream, 27 quarts of water are to be added to it. This petroleum-emulsion is to be scattered over plants and animals by the pulveriser.

Pyrethrum-powder.(1)—This powder answers best when used in a dry state. It is generally mixed with 4 times its weight of flour and the mixture should be kept in a tightly covered jar. Kills caterpillars, particularly the cabbage-caterpillar, and is very useful in cases when it would be dangerous to use Paris-green; for instance, on vegetables and fruit a short time before they will be used. It poisons insects, but is, practically, harmless to man. To apply it to the crops, a bellows with a reservoir is used; this can be got at any seedsman's.

White-hellebore.—A poisonous vegetable insecticide, made from the roots of *veratrum album*, reduced to powder. Used in the same cases as advised for pyrethrum, where Paris-green would be hazardous. Applied as a dry powder or mixed with water at the rate of 1 oz. to 2 gallons. But the best way is to make an infusion to be poured round the roots of cabbages, radishes, turnips, &c., to kill the grubs that attack these plants; ½ lb. of hellebore to 2 gallons of boiling water.

Solution of sulphate of copper.—Dissolve 1 lb. of the sulphate in 24 gallons of water. This fungicide is used to destroy parasitic fungi, such as the rust, the anthracnose on haricot beans, the scab, and other fungoid diseases of the raspberry, pear-trees, apple-trees, vines, &c.

It is also useful for seed-grain; place the grain, in a bag, in the solution for a few hours, say 12; then, take it out, soak it in lime-water for 5 minutes, and let it dry before sowing.

Eau céleste (*heavenly water*).—This fungicide is thus made: 1 lb. sulphate of copper, 1½ pints of ammonia and 22 gallons of water. Dissolve the sulphate in about 2 gallons of hot water, and, as soon as cool, add to it 1½ pints of ammonia, then add water enough to make two gallons. Used like the following:

Ammoniacal solution of carbonate of copper. A mixture highly recommended against the fongous diseases of fruit-trees, such as the mildew of the vine, gooseberry, the scab on apple- plum- cherry-trees, &c., and the rust of strawberry-plants.

This solution is made of copper, ammonia, and water, thus: Dissolve 3 oz. of carbonate of copper (1) in one quart of ammonia, and where it is required for use, pour it into 25 gallons of water

Sulphuret of potash. — A fungicide against mildew in gooseberries and the rust in strawberry-plants. A solution of 1 oz. of sulphuret of potash in 2 gallons of water.

Paris-green.—An arsenite of copper, containing 50 to 60 % of arsenic. A very virulent poison, to be always kept under lock and key. A remedy against all sorts of insects, particularly mandibulars or gnawers. If given too strong, the leaves will be injured. To be used dry, or mixed with water. If dry, mix with from 50 to 100 times its weight of plaster, wood ashes, flour, or slaked lime, and scatter it over the leaves of the plants.

In a liquid form, to be used with the sprayers, take 1 lb of Paris-green and mix with 200 gallons of water; but, if the foliage is tender, as in plum - and cherry, trees, use *250 or 300 gallons.* As this green powder is not soluble in water, it is wise to make a thick mash (*pap*) with it and a little hot water before a adding it to the bulk of water. In using this insecticide, it should be pumped out forcibly itso as to drive into every cranny of the plant, but change the direction of the shower as soon as the leaves begin to drip. When you find a difficulty in getting these liquid mixture to stick to the leaves of some plants, such as cabbages, &c., add a little soap to the compound: it will make it stick to the leaves.

Solution of corrosive sublimate. — This is prepared by disolving 2¼ oz. of corrosive sublimate in 2 gallons of hot water, and 10 or 12 hours afterwards, adding 12 gallons of water. *Scab in potatoes* is cured (or rather prevented) by immersing the seed in it for an hour, a short time before planting. A virulent poison.

Alkaline solution.—This solution, recommended by Prof. Saunders, of the Ottawa Experiment, farm, is made by mixing a strong solution of washing-soda with soft-soap enough to make a pap. Instead of soft-soap, hard-soap, melted in a little boiling water, may be used. Applied to the trunks of trees, with a coarse brush, it forms a tenacious coating that kills the gnawing caterpillars, and gives vigour to the tree.

ATTENTION.

Remember that most of the insecticide and all fungicides are poisonous!

Put tickets on all poisonous matters, and put them out of the reach of animals, fools, and children!

Never put compounds of copper into *iron vessels!*

Do not continue the dressing on fruit-trees the fruit of which will be fit for use in 3 or 4 weeks!

Make trials on a small scale, if you are afraid the foliage will suffer from the dressing!

Never dress trees when in bloom!

H. NAGANT,
Assistant-Rédacteur du Journal d'Agriculture.

Québec May, 1894.

(*From the French*)

(1) This can be had at any druggist's. At Quebec, it is kept by J. E. Livernois, St. John's Street, price 45 cts. a pound.

(1) Carbonate of copper is easily made, thus: dissolve, apart, 1 lb. of sulphate of copper in 2 quarts of hot water, and, in another vessel, 1¼ lb. of washing-soda in 2 quarts of water; pour the second solution into the former, stir hard, and allow the mixture to rest for 5 or 6 hours, to allow the carbonate of copper to completely subside to the bottom of the vessel; decant the clear liquid, and you will find about 8 oz. of carbonate of copper, ready for use.