

proceeds so fast that by one or two o'clock in the morning its immediately available supply of heat is exhausted and the overlying air falls below the freezing point. The presence of a greater amount of moisture in the air will prevent this rapid dissipation of heat, and one of the means of insuring the presence of this moisture is by constructing wind-breaks in the form of rows of trees in order to retain the damp atmosphere over the fields rather than to allow it to be replaced by the drier air of the plains.

Smudges, the smoke from which on those quiet, bright nights will settle down over the land, would doubtless also have a very beneficial effect in hindering the occurrence of frosts.

The breaking up and tilling of the soil will also have a great effect in ^{Breaking of the soil.} reducing the diurnal variations of temperature. The direct rays of the sun during the day do not raise the temperature of ploughed land as high as that of the unbroken plains, but they warm it to a greater depth, a fact which may readily be observed in walking across the drier plains on a hot day in summer. The dry sod, covered with short withered grass, will be felt to be very hot, but if ploughed land is reached, the ground will at once be found to be much cooler. By taking a spadeful of earth from the two places the lower part below the sod will be found to be very much cooler than that under the ploughed land. The effect that this will have on the night temperature of the air will be that the radiation of heat from the ploughed land will be much slower than from that which is unbroken, but which is practically bare on account of the withering of the short grass. The temperature will be lowered comparatively slowly, and while in the latter case a frost might have set in at four or five o'clock in the morning, in the former the air will be kept above freezing point till the sun rises again.

But to return to the alluvial Lake Dauphin plain, the surface is so level or evenly sloping that lakes or ponds are very scarce, but plenty of good water can easily be obtained in wells ten to fourteen feet deep. In ascending from the lake to Riding Mountain, the surface rises by low steps to the foot of the more abrupt escarpment. The steps are occasionally replaced by ridges of rounded gravel, both the steps and ridges representing old shore lines of the ancient lake which formerly occupied the whole of the basin of Lake Winnipeg and the valley of the Red River, a lake the former existence of which was first clearly pointed out by Prof. H. Y. Hind in 1850 and which was afterwards named by the late General Warren, Lake Agassiz, in honour of Louis Agassiz, the first great exponent on this continent of the force of glacial erosion and of the former distribution over the northern portion of America of a great ice-sheet in glacial times. The full comparison of these ancient shore lines with the shores of the present adjoining lakes must be left to the final report on this area.