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and the University of Wisconsin College of Agriculture

SOIL SURVEY
OF
SAUK COUNTY, WISCONSIN

BY

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COUNTY SURVEYED

Sauk County is in the south-central part of Wisconsin. The southernmost part is about 45 miles north of the Illinois State line. Baraboo, the county seat, is a little more than 30 miles northwest of Madison. Wisconsin River forms the southern and extreme northeastern boundaries of the county. The county comprises an area of 842 square miles or 538,880 acres. The extreme east-and-west length is 36 miles and that north and south is 34 miles.

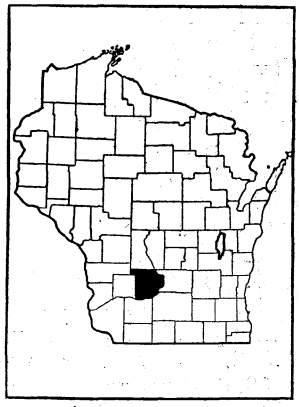


FIGURE 1.—Sketch map showing location of Sauk County, Wis.

The western three-fourths of Sauk County is in the unglaciated region of southwestern Wisconsin. This part of the county is therefore, for the most part, a well-dissected upland with rather deep valleys, in places bounded by short, steep slopes, with many conspicuous ledges of bedrock. The eastern part of the county was glaciated. The surface here is more subdued, and the features of relief are in part constructional. There are broad terraces along Wisconsin River.

The most conspicuous topographic feature in Sauk County is the Baraboo Range, which extends east and west. Its width ranges from 5 to 10 miles. The eastern half stands from 400 to 800 feet above the near-by plain and the western half only 100 or 200 feet above it. The range is rather flat topped, and its surface is at the same level as, or slightly above, the ridges of the western part of the county. The highest point in the range is 1,620 feet above sea level, but the altitude of the greater part of it is from 1,200 to 1,400 feet. The general elevation of the county ranges from 775 to about 1,000 feet.

The Baraboo Range has been fashioned by erosion into three topographic divisions: (1) A broad flat-topped south range sometimes spoken of as the Baraboo bluffs; (2) a narrow, interrupted north range, lower than that to the south and connected with it at both the eastern and western ends; and (3) a canoe-shaped, intermediate lowland from 400 to 800 feet lower than the north and south ranges. The north range is interrupted by five stream gaps and the south by one. Of these northern gaps, three are now occupied by stream valleys and two are drift filled, as is also the one large gap in the south range, now

occupied by Devils Lake. Besides these six transverse gaps, the north and south ranges are notched on both sides by a number of short, deep gorges.

Another important topographic feature of the county is the Wisconsin River terraces and glacial outwash plains. These are most pronounced on Webster Prairie in Delton Town, in Prairie du Sac Town, and on the terrace lands in Spring Green Town.

Sauk County lies entirely within the drainage basin of Wisconsin River. All parts of the county are reached by streams which afford outlets for the drainage waters. In some swamps and bottom lands drainage is difficult, but as a whole the county is well drained. In some of the marsh areas drainage ditches have been dug and a small part of the land improved.

The Indians directly and historically identified with Sauk County were the Sacs (Sauks), Foxes, and Winnebagos. Agriculture in this area began in 1746, when a band of Sac and Fox Indians was driven from the Green Bay region by the French and established itself on Sauk Prairie, where corn, beans, melons, and other crops were grown.

This settlement was an important trading center. The first settlements by white men were made in 1838 at the present site of Sauk City and at the south end of Sauk Prairie. In 1838–39 a settlement was made at the present site of Baraboo. In 1840 German settlement began. In 1839–40 Sauk County was formed from parts of Crawford, Portage, and Dane Counties.

In 1856 the Chicago, Milwaukee, St. Paul & Pacific Railroad was built through the southern part of the county, and Spring Green was established and laid out. The Chicago & North Western Railway through Baraboo was built in 1871–72. Sauk City was founded in 1854. The large hydroelectric plant at Prairie du Sac was begun in 1911.

The population of Sauk County in 1880 was 28,729 and in 1920 was 32,548. Only a small percentage of the inhabitants are foreign born. In 1920 Baraboo had a population of 5,538.

The Chicago & North Western and Chicago, Milwaukee, St. Paul & Pacific systems furnish adequate railway transportation facilities. There are many miles of graded highway, and many of the roads are crowned with gravel or crushed rock or are surfaced with concrete. The mileage of hard-surfaced roads is increasing each year. Rural free delivery reaches all parts of the county, and the telephone is in use in most country homes.

CLIMATE

The climate of Sauk County is favorable to the production of most general farm crops adapted to the region. The summers are short and cool, with an occasional very hot day, and the winters are long and cold. The average date of the last killing frost is April 20 and of the first is October 11, and the latest and earliest recorded killing frosts occurred on May 5 and September 16, respectively. This gives an average frost-free season of 174 days, which is sufficient for maturing the crops grown.

The average rainfall of 29.39 inches is well distributed. The greatest precipitation occurs in summer, during the growing season, and the lightest in winter. The low evaporation makes the rainfall as

effective as much higher precipitation in areas where the rate of evaporation is greater. The low winter precipitation causes virtually no leaching of fertility from the soil and no erosion.

Table 1, compiled from records of the Weather Bureau station at Prairie du Sac, gives the normal monthly, seasonal, and annual temperature and precipitation for Sauk County.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Prairie du Sac*

[Elevation, 750 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1918)	Total amount for the wettest year (1913)	Snow, average depth
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December	22.6	59	−23	0.77	1.16	0.22	5.1
January	16.9	59	−34	1.13	1.72	.97	7.7
February	19.2	56	−34	.77	.43	.42	5.9
Winter	19.6	59	−34	2.67	3.31	1.61	18.7
March	33.3	84	−18	1.15	.78	2.87	3.8
April	47.6	87	10	2.13	2.21	1.41	.2
May	58.9	95	22	4.52	5.79	7.40	.0
Spring	46.6	95	−18	7.80	8.78	11.68	4.0
June	68.3	105	35	4.25	2.06	4.15	.0
July	74.1	106	31	3.70	3.86	9.55	.0
August	71.4	102	34	3.01	1.49	1.99	.0
Summer	71.3	106	31	10.96	7.41	15.69	.0
September	63.0	97	28	4.21	1.46	3.82	.0
October	51.3	89	14	2.27	1.33	3.23	.8
November	37.2	74	−1	1.48	1.00	2.05	1.4
Fall	50.5	97	−1	7.96	3.79	9.10	2.2
Year	47.0	106	−34	29.39	23.29	38.08	24.9

SOILS

Sauk County lies within the timbered region of the United States where surface features, moisture supply, and climatic conditions favored the development of a dense forest. The prairie regions within the county do not cover more than a total of 25 square miles and have been encroached on more or less by the timber, so that part of the prairie lands were really "openings" or semiprairie rather than true prairie. The soils of the county have thus developed under two different covers—a dense forest growth over most of the region and a luxurious grass vegetation over a comparatively small area.

The soils throughout the greater part of the county are light colored and low in organic matter, as are all soils of a forested region. The dark color of the immediate surface soil extends to a depth of only a few inches and soon disappears under cultivation. In the prairie regions the dark color in the well-drained soils continues to a depth varying from a few inches to 16 inches. The dark color is imparted by finely divided organic material derived mostly from the decay of

roots and mixed with the mineral constituents of the soil. In poorly drained areas the organic matter is more abundant and in very marshy areas there are accumulations of peat. Even these marshy areas were for the most part timbered.

The dark-colored poorly drained soils with abundant organic matter are those of the Wabash, Clyde, and Dunning series. Dark-colored well-drained soils or prairie soils are the Waukesha and Carrington soils and the dark-colored phases of the La Crosse soils.

Throughout most of the county where relief has favored an active movement of soil water, weathering and leaching extend to a depth of 3 or 4 feet. The typical soil profile in the originally timbered areas shows a dark surface layer 2 or 3 inches thick underlain by lighter-colored material of the same texture, in most places silt loam, extending to a depth ranging from 10 to 14 inches, beneath which is a heavier layer grading into the parent material. Such soils fall into the Clinton, Dubuque, Thurston, Baraboo, La Crosse, and Bertrand soil series.

In the following pages of this report the soils are described in full and their agricultural possibilities are discussed; their distribution is shown on the accompanying soil map; and their acreage and proportionate extent are shown in Table 2.

TABLE 2.—*Acreage and proportionate extent of the soils mapped in Sauk County, Wis.*

Type of soil	Acres	Per cent	Type of soil	Acres	Per cent
Clinton silt loam	67,008	17.2	Bates silt loam	3,712	0.7
Steep phase	26,048		Bertrand silt loam	19,712	3.6
Dubuque silt loam	51,584		Bertrand fine sandy loam	5,184	1.0
Deep phase	4,288	10.8	La Crosse sandy loam	3,584	2.6
Steep phase	2,432		Dark-colored phase	10,240	
Boone loam	10,112	5.6	La Crosse fine sandy loam	4,480	.8
Rolling phase	20,032		La Crosse loam, dark-colored phase	5,824	1.1
Boone silt loam	3,904	.7	Waukesha silt loam	9,280	1.7
Boone fine sandy loam	21,184	5.8	Sparta sand	14,784	3.0
Steep phase	10,176		Rolling phase	1,600	
Boone fine sand	17,344	3.5	Coloma fine sand	5,568	1.0
Steep phase	1,728		Clyde silt loam	6,720	1.2
Baraboo silt loam	35,392	7.2	Clyde loam	2,048	.4
Steep phase	3,136		Dunning fine sandy loam	3,840	.7
Baraboo loam	896	.3	Vesper fine sandy loam	1,408	.3
Steep phase	320		Vesper silt loam	128	.1
Baraboo fine sandy loam	832	.3	Wabash silt loam	15,744	4.1
Steep phase	256		Colluvial phase	6,528	
Thurston silt loam	14,720	2.8	Wabash silty clay	2,624	.5
Steep phase	576		Wabash fine sandy loam	1,472	.3
Thurston loam	5,632	1.1	Alluvial soils (undifferentiated)	22,016	4.1
Steep phase	256		Peat	7,488	2.1
Thurston fine sandy loam	12,736	2.5	Shallow phase	3,712	
Steep phase	576		Rough broken land	66,560	12.3
Carrington silt loam	2,880	.5			
Carrington loam	576	.1	Total	538,880	

CLINTON SILT LOAM

The surface soil of Clinton silt loam to an average depth of 6 inches consists of dark grayish-brown smooth friable silt loam. In virgin wood lots there is in most places a layer, an inch or so thick, of darker-colored material at the surface where organic matter is more plentiful. Some leaf mold may cover the surface. The organic matter is mixed with the underlying soil on cultivation, so that the cultivated soil is lighter in color than the immediate virgin surface

soil. Between depths of 6 and 16 inches is light yellowish-brown silt loam which may be somewhat firm and a little heavier than the surface soil. Between depths of 16 and 36 inches is the layer of clay concentration. The material, which is yellowish-brown silty clay loam, is moderately stiff and heavy, is somewhat plastic when moist, and breaks into angular fragments from one-fourth to one-half inch in diameter. Below a depth of 36 inches the material is generally less clayey and varies from silt to fine sand of a yellowish-brown color. Below a depth ranging from 4 to 8 feet is either sandstone or limestone rock. In places the deep subsoil grades into red gritty or cherty clay loam. Where of sufficient extent such areas have been classed as Dubuque silt loam. Clinton silt loam is closely associated with Dubuque silt loam and in many places grades into it.

The upper layers of Clinton silt loam may be derived from a deposit of silt or very silty material known to geologists as loess. Some of this material may have been deposited by wind, but much of it on the lower valley slopes is of colluvial origin. The silty covering over rocks or residual material ranges in thickness from 3 to 6 feet. The underlying material may be residual from sandstone or limestone, differing in different parts of the county. In most places the reaction is acid throughout.

Clinton silt loam is an extensive and important soil in Sauk County, especially in the western and northern parts. It is the predominating soil in the towns of Reedsburg, Winfield, Lavalle, Woodland, and Franklin. The local relief ranges from nearly level to steep and rolling, but most of the soil is gently rolling. (Pl. 1, A.) Because of the unevenness of the surface, natural drainage is good. The soil retains moisture well. Erosion is active on some of the steeper slopes.

The natural vegetation on this soil was chiefly oak, maple, hickory, and basswood, but some pine was present in the original forests. Most of the land has been cleared and placed under cultivation. It is a good soil and is well adapted to general farming and dairying. The steep slopes can be utilized especially well in dairying, as they afford good grazing. The chief crops grown are corn, small grains, clover, and timothy. Alfalfa and pea yields are usually satisfactory. Most farms are well kept.

Clinton silt loam, steep phase.—The steep phase of Clinton silt loam is similar in soil characteristics to the typical soil. The soil may be, in general, somewhat thinner, especially where erosion has removed some of the surface material, but the distinction in mapping was based on the steeper slopes or very rolling surface of the steep phase. Most of the land so mapped is not adapted to ordinary farming. The steep slopes are difficult to cultivate and are subject to erosion. The land is largely in pasture or woodland and is well adapted to either use.

DUBUQUE SILT LOAM

The 2-inch surface layer of virgin Dubuque silt loam consists of dark-brown silt loam. Some leaf mold is on the surface and considerable organic matter is in the soil. Between depths of 2 and 12 inches the material is smooth, light yellowish-brown, friable silt loam similar to the corresponding material in Clinton silt loam. Between depths of 12 and 36 inches is brownish-red gritty clay loam which contains angular fragments of chert and limestone. This layer is

heavy and sticky when wet. It is underlain to a depth of 50 or more inches by heavy stiff clay, mottled dark brownish red with yellow blotches and dark-colored iron stains. This material becomes very cherty and at a depth varying from 4 to 8 feet rests in most places on limestone bedrock. Around the margins of the limestone, where the formation is thin sandstone, rock is found in places at a depth of 5 or 6 feet below the surface. The soil in such places grades into Clinton silt loam or Boone silt loam. The surface soil is slightly acid as a rule, and the subsurface soil is in many places strongly acid. In most places the acid condition extends to a depth of more than 3 feet, and in some places the material is acid to a depth of 50 inches, where limestone fragments occur in the subsoil. The interstitial material in the substratum is commonly acid.

There are a number of variations in this soil. Locally the depth to red cherty clay is less than that indicated, and on slopes the red clay is exposed in many places. Locally the silty covering is deeper and the soil grades into the deep phase of Dubuque silt loam. In the shallow areas chert is common on the surface.

When this soil is placed under cultivation the dark surface layer becomes mixed with the underlying material, so that the cultivated soil is somewhat lighter than the virgin surface soil. The silty surface soil is comparatively easy to till and works readily into a mellow seed bed.

This is an important and extensive soil and covers a considerable area in the west-central part of this county. It is found chiefly in the towns of Woodland, Ironton, Washington, Westfield, Bear Creek, and Franklin. It occurs mostly on the ridge tops and upper slopes, where the limestone has not been entirely eroded. The surface is for the most part gently rolling. (Pl. 1, B.) On the ridge tops which make up most of the soil the surface in a few places is nearly level, but level areas are of small extent. Because of the gently rolling relief, natural drainage is good.

The land was originally timbered, chiefly with oak, hickory, some elm, maple, and walnut. Most of the merchantable timber has been cut, although a few wood lots remain on the most sloping areas.

This is a good general-farming soil, and farmers on it are, in general, prosperous. All the major farm crops common to the region are grown, and good yields are obtained. The chief crops are hay, corn, small grains, and alfalfa. The last named is increasing in importance each year.

In the improvement of this soil, especially where alfalfa is to be grown, liming is advisable and usually necessary. The soil also responds well to the use of phosphatic fertilizers. Adding to the organic-matter supply by growing legumes is advisable.

Dubuque silt loam, steep phase.—The steep phase of Dubuque silt loam occurs on the valley slopes, where the relief is so steep as to preclude cultivation of farm crops. The soil is similar to typical Dubuque silt loam but, in general, the surface layers are thinner. The land is utilized largely for pasture or woodland.

Dubuque silt loam, deep phase.—The surface soil of virgin Dubuque silt loam, deep phase, to a depth of 3 or 4 inches consists of dark grayish-brown silt loam with a high organic-matter content. This layer, in the virgin forest, is covered with a 1 or 2 inch layer of leaf mold and other organic débris. Between depths of 4 and 14 inches

the material is smooth, friable, light yellowish-brown silt loam. Between depths of 14 and 40 inches is yellowish-brown silty clay loam, which is moderately plastic when moist and hard when dry. It breaks readily into angular fragments from about one-fourth to one-half inch in diameter. This layer is underlain, to a depth of 72 inches, by yellowish-brown light silty clay loam somewhat more open than the layer above. Some gray or grayish-yellow streaks run through it. It somewhat resembles the substratum of Clinton silt loam but is somewhat heavier as a rule. In places this material grades into red or reddish-brown cherty clay loam. In cultivated fields the surface soil is lighter in color than the virgin surface soil, owing to a mixing with underlying material. The immediate surface soil of the virgin soil is generally slightly acid, and the subsurface and subsoil layers are strongly acid in many places. The substratum is medium acid. The chemical profile does not show any free carbonate to a depth of about 72 inches. In almost all places the limestone lies at or above this depth.

There are a number of variations in this soil. It is associated with and grades into typical Dubuque silt loam and in a few places especially on slopes and where erosion is most pronounced, includes areas of that soil. On the nearly flat-topped ridges the soil is deepest and somewhat resembles Clinton silt loam. Chert occurs on the surface only on a few of the shallow areas on the slopes.

This soil occurs only in the western part of the county, chiefly in the towns of Ironton, Washington, Westfield, and Reedsburg. It is not nearly so extensive as typical Dubuque silt loam and because of its small extent is not important. It covers a total area of 6.7 square miles.

Areas of Dubuque silt loam, deep phase, are undulating or gently rolling, and natural drainage is generally good. The soil occurs on the ridge tops in the smoothest parts of the region, and a few small areas are nearly level. In such places drainage may be a little slow, especially in the spring.

Dubuque silt loam, deep phase, in its virgin condition supported a timber growth chiefly of oak, maple, elm, and hickory, with some walnut and other hardwoods. A few wood lots are left, but more than 90 per cent of the soil has been cleared and placed under cultivation. This is one of the most desirable soils in the county, and agriculture is highly developed on it. It is devoted to general farming, with dairying as the leading industry. Hay, corn, and grain are raised successfully, and the alfalfa acreage is increasing. Where alfalfa is grown lime is usually applied to the land.

The greatest need in the improvement of this soil is lime. Next in importance is a phosphatic fertilizer, to which the soil responds readily. It is also deficient in organic matter, as are the other light-colored upland soils of the State.

BOONE LOAM

The surface soil of Boone loam, where cultivated, to a depth of 10 inches consists of grayish-brown friable loam. In the virgin soil there is a 1 or 2 inch covering of dark-colored material and some leaf mold, but under cultivation this becomes mixed with the underlying material. Between depths of 10 and 24 inches the material is yellowish-

brown light clay loam, and between 24 and 36 inches it is brownish-yellow sandy loam which, in most places, contains shale or sandstone fragments. Bedrock of sandstone is generally present at a depth ranging from 3 to 5 feet. The parent material has been derived from sandstone with, in places, some shale. The surface soil, subsoil, and substratum materials are acid in reaction.

This soil is rather variable. In places it borders Clinton silt loam and includes some silt loam patches. On the other hand, it grades in many places into Boone fine sandy loam and contains sandy spots.

Boone loam is a fairly extensive soil. It occurs chiefly in the two northern tiers of towns from Delton and Excelsior Towns west, and in the southwestern part of the county in the towns of Bear Creek and Franklin. Smaller tracts are in adjoining towns. The soil does not occur in the eastern and southeastern parts of the county, where the region is glaciated.

Boone loam occupies sloping lands and is undulating or rather steep. Because of the sloping surface and the looseness of the substratum, natural drainage is good.

Areas of Boone loam were originally timbered with a growth of mixed hardwoods and pine. The greater part of this soil has been cleared and placed under cultivation. It is devoted to general farming and dairying, and most of the crops common to the region are grown. It is a fairly good soil, though not naturally so productive as Dubuque silt loam or Clinton silt loam.

In the improvement of this soil lime should be applied, and phosphatic fertilizers can be used with profit. In general the methods of farming followed are the same as on Clinton silt loam and Dubuque silt loam.

Boone loam, rolling phase.—The rolling phase of Boone loam includes distinctly rolling or steeply sloping areas of Boone loam. In such areas the soil is similar to or identical with typical Boone loam, but the relief renders it more subject to erosion when cleared and cultivated. Such areas are to a large extent in pasture or remain as woodland.

BOONE SILT LOAM

Boone silt loam is a light-colored soil of the uplands. Where undisturbed in timbered areas, the surface soil to a depth of 2 or 3 inches is very dark grayish-brown silt loam consisting of a mixture of fine silty mineral material and finely divided organic matter. The second natural soil layer, which is 4 or 5 inches thick, is grayish-brown silty loam containing very little organic matter. The third layer is distinctly heavier in texture than the two above it and is commonly referred to as the subsoil. The material is yellowish-brown silty clay loam, coherent, somewhat plastic, and slightly sticky when moist and breaking into rather hard angular fragments when dry. This layer is from 12 to15 inches thick, extending to a depth ranging from 20 to 30 inches. Below it the material is variable, in places being gritty and silty and containing numerous fragments of sandstone or shale and elsewhere containing chert or quartzite fragments. Typically shale or sandstone bedrock occurs within 3 or 4 feet of the surface. Under cultivation the thin surface soil layer is mixed with the material beneath it to form a grayish-brown or light grayish-brown silt loam surface soil. Sandstone and shale fragments are

common on the surface and throughout the soil. All soil layers are acid in reaction.

The surface relief of Boone silt loam is rolling or gently sloping. Many areas occur on slopes. The soil occupies 6.1 square miles in Sauk County. It occurs as small areas throughout the county but is most extensive in the north-central and northwestern parts.

The areas of this soil were originally covered with hard maple, oak, hickory, and basswood, and a considerable percentage of the land is still in small timber and second growth. Where cleared, the lands are utilized for pasture and for the general farm crops of the region.

BOONE FINE SANDY LOAM

The surface soil of virgin Boone fine sandy loam to a depth of 2 inches consists of dark grayish-brown fine sandy loam over which in wooded areas lies a thin covering of leaf mold. Between depths of 2 and 16 inches the material is yellowish-brown light fine sandy loam. Between depths of 16 and 36 inches is brownish loam or heavy fine sandy loam. This layer is coherent, with a marked but variable clay content. It is underlain to a depth of 72 inches by yellow, gray, or nearly white fine sand. Sandstone rock occurs in most places at a depth of 5 or 6 feet. In cultivated fields this soil contains less organic matter and is lighter in color than the immediate surface of the virgin soil; after a few years of cultivation the organic matter largely disappears. The entire soil is acid.

This soil is subject to some variation and contains some small areas of fine sand. In places the material is fine sandy loam with a fine sand subsoil and in other places the surface soil is more sandy and the subsoil heavier, but everywhere the soil is underlain by sandstone rock or by sand derived from this rock.

Boone fine sandy loam is widely distributed over the two northern tiers of towns. Most of the areas are small, few exceeding 1 square mile in extent. In many places the soil occupies lower slopes below Clinton silt loam. In Dellona Town, however, in numerous places the soil occupies all the ridge tops as well as the slopes.

This soil is for the most part gently rolling, but some slopes are too steep to cultivate. The areas were originally timbered with hardwoods and pine. Most of the timber has been cut, but some of the steep slopes are still wooded or brush covered. Cleared land is devoted to general farming, and most of the crops common to this region are grown. Corn, grain, and hay are the chief crops, and dairying is the chief type of farming. This is a fairly good soil, warms up early in the spring, is easily cultivated, and responds readily to fertilization.

Boone fine sandy loam, steep phase.—The steep phase of Boone fine sandy loam includes areas with soil characteristics similar to or identical with those of typical Boone fine sandy loam but with very rolling or steeply sloping surface relief. The areas are mostly in wood lots or pastures or are used for the production of hay.

BOONE FINE SAND

The surface soil of virgin Boone fine sand consists of light grayish-brown fine sand to a depth of about 2 inches. Over this there is in many places a thin layer of leaf mold. Under cultivation the color of the soil becomes lighter, and the organic matter partly disappears.

Between depths of 2 and 20 inches the material is loose yellow sand. This is underlain, to a depth of 40 inches, by pale-yellow fine sand. In many places the soil contains some sandstone fragments and rests on sandstone rock at a depth ranging from 3 to 6 feet. In places, the color of the soil is darker than described, and in a few places the material was found to be somewhat loamy. Outcrops of the underlying rock are not uncommon.

Boone fine sand is extensive in several towns, chiefly Dellona, Delton, and Excelsior, where it is associated with other Boone soils. A few scattered areas are in all the northern towns. The surface relief is for the most part gently rolling, but some included tracts are nearly level. The soil is droughty.

Considerable of the native timber of scrub oak and jack pine is still standing. Probably not more than half the soil is cleared and under cultivation. In places cultivated fields have been allowed to remain idle for several years because of low crop yields obtained. The soil has a low value and requires special care and fertilization to make farming profitable. It is poor in humus and mineral plant-food elements, which must be supplied to make crop yields profitable. The soil material is all residual from sandstone and is highly acid. The soil is best suited to early truck crops, but these will require heavy fertilization.

Boone fine sand, steep phase.—A number of areas of Boone fine sand, aggregating less than 3 square miles, are indicated on the soil map as a steep phase. These areas differ from typical Boone fine sand only in their steeper relief.

BARABOO SILT LOAM

The surface soil of Baraboo silt loam, to an average depth of 3 inches, consists of gray smooth friable silt loam. Over the surface in wooded areas there is a thin covering of leaf litter and mold, and to a depth of an inch or more the surface soil is very dark gray in color. Under cultivation this dark color is soon lost. Between depths of 3 and 14 inches the material is grayish-yellow floury smooth silt loam. Below this, to a depth of 40 inches, the material is mottled yellowish-brown and gray silty clay loam or clay which breaks into angular fragments from one-fourth to one-half inch in diameter. It is underlain to a depth of 60 inches by sandy clay loam grading into more sandy material. In color this layer is mottled reddish and yellowish brown. It contains numerous quartzite fragments. Stones, chiefly quartzite rock fragments, are present on the surface in places, and the upper part of the subsoil is commonly gritty and frequently contains rock fragments. The surface soil, subsoil, and substratum are strongly acid.

The soil is somewhat variable, especially in regard to the number of rock fragments present both on the surface and embedded in the soil. Where the stones are so numerous as to interfere with cultivation they are indicated on the soil map by stone symbols.

Baraboo silt loam is an important soil in the central part of the county on Baraboo Range. It occurs chiefly in the towns of Westfield, Freedom, Baraboo, and Greenfield, with smaller areas in some of the adjoining towns. The surface ranges from nearly level over small areas to gently and even steeply rolling. The hills are rather

high, the soil as a whole occupying some of the highest parts of the county. On some level areas drainage is somewhat deficient and the soil is cold and vegetation is backward in spring. As a whole surface drainage is fair, but internal drainage is slow as the subsoil is rather tight and impervious. The continuity of the soil is broken by areas of rough broken land. Some of these areas are steep, abrupt slopes, but in some places they are nearly level but extremely stony or are nearly level outcrops of bedrock.

All areas of Baraboo silt loam were timbered, chiefly with oak, maple, and hickory, together with some elm and ash, on the most poorly drained areas. In the original growth there was also a little pine in places. Fully half the soil is still timbered, and some merchantable timber is standing. This timber is mostly on stony areas and steep slopes which are probably better adapted to forestry than any other utilization.

Baraboo silt loam, partly because it is not so productive as some of the other silt loam soils, is not so highly improved as many other soils in the county. It is a cold soil, is very acid, and is rather difficult to cultivate. It is best suited to grass, hay, and pasture, and some small grains and is utilized principally for dairying. Crop yields, as a rule, are lower than on Dubuque silt loam, Clinton silt loam, or Thurston silt loam.

In the improvement of this soil lime should be used, especially for clover and alfalfa. It is probable that the soil will also respond to a phosphatic fertilizer.

Baraboo silt loam, steep phase.—The steep phase of Baraboo silt loam includes areas which are too steep for cultivation. Much of this land is stony. It is largely in wood lots and pastures, uses to which it is at present best adapted.

BARABOO LOAM

The surface soil of Baraboo loam, to an average depth of 10 inches, consists of grayish-brown loam. Some stones and bowlders are present, and where they are found in sufficient numbers to interfere with cultivation the areas have been indicated by stone symbols. Between depths of 10 and 30 inches the material is light-brown or brown heavy gritty clay loam which is hard when dry. This layer is underlain to a depth of 40 inches by brownish, with a suggestion of red, or slightly mottled clay loam. This layer is also gritty as a rule. The amount of grit and rock fragments in the subsoil varies. In places the layer is practically grit free, whereas in other places the grit and rock fragments are conspicuous. The entire soil is acid.

Areas of this soil are for the most part gently rolling, although a few level areas were mapped. As a whole the natural surface drainage is good, but the subsoil is somewhat impervious and water moves through it rather slowly. Level areas are somewhat deficient in drainage and are cold and backward in the spring. This soil, like Baraboo silt loam, overlies Baraboo quartzite and may have been formed from the weathering of that formation. The surface has been glaciated to some extent and some foreign bowlders are present on the surface.

Baraboo loam is associated with Baraboo silt loam on the Baraboo Range and is most extensive in the town of Greenfield in the glaciated

section. Fully half the soil is still timbered, mainly to oak, hickory, and elm, with some maple. There was some pine in the original forest.

This is a fairly good soil, but is not so productive as some of the loam soils of other series in the county. It is utilized for general farming and dairying and is best suited to hay and small grains. A large proportion of the cleared areas is utilized as pasture.

In the improvement of this soil, lime must be used for such crops as clover and alfalfa. Other farm crops will also benefit from it. The soil responds to phosphatic fertilizers. Timber on stony areas should be cut only as it matures. This will insure a small income from the land for a long time.

Baraboo loam, steep phase.—The steep phase of Baraboo loam includes areas where the slopes are so steep as to prevent cultivation of the soil. The total area mapped is only one-half square mile. This steep soil occurs as scattered areas associated with typical Baraboo loam. It is utilized for wood lots and pastures.

BARABOO FINE SANDY LOAM

In cultivated fields the surface soil of Baraboo fine sandy loam, to an average depth of 10 inches, consists of gray or grayish-brown sandy loam or fine sandy loam. Over the surface in wooded areas there may be some leaf mold and a dark layer of surface soil an inch or two thick. Between depths of 10 and 30 inches the material is commonly brown or yellowish-brown heavy loam or gritty clay loam and between 30 and 40 inches it is commonly very gritty loam or light clay loam, or, in places, sandy loam filled with rock fragments. Quartzite rock occurs in most places at a depth between 5 and 7 feet. Most of the material forming this soil seems to have come from Baraboo quartzite, upon which formation the soil rests. The entire soil is acid.

Baraboo fine sandy loam is of small extent. It occurs on Baraboo Range, largely in the towns of Greenfield and Fairfield, within the glaciated area of the county. The surface is for the most part gently rolling. Natural drainage is better than on Baraboo loam and Baraboo silt loam because of the more open subsoil.

The areas of Baraboo fine sandy loam are, or originally were, timbered with a growth of oak, hickory, elm, and maple. About half the soil is cleared and farmed. General farming and dairying are the important farming industries. Stony areas are used for pasture and seem best suited to grass, hay, and small grains. This may be considered a fairly good soil where it is not stony, but it is not so good as some of the other fine sandy loam soils of the county.

Baraboo fine sandy loam, steep phase.—This phase of Baraboo fine sandy loam includes small areas, totaling less than one-half square mile, where slopes are steep and the soil is in many places stony. The land is not adapted to cultivated crops and is only fair or poor pasture land. At present it can be best utilized as woodland.

THURSTON SILT LOAM

The surface soil of virgin Thurston silt loam, to a depth of 4 or 5 inches, consists of dark grayish-brown smooth silt loam over the surface of which there is generally a thin covering of leaf mold. On

cultivation this surface layer becomes mixed with the soil beneath it, so that the cultivated soil is lighter in color than the virgin surface soil. Between depths of 4 and 14 inches the material is grayish-yellow silt loam, and from 14 to 44 inches it is reddish-brown gritty compact clay loam. Below a depth of 40 or 50 inches is sandy, gravelly, clayey glacial till which is of a light-yellowish or grayish color. There is some variation in the depth to this glacial till, but it is usually more than 3 feet. There is also some variation in the thickness of the surface silt loam layers, which are thickest along lower slopes where there has evidently been some wash from higher lands. Along these lower slopes the color also may be somewhat darker. The reaction of the surface soil and upper part of the subsoil is generally acid; the unweathered till beneath is alkaline and generally contains sufficient lime carbonate to effervesce in hydrochloric acid.

Thurston silt loam occurs only in the eastern part of the county, chiefly in the towns of Sumpter, Merrimae, Greenfield, and Baraboo. It covers a total area of 23 square miles and is an important soil in the eastern part of the county. The surface varies from nearly level to gently rolling. Natural drainage is good, and the soil retains moisture well.

The native timber on this soil was mostly hardwood, consisting of oak, maple, hickory, basswood, and elm. Most of the merchantable timber has been cut, and more than 75 per cent of the land is under cultivation. This is a good general-farming soil and is better adapted to such crops as alfalfa and peas than are the more highly acid soils of the county. The chief crops grown are corn, hay, and small grain.

Thurston silt loam, steep phase.—A number of small areas of Thurston silt loam occur on slopes so steep that ordinary farming operations are not practicable. Such lands are classed as the steep phase of the soil and are used mostly for pasture or are left as woodland.

THURSTON LOAM

The surface soil of Thurston loam to a depth of 10 inches consists of brown or dark-brown fine loam. Between depths of 10 and 28 inches the material is reddish-brown heavy sandy loam or gritty loam carrying some fine gravel. This is underlain to a depth of 40 inches by yellowish-brown gravelly sandy loam or fine sand. This sandy substratum may grade, at a depth of 5 or 6 feet, into gray gravelly till. The soil is variable, containing some small silty and sandy spots. It is derived from sandy glacial till containing only a small proportion of limestone material. The surface soil is commonly slightly acid, the subsoil is acid or neutral, and the substratum is alkaline in reaction.

Thurston loam occurs only in the eastern part of the county chiefly in the towns of Greenfield, Merrimac, and Sumpter, where it is associated with other members of the Thurston series. It covers an area of nearly 9 square miles. The surface relief varies from undulating to gently rolling. Because of its relief and the openness of the subsoil natural drainage is everywhere good. The areas were orginally timbered, but practically all the merchantable timber has been cut. The land is nearly all under cultivation to general farm crops. Methods of cultivation and crop rotation are the same as on Thurston silt loam.

Thurston loam, steep phase.—Associated with the typically rolling or undulating areas of Thurston loam are a few small areas, mapped as the steep phase of the soil, where the surface is too steep to allow cultivation. The total area of this steep soil is less than one-half square mile. Such areas are used mostly for pasture and woodland.

THURSTON FINE SANDY LOAM

The surface soil of Thurston fine sandy loam, to a depth of 8 inches, consists of grayish-brown fine sandy loam. In virgin areas darker sandy material about 2 inches thick lies at the surface, and in wood lots a small amount of leaf mold is to be found. This becomes mixed with the underlying material under cultivation, so that the cultivated fields are lighter in color than the virgin surface soil. Between depths of 8 and 26 inches, the material is yellowish-brown loam or fine sandy loam which is coherent when moist and hard in places when dry. Between depths of 26 and 40 inches the material is commonly yellowish fine sandy till which in places contains some fine gravel. This soil has been derived from very sandy glacial till admixed with only small amounts of limestone material. The surface soil is in most places somewhat acid as is also the subsoil in places, but the substratum is generally alkaline and in places is calcareous.

Thurston fine sandy loam occurs only in the eastern part of the county in the glaciated region, chiefly in the towns of Delton, Baraboo, Fairfield, Greenfield, Merrimac, and Sumpter. There are no large tracts, but areas varying in extent from 40 to 160 acres are common. The soil is associated with other soils of the Thurston series and resembles Thurston loam, though it is a little lighter in texture. The surface is for the most part gently rolling, though some areas are nearly level. Because of the surface relief and sandy texture of this material, natural drainage is good. The soil is fairly retentive of moisture but does not hold so much as Thurston loam and Thurston silt loam.

This was originally a timbered soil, but the greater part of the timber has been cut and the land has been placed under cultivation. It is a fairly good or good soil, and all crops common to the region are grown successfully on it. Although it is devoted to general farming and dairying, it is better suited to early truck crops and potatoes, and where it is favorably located it should be utilized for trucking. It is poor in organic matter, and legumes should have a place in each rotation. This is a soil which responds well to fertilization.

Thurston fine sandy loam, steep phase.—A few small areas of Thurston fine sandy loam are indicated on the soil map as a steep phase. These areas, which do not total quite a square mile, are too steep for ordinary agriculture and are at present mostly in woodland.

CARRINGTON SILT LOAM

The surface soil of Carrington silt loam to a depth of 10 inches consists of dark-brown or nearly black smooth silt loam with a rather high content of organic matter. This layer is underlain to a depth of 16 inches by chocolate-brown heavy silt loam which in turn is underlain to a depth of 36 inches by yellowish-brown silty clay loam becoming gritty at a depth of about 30 inches. Between depths of 36 and 72 inches the material is brown or dark-brown gritty sandy clay loam which becomes lighter in color and texture with depth.

The soil has been derived from glacial till which carries some limestone material. The surface soil and subsoil are acid, but the substratum is generally calcareous and contains small limestone fragments. The surface soil varies somewhat in color but is uniform in texture. The depth to till is also variable but in most places is more than 30 inches.

Carrington silt loam is of small total extent. It occurs east of Baraboo, chiefly in Greenfield Town where it covers an area of about 3 square miles. There are a few other small scattered areas in Merrimac and Sumpter Towns. The surface is for the most part gently rolling, and natural drainage is good.

Carrington silt loam was typically prairie land, but in this region the hardwood timber had encroached somewhat on the grassland and the soil was partly wooded. Practically all of it is now cleared, under cultivation, and highly developed. It is devoted to general farming and, near Baraboo, to trucking. It may be considered one of the most desirable soils in the county and is well adapted to all crops commonly grown in this region.

CARRINGTON LOAM

Carrington loam to a depth of 10 or 12 inches consists of dark-brown or black loam underlain by chocolate-brown loam or silt loam extending to a depth of about 18 inches, where yellowish-brown clay loam occurs. Below a depth of 30 inches is gritty material underlain to a depth of 40 inches by unassorted glacial till. The soil ranges from fine sandy loam to silt loam but is mostly a loam. The surface soil and subsoil are acid, but the underlying till is calcareous. The soil has a total area of less than 1 square mile. It occurs chiefly in small patches in Greenfield, Merrimac, and Sumpter Towns.

Areas of Carrington loam are undulating or gently rolling, and drainage is good. The land was typically prairie, but the timber had encroached on much of it to form the so-called "openings."

This is a good soil and with the Thurston soils, with which it is associated, it is devoted to general farming and dairying. The same crops are grown as on Carrington silt loam, and the two soils have about the same agricultural value.

BATES SILT LOAM

The surface soil of Bates silt loam, to a depth of 12 inches, consists of black silt loam. The soil is friable and works readily into a mellow seed bed. There is present a large amount of organic matter, which accounts for the dark color. The subsoil is yellowish-brown silty clay loam which in many places becomes a little looser and more open below a depth of 3 feet. At a depth ranging from 4 to 6 feet the substratum commonly grades into sandy material or rests on sandstone bedrock. The surface soil, subsoil, and substratum are acid except in a few places where calcareous material is found at a depth of about 6 feet. In most places rock or sand lies above a depth of 6 feet.

This soil is of small extent and minor importance. It occurs mainly in Dellona, Ironton, and Reedsburg Towns in small scattered areas. The surface ranges from undulating to gently rolling but is for the most part gently rolling. Natural drainage is good, and no part of the soil is in need of tile drains.

Originally this soil was partly timbered and partly grassland, the timber being apparently a recent encroachment on the grassland. The soil is now practically all cleared, under cultivation, and well improved. It is a good soil, in fact one of the most desirable in the county. It is used for general farming and dairying and is highly prized by the farmers of this community.

BERTRAND SILT LOAM

The surface soil of Bertrand silt loam to an average depth of 4 inches consists of dark grayish-brown friable smooth silt loam. In virgin areas nearly black material about 2 inches thick is on the surface in most places, and over the surface of wooded areas there is commonly some leaf mold. In cultivated fields the color is lighter than in the virgin surface soil. Between depths of 4 and 14 inches the material is grayish-brown silt loam. This is underlain to a depth of 40 inches by yellowish-brown heavy silt loam or silty clay loam, in flatter areas slightly mottled and very compact. The next lower layer, to a depth of 72 inches, is yellow, grayish, or slightly mottled silt loam or very fine sandy loam.

This soil occurs on level or nearly level bench land along stream courses. Natural drainage is fair except in a few places where the areas border low alluvium. This soil in many places grades into low alluvium without a sharp line of distinction. This is especially true of the area near Loganville.

Bertrand silt loam has a total area of more than 30 square miles and is mapped in all parts of the county. Large areas occur as terraces along Baraboo River, Narrows Creek, Honey Creek, and some of the other tributaries of Baraboo River.

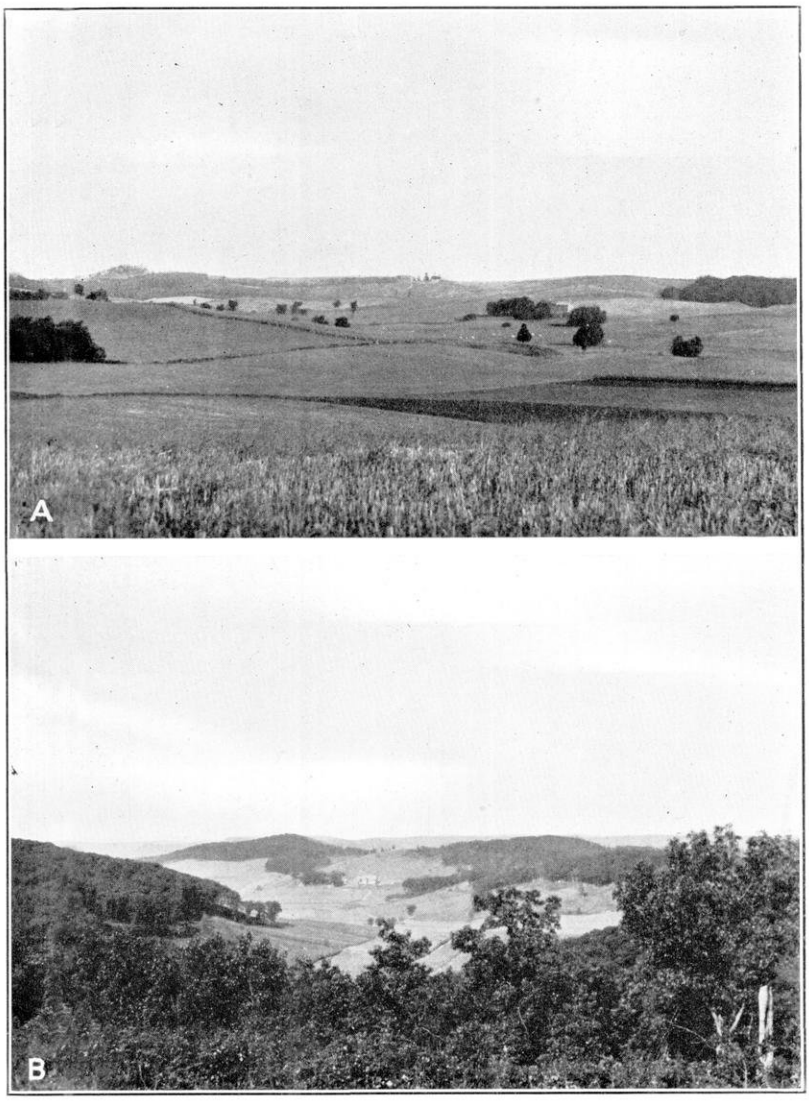
In origin the parent material of this soil is largely alluvial but in some places is colluvial. The colluvial material occurs along the margins of the areas, where they border the uplands. The native timber was mostly elm, soft maple, and oak. Most of the timber has been cut, and more than 75 per cent of the soil is cleared and in cultivation. It is a very good soil and is devoted to general farming and dairying. The chief crops grown are corn, oats, and hay, with some special crops in places. Alfalfa does well, and the acreage is increasing.

BERTRAND FINE SANDY LOAM

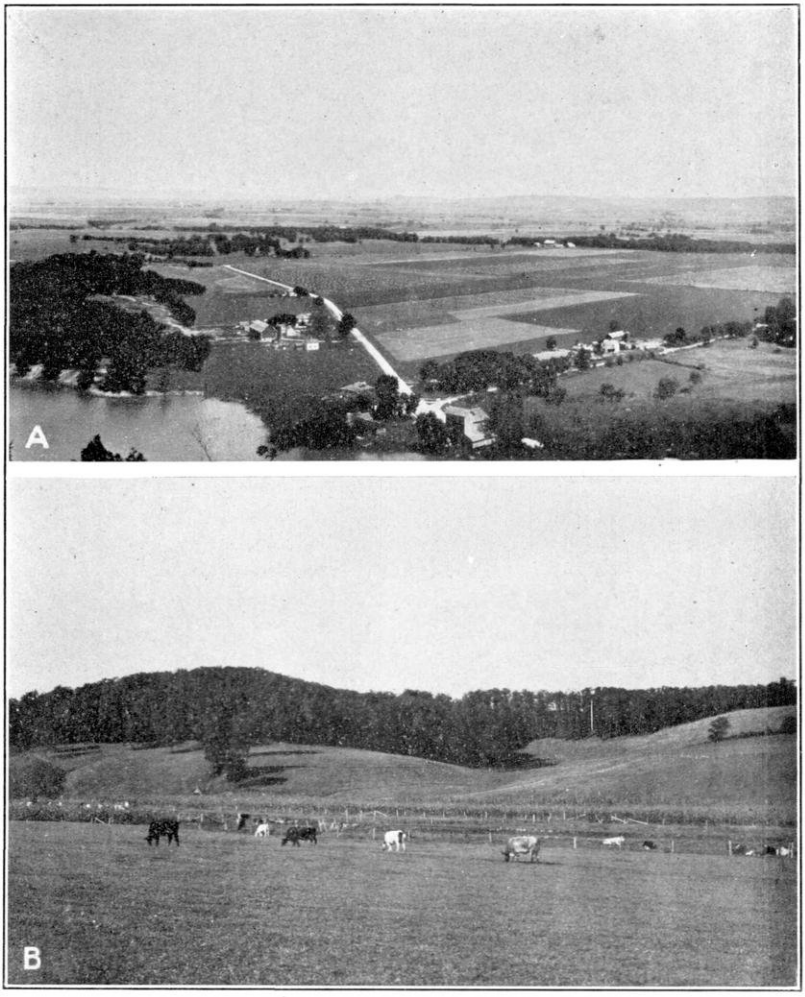
The surface soil of Bertrand fine sandy loam, where cultivated, to a depth of 12 inches is grayish-brown or dark grayish-brown fine sandy loam. Beneath this and continuing to a depth of 26 inches is light-brown or yellowish-brown fine sandy loam or sandy clay loam underlain to a depth of 40 inches by fine yellow sand. The soil is somewhat variable and ranges from loam to fine sand. The parent material of this soil is of alluvial and colluvial origin. The entire soil is somewhat acid.

This soil is mapped chiefly on the terraces or second bottoms in the valleys of Wisconsin and Baraboo Rivers and smaller streams of the county. It occurs mostly as areas less than 1 square mile in extent. The surface is level, and drainage is usually good.

The greater part of this soil is cleared and under cultivation. It is a good soil, and although it is devoted to general farming it is better suited to trucking. It is an early soil.



A, Clinton silt loam landscape; B, Dubuque silt loam landscape



A, Landscape on Waukesha and Sparta soils; B, alluvial soils (undifferentiated) in foreground and the steep phase of Clinton silt loam in background

LA CROSSE SANDY LOAM

Where cultivated the surface soil of La Crosse sandy loam, to an average depth of 10 inches, consists of brown loamy medium sand or light sandy loam. Between depths of 10 and 30 inches the material is reddish-brown or yellowish-brown sticky sandy loam which in many places carries some gravel. Below a depth of about 30 inches is stratified yellow medium sand. The soil is derived from alluvial material deposited as outwash plains and river terraces. The parent material was largely sandy débris from sandstone rocks and sandy glacial till. The entire soil is acid. There is some variation in the color of the surface soil.

Areas of this soil are level or very gently undulating, and because of the openness of the sandy substratum natural drainage is excessive and the crops suffer from drought during some part of nearly every growing season. The soil covers an area of 5.6 square miles. The largest area is from 2 to 3 miles west of Sauk City in the town of Prairie du Sac. The soil is found in association with its dark-colored phase and in many places grades into it so gradually that there is no sharp line of separation.

This soil was mostly timbered with hardwoods and pines. The timber has all been cut and the land placed under cultivation. It is devoted to general farming but is better suited to special crops. It is a soil of rather low agricultural value, is deficient in organic matter, needs lime, and is lacking in phosphorus and potash. Under careful management it can be cultivated with profit.

La Crosse sandy loam, dark-colored phase.—The surface soil of the dark-colored phase of La Crosse sandy loam, to an average depth of 16 inches, consists of dark-brown or nearly black medium sandy loam. This is underlain to a depth of 30 inches by chocolate-brown medium loamy sand beneath which, to a depth of 42 inches, is yellow medium sand which in places contains some gravel. The soil is somewhat variable and grades into adjoining La Crosse soils of different surface texture. The soil, like typical La Crosse sandy loam, is derived from alluvium deposited as terraces or as outwash plains. The entire soil is acid.

This phase of soil occurs chiefly on the Wisconsin River terraces and on outwash plains. It is most extensive just northwest of Prairie du Sac and Sauk City on the southern part of Sauk Prairie. A number of areas also occur near Spring Green on the river terrace, and a large area is found on Webster Prairie in Delton Town. The surface is level, and because of the looseness of the material natural drainage is somewhat excessive. Crops suffer somewhat from drought during nearly every growing season. The native vegetation was chiefly prairie grasses, with scattered trees in places.

Practically all this soil is under cultivation, chiefly to general farm crops, though the soil is better suited to special crops. In some places crops for the canning factory are grown. The soil is of rather low agricultural value and requires careful management and special fertilization to make farming profitable on it. In its improvement lime, phosphate, and potash should be applied.

LA CROSSE FINE SANDY LOAM

In cultivated fields the surface soil of La Crosse fine sandy loam to an average depth of 10 inches consists of brown fine sandy loam. Between depths of 10 and 24 inches is yellowish-brown gritty loam, and below this the material is yellowish fine or medium sand. The second layer is variable in texture and ranges from light loam or fine sandy loam to gritty clay loam. The depth to stratified sand is also variable. The soil has been derived largely from glacial material which has been reworked by water and deposited as outwash plains or stream terraces. The surface soil and subsoil are usually acid.

This soil occurs only in the eastern part of the county, chiefly in the towns of Delton, Baraboo, Sumpter, and Merrimac. None of the areas are more than 1 square mile in extent, and most of them are much smaller. The surface is level and natural drainage is good.

The native timber was hardwood and pine, but practically all timber has been cut, and more than 90 per cent of the soil is under cultivation. This is a fairly good soil and although devoted chiefly to general farming and dairying is well suited to truck crops, which require a quick, warm soil.

LA CROSSE LOAM, DARK-COLORED PHASE

The surface soil of the dark-colored phase of La Crosse loam to a depth of 16 inches consists of black, mellow, medium loam beneath which is an 8-inch layer of dark grayish-brown heavy sandy loam. This is underlain to a depth of 38 inches by reddish-brown gritty sandy clay loam beneath which, to a depth of 72 inches, is gravelly sandy loam underlain by stratified sand. This soil is somewhat variable as to the thickness of the surface soil layer and depth to stratified sand, but the surface soil is uniformly loam in texture. The surface soil and subsoil are acid throughout.

Areas of this soil occur on level or nearly level stream terraces or benches, mostly in the Wisconsin River Valley. An area several square miles in extent is northwest of Prairie du Sac on Sauk Prairie. Some small areas are found near Spring Green, and several occur in the valley of Honey Creek and along the Baraboo River benches or terraces.

The original vegetation on this soil was chiefly prairie grasses. Practically all the soil is improved and under cultivation. It is well suited to such crops as corn, small grain, and hay. It is devoted chiefly to general farming and dairying.

In the improvement of this soil lime and phosphatic fertilizers should be used.

WAUKESHA SILT LOAM

The surface soil of Waukesha silt loam, to an average depth of 14 inches, consists of black, smooth, friable silt loam carrying a high content of organic matter. This is underlain to a depth of 24 inches by chocolate-brown heavy silt loam somewhat firm in place, and this, in turn, to a depth of 60 inches by yellowish-brown silt loam slightly mottled below 48 inches. Below a depth of 60 inches the material is sandy silty loam. A fine sand substratum occurs at a depth of about 7 feet. In a few places gravel was found in the subsoil at a depth ranging from 28 to 36 inches, but this is unusual. The surface

soil and upper part of the subsoil are uniform, but the deep subsoil and substratum are subject to considerable variation.

Waukesha silt loam occurs on bench land or outwash plains. The surface is level (pl. 2, A), and natural drainage is, in general, good. Where the sand or gravel substratum lies at a considerable depth drainage may be slightly deficient, but as a rule tile drainage is not considered necessary.

Waukesha silt loam is rather widely distributed along the larger streams of the county. The largest area is on Sauk Prairie in the towns of Sumpter and Prairie du Sac. Part of this area is underlain by gravel. Other areas occur in the Wisconsin River Valley in the vicinity of Spring Green. The soil is also rather extensive in places in the valleys of Baraboo River, Honey Creek, and some of the other streams of the county, both in glaciated and unglaciated regions. The soil is acid throughout. The original vegetation consisted of prairie grasses.

Practically all this soil is under cultivation and is highly improved. It is excellent farm land and is highly prized for general farming and dairying. It is well suited to corn, hay, small grain, and all crops common to the region.

SPARTA SAND

The surface soil of Sparta sand to a depth of 10 or 12 inches consists of dark grayish-brown loamy fine or medium sand. In some places the grayish-brown color extends to a depth of 16 or 18 inches. The soil is loose and open, and in cultivated fields or on bare fields it is sometimes blown by the wind. The dark color gradually fades downward, the soil grading into yellowish-brown sand or fine sand. This grades, at a depth of 25 or 30 inches, into yellow sand or fine sand. The parent material is alluvium laid down as stream terraces or outwash plains. The dark color is due to organic matter intimately mixed with the sand. The soil is acid throughout.

Sparta sand is rather extensive on the Wisconsin River terrace north and west from Spring Green. Some areas are in the town of Prairie du Sac and some occur in the outwash plain in Delton Town. The surface is mostly level, but the material is so loose and open that it has in places been blown into low dunes. Because of the looseness of the material natural drainage is excessive. The soil suffers from drought each growing season.

The natural vegetation on this soil was largely scattered pine and scrub oak. A few areas were grassland. On the dunes some pine remains, but on the level areas most of the brush and timber has been removed and the land has been cultivated. It is not all cultivated at present, and numerous fields are allowed to remain idle for several years at a time.

This is a soil of low value, which must be liberally manured or otherwise fertilized to become productive. It is devoted mostly to general farming where cultivated, but it is better suited to potatoes, rye, and special truck crops.

Sparta sand, rolling phase.—The rolling phase of Sparta sand includes those areas in which the wind has blown up the sand to form low dunes which, with the intervening hollows, cause a rolling surface relief. In places the areas are in the form of low, narrow ridges or

small isolated hills from 5 to 10 feet high. The agricultural value of this soil is even less than that of typical Sparta sand. Much of it remains in small timber and brush.

COLOMA FINE SAND

The surface soil of Coloma fine sand, to a depth of 3 inches, consists of grayish-brown loamy fine sand, containing a small amount of organic matter. On cultivation this organic matter largely disappears and the surface soil becomes lighter in color. This layer is underlain to a depth of 8 inches by light-brown fine sand beneath which is yellow fine sand. The color of the surface soil varies somewhat, being deeper and darker on lower slopes. The subsoil is uniform. Small areas of Coloma sand were included in mapping.

This soil occurs in the northeastern part of the county, chiefly in the towns of Delton, Fairfield, and Merrimac. The surface is undulating or gently rolling, and natural drainage is excessive. Crops suffer from drought during some part of nearly every season. Coloma fine sand is derived largely from glacial drift, mostly sandstone material which is in part ice laid, in part water-laid, and in places modified to some extent by wind action. The entire soil is acid and in need of lime. It is low in fertility and requires careful management to produce profitable crops. It warms up early in the spring and is best suited to early truck crops.

CLYDE SILT LOAM

The surface soil of Clyde silt loam consists of black heavy silt loam with a high content of organic matter. Over the surface a thin layer of peat or muck in some of the lowest places is common. The surface soil extends in most places to a depth of about 14 inches, although locally the dark silty material continues to a depth of 2 feet. Between depths of 14 and 36 inches the material is drab or yellowish mottled heavy silty clay loam. In some places there are lenses of fine sand in the lower layers. The heavy subsoil or substratum extends in many places to a depth of 4 or 5 feet before any sand is found.

Clyde silt loam occurs typically in depressions in areas of glacial till but includes some areas of alluvial material, especially along Baraboo River. It occurs only in the eastern part of the county in the glaciated region. It is most extensive in Fairfield and Greenfield Towns, along the valley of Baraboo River. Smaller areas are in Merrimac Town and in Baraboo Town. Areas are low, level, and all so poorly drained that practically none can be safely cultivated without artificial drainage. Some of this soil along streams is subject to flooding during times of high water.

A part of this soil in Sauk County is included within drainage districts and is being reclaimed. When drained it is one of the best and most productive soils in the State. It is especially adapted to corn, hay, cabbage, and sugar beets. Small grains usually go too much to straw and are apt to lodge. The grain does not fill so well as on upland soils and is not of as good quality.

The native timber on this soil was chiefly elm, ash, soft maple, and willows. Most of the merchantable timber has been cut, although considerable of the soil is still uncleared.

CLYDE LOAM

The surface soil of Clyde loam, to a depth of 12 or 14 inches, consists of dark-brown or black loam containing a large amount of organic matter. Peat or muck a few inches thick may cover the surface in small areas. The subsoil is drab, bluish, yellowish, or mottled material variable in texture but in most places distinctly heavy. Below a depth of 3 feet sand or fine gravel is found in places. This gives the subsoil or substratum a gritty feel. Typically the soil occupies depressions in glacial till plains and is derived largely from glacial débris, but here it includes soil derived in part from alluvial material, especially in areas along Baraboo and Wisconsin Rivers and some smaller streams.

Clyde loam is of small extent and minor importance. It occurs only in the eastern part of the county in the glaciated region, chiefly in the towns of Fairfield, Greenfield, and Merrimac. Few of the areas are more than 80 acres in extent and many occur as narrow belts bordering areas of Clyde silt loam. The land is all low, level, or depressed, and natural drainage is poor. The soil can not be safely farmed without drainage.

The native timber growth consisted chiefly of elm, soft maple, ash, and willows, with some alder. Nearly all the merchantable timber has been cut, but probably not half the land has been cleared. Some of the land is in drainage districts and is being reclaimed. When properly drained it is well suited to such crops as corn, cabbage, hay, and sugar beets.

DUNNING FINE SANDY LOAM

The surface soil of Dunning fine sandy loam, to an average depth of 8 inches, consists of very dark grayish-brown or black fine sandy loam with a high organic-matter content. In places a thin layer of peat or muck is over the surface. Between depths of 8 and 28 inches the material is drab loamy fine sand underlain to a depth of 40 or more inches by nearly white fine quartz sand. The soil material is partly alluvial in origin, and it may be partly residual, especially the lower part of the subsoil. There is some variation in the soil, chiefly in the thickness of the dark-colored surface soil which may range from 6 to 18 inches. In places the underlying sandstone rock comes within 4 or 5 feet of the surface. The dark color is due to accumulations of organic matter. The entire soil is acid. Small areas of Dunning loam and Dunning fine sand were included with this soil in mapping.

This soil occupies 6 square miles in the county. It occurs in the northeastern part, chiefly in the towns of Dellona and Delton. The surface is low, level, or depressed, and natural drainage is poor. Most of this soil is uncultivated and is covered with alder or willow brush or timbered with small soft maple, ash, and other moisture-loving trees and shrubs. It is a soil of rather low agricultural value. In its improvement drainage is the first step.

VESPER FINE SANDY LOAM

The surface soil of Vesper fine sandy loam to an average depth of 4 inches consists of grayish-brown fine sandy loam. Between depths of 4 and 24 inches is yellowish-brown light fine sandy loam and between 24 and 36 or more inches is grayish-drab and yellow mottled loamy sand with sticky layers. At a depth ranging from 2 to 4 feet the material rests on or grades into sandstone or shale, and fragments of the rock are found in many places in the soil. The color of this soil is extremely variable, as is also the texture. The surface soil is everywhere sandy, and the subsoil is in most places as heavy as or heavier than the surface soil. It rests everywhere on the broken rock. This soil has been formed from the weathering of the underlying sandstone and shale rock. Both surface soil and subsoil are acid, and the soil is in need of lime.

This soil is of small total extent and occurs only in the northeastern part of the county, chiefly in Delton and Dellona Towns. The surface is level or very gently undulating, and natural drainage is somewhat deficient. Much of the soil would be benefited by tile drains.

The native timber was chiefly alder, willows, soft maple, and some elm. Most of the good timber has been cut, but a large part of the soil is still in small second-growth timber and brush. Cleared areas are devoted to general farming, but crop yields are low. This is considered a soil of low agricultural value. It needs careful management to make farming successful on it.

VESPER SILT LOAM

The surface soil of Vesper silt loam to an average depth of 7 inches consists of grayish-brown silt loam. In virgin wood lots there is in most places a 1 or 2 inch layer of darker-colored material at the surface, but this becomes mixed with the underlying material on cultivation. Between depths of 7 and 20 inches, the material is mottled gray, bluish, brown, and yellow silty clay loam which may contain some lenses of fine sand or through which the fine sand may be mixed. The next lower material, continuous to a depth of 36 inches, is generally mottled yellow, white, and grayish fine sand or sticky sand resting on sandstone rock with which some shale is in many places admixed. The soil is variable but is commonly loam or silt loam at the surface, with a heavy layer below resting on rock at a depth ranging from 3 to 5 feet. This is largely a residual soil, formed from the weathering of sandstone and shale. The soil is acid throughout and is in need of lime.

This soil occurs in the northeastern part of this county, chiefly in the town of Delton. The surface is level or gently undulating, and natural drainage is deficient. The subsoil is rather tight, and water moves through it slowly. Most of the soil would be benefited by tile drains or open ditches. It is cold and backward in the spring.

The timber on this soil was largely elm, ash, and soft maple, with alder and willow brush in the wettest places. Most of the timber has been cut, but not all the land has been fully cleared. It is a soil of rather low value under natural conditions, and it requires drainage and fertilization to make successful farming possible.

WABASH SILT LOAM

The surface soil of Wabash silt loam to an average depth of 14 inches consists of black, smooth, friable silt loam containing a large quantity of organic matter. Below this to a depth of 36 or more inches the material is dull-gray or mottled silty clay loam or heavy silt loam. The surface soil varies somewhat, especially as to thickness, the black material in places extending to a depth of 2 or even 3 feet without the development of a well-defined heavier-textured subsoil. Most of the soil material is alluvium or wash from the uplands carried down by run-off waters and deposited by streams in times of high water. Part of the material, especially along intermittent streams, may be colluvial in origin, and the soil has been mapped to extend up the lower slopes in places for a short distance. It seems evident that the organic matter, which gives the surface soil its dark color, was accumulated for the most part after the deposition of the alluvial material.

Wabash silt loam is widely distributed over the county as a first-bottom soil. It is most extensive in the small narrow bottoms in the towns of Bear Creek and Franklin but is also rather extensive in the valleys of Baraboo River and some of its tributaries. The bottoms range in width from one-eighth to one-half mile. In some of the bottoms the soil grades into light-colored bottom-land soils, and it is sometimes difficult to draw a line between the two soils. Areas are low and level or have only a gentle slope toward the stream along which they occur. The soil is subject to overflow, and for the most part drainage is poor.

The native timber on this soil consisted of ash, elm, soft maple, willows, alder, and similar trees. Part of the soil is cleared and utilized for pasture. Small areas are under cultivation. Where drainage is sufficient this is an excellent soil, well suited to corn, hay, root crops, cabbage, and beets. Its chief use is for pasture, for which it is excellent.

Wabash silt loam, colluvial phase.—The colluvial phase of Wabash silt loam differs from the typical soil chiefly in respect to physiographic position. It occurs as gently sloping areas between the first bottoms and the adjacent uplands or as small shallow basins at the heads of drainage ways. Due to the gently sloping surface and freedom from most overflows, areas of this phase of Wabash silt loam are better drained than the typical soil and are more nearly all under cultivation. This is excellent farm land, producing especially good crops of corn and hay and well suited to root crops and cabbage. Small grains are subject to lodging, because of the rank growth they make.

WABASH SILTY CLAY

The surface soil of Wabash silty clay, to an average depth of 12 or 14 inches, consists of heavy black silty clay or clay loam which contains a large quantity of organic matter. In places the color is somewhat lighter and may be dark grayish brown. Below this layer the material is drab or mottled dull-gray and yellowish-brown silty clay loam or clay, with lenses of sand in the substratum. The thickness of the surface soil is variable, and the black color may extend to a depth of 25 or 30 inches. Typical Wabash soils are derived

from alluvium, but the large area of Wabash silty clay referred to below has the appearance of having been an old lake bed that was filled in with silt and clay. The soil is commonly somewhat acid throughout, except where wash from limestone in the uplands has influenced the reaction.

Wabash silty clay is a soil of small extent and minor importance. It occurs mainly in one large area in the town of Freedom, about 3 miles south of Ableman. Smaller areas are along streams in this and other towns in regions where the soils of the uplands are heavy. The surface is low, level, or depressed, and natural drainage is deficient. Little of the land can be safely farmed without drainage. A number of ditches have been installed, and the land is partly drained. Some areas are flooded each year.

The native timber on this soil included elm, ash, soft maple, willow, alder, and other species. Most of the merchantable timber has been cut and the land cleared and placed under cultivation. When drained, this is a good, strong, productive soil, but because of its heavy texture it is hard to cultivate. It is well suited to hay, root crops, and corn. Small grains are apt to lodge and do not fill so well as on the light-colored upland soils. A part of the soil is utilized for pasture, for which use it is well suited where not too wet.

In the improvement of this soil, drainage is the first need. All the land should be tile drained and because of the heavy texture it would be necessary to place lines of tile close together, probably 4 or 6 rods apart.

WABASH FINE SANDY LOAM

The surface soil of Wabash fine sandy loam to a depth of about 14 inches consists of nearly black loam or fine sandy loam carrying considerable organic matter. This is underlain to a depth of 30 inches by mottled dull-gray and yellow heavy fine sandy loam or loam beneath which, to a depth of 40 inches, lenses of fine sand embedded in heavy material are common. The subsoil material is variable, as is also the thickness of the dark-colored surface soil, which in many places is as much as 2 feet. The soil material is mostly alluvium, although part of it is probably colluvial in origin.

This soil is of small extent and minor importance. It occurs chiefly in the northern part of the county as dark-colored first-bottom land, mostly in the valley of Baraboo River. Areas are low, level, and poorly drained and are nearly all subject to overflow.

The native timber was elm, ash, willow, and alder. In some open places grass was the chief growth. Part of the soil has been cleared and is used for pasture and to a less extent for crops. It is a good soil, where protected from flooding, and produces good crops of hay and corn.

ALLUVIAL SOILS (UNDIFFERENTIATED)

The soil materials classed as alluvial soils (undifferentiated) include all recent alluvium of the present stream flood plains, except that previously described as Wabash silt loam and Wabash fine sandy loam. The texture ranges from silt loam to sand, with extreme local variations. The color of the surface soil varies from grayish brown to nearly black, and the subsoil is mottled or yellowish brown according to drainage conditions. Many areas along the smaller streams

in the more dissected western part of the county are marked by deposits of light-colored silty material, ranging from a very thin layer to 12 or 15 inches in thickness, which overlie black soils like those of the Wabash series. This light-colored material has been recently washed down from adjacent uplands and spread over the original flood plains. Such soils are similar to Ray silt loam, as mapped in eastern Iowa.

The largest continuous areas of undifferentiated alluvium are in the flood plains of Wisconsin River, on the southern border of the county. Other fairly large areas are along Baraboo River, and small linear areas occur along smaller streams in all parts of the county.

Practically all areas of this material are subject to overflow in flood times. Lower areas retain standing water during rainy periods, and other areas are cut by abandoned stream channels.

The areas were generally timbered with elm, soft maple, and willows, but some open places supported a heavy growth of grass. Most of the best timber has been cut, although some fair timber stands along Wisconsin River. The better-drained areas have been cleared in places and are producing good crops, especially of corn. For the most part, the land is utilized for pasture. (Pl. 2, B.) Small grains are apt to lodge. In the improvement of this land drainage and protection from flooding are important.

PEAT

The material mapped as peat consists of black or dark-brown vegetable matter in various stages of disintegration, with which there has been incorporated a small and variable amount of mineral matter. Peat extends to a depth ranging from 2 to 15 or more feet, averaging 4 or 5 feet. As a rule the material is fairly well disintegrated and dark in color, but in a few places it was sufficiently raw that the original fibrous material could readily be distinguished. The fibrous material is commonly brown or light brown. The material is all sufficiently high in content of organic matter to burn when dry. The peat deposits contain layers of material, especially at lower depths, sufficiently fine and coherent to be molded into fixed forms by the hands. The composition of the underlying mineral material is variable. Where the surrounding uplands are sandy the mineral substratum beneath the peat deposit is usually sandy, and where the uplands are heavy in texture the mineral substratum is mostly heavy.

Peat is not so extensive in this county as in counties that are entirely glaciated. It occurs mostly though not entirely in the eastern part of the county in the glaciated region. The largest area is in Fairfield Town, where in one marsh peat covers about 5 square miles. Outside the glaciated areas peat is most extensive along the valley of Honey Creek.

Areas of peat are all level, low, and naturally very poorly drained. Portions are under water part of the time. Naturally the water table is always close to the surface. Some drainage ditches have been installed, and some of this land is partly improved.

For the most part peat shows varying degrees of acidity. Where the marshes are so situated that they receive the wash from limestone uplands the material is generally nearly neutral or alkaline in reaction, but elsewhere much of it is acid.

The natural vegetation on the peat areas was variable. Tamarack, cedar, alder, willow, and some elm and ash were found, and in some areas the vegetation consisted of coarse grasses. A few of the smaller peat areas have been cleared and drained and are being farmed. In the big marsh in Fairfield Town numerous open ditches have been dug and the land is partly improved so that on part of the marsh corn can be grown with a fair degree of safety. The peat is suited to hay, some root crops, onions, and cabbage. Small grains are apt to lodge and as a rule do not fill well. Peat is an unbalanced soil, being high in organic matter and nitrogen but deficient in mineral plant-food elements, which must be supplied in the permanent improvement of this type of land.

Peat, shallow phase.—The shallow phase of peat includes areas in which the deposits of peat are less than 2 feet thick. The organic material is similar to and shows the same variations as the deeper material described. In general the shallow peat may contain a higher percentage of mineral matter and be a little more thoroughly disintegrated than most of the deeper peat. These characteristics, in addition to the greater influence of the underlying mineral material, favorably influence the agricultural possibilities of the shallow peat, especially where the substratum is composed of medium or heavier-textured materials.

ROUGH BROKEN LAND

Rough broken land includes rough, rocky, steep, and broken land which can not be cultivated. Some areas afford fair grazing, and in a few places attempts to cultivate small patches have been made with indifferent success. The soil is shallow and rocky or is so steep that there is serious danger of erosion.

Rough broken land occurs in all towns within the county but especially in the rougher parts. It is most extensive in the towns of Bear Creek and Franklin. A very conspicuous area borders Devils Lake, where rocks rise to an elevation of several hundred feet above the lake.

Three distinct rock formations, limestone, sandstone, and quartzite, outcrop extensively in areas of rough broken land. The sandstone is most extensive in the northern and northeastern parts of the county, the limestone in the western part, and the quartzite in the central and east-central parts.

More than 75 per cent of the rough broken land is forested, mostly with oak and hickory, with some maple and a little pine in places. Most of the best timber has been cut, but some merchantable timber still stands. This land should remain forested and cleared areas could well be reforested. A large proportion of this soil on a farm greatly detracts from its value.

AGRICULTURE

Agriculture was practiced in Sauk County by the Sac Indians as early as 1746. In 1838 the first white family settled at the south end of Sauk Prairie. The German influx started about 1840, and the farming operations of these settlers greatly advanced the agricultural interests of the county. By 1855 agriculture was so well organized that a fair was held at Baraboo.

Most of the county outside the prairies was heavily timbered and clearing was a big undertaking. In the early days lumber was cheap, and there was not always a market for timber that had to be cut to clear the land. As a result, much good timber was burned to get it out of the way. Over most of the county lumbering became an important industry before agriculture.

Corn, wheat, and potatoes were the most important crops of the early settlers. For a number of years wheat was the leading cash crop. The virgin soil produced excellent yields of wheat, but continual cropping, together with the ravages of the chinch bug, so reduced the yields that the crop could not be produced with profit. Grain growing gradually gave way to a more diversified system of farming. Corn and oats proved profitable, and the raising and feeding of livestock gradually developed into an important industry.

Along with the raising of wheat, pork afforded an important source of income. Potato raising early formed a part of the farmers' program, since the potato was one of the main subsistence crops. The Colorado potato beetle first appeared in 1871 and at that time was a very serious pest, as means for fighting it had not then been found. Hops early became an important cash crop. Many farmers paid for their land with one crop of hops.

In 1868 there were in the county 85,000 acres of improved land and about 447,000 acres of unimproved land. Wheat, corn, and oats continued to be important crops for a number of years. In 1879, according to the 1880 census, total yields of various crops were as follows: Wheat, 620,522 bushels; corn, 963,060 bushels; oats, 943,246 bushels; barley, 47,136 bushels; rye, 64,843 bushels; potatoes, 292,318 bushels; hops, 235,018 pounds; tobacco, 2,316 pounds; and hay, 49,523 tons. These items indicate clearly that agriculture was becoming diversified.

At present, the chief type of agriculture is general farming, with dairying as the most important branch. Corn is one of the most important crops in acreage and value. It is grown in all parts of the county and on all soils. The light-colored silt loam soils, such as Waukesha silt loam and Carrington silt loam, are best suited to the crop, but even on the sandy soils fair yields can be obtained by the use of fertilizers.

Tame hay, mostly mixed timothy and clover, is an important crop. It does not do well on the sandy soils but thrives on the loams and silt loams. The acreage of alfalfa is gradually increasing. Most of the soils need lime to insure a good stand of alfalfa.

Oats do best on the loam and silt loam soils. They are not grown extensively on the sandy and sand soils.

Barley is not grown so extensively as it formerly was. Rye is grown chiefly on the sandy soils, where it does better than other small grains. Wheat does well on such soils as Clinton silt loam, Dubuque silt loam, and Thurston silt loam. Buckwheat is an unimportant crop.

Dry peas are not an important crop, but peas for canning are a major special crop. Peas are grown to some extent on sandy soils about Sauk City, but they do best on silt loam soils which are well supplied with lime. Potatoes do best on the sandy loam and fine sandy loam soils but are grown for home use on nearly all soils in

the county. Soybeans are a comparatively new crop. They make a good hay crop when clover fails and are sometimes grown with corn for silage.

Table 3 gives the acreage and yield of important crops in 1909, 1919, and 1924, according to the census.

TABLE 3.—*Acreage and yield of important crops in Sauk County in 1909, 1919, and 1924*

Crop	1909		1919		1924	
	Acres	*Bushels*	*Acres*	*Bushels*	*Acres*	*Bushels*
Corn	48,471	1,330,875	40,785	1,459,891	25,573	613,661
Oats	54,160	1,748,555	55,383	1,942,294	58,974	2,249,287
Wheat	4,247	81,898	8,386	129,488	3,848	93,613
Rye	9,313	111,826	11,531	125,284	7,999	100,753
Barley	11,142	304,274	9,807	265,931	5,019	160,718
Potatoes	9,901	1,226,487	5,838	541,983	4,140	452,382
		Tons		*Tons*		*Tons*
Hay and forage	61,690	105,455	96,248	250,644	[1]59,884	[1]101,185

[1] Hay only.

Dairying is by far the most important branch of farming in Sauk County and is the channel through which most of the farm crops are marketed. The chief dairy products are butter and cheese. In July, 1926, there were 27 cheese factories and 13 butter factories within the county, as well as 1 condensery and 9 receiving stations. In 1925 there were in the county 45,124 cows 2 years old and older. Pure-bred and grade Holstein cattle are most numerous, with those of the Guernsey breed second. The value of dairy products in 1924 was $2,793,716.

In connection with the dairy industry the question of pastures is very important. There is more pasture land in Sauk County than in many counties of the eastern part of the State where the surface is more generally level or undulating. In 1925 there were 28,654 acres of plowable pasture, 118,865 acres of woodland pasture, and 53,113 acres of other pasture in the county, making a total of 200,632 acres of pasture land. Grasses do best on heavy soils, which predominate in the roughest parts of the county.

In 1925 there were 46,189 head of hogs on the farms of Sauk County, having a value of $559,932. Hog raising goes hand in hand with dairying, and a large amount of whey, skim milk, and buttermilk is used as feed for pigs. In the same year there were in the county 13,521 horses and 179 mules, which had a value of $1,184,437, and 5,377 sheep, with a value of $60,070. A large acreage of land in the county is well suited to sheep production, and it would seem that this industry could be materially extended.

The 346,584 chickens raised in the county in 1924 had a value of $266,870. In the same year 1,334,316 dozen chicken eggs, with a value of $346,922, were produced. Poultry provides a substantial supplementary income on many farms.

All livestock in the county on January 1, 1925, had a value of $5,459,707.

In 1925 there were in the county 3,612 farms, whereas in 1900 there were 3,886 farms. The tendency seems to be for the farm to increase in size. The average-sized farm in 1925 included 134 acres.

The percentage of land in farms was 89.8 per cent. The average value of all property to the farm was $13,880, and the average value of land alone was $55.53 an acre. Only 584 farms were operated by tenants.

The farm buildings are generally well built and substantial. The silo forms a part of the equipment on most dairy farms. Fences are fair or good. The equipment of farm machinery in general use is complete on most farms. There were 576 tractors in the county in 1925. Machines for threshing grain travel about the county, serving the farmers. Silo fillers are operated in the same way as threshing machines.

The 1925 census shows that for 1924, 2,165 farmers reported a total expenditure of $562,791 for labor.

While the soil survey of Sauk County was in progress special studies showing the acreage of crops on different soils were made on five sections of land. These sections were selected in different parts of the county where different soils and groups of soils predominated.

In section 10, T. 10 N., R. 5 E., Clinton silt loam predominates and nearly all the other soils are silt loams. In the entire section of 640 acres there were 89 acres of corn, 127 acres of oats, 128 acres of hay, 213 acres of pasture and woods, 35 acres of barley, 2 acres of potatoes, 11 acres in garden and yards, 27 acres in wheat, and 8 acres in orchards. The acreage of Clinton silt loam in this section is 296 acres, of which 49 acres were devoted to corn during the year of the survey, 61 acres to oats, 65 acres to hay, 60 acres to pasture and wood lots, 24 acres to barley, 2 acres to potatoes, 17 acres to wheat, 8 acres to orchards, and 10 acres to yards and gardens.

Wabash silt loam, mostly colluvial phase, covers 164 acres in this section, and on this soil 15 acres of corn, 15 acres of oats, 50 acres of hay, 75 acres of pasture, and 1 acre of barley were grown. The cultivated crops are all grown on the better-drained colluvial phase of Wabash silt loam where there is not much danger from flooding. Where there is danger of flooding the soil is used mostly for pasture.

In section 8, T. 8 N., R. 4 E., the sandy loams and loam soils predominate. La Crosse sandy loam, La Crosse sandy loam, dark-colored phase, and La Crosse loam, dark-colored phase, each cover between 100 and 200 acres. On these three soils the chief crops, in order of acreage, are corn, pasture, oats, and hay. Alluvial soils (undifferentiated) are extensive in this section, but they are used only for grazing.

In section 5, T. 9 N., R. 5 E., Waukesha silt loam predominates. In this section the acreage of Waukesha silt loam is 495 acres. On this soil there are 205 acres of corn, 130 acres of oats, 106 acres of hay, 13 acres of pasture, 26 acres of barley, 3 acres of potatoes, and 12 acres in yards and gardens.

In section 12, T. 12 N., R. 4 E., there are three main soils—Boone fine sand occupying 163 acres, Boone fine sandy loam 380 acres, and Boone loam 61 acres. On all these soils corn is grown most extensively, followed by pasture, oats, and hay. Rye is a minor crop on these soils, as are also potatoes.

In section 4, T. 8 N., R. 3 E., Sparta sand predominates. Of the Sparta sand with its rolling phase there are 350 acres; La Crosse sandy loam, dark-colored phase, occupies 168 acres; La Crosse sandy loam, 79 acres; and La Crosse loam, dark-colored phase, 34 acres. These

soils are used mainly for pasture and furnish very poor grazing. Of the crops grown, corn leads on most farms, with rye as a major grain crop. Oats is a minor crop and not much hay is raised.

ADAPTATION OF SOILS TO CROPS

It is generally recognized by practically all farmers that certain soils are better suited to some crops than to others. The crops which are most extensively grown on the various soils at present are those which thrive fairly well on the soils. However, as on any farm it is desirable and necessary to raise different crops in order that the various feeds may be produced, rotation must be practiced, and the best methods of soil improvement followed. It is evident, therefore, that no one crop can be grown exclusively on a soil which may seem to be best suited to that crop. It is generally recognized that the dark-colored soils are well suited to corn, but it is not considered advisable to grow corn to the exclusion of other crops on this land. Clyde silt loam and the Wabash soils, where well drained, are among the best corn soils in the State. Yet even on these soils other crops should be grown in rotation with corn.

Such crops as rye and potatoes are grown more extensively on the sandy than on the heavy soils. Small-grain crops seem to produce better-quality grain on light-colored soils than on the dark-colored soils and there is less danger from lodging. Sugar beets grown on a light-colored soil have a slightly higher sugar content than those grown on prairie soils or such soils as Clyde silt loam. However, the tonnage is usually higher on the dark soils, so that the total sugar yield is frequently greater on them than on the light-colored land. Farmers in general recognize that soils of the Thurston series are well suited to alfalfa. There is still much to be learned, however, in regard to the adaptation of soils to crops, and it would be well for every farmer to make careful observations relative to the behavior of different crops on various soils and to be guided, as far as is practical, by the results of these observations.

Field tests, plot experiments, and the experience of farmers indicate the advisability of applying lime to most of the Sauk County soils, especially when crops with high lime requirement are to be grown. There are a number of local limestone-grinding outfits in the county, and more are being bought each year. Some of these local grinders locate permanently, grind the rock, and sell it to surrounding farmers. Other grinders move from farm to farm to do custom work as do threshing machines. The cost to the farmer for locally ground rock is usually about $2.50 a ton at the grinder.

There are many fields in Sauk County which would be improved by drainage, and some of them can not be used for cultivated crops until some form of drainage is supplied. The peat soil and large areas of the Dunning, Clyde, Wabash, and alluvial soils (undifferentiated) are in need of drainage. Some areas are subject to flooding each year.

Part of the large marsh in Fairfield and Greenfield Towns is within a drainage district and is partly improved so that cultivated crops are being grown successfully. The lowland south of Ableman is also partly improved by drainage, but in both these areas added drainage is needed to make the entire area safe for cultivated crops. Numerous areas of lowland along Baraboo River and smaller streams might be made safely productive by drainage and the use of dikes to prevent

flooding. Where drainage is needed, no other form of improvement can take its place. There are many small areas on individual farms where a single line of tile would reclaim several acres and fit it for production of farm crops.

Analyses of the soils, crop studies, and field tests indicate that much of the land of Sauk County is somewhat deficient in phosphorus, as are many Wisconsin soils. The light-colored soils of the uplands are relatively low in nitrogen and organic matter and are mostly acid. The black well-drained soils are usually acid, and the peat marshes are low in both potash and phosphorus and are acid in places.

In supplying fertilizer materials to the soil the most economical sources available should be drawn upon. The most common source of fertilizer for the farms is stable manure. The supply is greater than in a grain-raising region, but is not sufficient to meet the fertilizer needs of the land. Readily available plant foods in the form of commercial fertilizers are now being used to some extent. In 1924, 570 farmers reported the use of commercial fertilizer, including lime, for which a total of $26,144 was expended.

Phosphorus can best be supplied in the form of superphosphate (acid phosphate), which is readily available, or it may be applied in the more slowly available forms of raw rock phosphate or bone meal. In the trucking region where crops are forced and where large amounts of readily available plant food must be at hand the complete fertilizers are most commonly used, and applications run as high as 1,000 pounds or more to the acre. Frequently liberal applications of mixed fertilizers are used to supplement stable manure, and it is usually such combinations which produce the largest and most economical yields.

For general farm crops the usual application of superphosphate is from 300 to 400 pounds of 16 per cent material to the acre, when applied broadcast. If applied in the row or hill about half this amount is sufficient. Subsequent applications should be at the rate of about 200 pounds every three or four years.

The most satisfactory way to apply commercial fertilizers is with a fertilizer spreader or fertilizer attachment to a grain drill or corn planter. If sown broadcast it should be evenly distributed on the plowed ground and worked well into the soil. Commercial fertilizers may also be applied by spreading them over the top of a load of manure in the manure spreader. An application should be made at least once during each rotation, preferably on the small-grain crop or the corn. Frequently both these crops are given an application.

For further information on the use of commercial fertilizers see Bulletin No. 341, Agricultural Experiment Station of the University of Wisconsin, entitled "The use of fertilizer on dairy farms."

Land values have a very wide range in Sauk County, owing chiefly to the variations in the productivity of the soil. The well-drained dark-colored silt loam soils at the time of the survey commanded from $125 to $200 an acre, depending on improvements, location, and other conditions. A number of farms on the sandy soils of the county have recently changed hands at a price as low as $15 or $20 an acre. These are well-located lands of low producing power and buildings are poor. Between these extremes all variations can be found.

SUMMARY

Sauk County is in the south-central part of Wisconsin. It comprises an area of 538,880 acres. The population in 1920 was 32,548.

The surface relief is variable. There are considerable stretches of level river-terrace land along Wisconsin River. Much of the county is gently rolling, and a large area, especially in the western part, is rough. The Baraboo Range is a conspicuous surface feature.

The highest elevation in the county is 1,620 feet, but the elevation of most of the county is between 775 and 900 feet above sea level. There are a few marshes in the eastern part but very few in the western part. Most of the county is well drained.

The average length of the frost-free season is 174 days.

The soils of Sauk County cover a wide range in texture, color, and organic-matter content. There are soils from glacial, alluvial, and residual material. Most of the area was timbered and the soils developed under a forest cover, but there are also some prairies where black soils are found. Each soil type and series has characteristics by which it can be readily recognized.

Agriculture in Sauk County was first practiced by the Sac Indians as early as 1746. Permanent agriculture was established between 1835 and 1840.

Wheat, corn, and potatoes were the most important crops of the early settlers. At the present time, the chief agricultural industry is general farming, with dairying as the most important branch.

Farm buildings are substantial, and most farms are well equipped. There is a silo on nearly every farm, and tractors are common.

On the dark-colored soils corn is the predominating crop, whereas on the light-colored upland soils small grains, including oats, wheat, and barley, are widely grown and on the sandy soils rye is an important crop. Much of the steep land and bottom land is utilized as pasture, for which use it is well suited.

From studies made it is evident that the phosphorus supply in the soils of this county is being gradually depleted. Most soils of the county are acid. There are numerous outcrops of good limerock, which can be ground and used for liming the soil. Commercial fertilizers are not extensively used at present.

There are several areas of low wet land in the county, and the complete drainage of these areas will add considerably to the acreage of tillable land in the county.

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF CHEMISTRY AND SOILS
HENRY G. KNIGHT, CHIEF
A. G. McCALL, CHIEF, SOIL INVESTIGATIONS
CURTIS F. MARBUT, IN CHARGE SOIL SURVEY

SOIL MAP
SAUK COUNTY
WISCONSIN

WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY
ERNEST F. BEAN, DIRECTOR
UNIVERSITY OF WISCONSIN COLLEGE OF AGRICULTURE
H. L. RUSSELL, DEAN
A. R. WHITSON, IN CHARGE SOIL SURVEY

LEGEND

- Baraboo fine sandy loam — By
- Dubuque silt loam — Du
- Steep phase — By
- Steep phase — Du
- Baraboo loam — B
- Deep phase — Du
- Steep phase — B
- Dunning fine sandy loam — Df
- Baraboo silt loam — Bm
- La Crosse sandy loam — Ll
- Steep phase — Bm
- Dark colored phase — Ll
- Bates silt loam — Ba
- La Crosse fine sandy loam — L
- Bertrand fine sandy loam — Bd
- La Crosse loam, Dark colored phase — Lm
- Bertrand silt loam — Br
- Sparta sand — Ss
- Boone fine sand — Bs
- Rolling phase — Ss
- Steep phase — Bs
- Thurston fine sandy loam — Tf
- Boone fine sandy loam — Bf
- Steep phase — Tf
- Steep phase — Bf
- Thurston loam — Tl
- Boone loam — Bl
- Steep phase — Tl
- Rolling phase — Bl
- Thurston silt loam — Ts
- Boone silt loam — Bs
- Steep phase — Ts
- Carrington loam — Cl
- Vesper fine sandy loam — Vf
- Carrington silt loam — Ca
- Vesper silt loam — Vl
- Clinton silt loam — Cm
- Wabash fine sandy loam — Wf
- Steep phase — Cm
- Wabash silt loam — Ws
- Clyde loam — Cy
- Colluvial phase — Ws
- Clyde silt loam — C
- Wabash silty clay — Wc
- Coloma fine sand — Cs
- Waukesha silt loam — Wk
- Peat — P
- Alluvial soils (Undifferentiated) — A
- Shallow phase — P
- Rough broken land — Rb

CONVENTIONAL SIGNS

CULTURE (Printed in black)
- City or Village, Roads, Buildings, Wharves, Jetties, Breakwater, Levee, Lighthouse, Fort
- Secondary roads and Trails
- Railroads Steam and Electric
- Bridges, Ferry
- R.R. crossings, Tunnel
- Ford, Dam
- School or Church, Cemeteries
- Mine or Quarry, Mine dumps, Made land
- Bluff, Escarpment, Rock outcrop, and Triangulation station
- Stony and Gravelly areas
- Soil boundaries
- Boundary lines
- Boundary lines
- Boundary lines
- U.S. township and section lines

RELIEF (Printed in brown or black)
- Contours, Depression contours
- Prominent Hills, Mountain Peaks
- Sand Wash, and Sand dunes
- Shore and Low-water line, Sandbar

DRAINAGE (Printed in blue)
- Streams
- Lakes, Ponds, Intermittent lakes
- Intermittent streams
- Springs, Canals and Ditches, Flumes
- Swamp, Salt marshes
- Submerged marsh, Tidal flats

The above signs are in current use on the soil survey maps, but some of them may not appear in some maps of earlier dates.

Mark Baldwin, Inspector, District 1.
Soils surveyed by W. J. Geib, in charge, and M. J. Edwards, E. H. Bailey and A. C. Anderson, U. S. Department of Agriculture, and T. J. Dunnewald, J. F. Fudge, O. L. Stockstad, and Homer Chapman, Wisconsin Geological and Natural History Survey

BASE MAP IN PART FROM U. S. GEOLOGICAL SURVEY SHEETS

Scale 1 inch = 1 mile

WILLIAMS & HEINTZ CO. WASH. D.C.

Field Operations
Bureau of Soils
1925

[PUBLIC RESOLUTION—No. 9]

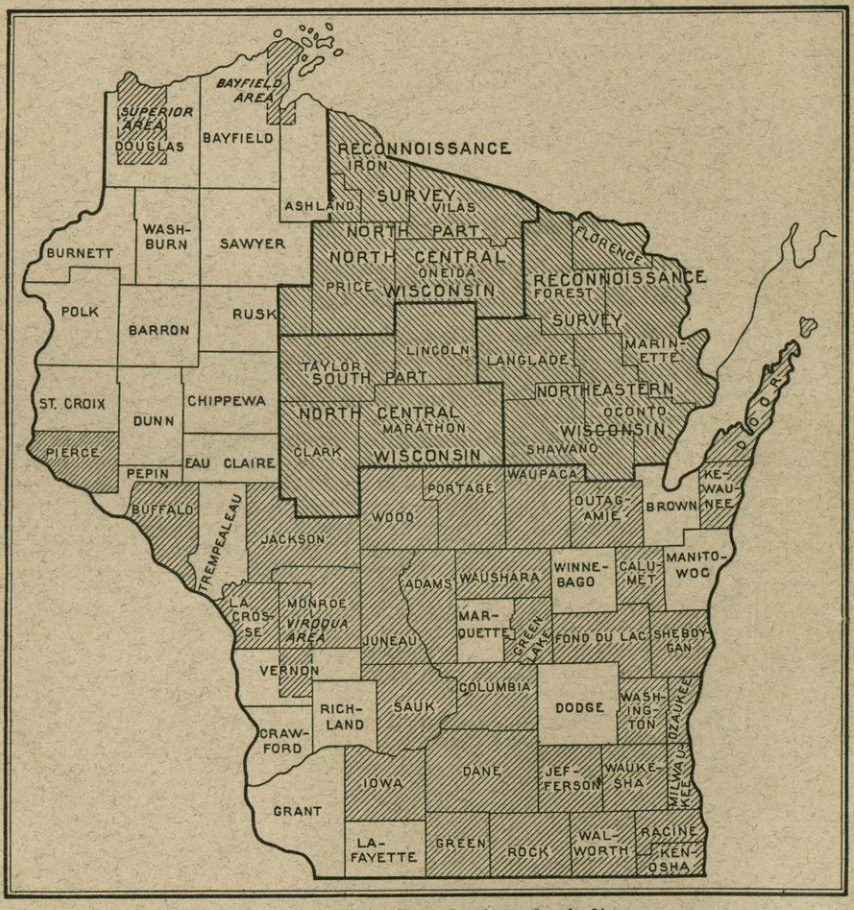
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils, and on July 1, 1927, the Bureau of Soils became a unit of the Bureau of Chemistry and Soils.]



Areas surveyed in Wisconsin, shown by shading

U. S. GOVERNMENT PRINTING OFFICE: 1930