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**Physiography of the Area.**

The territory covered is that part of the State lying north of a line from Green Bay to the mouth of the St. Croix river, with the counties of Portage, Wood, and Jackson as southern projections; it involves 27 counties with a total land area of about 18.5 million acres or about 53 per cent. of the entire State, and contains almost all of the present supplies of lumber sized timber of both pine and hardwoods remaining in Wisconsin.

*Topography.*—Over 90 per cent. of this territory is a broad slope, which rises gently from the southeast, south, and southwest to a flat divide running near to and parallel with the south shore of Lake Superior; about 9 per cent. is occupied by the more abrupt slope from this divide to the lake.

In going from east to west, the divides between the several large rivers which drain the larger slope, are very gradual, almost imperceptible, and in some cases are entirely lost in labyrinths of lakes and swamps. Hills over 300 feet high from their base are scarce; a few "mounds," or isolated steep hills with extremely narrow bases, rise out of the sandy plains of Jackson and Clark counties and a few larger, more massive hills occur in the valleys of the Wisconsin, Chippewa, and St. Croix rivers and a range of low, broad hills form the crests of the Iron and Copper ranges. On the whole, however, the hills and hilly tracts do not occupy over 5 per cent. of the total area, while about 45 per cent. is level upland, and about 50 per
SOILS.

cent. is rolling country, of which a considerable portion is steeply rolling, "kettle," or "pot hole" land.

Soils.—The greater part of this area is covered by deep grayish clay and loam soils, bearing everywhere a forest of mixed hardwoods, or of hardwoods and conifers. A narrow belt of fertile "red clay" lands skirts Lake Superior and is stocked with a unique mixture of conifers and hardwoods, remarkable in the species which are associated and resembling more the regular pinery of the sandy lands than the mixed woods of the loamy soils. A very variable mixture of loam and sandy loam overlies the land about Green Bay, also parts of Chippewa, Dunn, Barron, and Polk counties. About Green Bay this land bore a very heavy forest of pine with a fair mixture of hardwoods; in the western counties part of it was openings and part bore heavy pine forests. Throughout this area the presence of sand is indicated by the characteristic white birch. Sandy lands, continuous with the sands of Waushara, Adams, and Juneau counties, form the southern edge of this district through Portage, Wood, Jackson, Clark, Chippewa, and Dunn counties. These sandy lands are either oak and jack pine openings, i.e., brush prairies scatteringly covered by low brushy oaks and dense groves of small jack pine, or else the were regular pinery covered by a dense stand of valuable pine, without hardwoods.

Within the large loam land area there occur three islands of sandy soil rather well defined, and in most places sharply marked. One of these, the "St. Croix Barrens," extends in a belt 10-20 miles wide from the northwest corner of Polk county to the peninsula of Bayfield; the other a V shaped tract with its southern apex near the junction of the Tomahawk and Wisconsin rivers and occupying the greater part of Oneida and Vilas counties, and the third a broad belt like the first, extending from the Menominee river to about Lake Shawano and occupying the central part of Marinette and a broad strip through Oconto and part of Shawano counties.

In the aggregate the four several sandy districts occupy over one-fourth of the entire area under consideration; they are gen-
erally pine lands proper, being covered with dense and almost pure forests of pine, both white and red (Norway) and only in small part stocked with jack pine. The grayish to reddish-gray soil and subsoil of these sandy areas are not generally differentiated. They are usually of great depth, of medium to fine grain and over more than two-thirds of the area contain sufficient clayey matter to deserve the name of loamy sand. These soils support a luxurious growth of pine, but are unsuited to hemlock and hardwoods, which latter are represented only by the white birch, poplar, aspen, and some stunted maple. The most characteristic plants of the cut-over lands of these sandy areas are the jack pine, scarlet oak, and sweet fern, while the white birch is common to all loamy sands but does not thrive on the poorest soils.

The districts of sandy loam before mentioned occupy about 15 per cent. of the total area. They border, for the most part, on the sandy lands fringing this territory on the south, and are mere modifications of the same. The soil in these districts though generally quite fertile is extremely variable, quite heavy in places, often very sandy, and is covered in numerous small and large patches by layers of black muck which greatly increase their fertility. The soil and subsoil of the large body of gray loam and gray clay lands are usually more or less well defined and generally there is found a small amount of humus cover. In most localities the subsoil, especially of all knolls, etc., is mixed with gravel, which occurs either in layers of irregular thickness and distribution or else is mixed promiscuously through the ground. Generally, too, stones or boulders of large size (4 inches to 50 inches) occur both on top and in the ground, which though quite abundant in places do not on the whole, interfere with agriculture, but are even regarded as an indication of good land. The mixture of gravel and loam or clay is extremely variable and in places sufficient sand and fine gravel appears on the surface to make a soil classification quite difficult.

These general outlines will require much modification in a
detailed description. Strips of sandy land follow up the rivers, especially the Wisconsin and its tributaries, small islands of loamy soils occur in all three of the large sand districts, while patches of heavy clays and lighter gravelly soils occur in all portions covered by gray loams. The swamps include all poorly drained tracts, either stocked with tamarack, cedar, spruce, or bare grass marshes and moss bogs. They occupy nearly 12 per cent. of the area. They have for the most part a clay bottom, and furnish a good soil, especially suited to hay crops.*

Grouping the land from the farmers’ standpoint, it would appear that about 20 per cent. of the area is good farm land, about 40 per cent. medium, while nearly 40 per cent. is either not at all suited to farming or only doubtfully so and should by all means be left to forest. In such classification great divergence of opinion naturally prevails. Most estimates increase the proportion of good farm land at the expense of the medium land, but we have preferred to adhere to the above conservative classification.

*Climate and Drainage.—The climate is cold, the winters are long, springs almost wanting, summers short but warm and the fall long, cool, and delightful. To illustrate the climate it may be said that the black walnut and hickories are wanting, the timber oaks, both white and red oaks, are replaced by birch in all but the southern and southwestern part of this territory. Corn is raised with difficulty except in the south and the drier western part, while fruit trees, even apples, do not prosper in the greater part of North Wisconsin. The precipitation over the State is about 32 inches per year of which 60 per cent. falls in summer and autumn. The territory under consideration is well supplied with streams and has a far better drainage than is generally supposed.

*For a fairly accurate account and map of the soils of this state see the account by Prof. F. H. King in the Settler's Handbook of Northern Wisconsin, by W. A. Henry, Dean of the College of Agriculture, University of Wisconsin, Madison, 1895.