CARING FOR MACHINERY.

Never in the history of Canadian Agriculture has there been a greater need of retrenchment of expenses along every line connected with farming than at the present time.

In travelling throughout the whole Dominion one is everywhere met with the cry of "hard times" among the farming communities, and the question is often asked: "What are we to do to make farming a paying business?"

A great many answers are suggested for the solving of the difficulty, and there are none more important than those advocating economy as much as possible. The assertion may be freely ventured that farmers, as a rule, practise less economy in the care of agricultural implements than in any other line on the farm.

How often we find implements of all kinds left exposed to the inclemencies of the weather during the winter months, in the exact spot where the workman left off work the last day!

The plow is often left beam deep in the soil for four months of the year, and, other times, dragged into the nearest fence corner, and there left still more exposed. The iron harrows are piled leaning against some fence; the cultivator in the corner of the turnip field; the hoes, hanging on the fence at the end of the last row; the self-binder drawn under some tree half the size of itself, being partly shaded from the morning sun, but getting full benefit of all the showers and the sun in the afternoon, and the wagon left along the lane fence, where it is covered with snow during the greater part of the winter.

In this short article, only the care of tillage implements will be spoken of, as most certainly the management and care of strong tillage implements must differ somewhat from that of barn machinery, which is always under cover, so that neither suffers from the same dangers, nor can it be treated in quite the same fashion, as that which is constantly exposed.

All strong tillage implements undergo a certain amount of unavoidable wear in the performance of their work, and, sooner or later, must give way in some part or other, but a great deal of the deterioration from other sources may be avoided.

The wearing and deterioration, as spoken of, of farm implements that may be regarded as unavoidable or reducible by adequate care, are chiefly due to the action of atmospheric agencies, which have played such an important part in the physical, as well as the life history of our globe. Air, moisture and change of temperature act with as much persistency in destroying implements and machinery as they have done in the disintegrating of rocks and converting them into fruitful soils.

One of the most active of the agents is the oxygen of the air, which causes the so-called rusting of the iron and steel. Rust is the result of a process of oxidation. The oxygen of the air attacks the iron part of the implements and converts it into "hydrated sesquioxide of iron," or iron rust, and thus the substance and strength of the implements are gradually worn away. The corroding oxidation occurs only in the presence of damp or moisture, iron, in its ordinary state, being unaffected by dry air.

The new combination remains in a state of loose cohesion and readily rubs or scales off the surface of the metal. The laborer, who is ignorant of the above facts, becomes accustomed to the appearance of rust, and does not feel that it can do any real mischief. But the action of rusting, though apparently slow and slight, is none the less sure and none the less detrimental; and it cannot be too well realized that its presence indicates the operation of a constant foe to all iron implements. Just as, in the human subject, the painful disease of cancer cuts into the flesh of its victim, and gradually saps away his vital force, so the rusting goes on continually, and, sooner or later, its wasting action diminishes the efficiency of the strongest machine. Under constant exposure to its operations the thickest plates grow slowly thinner, bolts are weakened, screws become unworkable, the several parts no longer act harmoniously; and, at length, with some final jerk or strain, the catastrophe is reached, and the implement is unexpectedly found to be worn beyond repair.

Such a breakage of an implement or machine, during working hours, is commonly spoken of and considered as a misfortune, like bad weather, at which the farmer feels, perhaps, aggrieved at Providence, but for which he does not think himself in any way personally responsible. The view is false. Breakage of implements at work is usually like a stroke of paralysis in man, the final result of a gradual process of destructive weakening that has ultimately reached its point of culmination.

In nearly every instance the unexpected accident might have been foreseen and avoided, for it has been the direct and natural consequence of a gradual waste that has secretly impaired the power of the implement, and has rendered inevitable a break-down, which otherwise might have been long averted.

The effects produced on implements by alternations of temperature are by no means so generally understood as the action of air and moisture. It is, however, well known that metals expand when exposed to heat and contract when exposed to cold. In the same metal the expansion and contraction is always in the same ratio, but it is not the same in different substances. Thus, untempered steel has a lower co-efficient of expansion than cast iron, and the latter a lower than wrought iron. Pine wood has only about one-half the expansion of wrought iron, while that of the latter is considerably exceeded by copper, brass, tin, and still more by lead, which has an expansion nearly five times as great as that of pine wood.

Now, when an implement is left in a field or an open yard, exposed to the heat of the noonday sun in summer and to the keenest frosts of winter, its parts undergo this alternate contraction and expansion to the utmost degree that the range of four temperatures permits. Should the implements be constructed of the same material throughout, the expansion and contraction would be uniform through the whole body. But should the implement be made of two or more substances, as is the common combination of wood and iron, the exposure to these extremes of temperature is more liable to be attended with injury. The wooden sections expand and contract in a different ratio from the iron; the harmony of the parts is disturbed, undue pressure of one part may be caused by the extra swelling, and undue looseness of another by the greater shrinkage. When the implement has recovered its normal temperature there is every likelihood that the firmness of its adjustments may be found somewhat impaired, and will succumb more readily to the strain of working. The repetition