

Horticulture.

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On Practical Climatology.

"The want of a perfect and simultaneous system of meteorological observations has long been felt by individual observers. The climatology of so vast an extent of territory must surely influence man's present happiness and future destiny; but a perfect and unbroken cord of observations taken at the same hours has, up to the present time, not been attempted. This cannot be owing to its want of importance, for it has a direct bearing on the health of individuals, on agriculture, and on the wealth and commerce of nations."

The above remarks, written in 1866 by Arthur Harvey, Esq., for the "Year Book" of 1867, are still in force, little or nothing having yet been done by either individuals or agricultural societies to further the science in Canada. Some regrets are also expressed in the Report of the Department of Agriculture of the United States for 1870, just issued, in which the writer, André Poey, late director of the Observatory at Havana, says: "A division of meteorology should be established in connection with the Department of Agriculture." This gentleman, in a very able and practical article, gives much useful information in a condensed form, with excellent suggestions for future observations, and regrets that although stations are established for observations under the direction of the War Department, these observations will only have a partial and indirect bearing on agriculture.

The observatories of Quebec, Montreal and Toronto, give the state of the barometer, thermometer, rainfall, and direction of the wind, daily throughout the year, and in some other countries these observations are carried on with much more detail than here. In England, for instance, by walking into the Exchange in Liverpool, you may see the direction of the wind, the state of the weather, if cloudy, sunshine, or rainy, at fifty different points in the United Kingdom and on the continent of Europe, all telegraphed up to the latest moment. These observations are of great utility with regard to shipping and commerce; but in a country like this, where the climate varies in every degree of latitude as well as longitude, it would be of the utmost importance to agriculture if some means could be taken to have an accurate register at least of the thermometer at all inhabited points, at distances of not more than fifty or sixty miles apart, and also of the rain and snow fall, with the date and depth of the first three falls of snow, and the number of days it covers the ground during winter. At present the only practical idea of the climatology of this country with regard to fruit

culture is to be gained by carefully watching the birds which inhabit the various sections of the Province, and the date of their appearance and departure.

The writer having lived for many years near London, Ont., has noticed that many kinds of birds found there in great abundance are never met with in this vicinity (Ottawa) by any chance. Amongst these I may mention the quail, the meadow-lark, (*Sturnus ludocianus*), and the bluebird (*Sylvia sialis*). I am unable to account for the reason why the two latter do not reach this section, being birds of passage, and our summers are as genial as those further west; but I suppose the food they prefer is not found here in sufficient quantity to entice them to our more northern region. Perhaps some of our naturalists could throw light on this subject, and I for one should take it as a great favour if the cause was made known. The insect life required for the blackbird, who feeds principally on Coleoptera caterpillars, spiders, and other insects, and ripe fruits in their season, may be extinguished by the rigour of our winters, and the small amount of cereals grown here may possibly be the reason for the non-appearance of the meadowlark.

I am not surprised at the absence of the quail, because even as far west as the township of Warwick—30 miles west of the City of London—these birds are frequently decimated by being smothered in the drifts which form along the snake fences. Here, where the snow lies for three months at a half on the ground every winter with the greatest regularity, they could not possibly obtain sufficient food to support life.

Prairie fowl are sometimes shot as far east as Walpole Island, on the St. Clair River, but in no other part of Canada. Again, Ptarmigan, I believe, are not found to the west of Quebec. Chipmunks and red squirrels, which lay up stores for the winter, are found here in great numbers, but the black squirrel, who obtains his food from day to day in the woods, is never met with, although exceedingly plentiful in the western part of this Province, where acorns and beech-nuts, upon which he principally lives, are found in great abundance. This fact shows that our snows are too deep, and the time of their remaining on the ground of too long duration, for him to gain a livelihood. It is also found that although we have sufficient summer heat to ripen the peach and the grape, and I have no doubt the fig also, our winters are so severe that, without some mode of artificial protection, these varieties of the vegetable kingdom cannot support life through it. The Lawton blackberry has not yet been successfully established, and some other plants require unusual care to keep them from being killed by frost. The apple also, from some cause, has become a partial failure, and orchards, which are seen on nearly every farm from Bowmanville to Windsor, are

rarely met with in this neighbourhood, although apples are successfully grown upon the Island of Montreal. I am not yet fully prepared to say that this is the fault of frost. I am more inclined to think that sufficient care is not bestowed upon the trees, and that they become a prey to borers and other insects; but I intend giving this subject my best attention. Although the climatic changes range from 96° in the shade in summer to 40° below zero in winter, and are destructive to many of the finer fruits, I am still in hopes the apple, our greatest stand-by, may yet be grown in reasonable abundance.

It does not appear that we are freed from the insect pests which prey upon the fruits of the west on account of our long cold winters. It is true we had not the Colorado potato beetle last summer, but we expect him next. We had three days and four nights last winter during which the thermometer did not at any time rise above 7° below zero, and the lowest touched during that period was 37° below zero. I thought this would have touched the currant-worm or sawfly, but he appeared rather to like it, although the exceptionally cold spring made him hatch out later than usual. When he did appear, he was very persistent in his attacks, and required looking after until the end of August.

I believe, as a rule, we have more inches of frost in the ground than is found about Quebec. This is owing to the snow falling earlier there, which keeps the soil from freezing, and digging may sometimes be performed after clearing away the snow in the middle of winter. Some interesting experiments might be made by burying potatoes at various points in similar soils at different depths, and watching in the spring to observe the lightest covering of soil that would protect them sufficiently to enable them to sprout. Such experiments as these require co-operation throughout the Provinces.

I am now trying some experiments with the peach, the tenderest of our fruits. I have about twenty seedlings this year from the stone. I have taken up most of them, cut off the tap roots, and pruned the tops pretty severely, and laid them in a trench. In the spring I shall plant out, leading the roots in two opposite directions from the stem. Next autumn, by digging away the earth at the two sides, where no roots are planted, I expect to be able to throw the young trees over on their sides into trenches, and burying them up, having first gathered the branches close along the stem. But I do not intend to let my experiments at defeating Jack Frost rest here; I propose also growing some on the "souch," cutting off the tree a foot from the ground, and burying the branches which radiate therefrom during winter; and my third plan is to grow on the French cordon system, leading two branches eight inches from the ground along a wire. These arms may also be covered with earth, leaves, or some other protection. I am looking forward with no little interest to the report of the Fruit Growers' Association on the Eumelan grape, which has been distributed over the greater part of Canada; here it was killed down to the snow line where unprotected. This report will give the best essay we have yet had in this country on practical climatology.

P. E. BUCKE.

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