SOIL SURVEY OF THE AUBURN AREA, NEW YORK.

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LOCATION AND BOUNDARIES OF THE AREA.

The Auburn area is situated in the central western part of New York State, about half way between Buffalo and Albany, and about 25 miles south of Lake Ontario. The area includes all of Cayuga County south of parallel 43° N., which passes about half a mile north of the village of Sennett. The eastern boundary is formed by

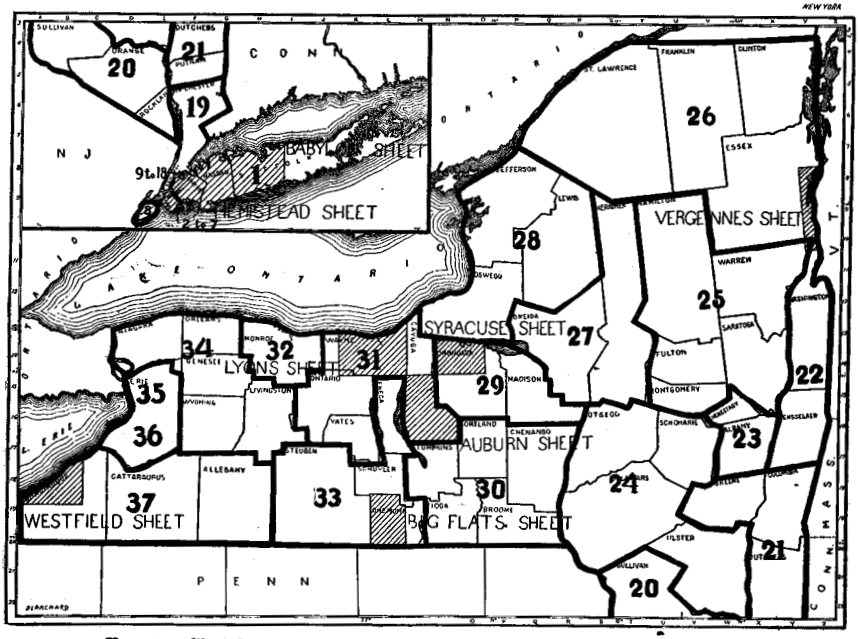

FIG. 2.—Sketch map showing location of the Auburn area, New York.

Onondaga and Cortland counties; the southern by Tompkins County, and the western by Seneca County. The area is 26 miles long from north to south, and 14 miles wide at the north end. About 11 miles south of the forty-third parallel the county offsets at right angles 4 miles to the east, and thence southeast for a distance of 8 miles Skaneateles Lake forms the boundary between Cayuga and Onon-

daga counties. The western boundary throughout the whole distance is formed by Cayuga Lake and 4 miles of the Montezuma Marsh at the lower end of the lake. The average width of the central and southern half of the county is about 22 miles.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

It was not until after the close of the Revolutionary war that Cayuga County was first settled. In 1789 all western New York was called Montgomery County. This county was subdivided, and what is now Cayuga County was then included in Batavia Township. Herkimer County was formed from Montgomery in 1791, and in 1794 was redivided and the territory under present consideration came into Onondaga County. Cayuga County was formed from Onondaga in 1799.

The first white settler in Cayuga County came to Aurora in 1789, when the territory was known as the Onondaga military tract, which had been surveyed into lots to satisfy the bounty claims of the veterans of the Revolutionary and border wars, each private of which was to receive one of these lots of 500 acres. In 1793 Capt. John L. Hardenburgh secured one of these lots located on Owasco Outlet, at the present site of Auburn. The Outlet was crossed at this point by an Indian trail, which later developed into the thoroughfare known as the Genesee road. Hardenburgh brought with him besides his family two negro slaves, and with their help began the clearing of a patch of land on his new claim and the erection of a gristmill, which had a daily capacity of 12 bushels of wheat. Other settlers soon began to be attracted to what was for many years known as Hardenburghs Corners. In three or four years a schoolhouse was built, and following this another gristmill.

Among the first white people to come to Hardenburghs Corners were several families from Gettysburg, Pa. The greater proportion of the settlers, however, came from the eastern part of the State and from Massachusetts and Connecticut, where the richness of the lands of the Onondaga military tract was already well known.

The development of the country was hindered to some extent by the lack of transportation. The roads were merely widened Indian trails, and the one passing through the Corners for many years held the reputation of being the worst in the western part of the State. Stages were running in 1800, with semiweekly mails, and two or three years later the Genesee road, or Seneca turnpike, was constructed, and for many years was the principal channel of trade across the State. Large numbers of settlers located along this road wherever

they were able to secure desirable lands. One of the early modes of travel from Cayuga Lake to Utica and Schenectady was by boat, or bateau, through the Mohawk, Seneca, and other connected rivers. The trip from Schenectady to Seneca Lake could be made in from fifteen to twenty days with 1½ tons of goods. By 1820 the Grand Canal was so far completed that boats ran from Montezuma, the port for Cayuga County, to Utica in two days, and in another year the packet boats were able to go through to Schenectady. The canal, now called the Erie Canal, was finally completed in 1825, furnishing relatively cheap though slow transportation to the East for the rapidly increasing volume of farm produce.

The first track, made of wood, of the Auburn and Syracuse Railroad was laid in 1838, and for the first year the cars were drawn by horses. This equipment was superseded in 1839 by iron rails and locomotives. The Auburn and Rochester Railroad was completed into Auburn in 1841, and a few years later the two roads were consolidated into the New York Central. The Southern Central Railroad was opened from Fair Haven to Sayre, Pa., in 1869, and what later became another branch of the Lehigh Valley Railroad, from Auburn to Ithaca, was completed in 1873.

The agricultural population of Cayuga County increased rapidly from the first, and in 1800 it had reached 15,000, while Auburn, the chief town, had only a few hundred inhabitants. An agricultural society was organized and a fair held in the county as early as 1818, and from the fact that these fairs were, with few interruptions, held annually for many years, it may be judged that the settlers were alive to the desirability of improving the quality of their products, to the adoption of new methods, machinery, etc., and that they gladly welcomed these mutually profitable yearly exhibitions. Save for the interruption and unusual hardships entailed by the civil war, the prosperity of the farming population has remained unchecked from the time of the establishment of adequate railroad and canal communication with the outside world to the present time.

CLIMATE.

The climate of the Auburn area is characterized by long, cold winters and correspondingly short summers. The rainfall is well distributed throughout the growing season, and while the summer temperature seldom reaches 90° F., all of the ordinary farm crops produced north of Maryland can be profitably grown in this climate.

The following table shows the average temperature and the amount and distribution of precipitation throughout the year:

Normal monthly and annual temperature and precipitation.

Month.	Auburn.		Baldwinsville.		Romulus.	
	Temperature.	Precipitation.	Temperature.	Precipitation.	Temperature.	Precipitation.
	° *F.*	*In.*	° *F.*	*In.*	° *F.*	*In.*
January	24.1	2.59	22.5	3.32	24.4	2.18
February	24.9	2.16	23.6	3.38	23.9	2.05
March	32.8	2.28	30.4	3.71	32.7	2.55
April	45.5	2.37	44.4	2.22	46.4	2.14
May	56.5	3.54	56.2	3.62	57.7	3.99
June	65.8	3.85	65.6	3.36	67.7	3.13
July	70.6	3.69	70.3	4.13	67.2	.....
August	69.0	3.44	67.7	3.41	70.0	3.16
September	60.9	3.10	61.1	3.21	62.7	2.83
October	49.7	3.38	49.4	3.05	51.3	3.02
November	38.5	4.24	38.3	3.51	39.6	2.99
December	29.2	2.82	28.3	3.81	29.5	2.53
Year	47.3	37.46	46.5	40.73	47.8	.....

PHYSIOGRAPHY AND GEOLOGY.

The physiography of the northern part of the area is characterized by the presence of many glacial hills, or drumlins. These hills lie parallel in a general direction (N. 18° W.), and usually show the lenticular, drumlinoid form—long and narrow. Their length ranges from one-fourth of a mile to 1 mile, the width is about one-third of the length, and the height ranges from 20 to 120 feet at the highest part of the hill, which is usually about one-third of the distance back from the northern end. The northern ends of these hills are quite abrupt, and many of them possess a pronounced shoulder, or bench, near the top. The southern ends slope away at a very gentle angle, some of them measuring only about 1° and gradually disappearing until the level of the surrounding plain is reached. The sides are in most instances quite steep, showing an angle usually somewhat steeper than that of the northern end. A glance at the map shows the influence of these parallel, interlocking hills upon the laying out of the roads, nearly all of which are naturally forced to follow the general trend of the drumlins, with few connecting crossroads. The hollows and depressions intervening between these hills follow, as a rule, quite straight corresponding lines, and in these are located the swamps and streams, with the drainage uniformly toward the north.

South of a line from Cayuga to Auburn these abrupt hills disappear and give place to a rolling topography exhibiting smoother contours, and, with the exception of a few outlying drumlins, showing

none of the uniformity of conformation and direction just described. This area occupies a position between the northern ends of Owasco and Cayuga lakes, and forms a kind of basin between the drumlin area and the gradually rising plateau to the south. The drainage of this basin is partly northward into Owasco Outlet and Crane Brook, and partly westward into Cayuga Lake. It is upon this type of topography that the Dunkirk clay loam is best developed.

East of Auburn the drumlin topography persists a little farther to the south, although somewhat interrupted along the Franklin Street road, disappearing again before reaching Dutch Hollow Brook. Southward from the northern end of Owasco Lake, on both sides, the country rises more rapidly and uniformly, forming high, rounded table-lands, or plateaus. The long, narrow, parallel lakes—Cayuga, Owasco, and Skaneateles—constitute the chief physiographic feature of the Auburn area. The plateau on the east side of Owasco Lake reaches its maximum elevation of 1,840 feet in Sempronius Township, and on the west side of the lake an elevation of 1,400 feet is attained in Venice Township. From these points there is a gentle slope southward to the Tompkins County line and northward to Lake Ontario.

Into the plateau between Owasco and Cayuga lakes the main branch of Salmon Creek has eroded a comparatively steep-sided valley, which is 200 feet deep at Venice Center, and 400 feet deep 8 miles farther south, at the county line. A smaller, but quite deep, valley is also cut by little Salmon Creek, the course of which runs nearly parallel to the main stream and is 5 miles long, the two valleys coalescing about a mile north of the county line.

The eastern plateau, lying between Owasco and Skaneateles lakes, is divided into three parts. Dutch Hollow Brook, rising near Kelloggsville and flowing northwest into the lower end of Owasco Lake, and Dutch Creek, rising about 2 miles east of Omro and flowing southwest through a continuation of the same ancient valley into the upper end of Owasco Lake, separate two of these divisions, the other boundaries of which are formed by Owasco and Skaneateles lakes. The third division is separated from the other two by Montville Creek, rising near Dresserville and emptying into Owasco Inlet near Moravia, and Fall Creek, heading near North Summer Hill, gaining accessions in Lake Como, and passing out of the southeast corner of the county. These latter two creeks, like Dutch Hollow Brook and Dutch Creek, take opposite directions in the trough of a common preglacial valley. Besides these valleys, Owasco Inlet and its principal tributary, Stony Creek, together form a triangular area of about 6 square miles, which reaches at the county line a maximum height of 500 feet above the stream beds. All of these deep valleys in the two plateaus are filled to depths ranging from 20 to 100 feet

or more with glacial moraine. This morainic material along most of the streams influences the soil to a marked extent. To this cause is due the band of Miami stony loam along the Owasco Inlet and Big and Little Salmon creeks, and also along Montville Creek emptying at Moravia.

These plateaus have their highest elevations, as well as their steepest slopes toward the lakes, along the southern ends of the easterly escarpments. The western plateau has a slope, north of Wykoffs, of only about 200 feet to the mile, which gradually increases until, at the head of Owasco Lake, it is nearly 500 feet to the mile. Opposite Moravia it becomes quite precipitous, rising to a height of 700 feet above the valley in a horizontal distance of little more than half a mile. This mountainous slope is maintained to the southward for several miles, while across the valley on the west slope of the eastern plateau the inclination is not greater than 500 feet to the mile. The eastern escarpment of this plateau, at Glenhaven, situated at the upper end of Skaneateles Lake, exhibits about the same declivity as the one opposite Moravia, but the relative elevation is somewhat greater, the crest of the escarpment being about 950 feet above the lake.

The slope of the plateau along Cayuga Lake also gradually increases to the southward, ranging from about 200 feet to the mile at Union Springs to 500 at the southern boundary line. Streams from half a mile to 2 or 3 miles in length flow off these slopes into the lakes at from one-fourth of a mile to 1 mile apart, forming sometimes deep, rocky gorges 200 or 300 feet in depth and thickly forested with oak, hickory, elm, maple, and other hardwood trees, among which is a scattering of hemlock.

The underlying rocks of the area consist for the most part of limestones and shales, and range from the Upper Silurian, covered by the glacial drift of the northern part of the area, to the more recent rocks of the later Devonian, found in the southern part of the county. There are probably no considerable areas of residual soil, it being all influenced to a greater or less extent by the grinding, mixing, and transporting action of the glaciers which once covered this portion of New York State. A large part of the transported stone present, especially in the northern part of the area, consists of the rounded fragments of crystalline rocks, which have been brought long distances from the north. Mixed with these are many fragments of limestone and shale which have not been carried far from their original position. In the southern and south-central parts of the county these fragments give little evidence of glacial action, and are quite sharp and angular. The Volusia loam in some portions of Sempronius, Summer Hill, Moravia, and Locke townships

is largely the product of residual weathering of Hamilton and Genesee shales, and has been reworked comparatively little by glacial action. Along the walls of such valleys as the one south of Moravia, the valley of Montville Creek, and the Salmon Creek valleys, large amounts of glacial débris have been deposited as moraines, and the influence of the native rock is less apparent in the soil formation.

SOILS.

Exclusive of Meadow and a few small areas of Muck, nine types of soil have been recognized and mapped in the Auburn area. The following table shows the actual and relative extent of each type:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Miami stony loam	114,624	38.9	Dunkirk clay	2,880	1.0
Volusia loam	70,720	24.0	Miami fine sand	1,920	.6
Dunkirk loam	50,304	17.1	Dunkirk gravelly loam	640	.2
Dunkirk clay loam	35,584	12.1	Muck	512	.1
Meadow	8,000	2.7	Total	294,976	
Miami loam	5,696	1.9			
Dunkirk stony clay	4,096	1.4			

MIAMI STONY LOAM.

The soil of the Miami stony loam, to an average depth of about 9 inches, is a brown or grayish-brown loam, containing about 35 per cent of the various grades of sand and some small gravel. Upon drying after a rain the surface is firm and compact, often hard, yet it does not form troublesome clods in cultivation. The surface is covered with from 20 to 50 per cent of stones, ranging from 1 to 5 inches in diameter. Many of these are fragments of crystalline rocks, which were well rounded during their transportation by the glaciers. There are also present some pieces of flat and partially rounded shale and limestone, which have been transported comparatively short distances. The quantity of stone at the surface interferes to some extent with cultivation.

The subsoil is a compact loam, slightly sandy, and usually light-brown in color, though sometimes grayish brown and mottled. In some localities small pockets of fine gray sand are present, together with minute chips of drab shale. The percentage of stones is usually less than in the soil, owing to the tendency of frequent washing and cultivation to leave them exposed at the surface.

The Miami stony loam mapped south of Auburn, on both sides of Owasco Lake, is generally more sandy and as a rule a little less stony

in character than is the case with the thicker glacial deposits to the north. This type is found best developed in the northern part of the area, though it has been quite extensively mapped southeast of Auburn, in Niles Township, and southwest, in Ledyard, Venice, and Genoa townships. In the former instance it occupies the glacial hills and the well-drained intervening depressions, and in the latter the table-lands or plateaus between the parallel lakes. The glacial hills are, for the most part, long and narrow and rise in height from 20 to 200 feet above the surrounding country. Their sides are in some instances too steep for cultivation, and upon the tops of some of the narrower, steeper ones erosion has exposed the underlying glacial till. The slope of the Miami stony loam occupying the plateaus is more gentle, rendering transportation easier and cultivation less difficult.

The topography of the type, combined with the natural porosity of the soil and subsoil, insures sufficient drainage in most instances without resort to artificial means. A few depressions between the glacial hills, however, require to be ditched.

The soil is for the most part derived from the weathering of the material left behind after the retreat of the glaciers, although in the central and southern parts of the area it is probably more or less reworked and intermixed with residual soil.

Upon this type of soil nearly all of the ordinary farm crops give fair results. Among the glacial hills its use for crops requiring much cultivation is limited on account of the naturally rough topography on some of the steeper-sided drumlins, and it is here better adapted to grazing and for hay.

Corn, oats, potatoes, barley, and to some extent buckwheat, are grown upon the Miami stony loam. Grass, also, is given quite a large acreage, though the yield is not so great as upon the heavier types of soil, from 1 to 2 tons of hay being a good average. Corn produces about 35 bushels per acre under good conditions. Sixty bushels is a fair crop of oats, while potatoes yield from 50 to 150. Wheat receives comparatively little attention, though 25 bushels an acre is not an uncommon yield. Fruit does well on this type, and apples, pears, cherries, and other kinds are grown.

The following table shows the results of mechanical analyses of the fine earth of this type:

Mechanical analyses of Miami stony loam.

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P.ct.	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*
11738	2½ miles S. of Genoa.	Brown loam, 0 to 8 inches.	2.6	4.5	2.8	11.4	20.9	40.1	17.9
11736	½ mile S. of Austin ..	Brown loam, 0 to 10 inches	2.4	4.0	3.1	10.3	19.0	41.7	19.3
11407	¼ mile E. of Throop .	Brown heavy loam, 0 to 10 inches.	.5	1.9	2.6	16.8	12.0	34.0	32.1
11739	Subsoil of 11738	Yellow loam, 8 to 30 inches	2.9	4.7	3.2	11.5	18.9	40.8	17.9
11737	Subsoil of 11736	Brown loam, 10 to 36 inches.	2.4	6.5	3.6	11.1	19.0	33.0	24.4
11408	Subsoil of 11407	Light-brown clay, 10 to 36 inches.	Tr.	1.5	1.5	9.2	6.6	40.1	40.5

DUNKIRK CLAY LOAM.

The soil of the Dunkirk clay loam is a dark-brown to grayish-brown clay loam extending to a depth of 8 inches. It contains considerable silt and a small amount of fine sand, but is quite stiff and heavy, often exhibiting many cracks at the surface after rains. In many localities large stiff clods are turned up by the plow and are with much difficulty broken and crumbled by the harrow and roller. As a rule the surface is quite free from stone, although from 5 to 15 per cent is sometimes found in local spots. The subsoil is a mottled brown and gray heavy clay loam or clay. The gray mottling is usually due to small, irregularly distributed lumps of thoroughly decomposed shale. The subsoil is mostly free from stone or gravel.

With the exception of a strip of land bordering Cayuga Lake, the Dunkirk clay loam is confined to the northern third of the area surveyed. The areas are generally connected and fairly uniform, though interrupted here and there by spots of the Dunkirk clay, Meadow, and Miami stony loam. Its best development is upon the gently undulating topography occurring just south of the glacial hills, though it is also found to quite an extent in the depressions between the southernmost of these hills. Along the shore of Cayuga Lake the type has fewer depressions, but slopes, sometimes gradually, sometimes abruptly, toward the lake. The drainage in the latter-mentioned locality is nearly always good, but in the less sloping or in

depressed areas it is often necessary to resort to artificial means. On account of its heavy compact nature and the general absence of stone, the subsoil is almost impervious to water.

The Dunkirk clay loam was probably formed from a mixture of the finer sediments washed out at the front of the glacier and those brought down from the south. It is believed that these sediments were all reworked and intermixed with more or less material derived directly from weathering of the underlying limestone and shale, and deposited in pondlike depressions at the foot of the glacier during its retreat, and while it still partially blocked the way of escape of waters to the north.

The type is well adapted to the production of wheat and grass. Corn also does well, but the task of cultivation is greater than upon some of the other types. It is in demand for general farm crops, and produces good yields of nearly all crops requiring a heavy soil. Wheat yields about 25 bushels and grass from 1½ to 3 tons per acre. Timothy and clover are the grasses most extensively grown, though alfalfa has met with fair success in some localities. Grapes do well upon this type, and also peaches, where the trees are not killed by the severe winters.

The following table gives the results of mechanical analyses of the soil and subsoil of the Dunkirk clay loam:

Mechanical analyses of Dunkirk clay loam.

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
11729	5 miles SE. of Aurora	Brown clay loam, 0 to 8 inches.	2.2	2.6	2.3	10.3	17.4	36.0	29.0
11405	1 mile N. of Levanna	Clay loam, 0 to 9 inches	2.4	3.8	3.4	15.0	10.8	35.1	29.4
11730	Subsoil of 11729	Heavy clay loam, 8 to 30 inches.	1.4	3.3	2.2	8.9	14.9	36.3	32.3
11406	Subsoil of 11405	Brown clay, 9 to 36 inches	3.2	4.6	3.2	10.0	10.1	31.6	36.9

DUNKIRK LOAM.

To an average depth of 10 inches the soil of the Dunkirk loam is a light or dark-brown loam, sometimes slightly heavy and clayey. Generally, however, it contains considerable fine and very fine sand, which renders it friable, mellow, and easily cultivated. It seldom

clods under cultivation, and, as a rule, there is not enough stone present (5 to 20 per cent) to interfere with tillage.

From 10 to 20 inches the subsoil is a yellow or light-brown fine sandy loam, usually rather compact, but sometimes only moderately coherent. Below 20 inches the subsoil becomes darker in color and heavier in structure, though sometimes containing small pockets of fine sand at irregular depths. The quantity of stone rather exceeds that in the soil, and in some parts of the county it is sufficient at 18 or 20 inches to interfere seriously with boring. These stones are small in size, seldom exceeding 2 or 3 inches in diameter, while the greater proportion ranges from small gravel to a little over an inch in diameter.

The Dunkirk loam occupies a large and continuous area south of the latitude of Auburn and west of Owasco Lake, and includes the larger part of Scipio Township, as well as a number of square miles in Fleming and Ledyard townships. Only one or two small areas have been mapped east of Owasco Lake.

The topography of the type is characterized by gentle undulations, with no considerable hills or deep valleys. In Venice and Genoa townships the topography is quite similar to that of contiguous areas of the Miami stony loam, and considerable difficulty was experienced in separating the two types. In most places adequate natural drainage is secured by the rolling topography, aided by the porosity of the subsoil.

The Dunkirk loam was derived from glacial material in much the same manner as the Miami stony loam. The material, however, was more sandy in character and contained considerably less clay. It is probably in part reworked with residual soil derived from sandstone or arenaceous shale.

On account of its slightly sandy nature and the comparative ease with which it can be tilled, this is a desirable type of soil for general farm purposes. Its relative earliness in the spring, good drainage, and comparative freedom from stone make it well adapted to corn, potatoes, and most vegetables needing a friable, easily cultivated soil.

Corn, oats, potatoes, buckwheat, and barley are the principal crops. Corn yields from 30 to 50 bushels, oats 40 bushels, barley 30 to 40 bushels, and buckwheat 20 bushels or more per acre. Potatoes of good, smooth quality are produced at the rate of from 75 to 200 bushels per acre. Fruit, especially apples and pears, does well on this type.

The following table shows the results of mechanical analyses of the fine earth of the soil and subsoil of this type:

Mechanical analyses of Dunkirk loam.

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
11723	3¼ miles E. of Ledyard.	Dark-brown loam, 0 to 9 inches.	0.8	2.6	2.8	14.6	15.7	52.0	11.12
11725	3 miles E. of Aurora.	Dark-brown loam, 0 to 9 inches.	1.4	3.1	3.5	17.4	21.1	39.6	13.6
11724	Subsoil of 11723	Loam, 9 to 30 inches	1.5	4.8	4.0	16.8	16.6	43.4	12.6
11726	Subsoil of 11725	Fine sandy loam, 9 to 24 inches.	3.4	4.2	3.8	13.8	24.7	33.2	16.8

VOLUSIA LOAM.

The soil of the Volusia loam is usually a smooth, uniform loam, containing considerable silt, with a depth of 7 inches. There are often present a great many minute chips of partially decomposed shale, which, upon a rain-washed surface, give to the soil a gravelly appearance. The color is usually a yellow or light brown, though in some localities it is a dark brown, owing to the higher content of organic matter. The surface is strewn with from 20 to 75 per cent of irregular, angular, flat pieces of shale, together with a few small, rounded, glacially transported stones. The shale fragments are frequently a square foot in area and 2 or 3 inches thick, and so numerous as to afford abundant material for fences.

The subsoil is a heavy, compact loam, also quite silty, the texture of which is about the same as that of the soil, except that it contains a rather larger quantity of fine shale chips. The rock fragments of various sizes are so numerous in the subsoil that it is difficult to bore into it below 24 inches.

The Volusia loam is found to the greatest extent in the southern part of the county, where it occurs in a large and continuous area of nearly 100 square miles. It occupies a high upland plateau reaching a maximum elevation of a little over 1,800 feet. Into this the old valleys of Skaneateles and Owasco lakes and their inlets have cut to a depth of from 400 to 900 feet. The surface is gently rolling over most of the plateau, with steep sides along the western edges of Skaneateles and Owasco valleys.

The surface drainage is for the most part adequate, though in some places water runs out of the joints between the shales and forms wet areas, which are soon covered with water-loving grasses and trees. In Summer Hill Township there are a number of these hanging meadows on hillsides where the slope would ordinarily be ample for the complete drainage of all surface water.

This soil is the product of the weathering of the underlying shale and limestone, this later being mixed with a small percentage of glacial material.

The Volusia loam is adapted to most of the ordinary farm crops where the shale fragments are not so numerous as to interfere seriously with cultivation. Hay produces well, and it is recommended that dairying be more extensively developed on this type of soil. Fruit does well, and it is believed that grapes would prove a profitable crop on many of the shale-loam slopes.

Corn, barley, buckwheat, potatoes, oats, and grass are the principal crops grown. Grass is given the largest acreage, and next to this probably buckwheat. The former yields from $1\frac{1}{2}$ to $2\frac{1}{2}$ tons, while buckwheat produces from 20 to 25 bushels per acre. Potatoes average about 75 bushels; oats, 50 bushels, and barley, 30 bushels.

The following table gives the results of mechanical analyses of the fine earth of typical samples of the Volusia loam:

Mechanical analyses of Volusia loam.

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
11731	¼ mile SW. of Summer Hill.	Brown loam, 0 to 6 inches.	2.3	6.1	4.1	11.8	15.0	39.1	21.0
11733	1½ miles E. of Austin.	Yellow clay loam, 0 to 7 inches.	1.0	2.6	1.6	5.8	9.1	44.5	35.1
11732	Subsoil of 11731	Loam, 6 to 18 inches	2.4	7.4	4.6	12.1	15.5	40.8	16.8
11734	Subsoil of 11733	Clay loam, 7 to 30 inches.	1.3	4.4	2.9	8.5	11.7	44.3	26.9

DUNKIRK STONY CLAY.

The soil of the Dunkirk stony clay, to a depth of 8 or 10 inches, is a yellow or gray silty clay loam, which becomes quite compact at the surface and often exhibits sun cracks. From 10 to 20 per cent of rounded and angular stones occur in the surface foot. The greater proportion of these are small fragments ranging from one-fourth inch to 1 inch in diameter, though some as large as 3 inches in diameter are scattered through the soil mass. The subsoil to a depth of 3 feet or more is a solid, stiff mass of brown, yellowish-brown, or mottled clay, which becomes very sticky and plastic when wet. The stone content of the subsoil is greater than that of the soil.

The Dunkirk stony clay is found along the east shore of Cayuga Lake, south of Aurora, and extends into Tompkins County, where it is most typically and extensively developed. The surface is usually steeply to gently sloping, and the erosion is characterized by a series of parallel gullies and ridges which are rounded rather than angular in cross section. At the maximum elevation—about 980 feet along Cayuga Lake—the surface is rather flat and the soil deeper, the gullies gradually deepening and the soil on the intervening ridges thinning as the lake is approached at the foot of the slope.

Though there is usually sufficient slope for surface drainage, the underdrainage is retarded by the very compact nature of the subsoil, so that ditching and tiling are necessary to secure the best results. On account of the comparatively impervious character of the soil some erosion attends heavy rains.

From the uniform height at which its maximum elevation is attained and its association with gravelly delta deposits, as well as the laminated structure of the subsoil, as observed in the Tompkins County area, it is believed that the Dunkirk stony clay is an old lake sediment, the deposition of which commenced when the lake was at a much higher level than it is at present.

This is the best type of soil in the area for grapes, which do very well under the favorable climatic conditions along the immediate lake shore and for a distance of half a mile or so inland—300 or 400 feet above the level of the lake. Pears and apples also do well. Of the ordinary farm crops wheat and grass are among those most profitably grown. Wheat yields on an average from 20 to 30 bushels to the acre and hay 1½ to 3 tons. Grapes produce about 4 tons to the acre, the Concord, Niagara, and Delaware being the favorite varieties.

The following table gives the results of mechanical analyses of the fine earth of the soil and subsoil of this type:

Mechanical analyses of Dunkirk stony clay.

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
11721	½ mile E. of Atwater.	Yellow silty clay, 0 to 10 inches.	2.1	4.6	2.6	10.4	13.8	41.8	24.6
11722	Subsoil of 11721.....	Yellow clay, 10 to 30 inches.	3.0	5.1	2.7	8.5	10.1	35.3	35.1

DUNKIRK CLAY.

The soil of the Dunkirk clay is a heavy, brownish-gray clay loam extending to a depth of 9 inches. It is quite close and compact, and is not easily cultivated. The soil does not dry out until late in the spring, and early plowing always results in the formation of troublesome clods. There is seldom any stone at the surface or in the subsoil, except in a few instances where it borders the Miami stony loam. The subsoil, to a depth of 36 inches, is a uniformly mottled gray, brown, and yellow clay. In a few instances quicksand has been observed at a depth of 20 inches or more.

The Dunkirk clay is confined almost entirely to the northern third of the area surveyed, though a few spots occur irregularly in other parts of the county. It occupies flat or only slightly undulating positions, and is generally found in depressions occurring in areas of the Dunkirk clay loam or the Miami stony loam, and along the margins of swamps. It is necessary to resort to artificial means to secure drainage of this type, and this is often difficult, for the fall to natural outlets is usually slight.

This soil is derived from the finer sediments which have been washed down from the surrounding upland and deposited under water.

The Dunkirk clay, on account of its inadequate drainage, the impossibility of preparing it for early spring crops, and the difficulties of tillage, is best adapted to grass, and it is to this crop that the areas of this type are principally devoted. Hay yields from 2 to 3 tons to the acre. Corn is grown to some extent upon the highest, best drained portions of the type, and produces from 20 to 40 bushels per acre.

The following table shows the results of mechanical analyses of typical samples of the Dunkirk clay:

Mechanical analyses of Dunkirk clay.

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
11717	½ mile N. of Moravia.	Brown clay loam, 0 to 7 inches.	0.3	1.0	0.8	3.5	3.8	59.8	30.7
11719	½ mile SE. of Throopsville.	Heavy clay loam, 0 to 8 inches.	2.1	4.3	2.5	9.7	7.9	39.3	34.0
11718	Subsoil of 11717	Mottled clay, 7 to 36 inches.	.0	.2	.2	1.4	6.9	54.3	36.9
11720	Subsoil of 11719	Brown heavy clay, 8 to 36 inches.	.7	2.2	2.1	8.3	8.1	37.0	41.2

DUNKIRK GRAVELLY LOAM.

To a depth of 10 inches the soil of the Dunkirk gravelly loam is a dark-brown loam, containing from 20 to 50 per cent of rounded glacial gravel from one-fourth of an inch to 3 inches in diameter. The soil is mellow and easily tilled, the stones seldom being large or numerous enough to offer much resistance to the plow or cultivator. The subsoil to 36 inches is a heavier brown loam, containing from 30 to 60 per cent of gravel, so that boring below 20 inches is usually impossible.

This type of soil has been mapped in but two places in the area—one a mile northeast of Moravia, and the other south of Locke. It occupies distinct and nearly flat-topped terraces, having a depth of about 100 feet to the beds of the streams which have formed them. There is sufficient surface slope, combined with the open, porous condition of the subsoil, to furnish adequate natural drainage.

This soil is derived from glacial and residual material brought down by the confluent streams and deposited at their junction. The soil thus formed is added to by more or less wash direct from the adjacent upland. This work of deposition was in progress long ago, when the streams were at a much higher level, and is going on to a less extent at the present time.

When the seasons are not too dry this type is particularly well adapted to corn, and it should also prove an excellent soil for grapes and small fruit. Corn yields from 50 to 70 bushels, and oats about 50 bushels per acre.

The following table gives the results of mechanical analyses of the fine earth of both soil and subsoil of this type:

Mechanical analyses of Dunkirk gravelly loam.

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
11752	1¼ miles NE. of Moravia.	Brown loam, 0 to 10 inches.	7.1	9.2	4.6	10.0	8.5	39.3	21.1
11753	Subsoil of 11752.....	Brown loam, 10 to 30 inches.	7.2	9.3	5.6	13.6	10.1	36.5	17.6

MIAMI FINE SAND.

The Miami fine sand as mapped in this area varies somewhat in topography, soil structure, and drainage features, according to its location.

On the rolling hills and where the topography is rough and broken, the soil, to an average depth of about 12 inches, consists of a yellowish-brown fine sand, usually loose and mellow, and inclined to be incoherent, though in some instances in the depressions it may be somewhat loamy, but never compact. The underlying subsoil is a fine incoherent orange sand to a depth of 3 feet or more. Seldom any stone is found in either soil or subsoil. Owing to the natural porosity of both soil and subsoil and the rolling topography of such areas artificial drainage is seldom necessary.

Another phase of the type in the glacial hill country in the northern part of the area occupies flat and only slightly rolling areas, usually along the margins of swamps or streams. Here the soil to a depth of 10 inches is a brown fine sandy loam, somewhat silty in texture, and free from stone and gravel. The subsoil is a yellowish or grayish fine sand, which at about 18 inches usually becomes quite compact and resembles a hardpan. This condition persists for from 4 to 10 inches, and is succeeded by a fine incoherent yellow sand partaking in some localities of the characteristics of a quicksand. In these low-lying areas the natural drainage is not sufficient for the needs of most crops. The mechanical difficulties of excavation are not great, however, and the work of ditching where there is enough fall is less expensive than upon many of the other types of soil.

The Miami fine sand is of glacial origin, the soil being formed

as the result of deposition. In the low flat areas the soil is derived from the materials deposited by streams and glacial waters, and to the assorting power of stream action is due the uniform texture of the soil.

The type as a whole is not well adapted to general farming like some of the heavier soils. Its best usefulness has been found in the growing of the early special crops and vegetables. It is not much used for the ordinary farm crops, but near Auburn it is used to some extent for market gardening. A considerable portion of the hilly phase of the type northeast of Auburn is still in forest, the growth being principally beech and maple. The low-lying areas are devoted largely to grazing and to the production of hay, but if well drained would be suited to corn, potatoes, and garden vegetables.

The following table gives the results of mechanical analyses of typical samples of both soil and subsoil of the Miami fine sand:

Mechanical analyses of Miami fine sand.

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
11744	1 mile W. of Auburn.	Brown fine sand, 0 to 12 inches.	0.1	1.1	4.8	58.4	24.7	6.3	4.5
11742	3 miles E. of Auburn.	Brown fine sand, 0 to 8 inches.	.1	1.5	4.8	58.0	24.6	5.6	5.3
11748	1 mile SE. of Throopsville.	Fine sandy loam, 0 to 15 inches.	.3	.6	.8	38.9	36.4	16.9	5.8
11746	2 miles SE. of Auburn	Fine sandy loam, 0 to 12 inches.	1.2	2.7	3.8	31.2	36.0	14.4	10.4
11743	Subsoil of 11742	Fine sand, 8 to 36 inches.	.1	.9	3.6	66.6	25.1	1.6	2.1
11749	Subsoil of 11748	Fine sand, 15 to 36 inches.	.3	.9	.7	60.5	28.5	5.8	3.0
11745	Subsoil of 11744	Fine sand, 12 to 36 inches.	.1	.9	2.9	37.9	33.8	16.9	7.3
11747	Subsoil of 11746	Fine sandy loam, 12 to 36 inches.	.3	1.6	3.1	38.3	30.6	17.9	8.1

MIAMI LOAM.

The soil of the Miami loam is a deep, rich, dark-brown loam, almost a silt loam, extending to an average depth of about 12 inches. Though generally of a pronounced silty character, it contains enough fine and very fine sand to render it mellow and easy to work. In some localities both the soil and subsoil contain quite a large percentage of rounded and angular stone and gravel, enough in places to hinder proper tillage. This condition is most conspicuously seen where the type joins the Volusia loam.

The subsoil is a heavier silt loam, though never as compact as in the case of the upland types, and the color is usually somewhat lighter and not infrequently mottled. In the gravelly phase of the type the gravel is more abundant in the subsoil than in the surface foot.

The Miami loam is sparingly distributed along many of the streams in different parts of the area. It occurs principally along Owasco Outlet, Dutch Hollow Brook, and Owasco Inlet, occupying flat positions only a few feet above the beds of the streams, and as a consequence the natural drainage is not very good. Drainage conditions are favored, however, by the natural porosity of the subsoil, but it is usually necessary to dig ditches through these areas to secure the best results. Many of these bottoms are overflowed as often as once a year.

The soil is alluvial in origin, being derived from the sediments brought down and deposited by the streams in times of freshet. The stony phases of the type are caused by the short, rapid, lateral streams bringing down relatively large quantities of shale and glacial gravel from the adjacent hillsides.

Much of this type of soil is available for the growing of corn, hay, and potatoes, to which crops it is well adapted, while the less well-drained portions can be profitably used for pasture. Corn produces from 40 to 50 bushels, and grass from 1 to 2 tons per acre.

The following table gives the results of mechanical analyses of the fine earth of the soil and subsoil of the Miami loam:

Mechanical analyses of Miami loam.

No.	Locality	Description.	Fine gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
11750	1¼ miles NE. of Fosterville.	Dark-brown loam, 0 to 12 inches.	0.0	0.6	0.8	11.5	20.1	53.6	13.3
11754	½ mile S. of Moravia.	Brown to black loam, 0 to 12 inches.	2.7	2.7	1.3	5.2	10.7	50.9	26.0
11751	Subsoil of 11750	Dark-brown loam, 12 to 36 inches.	.1	.9	1.2	8.7	18.0	51.0	19.7
11755	Subsoil of 11754	Brown loam, 12 to 36 inches.	1.9	4.0	2.2	7.1	8.9	52.0	23.9

MUCK.

The Muck, to a depth of 12 inches or more, is a black fine-grained loam, consisting of a large amount of organic matter mixed with a small amount of fine sand and silt. Where a subsoil exists it usually consists of gray clay or fine sand, or a mixture of both.

While there is a thin covering of mucky soil in many of the areas mapped as Meadow, especially in the northern part of the survey, it was only where the Muck had a depth of at least 1 foot that it was believed to have a sufficiently distinct agricultural value to warrant its recognition as a soil type. The larger areas are located in Summer Hill and Sempronius townships; smaller ones were mapped in Sennett and Throop townships.

The Muck occupies low, flat positions along streams and in swamps where there is not sufficient fall to secure drainage under natural conditions. It is formed by the decay under moist conditions of large quantities of vegetable matter constantly accumulating in these depressions. This rotting vegetation is mixed with a small amount of fine sand and silt deposited in times of high water and drifted into the swamps upon the winds.

When well drained the Muck is a very desirable soil for the production of potatoes, onions, celery, cabbage, etc. Most of the Muck mapped is in forest. A small portion has been cleared and is used for pasturage, but none is under cultivation.

MEADOW.

There is no definite character to the soil or subsoil of Meadow, it being as a rule an indiscriminate mixture of blue and yellow clay and gray sand, which is sometimes covered with a few inches of Muck. Meadow is represented in all parts of the area surveyed, but is most extensively found in the northern part where it occupies the depressions between the glacial hills, and on the flat lands along many of the small streams. Most of this type is covered with willow, tamarack, and other water-loving trees, or with coarse, rank grasses. Much of the soil is amenable to drainage, and might be fitted for grass land at some expense. In localities where there is a covering of Muck the higher areas, when freely drained, are often well adapted to celery, onions, cabbage, and other vegetables.

AGRICULTURAL METHODS.

The agricultural methods in the Auburn area do not differ materially from those in use in many other Northern States where a fairly intensive system of farming is practiced. Deep plowing is the rule, and the land is thoroughly tilled. The land roller is a common

implement on all farms, and on many it is a necessity. Great care is taken that all clods are thoroughly pulverized by the roller and harrow. This, in the case of some of the heavier soils, like the Dunkirk clay, requires the expenditure of considerable time and labor, especially when, as not infrequently happens, a late spring forces the farmer to plow for early crops while the soil is still too wet. The disk harrow is coming into very general use, except upon the farms covered with stone and flat shale, where the spring or spike tooth harrow takes its place. Sulky plows and harrows are rarely seen, though corn is worked with a riding wheeled cultivator. The old style walking plow is in general use, and the wide and deep furrow turned by it requires the use of three strong horses. The corn is cut and shocked by hand. Upon the dairy farms much of the corn is planted in drills and cut green with the corn binder, after which it is drawn to the silo and either cut or shredded by power machinery. Not all of the dairy farms, however, feed silage, owing to a difference of opinion as to the economic value of this method of feeding.

Wherever the topography and character of the surface will permit, the self-binder is used for wheat and oats, and also for barley if the straw is long enough. With the hay and large dairy farmers the piece of machinery next in importance to the mower and rake is the hay tedder, which is in very common use in the central and southern parts of the area. Nearly all of the farmers employ horse forks in unloading in the barn, and the hay loader is sometimes used in the field. Some farmers have several hundred dollars invested in machinery of this class, which, with few exceptions, is well cared for and housed from the weather when not in use.

AGRICULTURAL CONDITIONS.

In general, the farmers of the Auburn area are prospering, as evidenced by well-kept farms, substantial and attractive dwellings, and large and well-ventilated barns suited to the needs of the dairy and grain farmer. Silos and windmills are found on nearly all of the better farms. Well-ordered and closely trimmed lawns are quite often seen around the farmhouses, and special care is also given to the appearance of the highways. The weatherbeaten and unstable board fencing is fast disappearing, and in many instances the roadsides are bordered by fruit trees of various kinds, or by maple, elm, and other shade trees. In some sections of Cayuga County the fences are built of stone, while in others hedges of locust, osage orange, etc., are planted. The fence rows are for the most part kept free of briers and weeds.

The principal exceptions to these evidences of general prosperity are noted in parts of the townships of Sempronius and Summer Hill, where the fences and fields are not so well cared for and where many abandoned farmhouses are seen. This is no doubt due in part to the hindrances to cultivation offered by a very stony and less productive soil, and also to the fact that upon these farms there is more or less waste land in the form of sloping marshy meadows difficult of drainage. Owing to these natural disadvantages and the difficulties in the way of diversified farming, as well as to the extension of the dairying industry, the smaller farms are being gradually absorbed by the more thrifty and provident farmers, who have little use for the smaller dwellings except as storerooms.

From 60 to 70 per cent of the farmers of the area own their farms, about 20 per cent are share tenants, and the remainder are cash tenants and part owners. It is believed that the tenant class is gradually decreasing, a condition decidedly conducive to the increase of farm values, because of the more careful cultivation and fertilization which the farms receive from their owners than from tenants.

The farms range in size from 20 to 300 acres, the average for the county being 81 acres. Aside from the fruit and vegetable farms near Auburn, this acreage per farm is increasing, which is in part due to the demand for more land by the dairy farmers. On the other hand, as the farmers have come to realize the impossibility of competing with the West there has been a gradual decrease in the production of cereals, with a corresponding tendency toward a decrease in acreage.

For many years there has been a great scarcity of labor, and consequently wages are high. The young men have drifted to the cities to find more congenial employment, their places on the farms being supplied to some extent by laborers of an inferior class and by foreigners ignorant of American customs and methods of agriculture. This results in the farmer doing as much of his own work as possible, assisted in many instances by his wife and children. Laborers employed by the month are paid on an average about $25, with board. Much of the labor during the summer season, however, is hired by the day, a wage of from $1.50 to $2 or more being paid.

Dairying and hay and fruit growing have for a long time been the specialties of the Cayuga County farmer. Each little settlement supports a skimming station, and there are several creameries in the area. Along the line of the Lehigh and New York branch of the Lehigh Valley Railroad a great deal of milk is shipped direct to Philadelphia in refrigerated milk cars.

Timothy and timothy with clover are extensively grown and give fair yields, though the quality in some sections of the area is seriously affected by the presence of daisies and Canada thistles. A large proportion of the crop is baled and sold soon after cutting, $10 a ton being a fair average price. Barley and oats are profitable crops and yield well. The acreage of corn, except for silage, is being reduced, and this, as well as wheat, is becoming only a secondary crop. Cayuga County is one of the largest producers of buckwheat in the United States, and in point of yield per acre stands second. Vegetables are not extensively grown, except partially to supply the later home market. The culture of fruits, especially apples, pears, plums, and cherries, is an important industry. The apples are noted for their good color, fine flavor, and keeping quality, and in years of normal production give a fair profit. Grapes are grown comparatively little, except along the shore of Cayuga Lake. Peaches are grown along the lake to some extent, and the quality is excellent, but the winters are rather too severe for their profitable production. Irish potatoes yield well, and when grown upon the lighter soils, such as the Dunkirk loam, are up to the average in appearance and keeping qualities.

The adaptation of soils to crops is pretty well understood by the farmers. The heavier soils are generally selected for grass, and the most extensive areas of hay are to be seen in the townships of Sempronius and Summer Hill, where the largest bodies of the Volusia loam were mapped. The silty Volusia loam has also proved admirably adapted to buckwheat. Grape culture is almost entirely confined to the heavy Dunkirk stony clay along the eastern shore of Cayuga Lake. Apples also find their best development upon the heavier types of soil, little difference being shown in quality and yield as between the Dunkirk stony clay, Dunkirk clay loam, and Miami stony loam. The earliest market vegetables are grown upon the Miami fine sand. The extension of market gardening is advised. Excellent stands of alfalfa have been profitably grown upon the Dunkirk clay loam, and it is believed that it would do even better upon some of the lighter types of soil. It is an invaluable crop for the dairyman, and should be thoroughly tried on the Dunkirk loam. Beets for cattle feeding have given excellent satisfaction upon some of the lighter upland and bottom soils in the southern part of the county, and their cultivation might be profitably extended. In connection with dairying, poultry raising is receiving considerable attention in the central and southern parts of the area, the White Leghorn being the favorite breed.

Transportation facilities within the area are furinshed by the Auburn branch of the New York Central Railroad, which connects with

the main line at Syracuse and at Rochester. The distance from Auburn to Syracuse is 26 miles, and to Rochester 77 miles. A branch of the Lehigh Valley Railroad traverses the county from north to south, making direct connections for Philadelphia, which is about twelve hours' run from Auburn. Another branch of the same road is built along the eastern shore of Cayuga Lake from Auburn to Ithaca, where connection is made with the main line. Auburn is also connected with Syracuse by electric cars, which carry express as well as passengers. During the summer months there is considerable passenger traffic by steamer on Skaneateles, Owasco, and Cayuga lakes. The last is 40 miles long, extending from Cayuga to Ithaca, and besides passengers the steamers carry a certain amount of freight.

There is only a limited home demand for the products of the area, the greater part being shipped to New York City, Boston, Philadelphia, and southward. It is a little over 300 miles from Auburn to New York City, about 325 to Boston, and about 375 to Philadelphia. The facilities for the quick handling of perishable products, and their speedy transportation to these large markets, are exceptionally good. There is without question opportunity for a considerable extension of vegetable growing for local consumption, though with the exception of such crops as celery, late cabbage, and potatoes, it is doubtful if vegetables could be profitably grown in competition with the products of the trucking sections of the Atlantic seaboard.

Auburn is a busy manufacturing city of 40,000 inhabitants, and is noted for its beautifully shaded streets and elegant homes. Fair wages are paid in most of the factories, and there is a good local demand for the best that the farm and garden afford.

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